GW - __028__

2018
AGWMR
(2 of 3)

2019

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/08/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 3366 ft. Lat: 32.7547° N Lon: -104.3835° W

Station: **ARTESIA 6 S, NM US USC00290600**

Observation Time Temperature: 0730 Observation Time Precipitation: 0730

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Observation	24 Hour Amounts Ending at Observation Time				At Obs. Time			4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2018	04	01	84	38	47	0.00		0.0		0.0		0.30	5	57	56			
2018	04	02	86	42	43	0.00		0.0		0.0		0.46	5	59	57			
2018	04	03	82	43	55	0.00		0.0		0.0		0.50	5	58	56			
2018	04	04	83	36	36	0.00		0.0		0.0		0.26	5	57	55			
2018	04	05	65	35	42	0.00		0.0		0.0		0.40	5	57	55			
2018	04	06	85	42	45	0.00		0.0		0.0		0.33	5	58	56			
2018	04	07	82	33	34	0.00		0.0		0.0		0.54	5	58	56			
2018	04	08	62	34	40	0.00		0.0		0.0		0.35	5	57	55			
2018	04	09	93	40	44	0.00		0.0		0.0		0.52	5	58	57			
2018	04	10	80	42	44	0.00		0.0		0.0		0.43	5	60	58			
2018	04	11	74	42	46	0.00		0.0		0.0		0.45	5	59	58			
2018	04	12	91	46	62	0.00		0.0		0.0		0.57	5	60	59			
2018	04	13	89	60	60	0.00		0.0		0.0		0.92	5	64	61			
2018	04	14	66	34	34	0.00		0.0		0.0		0.49	5	62	57			
2018	04	15	66	32	33	0.00		0.0		0.0		0.42	5	62	57			
2018	04	16	76	33	35	0.00		0.0		0.0		0.47	5	61	57			
2018	04	17	86	35	66	0.00		0.0		0.0		0.34	5	61	58			
2018	04	18	87	42	45	0.00		0.0		0.0		0.91	5	62	59			
2018	04	19	73	43	45	0.00		0.0		0.0		0.48	5	62	58			
2018	04	20	76	45	55	0.00		0.0		0.0		0.64	5	61	58			
2018	04	21	84	44	45	0.00		0.0		0.0		0.63	5	61	58			
2018	04	22	76	40	42	0.00		0.0		0.0		0.40	5	61	58			
2018	04	23	71	41	43	0.00		0.0		0.0		0.38	5	59	58			
2018	04	24	85	42	48	0.00		0.0		0.0		0.47	5	59	58			
2018	04	25	94	43	43	0.00		0.0		0.0		0.49	5	63	60			
2018	04	26	65	38	43	0.00		0.0		0.0		0.07	5	62	59			
2018	04	27	86	40	44	0.00		0.0		0.0		0.48	5	62	59			
2018	04	28	74	44	49	0.00		0.0		0.0		0.42	5	62	59			
2018	04	29	84	49	58	0.00		0.0		0.0		0.54	5	61	61			
2018	04	30	89	55	55	0.00		0.0		0.0		0.56	5	63	62			
		Summary	80	41		0.00		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests.

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

April 12, 2018

Ms. Julie Speer, P.G., EIT
Associate Project Manager
TRC
505 East Huntland Drive, Suite 250
Austin, Texas 78752

Subject: April 2018 (Non-Biennial Spring) Groundwater Monitoring
Sitewide Gauging, April 3, 2018
Groundwater Sampling, April 2-5, 2018
Navajo Refining Company, Artesia, New Mexico

Dear Ms. Speer:

This document summarizes groundwater monitoring field activities conducted by Hydrologic Monitoring, LLC (HMI) on behalf of TRC at the Navajo Refining Company, Artesia Refinery, Artesia, New Mexico.

Contents

Field Activities Narrative
Table 1: (Gauging Data, Groundwater Field Parameters, Well Inspections, & Analytical Program)
Groundwater Sampling SOP Memo
Groundwater Sampling Forms and Field Instrument Calibration Log
(provided in three emails, with wells in geographic-based order, per Table 1)
Chain-of-Custody Forms (provided in one email)

Field Activities Narrative

1. HMI conducted the *April 2018 (Spring - Non-Biennial) Groundwater Monitoring Event* (including only the "A" and "SA" designations on the attached scoping table for the Navajo Refinery in Artesia, New Mexico. Sitewide gauging was conducted April 3, 2018. Groundwater sampling (160 wells sampled) was conducted April 2-5, 2018. Per TRC, five wells changed sampling frequencies from semiannual to annual, first effective in 2H17 (MW-56, MW-77, MW-93, MW-107, and MW-129).

2. Groundwater sampling was conducted in accordance with the Site Sampling and Analysis Plan, EPA guidance, and the attached Memorandum - Low-Flow Groundwater Monitoring Standard Operating Procedures, Navajo Refining Co. - Artesia, New Mexico. Per regulatory request, if measured LNAPL thickness was *less than* 0.03 feet, in any well scheduled for groundwater sampling, the LNAPL was removed, and the well was sampled. And if LNAPL thickness was equal to, or greater than 0.03 feet in any well scheduled for sampling, the well was not sampled. Gauging data, groundwater field parameters, and well inspection information is summarized in Table 1. Samples were shipped overnight FedEx to ESC Lab Sciences, Mt. Juliet, TN. The groundwater sampling process is documented on the attached groundwater sampling forms.

3. Field QA/QC Sampling (per Refinery Area):

   <u>Evaporation Ponds</u>
   Duplicates:
   Dup-EP-01 at MW-7A
   Dup-EP-02 at MW-22A
   Dup-EP-03 at MW-3
   Equipment Blanks:
   EB-EP-01 collected over decontaminated gauging probe after sampling at MW-74
   EB-EP-02 collected over decontaminated gauging probe after sampling at MW-124
   EB-EP-03 collected over decontaminated gauging probe after sampling at MW-5A
   EB-EP-04 collected over decontaminated gauging probe after sampling at MW-79
   Trip Blank-EP-01
   Trip Blank-EP-02
   Trip Blank-EP-03

   <u>NCL</u>
   Duplicate:
   Dup-NCL-01 at NCL-49
   Equipment Blank:
   EB-NCL-01 collected over decontaminated gauging probe after sampling at NCL-32
   Trip Blank-NCL-01

TEL
Duplicate:
Dup-TEL-01 at TEL-4
Equipment Blank:
EB-TEL-01 collected over decontaminated gauging probe after sampling at TEL-3
Trip Blank-TEL-01

TMD
Trip Blank-TMD-01

REST ("rest" of the site)
Duplicates:
Dup-REST-01 at MW-113
Dup-REST-02 at MW-104
Dup-REST-03 at MW-134
Dup-REST-04 at MW-60
Dup-REST-05 at KWB-12B
Equipment Blanks:
EB-REST-01 collected over decontaminated gauging probe after sampling at MW-113
EB-REST-02 collected over decontaminated gauging probe after sampling at MW-104
EB-REST-03 collected over decontaminated gauging probe after sampling at MW-134
EB-REST-04 collected over decontaminated gauging probe after sampling at MW-60
EB-REST-05 collected over decontaminated gauging probe after sampling at KWB-12B
Trip Blank-REST-01
Trip Blank-REST-02
Trip Blank-REST-03
Trip Blank-REST-04

4. Notes:
1H18 – At badge reactivation, HMI was told of "LPS" approx. 30-minute class that is additionally-required – register/pay through the Wyoming-Montana Safety Council, to which HollyFrontier-Artesia Refinery belongs (GDS photo of wall notice); with Wyoming-Montana registration as outlined above, the class can be taken daily each morning, in the safety trailer, taught by Artesia safety trailer rep, 1H18 (HMI will also investigate this training's availability at HASC).
Beginning 2H17, "24HFNAV HOLLYFRONTIER SITE SPECIFIC ORIENTATION ARTESIA-NM" is taken annually (December cycle) by HMI at HASC, per Navajo.
HMI's DISA 2-yr backgound check/drug/alcohol requirements were approved by onsite safety-trailer personnel on 10-3-17, as reported through HASC system.
Per Navajo, purgewater is disposed in the pad sump, inside, and to the left of the Main Gate entrance. Alternately, North Bundle Pad sump, as previously (fenced area of drums, etc.), notifying FCC control room for entrance.
Sitewide well and gate lock combinations are "2013" (less often "2002").
With suggested telephone notification, FedEx pickup from locked shed (35-25-39 combination) no earlier than approximately 14:00 daily, across from Artesia Wool Co (access area from "inside" Refinery).
North side of Hwy 82, east of site, gate with cable and combination lock (8810).

POTW bldg, check-in as needed, to borrow a key or get gate unlocked.
Navajo's Mr. Robert Combs or Mr. Richard Orosco for daily permits, per team member.
Navajo-well locks were fully-deployed as possible, in 2H16, with four locks added 1H18.
Navajo is making well surface completion upgrades as needed, in a phased-approach.
HMI's well inspections are documented on respective well gauging and sampling forms (and are summarized in Table 1). Well inspection items of potential concern (i.e., "Issues") are highlighted in yellow-color in Table 1.

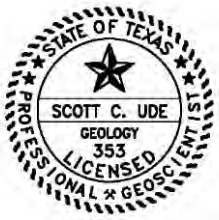
HMI appreciates the opportunity to assist TRC with this project. If you have any questions or would like additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude

Scott C. Ude, P.G.



The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on April 12, 2018.

Attachments

cc: Bryan Gilbert, P.G., TRC-Austin

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-6A	Monitoring	M/R	1	EP	3-Apr	14:35	NA	12.68	0.00	19.04	5-Apr	9:30	7.50	16.6	4,210	1.3	-82.8	3.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-6B	Monitoring	M/R		EP	3-Apr	14:40	NA	12.56	0.00	52.27										Yes	Closure	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-85	Monitoring	M/R		EP	3-Apr	17:00	10.11	11.81	1.70	20.34			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-86	Monitoring	M/R		EP	3-Apr	17:20	9.94	10.40	0.46	19.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-120	Monitoring	M/R	2	EP	3-Apr	14:45	NA	12.55	0.00	28.00	5-Apr	10:15	7.32	15.8	7,780	0.8	-122.5	3.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-121	Monitoring	M/R	3	EP	3-Apr	14:50	NA	13.02	0.00	27.31	5-Apr	11:00	7.33	16.5	5,520	1.5	-22.7	7.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-84	Monitoring	M/R	4	EP	3-Apr	15:35	NA	10.01	0.00	20.56	4-Apr	14:10	7.01	19.4	9,530	1.1	-111.9	3.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-122	Monitoring	M/R	5	EP	3-Apr	15:00	NA	10.74	0.00	23.32	5-Apr	9:20	7.22	17.8	6,450	1.0	-116.5	9.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-81	Monitoring	M/R	6	EP	3-Apr	15:05	NA	11.08	0.00	18.62	4-Apr	14:55	7.37	18.8	7,010	2.5	-101.5	5.0	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-80	Monitoring	M/R	7	EP	3-Apr	15:10	NA	9.21	0.00	19.69	4-Apr	15:40	7.46	17.8	8,980	1.5	-122.5	6.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-79	Monitoring	M/R	8	EP	3-Apr	15:20	NA	10.30	0.00	19.24	4-Apr	16:25	6.76	18.1	6,970	1.3	-27.5	7.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-82	Monitoring	M/R	9	EP	3-Apr	15:30	NA	9.79	0.00	20.01	4-Apr	13:25	7.47	20.0	6,930	1.0	-76.6	5.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-74	Monitoring	M/R	10	EP	3-Apr	15:45	NA	9.36	0.00	20.19	4-Apr	9:25	6.80	16.8	10,210	1.5	14.8	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-73	Monitoring	M/R	11	EP	3-Apr	15:55	NA	9.52	0.00	19.60	4-Apr	8:40	7.60	15.3	10,860	1.1	45.7	9.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-2A	Monitoring	M/R	12	EP	3-Apr	16:35	NA	10.88	0.00	17.30	5-Apr	10:05	7.06	18.1	20,500	1.1	-117.3	8.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-2B	Monitoring	M/R		EP	3-Apr	16:40	NA	11.61	0.00	52.00			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-72	Monitoring	M/R	13	EP	3-Apr	16:30	NA	7.60	0.00	13.92	4-Apr	17:10	7.33	17.9	12,120	0.9	32.5	7.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-6	Monitoring	M/R	14	EP	3-Apr	16:20	NA	11.01	0.00	26.69	4-Apr	17:55	7.02	19.7	14,120	1.1	-59.8	9.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7AR	Monitoring	M/R	15	EP	3-Apr	16:10	NA	9.97	0.00	21.28	4-Apr	18:40	6.95	19.6	12,020	1.1	-110.6	4.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7B	Monitoring	M/R		EP	3-Apr	16:15	NA	9.80	0.00	56.85										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-7C	Monitoring	M/R		EP	3-Apr	16:20	NA	9.38	0.00	71.95			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
RW-#15C [e]	Recovery [d]	M/R	16	REST	3-Apr	9:03	NA	16.58	0.00	22.30	5-Apr	8:40	6.73	23.0	3,260	0.7	-251.8	5.3	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-48	Monitoring	M/R	17	REST	3-Apr	9:00	NA	18.74	0.00	32.00	5-Apr	9:55	6.80	24.5	4,070	0.8	-336.3	8.1	Clear	Yes	Yes	Issue	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-130	Monitoring	M/R	18	REST	3-Apr	9:07	NA	20.43	0.00	45.00	5-Apr	9:55	6.79	21.5	2,978	1.1	102.8	6.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-4	Monitoring	RLR		REST	3-Apr	9:10	24.60	24.97	0.37	41.75			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-19	Recovery [d]	RLR		REST	3-Apr	9:13	24.83	25.06	0.23	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-76	Monitoring	SCD	19	EP	3-Apr	18:30	NA	11.10	0.00	20.33	4-Apr	10:55	6.94	18.3	6,130	1.5	-117.5	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-77	Monitoring	SCD	20	EP	3-Apr	17:45	NA	9.40	0.00	20.52	3-Apr	18:10	6.98	20.6	8,220	2.7	-73.7	7.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-78	Monitoring	SCD	21	EP	3-Apr	18:33	NA	11.41	0.00	19.57	4-Apr	10:10	7.07	17.4	4,840	2.1	38.9	4.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-75	Monitoring	SCD	22	EP	3-Apr	17:00	NA	9.55	0.00	23.74	3-Apr	17:25	7.19	20.9	7,820	1.4	-82.3	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-83	Monitoring	SCD	23	EP	3-Apr	18:37	NA	9.40	0.00	19.91	4-Apr	11:40	6.96	18.9	5,230	1.6	-152.3	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-3	Monitoring	SCD	24	EP	3-Apr	18:40	NA	11.43	0.00	22.10	4-Apr	12:25	7.15	18.8	6,110	1.2	-29.9	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-88	Monitoring	SCD	25	EP	3-Apr	9:50	NA	8.83	0.00	20.31	3-Apr	10:15	6.71	20.9	6,730	1.1	-145.6	8.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-22A	Monitoring	SCD	26	EP	3-Apr	10:35	NA	8.13	0.00	22.65	3-Apr	11:00	6.94	20.0	7,310	1.3	-78.1	8.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-22B	Monitoring	SCD		EP	3-Apr	11:35	NA	8.01	0.00	54.66										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-10	Monitoring	SCD	27	EP	3-Apr	11:40	NA	5.57	0.00	18.45	3-Apr	12:05	7.10	21.5	5,920	1.4	-43.8	5.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-123	Monitoring	SCD	28	EP	3-Apr	12:25	NA	5.92	0.00	25.71	3-Apr	12:50	7.17	20.7	6,480	1.4	-60.1	9.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4A	Monitoring	SCD	29	EP	3-Apr	16:15	NA	11.58	0.00	16.55	3-Apr	16:40	7.33	21.5	6,090	2.5	-159.2	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4B	Monitoring	SCD		EP	3-Apr	16:10	NA	11.32	0.00	72.37										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5A	Monitoring	SCD	30	EP	3-Apr	15:10	NA	8.57	0.00	20.15	3-Apr	15:35	7.25	20.5	13,650	1.5	-148.9	8.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-5B	Monitoring	SCD		EP	3-Apr	16:00	NA	8.79	0.00	53.54										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5C	Monitoring	SCD		EP	3-Apr	16:03	NA	8.99	0.00	71.64										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-7A	Monitoring	SCD	31	EP	3-Apr	13:10	NA	9.48	0.00	18.65	3-Apr	13:35	7.23	19.8	8,580	1.3	-103.5	9.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-7B	Monitoring	SCD		EP	3-Apr	14:10	NA	9.26	0.00	52.56										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-8A	Monitoring	SCD	32	EP	3-Apr	14:20	NA	9.06	0.00	20.74	3-Apr	14:45	6.96	20.1	11,010	1.3	-153.9	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
OCD-8B	Monitoring	SCD		EP	3-Apr	15:00	NA	9.15	0.00	56.65										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
KWB-P4	Monitoring	BRH		REST																					B	B	B	-	B	-	-	-	-	-	-
MW-25	Monitoring	BRH	33	TMD	3-Apr	11:05	NA	13.89	0.00	28.18	4-Apr	12:00	7.01	19.2	5,830	0.6	44.7	2.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-8	Monitoring	BRH		TMD	3-Apr	10:55	NA	12.82	0.00	>14.95	(blockage)		Not in sampling program; Navajo added PVC riser in 1H18							Yes	Issue	Yes	Yes		SA	Not in samp prgm; gauged to top of protective steel casing										
MW-1R	Monitoring	BRH	34	EP	3-Apr	11:15	NA	11.10	0.00	20.63	4-Apr	12:45	6.84	17.3	8,670	0.5	-112.3	1.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-15	Monitoring	BRH	35	EP	3-Apr	11:25	NA	12.09	0.00	21.70	4-Apr	13:30	6.79	18.8	4,810	0.6	28.3	6.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-1R	Monitoring	BRH	36	EP	3-Apr	9:25	NA	12.27	0.00	23.73	4-Apr	14:20	6.90	18.2	9,040	0.6	50.9	2.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-2A	Monitoring	BRH	37	EP	3-Apr	9:45	NA	12.48	0.00	27.58	4-Apr	15:05	7.06	18.4	5,050	1.0	-17.3	36.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-2B	Monitoring	BRH		EP	3-Apr	9:40	NA	11.72	0.00	50.39			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program										
OCD-3	Monitoring	BRH	38	EP	3-Apr	10:10	NA	12.83	0.00	25.20	4-Apr	15:50	6.70	18.6	7,560	0.5	7.5	23.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-4	Monitoring	BRH	39	EP	3-Apr	10:20	NA	12.33	0.00	25.42	4-Apr	16:35	6.77	18.8	3,380	1.0	41.8	9.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-11A	Monitoring	BRH	40	EP	3-Apr	9:55	NA	9.85	0.00	22.01	4-Apr	18:00	6.60	18.4	25,600	0.7	38.7	15.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	SA	SA	SA
MW-11B	Monitoring	BRH		EP	3-Apr	10:00	NA	9.82	0.00	47.30										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-5	Monitoring	BRH	41	EP	3-Apr	10:25	NA	10.48	0.00	25.41	4-Apr	17:20	6.72	18.2	14,680	0.5	31.9	47.6	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-87	Monitoring	BRH	42	EP	3-Apr	11:45	NA	8.74	0.00	20.39	4-Apr	8:35	7.18	15.6	15,060	0.6	-135.1	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-18A	Monitoring	BRH	43	EP	3-Apr	11:55	NA	10.41	0.00	22.58	4-Apr	9:25	6.89	16.8	20,700	0.5	33.1	1.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA
MW-18B	Monitoring	BRH		EP	3-Apr	12:00	NA	10.38	0.00	50.59										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-18T	Monitoring	BRH		EP	3-Apr	12:05	NA	10.45	0.00	50.58			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in samp prgm; gauged to highest pointt of shattered PVC									
MW-70	Monitoring	BRH	44	EP	3-Apr	12:20	NA	8.27	0.00	22.05	4-Apr	10:10	6.87	15.9	6,620	0.6	-31.8	9.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-124	Monitoring	BRH	45	EP	3-Apr	12:30	NA	8.79	0.00	22.01	4-Apr	10:55	6.76	16.8	11,990	0.5	-87.6	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-52	Monitoring	BRH	46	REST	3-Apr	18:15	NA	19.14	0.00	34.67	5-Apr	9:05	6.94	19.8	2,707	1.2	88.5	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-109	Monitoring	BRH	47	REST	3-Apr	18:10	NA	17.74	0.00	29.48	5-Apr	9:05	6.37	19.9	3,440	0.7	-363.7	3.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-110	Monitoring	BRH	48	REST	3-Apr	18:05	NA	15.79	0.00	29.74	5-Apr	9:45	6.42	20.7	1,636	0.5	-367.5	49.1	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-13	Monitoring	BRH		EP	3-Apr	13:55	NA	12.57	0.00	21.10			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-69	Monitoring	BRH		EP	3-Apr	13:50	NA	11.41	0.00	22.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-12	Monitoring	BRH		EP	3-Apr	13:45	NA	10.68	0.00	17.93			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-24	Monitoring	BRH		EP	3-Apr	13:20	NA	12.46	0.00	23.51			Not in sampling program							Yes	Yes	Issue	Yes		SA	No sampling due to location E. of river									
MW-14	Monitoring	BRH		EP	3-Apr	13:25	NA	>11.86	0.00	>11.86	(blockage)		Not in sampling program							Yes	Issue	Yes	Yes		SA	No sampling due to location N. of river									
RW-12	Recovery [d]	BTB	Field E of Refin		3-Apr		Not in gauging program						Not in sampling program												-	-	-	-	-	-	-	-	-	-	-
RW-12R	Recovery [d]	BTB	49	REST	3-Apr	8:28	NA	25.11	0.00	NM	4-Apr	12:00	7.44	19.3	2,861	0.3	-254.8	7.2	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-113	Monitoring	BTB	50	REST	3-Apr	8:32	NA	24.76	0.00	37.80	4-Apr	11:00	6.89	19.2	2,847	1.4	-57.2	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-8	Monitoring	BTB		REST	3-Apr	12:30	24.42	27.57	3.15	35.80			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
RW-22	Recovery [d]	BTB		REST	3-Apr	12:45	25.16	25.31	0.15	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20A	Recovery [d]	BTB		REST	3-Apr	12:05	>20.10	>20.10	#######	NM			Historical LNAPL; fluid level below top of pump during gauging							NA	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20B	Recovery [d]	BTB		REST	3-Apr	12:15	>19.40	>19.40	#######	NM			Historical LNAPL; fluid level below top of pump during gauging							NA	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-13	Recovery [d]	BTB	Field E of Refin		3-Apr		Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-13R	Recovery [d]	BTB	51	REST	3-Apr	13:25	NA	23.14	0.00	NM	4-Apr	12:50	6.93	17.7	2,220	1.2	-234.6	3.3	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-14	Recovery [d]	BTB	Field E of Refin		3-Apr		Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-14R	Recovery [d]	BTB		REST	3-Apr	8:20	20.29	21.72	1.43	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-133	Monitoring	BTB		REST	3-Apr	8:28	19.90	20.16	0.26	37.64			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-134	Monitoring	BTB	52	REST	3-Apr	8:36	NA	15.35	0.00	32.95	4-Apr	0:00	6.73	18.0	5,090	1.3	90.1	3.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RA-4798	Irrigation	BTB	53	REST			Not in gauging program			NA	3-Apr	13:35	7.03	19.4	1,208	1.9	43.6	1.1	Clear	NA	NA	Yes	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-4196	Irrigation	BTB	54	REST			Not in gauging program			NA	3-Apr	13:05	6.97	23.2	2,434	2.1	18.6	1.3	Clear	NA	NA	Yes	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-1227	Irrigation	BTB		REST									Removed from program by Navajo, 4-13-15												NA	A [h]	-	-	A [h]	-	-	-	A [h]	A [h]	A [h]
RA-3156	Irrigation	BTB	55	REST			Not in gauging program			NA	4-Apr	8:05	6.89	20.2	1,821	3.8	18.6	10.6	Clear	NA	NA	Yes	Yes		NA	A	-	-	A	-	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RA-313	Irrigation	BTB	56	REST			Not in gauging program			NA	4-Apr	18:30	6.89	22.2	1,103	3.1	-29.9	8.2	Clear	NA	NA	Yes	Yes		NA	A	-	-	A	-	-	-	A	A	A
KWB-7	Monitoring	BTB		REST	3-Apr	10:50	24.34	24.60	0.26	34.83			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-135	Monitoring	BTB	57	REST	3-Apr	11:10	NA	29.13	0.00	65.55	3-Apr	11:35	7.71	19.6	6,679	1.9	53.2	51.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-20	Monitoring	BTB	58	TMD	3-Apr	8:16	NA	10.65	0.00	26.66	4-Apr	13:40	6.97	19.8	5,124	1.5	-22.8	3.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-3	Monitoring	BTB		TMD	3-Apr	8:44	NA	11.95	0.00	21.59	(DTW is shallower than 2H17)					Not in sampling program				Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-4	Monitoring	BTB		TMD	3-Apr	8:40	NA	21.66	0.00	36.98			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-2	Monitoring	BTB		TMD	3-Apr	8:47	NA	13.94	0.00	21.49			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-1	Monitoring	BTB	59	TMD	3-Apr	8:50	NA	15.98	0.00	21.88	4-Apr	9:20	6.87	17.4	4,573	1.7	77.3	1.4	Clear	Yes	Yes	Yes	Yes		SA	SA	-	-	SA	-	-	-	A	A	A
NP-6	Monitoring	BTB		TMD	3-Apr	8:50	NA	13.64	0.00	20.35										Yes	Yes	Yes	Yes		SA	B	-	-	B	-	-	-	-	-	-
MW-8	Monitoring	BTB	60	TMD	3-Apr	8:51	NA	14.43	0.00	23.30	4-Apr	14:30	7.21	16.1	4,150	1.7	-8.6	4.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-21	Monitoring	BTB	61	TMD	3-Apr	11:48	NA	13.62	0.00	25.12	4-Apr	17:20	7.08	16.3	5,000	2.5	10.8	3.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-9	Monitoring	BTB		TMD	3-Apr	8:55	NA	15.06	0.00	22.25			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-71	Monitoring	BTB	62	TMD	3-Apr	8:48	NA	15.64	0.00	21.67	4-Apr	8:55	6.91	17.2	6,395	2.3	92.6	2.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-68	Monitoring	BTB	63	TMD	3-Apr	18:30	NA	22.34	0.00	26.52	3-Apr	18:55	6.93	21.0	2,853	0.8	117.2	4.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-27	Monitoring	BTB	64	TMD	3-Apr	17:40	NA	19.20	0.00	30.28	3-Apr	18:05	6.56	21.4	2,077	1.3	106.2	4.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-89	Monitoring	BTB	65	TMD	3-Apr	16:50	NA	13.28	0.00	20.28	3-Apr	17:15	6.96	18.8	2,996	2.3	53.7	6.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-16	Monitoring	BTB	66	TMD	3-Apr	16:00	NA	11.19	0.00	21.24	3-Apr	16:25	6.76	18.6	5,810	1.1	99.7	4.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-26	Monitoring	BTB	67	TMD	3-Apr	15:10	NA	12.33	0.00	27.58	3-Apr	15:35	6.95	18.5	7,945	1.4	53.1	2.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-11A	Monitoring	BTB	68	REST	3-Apr	9:15	NA	25.37	0.00	42.27	3-Apr	9:40	6.74	19.4	4,786	1.0	-64.2	2.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-11B	Monitoring	BTB	69	REST	3-Apr	10:00	NA	26.09	0.00	72.45	3-Apr	10:25	6.91	20.2	2,645	1.0	17.2	1.2	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-3AR	Monitoring	BTB		REST	3-Apr								Removed from program by Navajo, 4-13-15 (farmer Jack Joy, 575-365-6042)												SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-115	Monitoring	BTB	70	REST	3-Apr	8:35	NA	5.88	0.00	27.50	4-Apr	15:55	6.70	17.3	4,731	1.7	45.9	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-114	Monitoring	BTB	71	REST	3-Apr	8:30	NA	9.01	0.00	38.25	4-Apr	16:50	6.85	19.0	3,795	1.4	80.1	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-117	Monitoring	GDS	72	REST	3-Apr	18:14	NA	9.84	0.00	27.22	4-Apr	8:50	6.82	12.9	3,310	1.7	48.3	8.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-118	Monitoring	GDS	73	REST	3-Apr	18:20	NA	10.73	0.00	28.29	4-Apr	9:35	6.92	12.9	3,810	3.3	55.8	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-9	Monitoring	GDS		TMD	3-Apr	18:24	NA	9.10	0.00	25.62			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-119	Monitoring	GDS	74	REST	3-Apr	18:30	NA	10.09	0.00	28.11	4-Apr	10:20	7.00	14.2	3,490	1.4	56.0	9.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-5	Monitoring	GDS		REST	3-Apr	17:11	NA	12.83	0.00	25.09										Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
MW-136	Monitoring	GDS	75	REST	3-Apr	17:25	NA	11.46	0.00	27.90	3-Apr	17:50	6.94	16.6	3,950	2.7	10.8	10.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-126A	Monitoring	GDS	76	REST	3-Apr	13:30	NA	15.42	0.00	37.51	3-Apr	13:55	6.81	19.5	3,150	3.4	-109.9	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-126B	Monitoring	GDS	77	REST	3-Apr	14:10	NA	15.30	0.00	51.43	3-Apr	14:35	6.78	18.5	3,550	3.1	-56.0	3.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-127	Monitoring	GDS	78	REST	3-Apr	12:45	NA	19.89	0.00	53.21	3-Apr	13:10	6.86	20.8	2,320	2.6	-264.3	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-129	Monitoring	GDS	79	REST	3-Apr	11:56	NA	22.61	0.00	53.08	3-Apr	12:20	6.70	22.7	1,941	3.9	-86.4	16.9	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-#18A [e]	Recovery [d]	GDS	80	REST	3-Apr	10:55	NA	10.75	0.00	17.78	3-Apr	11:20	7.05	17.3	3,590	1.6	50.0	3.2	Clear	Yes	Yes	Yes	Yes		SA	A	-	-	A	A	-	-	A	A	A
KWB-1A	Monitoring	GDS	81	REST	3-Apr	10:10	NA	13.95	0.00	33.50	3-Apr	0:00	6.81	18.7	4,300	1.8	47.2	3.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
KWB-1B	Monitoring	GDS		REST	3-Apr	10:06	NA	15.64	0.00	33.92			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
KWB-1C	Monitoring	GDS		REST	3-Apr	10:08	NA	16.22	0.00	52.71										Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
KWB-10R	Monitoring	GDS	82	REST	3-Apr	9:20	17.30	17.31	0.01	29.46	3-Apr	9:50	6.62	20.7	1,568	2.7	-100.6	14.3	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-131	Monitoring	GDS		REST	3-Apr	11:51	23.71	23.92	0.21	53.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
KWB-5	Monitoring	GDS	83	REST	3-Apr	14:55	NA	23.96	0.00	37.68	4-Apr	11:25	6.73	16.6	2,470	2.2	-120.6	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-111	Monitoring	GDS	84	REST	3-Apr	14:58	NA	25.07	0.00	40.83	4-Apr	12:10	6.64	17.9	2,510	2.6	-41.9	21.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-6	Monitoring	GDS	85	REST	3-Apr	15:03	NA	22.75	0.00	36.44	4-Apr	13:00	6.86	17.5	2,020	1.5	-265.1	13.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-112	Monitoring	GDS		REST	3-Apr	11:45	21.37	24.19	2.82	37.54			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-132	Monitoring	GDS		REST	3-Apr	15:07	19.80	21.60	1.80	42.66			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-57	Monitoring	GDS	86	REST	3-Apr	16:48	NA	24.19	0.00	34.32	4-Apr	13:50	6.80	17.3	3,800	2.6	-37.7	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#11-0 [e]	Recovery [d]	GDS		REST	3-Apr	16:51	Well is dry			22.20			Not sampled; well is dry							Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-9	Monitoring	GDS		REST	3-Apr	16:53	(Historically-obstructed @ 15.11')						Removed from program by Navajo, 4-26-16 (farmer Jack Joy, 575-365-6042)												SA	A	A	-	A	A	A	A	A	A	A
KWB-12A	Monitoring	GDS		REST	3-Apr	16:59	Well is dry			25.03			Not sampled; well is dry							Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-12B	Monitoring	GDS	87	REST	3-Apr	17:03	NA	26.65	0.00	39.39	4-Apr	14:35	6.91	16.3	3,220	3.2	-3.2	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-2R	Monitoring	GDS		REST	3-Apr	16:40	NM	NM	NM	39.41	(Historical TD)		Unable to locate (...covered/destroyed by road construction)							Issue	Issue	Issue	Issue		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-58	Monitoring	GDS	88	REST	3-Apr	16:10	21.74	21.76	0.02	33.06	3-Apr	16:35	6.80	19.9	1,752	1.6	-167.3	6.8	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
KWB-13	Monitoring	GDS	89	REST	3-Apr	15:21	NA	26.29	0.00	33.10	3-Apr	15:45	7.01	25.9	3,390	5.4	-1.6	>200	Cloudy	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-103	Monitoring	SCU	90	REST	3-Apr	11:20	NA	18.68	0.00	25.22	3-Apr	13:00	7.21	31.0	22,400	2.4	-340.7	4.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-104	Monitoring	SCU	91	REST	3-Apr	11:23	NA	17.84	0.00	21.97	3-Apr	12:00	6.79	24.2	2,070	1.6	-301.5	2.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-64	Monitoring	SCU	92	REST	3-Apr	13:30	NA	19.71	0.00	34.08	3-Apr	13:55	6.96	29.6	2,770	1.1	-322.8	2.9	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-65	Monitoring	SCU	93	REST	3-Apr	14:25	NA	16.22	0.00	28.78	3-Apr	14:50	6.75	27.3	2,340	2.0	-252.2	7.3	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-5	Recovery [d]	SCU		S Refinery			Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-5R	Recovery [d]	SCU		REST	3-Apr	15:20	18.22	18.33	0.11	35.30			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-102	Monitoring	SCU	94	REST	3-Apr	15:30	NA	15.90	0.00	26.45	3-Apr	15:55	6.81	25.3	2,520	1.9	-317.6	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-4	Recovery [d]	SCU	95	REST	3-Apr	17:30	NA	14.40	0.00	36.62	4-Apr	8:55	6.91	21.7	2,290	0.9	-289.9	3.3	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RW-6	Recovery [d]	SCU	96	REST	3-Apr	17:20	NA	15.42	0.00	34.90	4-Apr	9:40	6.63	21.9	2,630	1.2	-272.9	3.5	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-99	Monitoring	SCU	97	REST	3-Apr	17:40	NA	17.97	0.00	27.80	4-Apr	10:10	6.71	21.8	2,400	2.0	-315.0	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-66	Monitoring	SCU	98	REST	3-Apr	17:50	NA	17.09	0.00	29.80	4-Apr	11:05	6.73	21.5	1,942	0.8	-230.6	3.2	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-28	Monitoring	SCU	99	REST	3-Apr	18:00	NA	22.81	0.00	34.55	4-Apr	12:05	6.73	21.3	3,050	1.1	-313.5	3.5	Clear	Yes	Issue	Issue	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-59	Monitoring	SCU	100	REST	3-Apr	18:05	NA	10.51	0.00	32.72	4-Apr	13:00	6.80	22.2	3,490	1.1	-266.2	1.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-60	Monitoring	SCU	101	REST	3-Apr	20:38	NA	11.63	0.00	37.78	4-Apr	13:50	6.80	22.1	4,150	3.8	-300.1	3.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-107	Monitoring	SCU	102	REST	3-Apr	18:20	NA	13.20	0.00	19.05	4-Apr	15:20	6.81	23.0	2,210	1.3	-194.1	3.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-128	Monitoring	SCU	103	REST	3-Apr	18:30	NA	15.63	0.00	35.35	4-Apr	16:40	6.66	23.3	2,030	4.1	-47.6	25.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-125	Monitoring	SCU	104	REST	3-Apr	9:10	NA	10.92	0.00	28.31	3-Apr	9:35	6.77	22.6	4,870	2.2	183.1	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-116	Monitoring	SCU	105	REST	3-Apr	9:50	NA	6.62	0.00	27.63	3-Apr	10:15	6.86	20.5	3,940	2.1	173.4	5.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-46R	Monitoring	SCU	106	TMD	3-Apr	10:35	NA	4.22	0.00	19.36	3-Apr	11:00	6.81	23.5	4,340	2.2	190.5	4.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
UG-3R	Monitoring	SCU	107	REST	3-Apr	16:55	NA	22.81	0.00	38.58	2-Apr	17:00	6.72	26.9	2,590	5.5	207.1	3.5	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
UG-4	Monitoring	SCU	108	REST	3-Apr	17:15	NA	20.10	0.00	39.24	2-Apr	18:10	6.83	23.8	4,330	3.0	272.6	3.3	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
UG-1	Monitoring	SCU	109	REST	3-Apr	17:05	NA	13.40	0.00	24.08	2-Apr	17:50	6.96	27.1	3,180	4.5	590.0	1.6	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
UG-2	Monitoring	SCU	110	REST	3-Apr	17:20	NA	18.53	0.00	29.28	2-Apr	19:25	7.29	25.1	2,440	4.5	233.7	2.1	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
MW-101	Monitoring	TAB	111	REST	3-Apr	14:40	NA	14.84	0.00	26.85	4-Apr	9:10	6.62	18.4	1,868	1.5	-82.2	2.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-105	Monitoring	TAB	112	REST	3-Apr	14:30	NA	10.70	0.00	17.20	5-Apr	10:25	6.76	22.4	1,767	0.4	-352.2	77.0	Cloudy	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-2	Recovery [d]	TAB	113	REST	3-Apr	16:40	NA	12.40	0.00	36.13	4-Apr	17:15	6.64	23.7	3,320	1.0	-375.1	6.7	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-61	Monitoring	TAB	114	REST	3-Apr	16:50	NA	12.77	0.00	29.30	5-Apr	9:35	6.89	22.4	2,600	0.3	-365.1	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-62	Monitoring	TAB	115	REST	3-Apr	17:00	NA	13.72	0.00	29.50	5-Apr	8:25	6.61	20.1	2,860	0.4	-359.4	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-93	Monitoring	TAB	116	REST	3-Apr	17:10	NA	8.15	0.00	20.23	4-Apr	18:00	6.49	22.8	3,040	1.2	-371.0	7.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-43	Monitoring	TAB	117	REST	3-Apr	17:50	NA	10.19	0.00	19.67	4-Apr	16:30	6.86	23.1	4,700	1.2	-395.0	7.8	Clear	Yes	Issue	No pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-137	Monitoring	TAB	118	REST	3-Apr	17:30	NA	8.47	0.00	29.60	5-Apr	9:50	6.71	25.7	5,060	2.0	-387.2	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-138	Monitoring	TAB	119	REST	3-Apr	17:40	10.03	10.04	0.01	24.81	5-Apr	11:10	6.60	28.8	2,890	2.0	-305.6	9.1	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-23	Monitoring	TAB	120	REST	3-Apr	17:20	NA	13.52	0.00	23.10	4-Apr	19:00	6.98	24.9	2,610	0.4	-289.4	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-4	Monitoring	TAB	121	TEL	3-Apr	9:00	NA	9.48	0.00	27.27	3-Apr	9:25	6.30	21.1	4,530	0.4	-226.7	8.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-3	Monitoring	TAB	122	TEL	3-Apr	10:20	NA	9.19	0.00	27.19	3-Apr	10:45	6.48	21.5	3,340	0.3	-321.8	3.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-2	Monitoring	TAB	123	TEL	3-Apr	11:20	NA	9.91	0.00	27.20	3-Apr	11:45	6.58	23.2	3,250	0.5	-350.6	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-1	Monitoring	TAB	124	TEL	3-Apr	12:10	NA	9.02	0.00	27.00	3-Apr	12:35	7.20	22.5	2,730	0.3	-229.9	3.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-39	Monitoring	TAB	125	REST	3-Apr	14:55	NA	9.58	0.00	25.44	4-Apr	10:45	7.07	18.5	3,430	1.0	-343.4	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-98	Monitoring	TAB	126	REST	3-Apr	12:55	NA	9.88	0.00	25.60	3-Apr	13:20	6.62	23.0	3,000	0.3	-374.8	1.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-10	Recovery [d]	TAB	127	REST	3-Apr	16:30	NA	9.39	0.00	22.49	4-Apr	11:35	6.88	18.6	2,710	0.2	-359.8	4.0	Clear	Yes	Yes	Issue	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-40	Monitoring	TAB	128	REST	3-Apr	15:05	NA	7.81	0.00	24.75	4-Apr	12:20	6.80	20.7	2,450	0.5	-351.4	7.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-41	Monitoring	TAB	129	REST	3-Apr	15:20	NA	7.27	0.00	21.56	4-Apr	15:20	6.45	20.2	4,140	0.5	-309.9	4.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-9	Recovery [d]	TAB	130	REST	3-Apr	15:15	NA	9.38	0.00	21.83	4-Apr	14:20	6.70	20.0	3,250	0.8	-356.7	4.8	Clear	Yes	Yes	Issue	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-42	Monitoring	TAB	131	REST	3-Apr	15:25	NA	10.00	0.00	24.32	4-Apr	16:10	6.82	19.8	3,420	0.4	-317.7	4.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-29	Monitoring	TAB	132	REST	3-Apr	15:50	NA	13.70	0.00	24.22	4-Apr	13:25	6.95	20.0	3,590	1.0	-191.2	2.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#16B [e]	Recovery [d]	TAB	133	REST	3-Apr	16:00	NA	11.84	0.00	17.70	4-Apr	17:05	7.02	19.6	3,500	0.7	-188.1	3.7	Clear	Yes	Yes	Issue	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-30	Monitoring	TAB		REST	3-Apr	16:20	NA	9.31	0.00	23.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-56	Monitoring	TAB	134	NCL	3-Apr	16:10	NA	10.50	0.00	26.50	4-Apr	18:00	6.74	22.3	3,280	0.7	-154.9	1.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-49	Monitoring	TAB	135	TEL	3-Apr	14:50	NA	10.70	0.00	33.05	4-Apr	9:55	6.55	21.0	2,540	0.5	-353.5	5.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-106	Monitoring	TAB	136	REST	3-Apr	13:50	NA	8.49	0.00	22.80	3-Apr	14:15	6.52	24.1	3,050	0.4	-372.5	2.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-45	Monitoring	TAB	137	NCL	3-Apr	18:00	NA	4.41	0.00	15.05	4-Apr	8:25	6.63	17.1	4,430	1.5	-0.6	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-50	Monitoring	CJH	138	REST	3-Apr	11:30	NA	15.68	0.00	28.22	3-Apr	11:55	7.02	23.8	6,600	1.4	65.0	2.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-97	Monitoring	CJH		REST	3-Apr	12:15	10.13	11.72	1.59	21.20			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-92	Monitoring	CJH		REST	3-Apr	12:30	12.21	12.29	0.08	22.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-1	Recovery [d]	CJH	139	REST	3-Apr	12:45	NA	11.14	0.00	35.39	3-Apr	13:10	6.89	24.5	3,240	1.2	-365.8	15.3	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-91	Monitoring	CJH	140	REST	3-Apr	13:30	NA	11.49	0.00	25.35	3-Apr	13:55	6.77	24.5	2,740	1.7	-374.8	8.1	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-90	Monitoring	CJH	141	REST	3-Apr	14:10	NA	12.22	0.00	22.80	3-Apr	14:35	7.16	23.5	3,240	1.4	-349.0	7.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-96	Monitoring	CJH	142	REST	3-Apr	14:50	NA	12.04	0.00	25.57	3-Apr	15:15	6.98	22.7	2,080	1.8	-350.7	8.7	Clear	Yes	Closure	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-94	Monitoring	CJH		REST	3-Apr	15:30	12.79	12.99	0.20	23.45			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-8	Recovery [d]	CJH		REST	3-Apr	15:44	11.65	12.54	0.89	37.22			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-67	Monitoring	CJH	143	REST	3-Apr	15:55	NA	9.98	0.00	27.30	3-Apr	16:20	7.27	24.0	2,570	1.7	-357.5	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-95	Monitoring	CJH	144	REST	3-Apr	16:40	NA	12.97	0.00	25.37	4-Apr	8:55	6.90	22.2	2,240	1.8	-282.6	5.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-7	Recovery [d]	CJH	145	REST	3-Apr	16:48	NA	11.84	0.00	37.00	4-Apr	9:40	6.58	22.6	2,330	1.3	-353.7	9.3	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
NCL-34A	Monitoring	CJH	146	NCL	3-Apr	16:57	NA	11.02	0.00	19.26	4-Apr	10:25	6.53	22.3	2,100	1.9	-357.8	5.5	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
NCL-33	Monitoring	CJH	147	NCL	3-Apr	17:07	NA	9.42	0.00	19.60	4-Apr	11:05	6.80	23.3	3,060	1.8	-253.8	6.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-44	Monitoring	CJH	148	NCL	3-Apr	17:54	NA	9.42	0.00	21.34	4-Apr	14:10	6.72	23.3	2,670	1.5	-283.2	5.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-32	Monitoring	CJH	149	NCL	3-Apr	17:45	NA	10.19	0.00	20.06	4-Apr	13:20	7.05	23.4	2,610	1.1	-223.5	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-108	Monitoring	CJH	150	NCL	3-Apr	17:36	NA	13.61	0.00	27.74	4-Apr	11:50	7.22	23.1	3,080	1.6	-347.0	8.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]										
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
NCL-31	Monitoring	CJH	151	NCL	3-Apr	17:18	NA	11.41	0.00	20.16	4-Apr	12:35	7.07	23.1	2,660	1.1	-263.9	5.2	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-19	Monitoring	CJH		NCL	3-Apr	17:26	NA	11.79	0.00	22.08			Not in sampling program							Yes	Yes	Issue	Yes		SA	Not in sampling program									
MW-55	Monitoring	CJH	152	NCL	3-Apr	18:10	NA	11.03	0.00	26.85	4-Apr	15:40	6.73	23.3	3,830	1.3	-77.6	7.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
RW-#17A [e]	Recovery [d]	CJH	153	REST	3-Apr	18:20	NA	10.63	0.00	16.01	3-Apr	18:45	6.77	22.7	5,460	1.6	-186.2	7.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-18	Monitoring	CJH	154	NCL	3-Apr	18:02	NA	11.03	0.00	22.20	4-Apr	14:55	6.94	23.7	3,160	1.7	-192.7	4.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-54A	Monitoring	CJH	155	NCL	3-Apr	9:10	NA	12.04	0.00	31.30	3-Apr	9:35	6.52	22.3	2,240	1.7	101.5	4.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-54B	Monitoring	CJH		NCL	3-Apr	9:48	NA	12.09	0.00	46.80										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
NCL-49	Monitoring	CJH	156	NCL	3-Apr	9:55	NA	16.26	0.00	32.18	3-Apr	10:20	6.95	24.8	3,480	1.8	100.2	4.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-53	Monitoring	CJH	157	NCL	3-Apr	10:45	NA	12.08	0.00	23.60	3-Apr	11:10	7.09	24.7	2,390	1.2	86.8	3.0	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-P3	Monitoring		Field E of Refinery				Not in gauging program						Not in sampling program												Not included in monitoring program due to distance from impacts										

Notes:

Abbreviations:

A = Annual (Mar/Apr event)
B = Biennial (starts Mar/Apr 2011)
BR = Bolton Road
DRO = Diesel Range Organics
E = East
EP = Evaporation Ponds
ft bgs = ft below ground surface
ft btoc = ft below top of casing
ft MSL = ft Mean Sea Level
GRO = Gasoline Range Organics
HR = Haldeman Road
in = inches
N = North
NA = Not accessible
NAPI = North API Separator
NCL = North Colony Landfarm
NE = Northeast
NW = Northwest
OCD = Oil Conservation District
PSH = Phase Separated Hydrocarbon
ROW = right of way
RR = Richey Road
S = South
SA = Semi-annual (Mar/Apr and Sep/Oct events)
SE = Southeast
SW = Southwest
TMD = Three Mile Ditch
TEL = Tetra Ethyl Lead Impoundment
UG = Upgradient
US285 = U.S. Highway 285
US82 = U.S. Highway 82
VOC = Volatile Organic Compounds
W = West
Y = Yes

Footnotes:

[a] Well const. info. provided where available. TOC & ground surface elevs relative to benchmark G-416. Total depth based on 4/2010 measurements.

[b] PSH was present during March 2012 gw monitoring event or a recovery pump is in place. Note that recovery wells are gauged at least monthly.

[c] Analytical Suite to include the following:

1. Purge parameters to be measured and recorded in the field will include pH, temp, spec. cond., diss. oxy., and oxidation-reduction potential.
2. DRO by Method 8015Mod.
3. GRO by Method 8015Mod.
4. VOCs by Method 8260, to include methyl tert butyl ether (MTBE).
5. Total metals by Method 6010/6020 and/or 7470. Specific metals shown in heading, abbreviations from periodic chart (incl B, Cd, Co, U, per 3-7-16 State request).
6. Dissolved metals - same list as total metals but only analyzed during April event (field filtered by HMI)
7. Cyanide by Method SM4500.
8. Cations/anions to include Calcium, Potassium, and Sodium by Method 6010 or 6020 and Sulfate, Chloride and Fluoride by Method 300.
9. Nitrates/Nitrites as Nitrogen by Method 300.
10. Total Dissolved Solids by Method 2540C.

"-" indicates parameter not required.

Note - samples will not be collected from any well where PSH is measured to be 0.03 feet thick or greater.

[d] Samples to be collected at frequency indicated only if <0.03 feet of PSH is present.

[e] Recovery trenches 11, 15, 16, 17 and 18 have multiple vertical "wells". Gauging & sampling points are: RW #11-0, RW #15C, RW #16B, RW #17A and RW #18A.

= Well with recently gauged LNAPL (light nonaqueous phase liquid)

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

M E M O R A N D U M

Groundwater Monitoring Standard Operating Procedures
Navajo Refining LLC – Artesia, New Mexico

HMI conducts low-flow groundwater sampling in accordance with the site Sampling and Analysis Plan and EPA guidance (including Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling; REV No. 4, September 19, 2017, and Yeskis & Zavala, 2002, EPA/542:S-02/00, Groundwater Sampling Guidelines for Superfund and RCRA Project Managers).

Groundwater Sampling Methodology

HMI conducts low-flow groundwater sampling using a peristaltic pump and dedicated polyethylene tubing at wells with requisite depths-to-water. At a limited number of wells with depths-to-water greater than peristaltic range, low-flow groundwater sampling is conducted using dedicated or non-dedicated bladder pumps. In 2016, at no cost to TRC, HMI installed HMI-owned bladder pumps in a limited number of wells (approximately four). At such time that HMI no longer conducts routine groundwater monitoring at the site, it respectfully requests the opportunity to recover these dedicated bladder pumps. Sample intakes are set at midscreen, when possible (generally at least two feet from the base of the well). Sample intake depths are permanently marked, ensuring future sampling events consistently monitor the targeted water-bearing interval. During sampling with a peristaltic pump, the sample tube is attached to the pump using a one-foot section of dedicated, flexible silicone tubing (item #5703, Geotech Environmental Equipment, Inc.). A two-foot segment of polyethylene tubing connects the silicone tubing in the pump to the flow-through cell, using a disposable segment of silicone tubing. Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), while well drawdown is monitored. Groundwater field parameter readings are measured at 0.5-liter intervals (generally an equivalent of one cell-volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside the cell. Groundwater field instrumentation is calibrated and recorded daily in accordance with manufacturer specifications.

Purging continues until a requisite volume of groundwater is purged (generally a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with EPA guidance:

> *Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)*

- pH +/- 0.1 units;
- Temperature -
- Conductivity +/- 3%
- Dissolved Oxygen +/- 0.3 mg/L
- ORP +/- 10%
- Turbidity 10%

Immediately prior to sampling, the input tubing to the flow-through cell is disconnected from the disposable silicone receiving tubing on the input barb on the flow-through cell, and groundwater samples are collected directly into lab-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI's custody until shipped to ESC Lab Sciences via FedEx-overnight. Peristaltic tubes and/or dedicated bladder pumps may be dedicated in respective wells. Alternatively, dedicated tubing may be retrieved, bagged, labeled, and stored in tubs maintained at HMI. Wells with very limited water column thicknesses may be sampled with disposable bailers. Active recovery well and irrigation wells are sampled using sample ports. The purging and sampling process is documented on groundwater sampling field forms.

Cross-Contamination Prevention Program

Dedicated peristaltic tubing and dedicated bladder pumps are used as possible, to minimize any potential cross-contamination issues during the groundwater monitoring process. Remaining non-dedicated equipment (e.g., electronic gauging probes or non-dedicated bladder pumps, etc.) is properly decontaminated prior to use and between wells. The decontamination procedure may include a combination of chemical and mechanical decontamination. For example, scrubbing with ethyl alcohol (isopropanol) as warranted, followed by scrubbing using an Alconox-water solution, and distilled water rinse. The decontamination procedure for non-dedicated bladder pumps consists of cycling an Alconox-water solution through the pump bladder. Distilled water is cycled through the pump bladder, followed by decontaminating the exterior body of the pump, using the methods outlined above.

HMI Deliverables

HMI provides field documentation of groundwater monitoring activities in a deliverables package that includes a brief narrative, summary table (with gauging data, field parameters, well inspection data, and required analytical scope), groundwater sampling forms, field instrument calibration log, and chain-of-custody forms (by Refinery "Area"), and a groundwater sampling SOP memo.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH / GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1435	NA	12.68	0.0	19.04	14.1	Yes	Yes	Yes	Yes		Weather: Sunny, 52 F
4/5/18	905	NA	12.71	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	910	12.72	0.5	7.79	15.4	4210	3.6	-55.8	10.9	Colorless / clear	*Low-flow groundwater sample:*
	913	12.72	1.0	7.71	15.7	4210	2.5	-62.5	7.0		(A) peristaltic pump w/ ded tubing
	915	12.72	1.5	7.63	16.1	4210	1.7	-68.8	5.5		B) ded bladder pump
	917	12.72	2.0	7.59	16.2	4210	1.6	-73.8	5.1		C) non-ded bladder pump; or
	920	12.72	2.5	7.56	16.4	4200	1.4	-76.1	4.4		*Standard groundwater sample:*
	923	12.72	3.0	7.55	16.4	4210	1.3	-78.3	4.0		D) bailer due to limited column; or
	925	12.72	3.5	7.52	16.6	4200	1.3	-81.3	3.9		E) recovery well cycling sample
	927	12.72	4.0	7.50	16.6	4210	1.3	-82.8	3.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	930	MW-6A	12.72	7.50	16.6	4210	1.3	-82.8	3.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1440	NA	12.56	0.0	52.27	47.3	Yes	Issue	Yes	Yes		Weather: Pt. Cloudy, 80s

*casing lid does not close all the way (minor)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-85
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1700	10.11	11.81	1.70	20.34	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record * Removed oil-sorbent sock & allowed well to equilibrate prior to gauging

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED DUE TO PRESENCE						B) ded bladder pump
			2.0		OF LNAPL ≥ 0.03'						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-85			NOT	SAMPLED				DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-86
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1720	9.94	10.40	0.46	19.21	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		NOT SAMPLED		DUE TO PRESENCE				(A) peristaltic pump w/ ded tubing
			1.5		OF LNAPL		>0.03'				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-86			NOT	SAMPLED				DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-120
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BRH / GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1445	NA	12.55	0.0	28.00	17.5	Yes	Yes	Yes	Yes		Weather: SUNNY, 60's
4/5/18	950	NA	12.61	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	955	12.75	0.5	7.51	16.6	8310	4.4	-97.7	5.2	colorless / clear	*Low-flow groundwater sample:*
	957	12.75	1.0	7.44	16.1	8500	2.2	-106.8	4.9		(A) peristaltic pump w/ ded tubing
	1000	12.75	1.5	7.36	15.8	8420	1.5	-113.0	4.5		B) ded bladder pump
	1003	12.75	2.0	7.34	15.8	8260	0.9	-114.2	4.2		C) non-ded bladder pump; or
	1005	12.75	2.5	7.33	15.8	8130	0.9	-116.3	3.7		*Standard groundwater sample:*
	1007	12.75	3.0	7.32	15.8	7950	0.8	-120.0	3.4		D) bailer due to limited column; or
	~~1008~~ 1010	12.75	3.5	7.32	15.8	7860	0.8	-121.7	3.6		E) recovery well cycling sample
	1013	12.75	4.0	7.32	15.8	7780	0.8	-122.5	3.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	1015	MW-120	12.75	7.32	15.8	7780	0.8	-122.5	3.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-121
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: BRH / CMS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1450	NA	13.02	0.0	27.31	17.5	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/5/18	1035	NA	13.02									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	1040	13.14	0.5	7.42	17.1	5630	4.1	-27.0	88.8	Colorless / Sl. Cloudy	*Low-flow groundwater sample:*
	1043	13.22	1.0	7.40	16.7	5580	2.7	-25.2	73.4		(A) peristaltic pump w/ ded tubing
	1045	13.25	1.5	7.39	16.5	5550	2.0	-24.3	69.7		B) ded bladder pump
	1047	13.28	2.0	7.37	16.5	5540	1.8	-23.2	50.1		C) non-ded bladder pump; or
	1050	13.29	2.5	7.36	16.5	5530	1.6	-22.5	41.1		*Standard groundwater sample:*
	1053	13.30	3.0	7.35	16.5	5530	1.5	-22.2	23.7	Colorless / clear	D) bailer due to limited column; or
	1055	13.31	3.5	7.34	16.5	5520	1.5	-22.3	10.2		E) recovery well cycling sample
	1057	13.32	4.0	7.33	16.5	5520	1.5	-22.7	7.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	1100	MW-121	13.32	7.33	16.5	5520	1.5	-22.7	7.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-84
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: BRH/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1535	NA	10.01	0.0	20.56	15.2	Yes	Yes	Yes	Yes		Weather: Clear 50's
4/4/18	1345	NA	10.00	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1350	10.09	0.5	7.19	19.2	9340	2.2	-81.2	6.8	Clear/gold tint	*Low-flow groundwater sample:*
	1352	10.13	1.0	7.11	19.3	9420	1.8	-92.3	5.2		(A) peristaltic pump w/ ded tubing
	1355	10.17	1.5	7.07	19.3	9490	1.5	-99.8	4.7		B) ded bladder pump
	1357	10.21	2.0	7.05	19.3	9490	1.3	-103.5	4.0		C) non-ded bladder pump; or
	1400	10.24	2.5	7.03	19.4	9510	1.2	-105.6	3.7		*Standard groundwater sample:*
	1402	10.26	3.0	7.02	19.4	9520	1.2	-107.2	3.5		D) bailer due to limited column; or
	1405	10.29	3.5	7.02	19.4	9520	1.1	-110.1	3.3		E) recovery well cycling sample
	1407	10.32	4.0	7.01	19.4	9530	1.1	-111.9	3.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1410	MW-84	10.32	7.01	19.4	9530	1.1	-111.9	3.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-122
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: BRH/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1500	NA	10.74	0.0	23.32	18.4	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/5/18	845	NA	10.75	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	850	11.24	0.5	7.32	17.4	6300	2.1	-93.8	32.8	Clear/colorless w/ orange particles	*Low-flow groundwater sample:*
	852	11.36	1.0	7.27	17.5	6380	1.7	-104.9	27.5		(A) peristaltic pump w/ ded tubing
	855	11.48	1.5	7.24	17.7	6410	1.4	-109.3	23.9		B) ded bladder pump
	857	11.59	2.0	7.23	17.7	6430	1.2	-111.5	21.5		C) non-ded bladder pump; or
	900	11.70	2.5	7.23	17.8	6430	1.1	-113.8	18.6		*Standard groundwater sample:*
	905	11.74	3.0	7.22	17.8	6440	1.1	-115.6	12.5		D) bailer due to limited column; or
	910	11.77	3.5	7.22	17.8	6440	1.0	-116.1	10.2		E) recovery well cycling sample
	915	11.80	4.0	7.22	17.8	6450	1.0	-116.5	9.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	920	MW-122	11.80	7.22	17.8	6450	1.0	-116.5	9.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-81
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1505	NA	11.08	0.0	18.62	13.7	Yes	Yes	Yes	Yes		Weather: Clear 50's
4/4/18	1430	NA	11.08	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1435	11.16	0.5	7.53	19.0	6720	3.9	-71.3	8.9	Clear/colorless	*Low-flow groundwater sample:*
	1437	11.25	1.0	7.48	18.9	6810	3.0	-83.5	7.5		(A) peristaltic pump w/ ded tubing
	1440	11.29	1.5	7.42	18.8	6890	2.8	-89.5	7.3		B) ded bladder pump
	1442	11.34	2.0	7.39	18.8	6930	2.7	-93.2	6.8		C) non-ded bladder pump; or
	1445	11.38	2.5	7.38	18.9	6970	2.6	-95.6	6.1		*Standard groundwater sample:*
	1447	11.41	3.0	7.38	18.9	6990	2.6	-96.7	5.8		D) bailer due to limited column; or
	1450	11.44	3.5	7.37	18.9	7000	2.5	-99.2	5.4		E) recovery well cycling sample
↓	1452	11.48	4.0	7.37	18.8	7010	2.5	-101.5	5.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1455	MW-81	11.48	7.37	18.8	7010	2.5	-101.5	5.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-80
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1510	NA	9.21	0.0	19.69	14.7	Yes	Yes	Yes	Yes		Weather: Clear 50's
4/4/18	1515	NA	9.20	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1520	9.29	0.5	7.64	18.5	9130	2.9	-103.8	11.2	Clear/colorless	*Low-flow groundwater sample:*
	1522	9.33	1.0	7.59	18.2	9070	2.0	-109.3	10.1		(A) peristaltic pump w/ ded tubing
	1525	9.36	1.5	7.54	17.9	9000	1.8	-113.5	9.8		B) ded bladder pump
	1527	9.37	2.0	7.50	17.9	9000	1.7	-115.9	9.1		C) non-ded bladder pump; or
	1530	9.37	2.5	7.48	17.8	8990	1.6	-117.6	7.9		*Standard groundwater sample:*
	1532	9.37	3.0	7.47	17.8	8980	1.5	-120.1	7.5		D) bailer due to limited column; or
	1535	9.37	3.5	7.47	17.8	8980	1.5	-121.9	6.9		E) recovery well cycling sample
	1537	9.37	4.0	7.46	17.8	8980	1.5	-122.5	6.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1540	MW-80	9.37	7.46	17.8	8980	1.5	-122.5	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ EB-EP-04 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-79
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH/SCD

Well Inspection Information

(4-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1520	NA	10.30	0.0	19.24	15.0	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/4/18	1600	NA	10.29	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1605	10.51	0.5	6.63	19.1	6830	2.8	-13.5	10.1	Clear/colorless	*Low-flow groundwater sample:*
	1607	10.56	1.0	6.70	18.6	6870	1.9	-19.5	9.6		(A) peristaltic pump w/ ded tubing
	1610	10.60	1.5	6.73	18.3	6890	1.7	-21.3	8.7		B) ded bladder pump
	1612	10.64	2.0	6.75	18.2	6910	1.5	-23.5	8.1		C) non-ded bladder pump; or
	1615	10.67	2.5	6.76	18.2	6930	1.4	-25.1	7.9		*Standard groundwater sample:*
	1617	10.70	3.0	6.76	18.2	6950	1.4	-26.8	7.5		D) bailer due to limited column; or
	1620	10.74	3.5	6.77	18.1	6960	1.3	-27.3	7.4		E) recovery well cycling sample
	1622	10.78	4.0	6.76	18.1	6970	1.3	-27.5	7.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1625	MW-79	10.78	6.76	18.1	6970	1.3	-27.5	7.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1635	EB-EP-04	NA							same	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-82
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH / SCD

Well Inspection Information (4-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1530	NA	9.79	0.0	20.01	15.0	Yes	Yes	Yes	Yes		Weather: Clear 50's
4/4/18	1300	NA	9.81	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1305	10.15	0.5	7.67	20.1	6830	2.1	-105.2	7.9	Clear/colorless w/ orange particles	*Low-flow groundwater sample:*
	1307	10.16	1.0	7.60	20.0	6870	1.7	-97.4	6.8		(A) peristaltic pump w/ ded tubing
	1310	10.16	1.5	7.54	20.0	6890	1.4	-90.3	6.3		B) ded bladder pump
	1312	10.16	2.0	7.50	19.9	6910	1.2	-84.1	6.0		C) non-ded bladder pump; or
	1315	10.16	2.5	7.48	19.9	6920	1.1	-80.3	5.9		*Standard groundwater sample:*
	1317	10.16	3.0	7.47	19.9	6920	1.1	-78.3	5.7		D) bailer due to limited column; or
	1320	10.16	3.5	7.47	20.0	6930	1.0	-77.2	5.6		E) recovery well cycling sample
	1322	10.16	4.0	7.47	20.0	6930	1.0	-76.6	5.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1325	MW-82	10.16	7.47	20.0	6930	1.0	-76.6	5.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-01 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-74
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1545	NA	9.36	0.0	20.19	14.8	Yes	Yes	Yes	Yes		Weather: Clear 40's
4/4/18	900	NA	9.40	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	905	9.50	0.5	6.99	16.4	10,030	2.7	9.5	7.9	Clear / colorless	*Low-flow groundwater sample:*
	907	9.54	1.0	6.92	16.6	10,150	2.1	11.3	7.1		(A) peristaltic pump w/ ded tubing
	910	9.55	1.5	6.89	16.7	10,180	1.8	12.3	6.8		B) ded bladder pump
	912	9.55	2.0	6.85	16.7	10,190	1.7	13.5	6.1		C) non-ded bladder pump; or
	915	9.55	2.5	6.83	16.8	10,190	1.6	13.9	7.9		*Standard groundwater sample:*
	917	9.55	3.0	6.81	16.8	10,200	1.5	14.2	7.5		D) bailer due to limited column; or
	920	9.55	3.5	6.80	16.8	10,210	1.5	14.5	7.3		E) recovery well cycling sample
↓	922	9.55	4.0	6.80	16.8	10,210	1.5	14.8	7.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	925	MW-74	9.55	6.80	16.8	10,210	1.5	14.8	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	935	EB-EP-01	NA	→	→	→	→	→	→	Same	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ Trip Blank - EP-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-73
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH/SCD

Well Inspection Information (4-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1555	NA	9.52	0.0	19.60	14.6	Yes	Yes	Yes	Yes		Weather: Clear 40's
4/4/18	815	NA	9.57	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	820	9.62	0.5	7.80	14.9	10,730	2.9	31.5	35.1	Clear/colorless	*Low-flow groundwater sample:*
	822	9.63	1.0	7.76	15.1	10,780	2.1	37.5	23.5		(A) peristaltic pump w/ ded tubing
	825	9.64	1.5	7.71	15.2	10,810	1.7	38.9	19.8		B) ded bladder pump
	827	9.64	2.0	7.69	15.2	10,830	1.5	39.5	15.5		C) non-ded bladder pump; or
	830	9.64	2.5	7.65	15.3	10,840	1.3	41.1	12.4		*Standard groundwater sample:*
	832	9.64	3.0	7.63	15.3	10,850	1.2	43.8	10.9		D) bailer due to limited column; or
	835	9.64	3.5	7.61	15.3	10,850	1.2	44.3	10.1		E) recovery well cycling sample
	837	9.64	4.0	7.60	15.3	10,860	1.1	45.7	9.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	840	MW-73	9.64	7.60	15.3	10,860	1.1	45.7	9.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH / SCD

Well Inspection Information (2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1635	NA	10.88	0.0	17.30	15.0	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/5/18	940	NA	10.89	0.0								

Well Purging Record * confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	945	11.15	0.5	7.09	18.6	19,170	2.6	-151.6	12.5	Clear / colorless	*Low-flow groundwater sample:*
	947	11.21	1.0	7.05	18.1	20,100	1.8	-131.6	10.9	w/ small particles	(A) peristaltic pump w/ ded tubing
	950	11.27	1.5	7.07	18.2	20,300	1.5	-128.6	10.1		B) ded bladder pump
	952	11.30	2.0	7.07	18.2	20,400	1.3	-124.9	9.8		C) non-ded bladder pump; or
	955	11.34	2.5	7.07	18.1	20,400	1.2	-122.7	9.5		*Standard groundwater sample:*
	957	11.38	3.0	7.06	18.1	20,400	1.1	-120.5	9.0		D) bailer due to limited column; or
	1000	11.41	3.5	7.06	18.1	20,500	1.1	-118.6	8.7		E) recovery well cycling sample
↓	1002	11.45	4.0	7.06	18.1	20,500	1.1	-117.3	8.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	1005	MW-2A	11.45	7.06	18.1	20,500	1.1	-117.3	8.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Not in "Sampling" program)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1640	NA	11.61	0.0	52.00	NS	Yes	Yes	Yes	Yes		Weather: Clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-72
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in ; stickup)

Initials: BRH / SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1630	NA	7.60	0.0	13.92	11.9	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/4/18	1645	NA	7.57	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1650	7.85	0.5	7.53	18.5	11,520	1.9	13.5	15.1	Clear / colorless	*Low-flow groundwater sample:*
	1652	7.86	1.0	7.44	18.1	11,980	1.4	18.2	10.1		(A) peristaltic pump w/ ded tubing
	1655	7.86	1.5	7.40	17.9	12,030	1.2	21.5	9.7		B) ded bladder pump
	1657	7.86	2.0	7.37	17.8	12,080	1.1	25.6	9.3		C) non-ded bladder pump; or
	1700	7.86	2.5	7.35	17.8	12,100	1.0	27.9	8.7		*Standard groundwater sample:*
	1702	7.86	3.0	7.34	17.8	12,110	1.0	29.1	8.4		D) bailer due to limited column; or
	1705	7.86	3.5	7.34	17.9	12,120	0.9	30.8	7.9		E) recovery well cycling sample
	1707	7.86	4.0	7.33	17.9	12,120	0.9	32.5	7.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1710	MW-72	7.86	7.33	17.9	12,120	0.9	32.5	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Be,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-6
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH / SCD

Well Inspection Information (2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1620	NA	11.01	0.0	26.69	21.6	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s
4/4/18	1730	NA	11.00	0.0								Clear 60's

Well Purging Record

PVC casing cut down to allow closure. Well pad replaced, New TDC data needed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1735	11.16	0.5	7.15	19.9	13,860	2.5	-80.2	25.4	clear/colorless w/ small particles	*Low-flow groundwater sample:*
	1737	11.16	1.0	7.09	19.9	13 940	1.8	-73.5	18.9		(A) peristaltic pump w/ ded tubing
	1740	11.16	1.5	7.05	19.9	14,030	1.5	-68.6	16.5		B) ded bladder pump
	1742	11.16	2.0	7.03	19.7	14,070	1.3	-65.3	12.9		C) non-ded bladder pump; or
	1745	11.16	2.5	7.02	19.6	14,090	1.2	-63.2	12.1		*Standard groundwater sample:*
	1747	11.16	3.0	7.02	19.6	14,110	1.2	-60.1	10.9		D) bailer due to limited column; or
	1750	11.16	3.5	7.01	19.7	14,120	1.1	-59.9	10.5		E) recovery well cycling sample
	1752	11.16	4.0	7.02	19.7	14,120	1.1	-59.8	9.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1755	OCD-6	11.16	7.02	19.7	14,120	1.1	-59.8	9.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7AR
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH / SCD

Well Inspection Information (4-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1610	NA	9.97	0.0	21.28	16.0	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/4/18	1815	NA	9.98	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1820	10.18	0.5	7.05	19.9	11,810	2.0	-84.1	6.9	clear/colorless w/	*Low-flow groundwater sample:*
	1822	10.22	1.0	7.03	19.6	11,910	1.7	-91.5	7.5	orange particles	(A) peristaltic pump w/ ded tubing
	1825	10.26	1.5	6.99	19.5	11,950	1.4	-99.3	7.0		B) ded bladder pump
	1827	10.29	2.0	6.97	19.5	11,990	1.3	-103.5	6.1		C) non-ded bladder pump; or
	1830	10.33	2.5	6.96	19.5	12,000	1.2	-105.6	5.4		*Standard groundwater sample:*
	1832	10.37	3.0	6.96	19.6	12,010	1.1	-107.5	5.1		D) bailer due to limited column; or
	1835	10.41	3.5	6.95	19.6	12,020	1.1	-109.2	4.3		E) recovery well cycling sample
	1837	10.44	4.0	6.95	19.6	12,020	1.1	-110.6	4.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1840	OCD-7AR	10.44	6.95	19.6	12,020	1.1	-110.6	4.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1615	NA	9.80	0.0	56.85	51.9	Yes	Yes	Yes	Yes		Weather: Pt.Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7C (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

(2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1620	NA	9.38	0.0	71.95	NS	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Tool Co. locks gate by 5:00 PM]

Monitoring Well Purging and Sampling Record

(Bagged tube & tubing - plus guidance device)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#15C
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (Trench-related RW; below-grade vault)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	903	NA	16.58	0.0	22.30	20.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 60's
4/5/18	840	NA	16.62	0.0								Clear, 60s

Well Purging Record * Narrow port in well head flange prevents drawdown monitoring

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	845	NM*	0.5	6.64	22.3	3150	1.0	-207.0	7.4	colorless, clear	*Low-flow groundwater sample:*
↓	847	↓	1.0	6.67	22.5	3210	0.9	-220.6	6.9	↓	(A) peristaltic pump w/ ded tubing
	850		1.5	6.69	22.8	3230	0.8	-237.2	5.9		B) ded bladder pump
	852		2.0	6.71	22.8	3250	0.8	-243.1	5.7		C) non-ded bladder pump; or
	855		2.5	6.72	22.8	3250	0.8	-244.6	5.5		*Standard groundwater sample:*
	857		3.0	6.73	22.8	3250	0.8	-246.9	5.3		D) bailer due to limited column; or
	900		3.5	6.73	22.9	3260	0.7	-248.8	5.3		E) recovery well cycling sample
↓	902	↓	4.0	6.73	23.0	3260	0.7	-251.8	5.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	905	RW-#15C	NM*	6.73	23.0	3260	0.7	-251.8	5.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-48
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	900	NA	18.74	0.0	32.00	26.9	Yes	Yes	Issue,	Yes		Weather: Partly Cloudy
4/5/18	925		18.70									Clear, 60s

§ Needs new at-grade pad/canister

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	935	18.96	0.5	6.77	24.0	4030	1.3	-317.1	13.1	gray tint, clear, odor	*Low-flow groundwater sample:*
	937	19.00	1.0	6.77	24.1	4040	1.1	-321.5	11.4		(A) peristaltic pump w/ ded tubing
	940	19.03	1.5	6.77	24.2	4040	1.0	-324.5	9.8		B) ded bladder pump
	942	19.03	2.0	6.78	24.4	4060	0.8	-330.5	9.4		C) non-ded bladder pump; or
	945	19.03	2.5	6.79	24.4	4060	0.8	-331.8	8.7		*Standard groundwater sample:*
	947	19.03	3.0	6.80	24.5	4060	0.8	-333.7	8.5		D) bailer due to limited column; or
	950	19.03	3.5	6.80	24.5	4070	0.8	-335.8	8.2		E) recovery well cycling sample
	952	19.03	4.0	6.80	24.5	4070	0.8	-336.3	8.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	955	MW-48	19.03	6.80	24.5	4070	0.8	-336.3	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-130
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	907	NA	20.43	0.0	45.00	37.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's
4/5/18	930		20.44									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	935	20.47	0.5	7.16	20.5	2842	2.7	80.1	13.2	Clear, colorless	*Low-flow groundwater sample:*
	938	20.48	1.0	6.99	20.7	2875	1.9	89.6	10.4	" "	(A) peristaltic pump w/ ded tubing
	940	20.49	1.5	6.91	20.9	2933	1.6	100.4	9.0	" "	B) ded bladder pump
	943	20.49	2.0	6.86	21.2	2950	1.4	100.7	7.9	" "	C) non-ded bladder pump; or
	945	20.49	2.5	6.83	21.3	2964	1.3	101.0	7.4	" "	*Standard groundwater sample:*
	948	20.49	3.0	6.81	21.4	2972	1.2	101.7	7.0	" "	D) bailer due to limited column; or
	950	20.49	3.5	6.80	21.5	2975	1.1	102.3	6.8	" "	E) recovery well cycling sample
	957	20.49	4.0	6.79	21.5	2978	1.1	102.8	6.5	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	955	MW-130	20.49	6.79	21.5	2978	1.1	102.8	6.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-4
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	910	24.60	24.97	0.37	41.75	31.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		No Sampling due to LNAPL					≥ 0.03	B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		KWB-4								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Equipped as RW in above-grade vault]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-19
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Gauge to top of 1-in galvanized pipe)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	913	24.83	25.06	0.23	NM	10' off bottom as needed	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		No Sampling due to LNAPL ≥ 0.03'						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-19								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-76
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1830	NA	11.10	0.0	20.33	16.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's
4/4/18	1030	NA	11.16	0.0								Clear 40's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1035	11.21	0.5	7.00	18.1	5990	2.8	-110.5	9.8	clear/colorless	*Low-flow groundwater sample:*
	1037	11.21	1.0	6.98	18.3	6030	2.1	-111.5	9.0		(A) peristaltic pump w/ ded tubing
	1040	11.21	1.5	6.96	18.3	6070	1.8	-113.8	8.9		B) ded bladder pump
	1042	11.21	2.0	6.95	18.3	6090	1.7	-114.9	8.3		C) non-ded bladder pump; or
	1045	11.21	2.5	6.95	18.4	6110	1.6	-115.8	8.0		*Standard groundwater sample:*
	1047	11.21	3.0	6.94	18.4	6120	1.6	-116.3	7.5		D) bailer due to limited column; or
	1050	11.21	3.5	6.94	18.4	6130	1.5	-116.9	7.3		E) recovery well cycling sample
	1052	11.21	4.0	6.94	18.3	6130	1.5	-117.5	7.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1055	MW-76	11.21	6.94	18.3	6130	1.5	-117.5	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-77
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: SCO

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1745	NA	9.40	0.0	20.52	15.2	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1750	9.54	0.5	7.19	21.5	8120	4.1	-68.5	10.1	Clear / gold tint; odor	*Low-flow groundwater sample:*
	1752	9.56	1.0	7.10	21.0	8190	3.5	-70.1	9.7		(A) peristaltic pump w/ ded tubing
	1755	9.58	1.5	7.08	20.8	8190	3.0	-72.3	9.1		B) ded bladder pump
	1757	9.59	2.0	7.05	20.6	8200	2.9	-72.9	8.6		C) non-ded bladder pump; or
	1800	9.60	2.5	7.00	20.5	8210	2.8	-73.2	8.3		*Standard groundwater sample:*
	1802	9.60	3.0	6.99	20.5	8210	2.8	-73.5	8.0		D) bailer due to limited column; or
	1805	9.60	3.5	6.98	20.6	8210	2.7	-73.6	7.5		E) recovery well cycling sample
	1807	9.60	4.0	6.98	20.6	8220	2.7	-73.7	7.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1810	MW-77	9.60	6.98	20.6	8220	2.7	-73.7	7.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-78
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1833	NA	11.41	0.0	19.57	14.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 90's
4/4/18	945	NA	11.46	0.0								Clear 40's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	950	11.54	0.5	7.44	17.4	5100	3.8	14.1	7.9	clear/gold tint	*Low-flow groundwater sample:*
	952	11.61	1.0	7.34	17.4	4960	3.2	27.7	6.5		(A) peristaltic pump w/ ded tubing
	955	11.66	1.5	7.22	17.3	4910	2.9	33.2	6.1		B) ded bladder pump
	957	11.70	2.0	7.18	17.3	4870	2.5	35.1	5.8		C) non-ded bladder pump; or
	1000	11.74	2.5	7.14	17.3	4850	2.3	37.9	5.6		*Standard groundwater sample:*
	1002	11.78	3.0	7.16	17.3	4840	2.2	38.3	5.3		D) bailer due to limited column; or
	1005	11.82	3.5	7.08	17.4	4840	2.2	38.5	5.0		E) recovery well cycling sample
	1007	11.86	4.0	7.07	17.4	4840	2.1	38.9	4.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1010	MW-78	11.86	7.07	17.4	4840	2.1	38.9	4.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-75
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1700	NA	9.55	0.0	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1705	9.58	0.5	7.38	21.7	7750	2.9	-68.1	9.8	Clear / Gold tint	*Low-flow groundwater sample:*
	1707	9.58	1.0	7.30	21.3	7790	2.3	-77.5	9.1	odor	(A) peristaltic pump w/ ded tubing
	1710	9.59	1.5	7.25	20.9	7810	2.0	-75.9	8.7		B) ded bladder pump
	1712	9.59	2.0	7.21	20.8	7820	1.7	-79.3	8.3		C) non-ded bladder pump; or
	1715	9.59	2.5	7.20	20.8	7830	1.5	-80.2	8.0		*Standard groundwater sample:*
	1717	9.59	3.0	7.20	20.8	7830	1.4	-81.5	7.8		D) bailer due to limited column; or
	1720	9.59	3.5	7.19	20.9	7830	1.4	-81.9	7.5		E) recovery well cycling sample
↓	1722	9.59	4.0	7.19	20.9	7820	1.4	-82.3	6.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1725	MW-75	9.59	7.19	20.9	7820	1.4	-82.3	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-83
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in ; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1837	NA	9.40	0.0	19.91	15.6	Yes	Yes	Yes	Yes		Weather: Clear 40's
4/4/18	1115	NA	9.42	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1120	9.52	0.5	7.10	19.0	5470	3.0	-123.8	14.1	Clear/gold tint	*Low-flow groundwater sample:*
	1122	9.57	1.0	7.06	19.0	5490	2.5	-133.5	12.8		(A) peristaltic pump w/ ded tubing
	1125	9.58	1.5	7.00	19.0	5510	2.0	-140.6	12.6		B) ded bladder pump
	1127	9.59	2.0	6.98	19.0	5520	1.8	-143.9	10.5		C) non-ded bladder pump; or
	1130	9.60	2.5	6.97	19.0	5520	1.7	-145.7	9.6		*Standard groundwater sample:*
	1132	9.60	3.0	6.97	18.9	5230	1.7	-149.1	8.9		D) bailer due to limited column; or
	1135	9.60	3.5	6.96	18.9	5230	1.6	-150.8	8.5		E) recovery well cycling sample
	1137	9.60	4.0	6.96	18.9	5230	1.6	-152.3	7.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1140	MW-83	9.60	6.96	18.9	5230	1.6	-152.3	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ DUP-EP-03 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-3
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1846	NA	11.43	0.0	22.10	18.1	Yes	Yes	Yes	Yes		Weather: Clear 40's
4/4/18	1200	NA	11.46	0.0								

Well Purging Record

* New TD

* Well repairs made; stickup and protective casing added

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1205	11.51	0.5	7.30	18.8	5900	2.4	-45.7	10.5	Clear/colorless	*Low-flow groundwater sample:*
	1207	11.54	1.0	7.24	18.9	6030	1.9	-41.2	9.1		(A) peristaltic pump w/ ded tubing
	1210	11.55	1.5	7.20	18.9	6050	1.6	-38.6	8.6		B) ded bladder pump
	1212	11.55	2.0	7.17	18.9	6070	1.4	-35.4	8.0		C) non-ded bladder pump; or
	1215	11.55	2.5	7.16	18.8	6090	1.3	-34.1	7.4		*Standard groundwater sample:*
	1217	11.55	3.0	7.16	18.8	6100	1.3	-32.1	7.0		D) bailer due to limited column; or
	1220	11.55	3.5	7.15	18.8	6100	1.2	-30.9	6.8		E) recovery well cycling sample
	1222	11.55	4.0	7.15	18.8	6110	1.2	-29.9	6.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1225	MW-3	11.55	7.15	18.8	6110	1.2	-29.9	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500-~~
	1100	DUP-EP-03	11.55	7.15	18.8	6110	1.2	-29.9	6.3	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-88
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; Stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	950	NA	8.83	0.0	20.31	14.8	Yes	Yes	Yes	Yes	Hole in pad	Weather: Partly Cloudy 70s

Well Purging Record

* Issue with pad; hole in west side of pad well remains functional

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	955	8.90	0.5	6.40	21.9	6700	2.6	-111.5	15.1	Clear/colorless w/ orange particles	*Low-flow groundwater sample:*
	957	8.91	1.0	6.52	21.6	6710	1.8	-119.1	11.5		(A) peristaltic pump w/ ded tubing
	1000	8.91	1.5	6.59	21.2	6710	1.5	-125.1	10.9		B) ded bladder pump
	1002	8.91	2.0	6.63	20.9	6730	1.3	-130.1	10.2		C) non-ded bladder pump; or
	1005	8.91	2.5	6.67	20.9	6720	1.2	-134.8	9.7		*Standard groundwater sample:*
	1007	8.91	3.0	6.69	20.9	6720	1.2	-139.6	9.4		D) bailer due to limited column; or
	1010	8.91	3.5	6.70	20.9	6730	1.1	-142.8	8.9		E) recovery well cycling sample
↓	1012	8.91	4.0	6.71	20.9	6730	1.1	-145.6	8.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1015	MW-88	8.91	6.71	20.9	6730	1.1	-145.6	8.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ Dup-EP-02 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1035	NA	8.13	0.0	22.65	17.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1040	8.20	0.5	6.99	21.3	7360	2.8	-51.5	12.1	Clear/colorless w/	*Low-flow groundwater sample:*
	1042	8.26	1.0	6.97	20.7	7340	2.0	-63.5	10.5	orange particles	(A) peristaltic pump w/ ded tubing
	1045	8.29	1.5	6.96	20.5	7340	1.7	-67.1	10.1		B) ded bladder pump
	1047	8.32	2.0	6.96	20.2	7320	1.5	-70.6	9.7		C) non-ded bladder pump; or
	1050	8.34	2.5	6.95	20.1	7320	1.4	-73.5	9.2		*Standard groundwater sample:*
	1052	8.35	3.0	6.95	20.1	7320	1.4	-75.2	8.9		D) bailer due to limited column; or
	1055	8.36	3.5	6.95	20.1	7310	1.3	-77.5	8.7		E) recovery well cycling sample
	1057	8.36	4.0	6.94	20.0	7310	1.3	-78.1	8.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1100	MW-22A	8.36	6.94	20.0	7310	1.3	-78.1	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1000	DUP-EP-02	8.36	6.94	20.0	7310	1.3	-78.1	8.1	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1135	NA	8.01	0.0	54.66	49.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

located 15 yds off the left side of path (after the "S" turn)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-10
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup) Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1140	NA	5.57	0.0	18.45	13.3	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70s

* cracked pad repaired prior to 1H 18 event

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1145	5.58	0.5	7.41	21.7	6140	2.7	-21.5	8.7	Clear/colorless w/	*Low-flow groundwater sample:*
	1147	5.59	1.0	7.29	21.7	6040	2.1	-29.6	7.9	small orange particles	(A) peristaltic pump w/ ded tubing
	1150	5.59	1.5	7.22	21.8	6010	1.8	-32.9	7.0		B) ded bladder pump
	1152	5.59	2.0	7.19	21.6	5960	1.6	-35.1	6.9		C) non-ded bladder pump; or
	1155	5.59	2.5	7.15	21.6	5940	1.5	-39.5	6.5		*Standard groundwater sample:*
	1157	5.59	3.0	7.13	21.5	5930	1.4	-40.2	6.1		D) bailer due to limited column; or
	1200	5.59	3.5	7.10	21.5	5930	1.4	-42.1	5.9		E) recovery well cycling sample
	1202	5.59	4.0	7.10	21.5	5920	1.4	-43.8	5.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1205	MW-10	5.59	7.10	21.5	5920	1.4	-43.8	5.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-123
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1225	NA	5.92	0.0	25.71	25.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1230	5.93	0.5	7.35	22.0	6470	2.7	-82.9	15.5	Clear / colorless	*Low-flow groundwater sample:*
	1232	5.94	1.0	7.29	21.4	6460	2.3	-75.4	12.8		(A) peristaltic pump w/ ded tubing
	1235	5.94	1.5	7.25	20.9	6480	2.0	-70.1	11.9		B) ded bladder pump
	1237	5.94	2.0	7.21	20.8	6470	1.8	-68.3	11.1		C) non-ded bladder pump; or
	1240	5.94	2.5	7.19	20.8	6470	1.6	-65.4	10.8		*Standard groundwater sample:*
	1242	5.94	3.0	7.18	20.7	6480	1.5	-62.1	9.9		D) bailer due to limited column; or
	1245	5.94	3.5	7.18	20.7	6480	1.4	-60.6	9.5		E) recovery well cycling sample
↓	1247	5.94	4.0	7.17	20.7	6480	1.4	-60.1	9.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1250	MW-123	5.94	7.17	20.7	6480	1.4	-60.1	9.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1615	NA	11.58	0.0	16.55	~~At~~ base of well	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80s

Well Purging Record * Well repaired prior to 1H18 event

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1620	11.59	0.5	7.53	22.1	6500	3.4	-135.2	11.5	Clear / colorless w/	*Low-flow groundwater sample:*
	1622	11.59	1.0	7.48	21.9	6390	3.1	-140.3	9.8	black particles	(A) peristaltic pump w/ ded tubing
	1625	11.59	1.5	7.43	21.6	6280	2.9	-146.8	9.1		B) ded bladder pump
	1627	11.59	2.0	7.40	21.5	6250	2.7	-149.3	8.6		C) non-ded bladder pump; or
	1630	11.59	2.5	7.37	21.5	6170	2.6	-151.9	8.3		*Standard groundwater sample:*
	1632	11.59	3.0	7.35	21.4	6120	2.6	-154.6	8.4		D) bailer due to limited column; or
	1635	11.59	3.5	7.34	21.4	6100	2.5	-157.3	8.1		E) recovery well cycling sample
	1637	11.59	4.0	7.33	21.5	6090	2.5	-159.2	7.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1640	MW-4A	11.59	7.33	21.5	6090	2.5	-159.2	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4B (Gauge Only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SLD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1610	NA	11.32	NA	72.37	67.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-03 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1510	NA	8.57	0.0	20.15	14.8	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record * confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1515	8.63	0.5	7.41	21.7	13,110	3.0	-132.1	14.8	clear/colorless w/	*Low-flow groundwater sample:*
	1517	8.63	1.0	7.37	21.3	13,280	2.3	-133.7	12.9	small orange particles	(A) peristaltic pump w/ ded tubing
	1520	8.63	1.5	7.34	21.0	13,440	2.0	-136.3	10.5		B) ded bladder pump
	1522	8.63	2.0	7.30	20.9	13,510	1.8	-138.7	9.8		C) non-ded bladder pump; or
	1525	8.63	2.5	7.28	20.7	13,570	1.7	-141.5	9.1		*Standard groundwater sample:*
	1527	8.63	3.0	7.26	20.6	13,610	1.6	-145.8	8.6		D) bailer due to limited column; or
	1530	8.63	3.5	7.25	20.6	13,630	1.6	-147.3	8.3		E) recovery well cycling sample
	1532	8.63	4.0	7.25	20.5	13,650	1.5	-148.9	8.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1535	MW-5A	8.63	7.25	20.5	13,650	1.5	-148.9	8.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1550	EB-EP-03	NA							Same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1600	NA	8.79	0.0	53.54	48.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5C (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1603	NA	8.99	0.0	71.64	66.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ Dup-EP-01 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1310	NA	9.48	0.0	18.65	13.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

* well repairs done prior to 1H 18 event

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1315	9.58	0.5	7.50	21.2	8570	2.6	-116.5	25.4	Clear/colorless w/	*Low-flow groundwater sample:*
	1317	9.59	1.0	7.39	20.6	8580	1.9	-112.3	19.3	orange particles	(A) peristaltic pump w/ ded tubing
	1320	9.59	1.5	7.30	20.3	8580	1.7	-109.5	14.1		B) ded bladder pump
	1322	9.59	2.0	7.28	20.0	8580	1.5	-107.3	12.9		C) non-ded bladder pump; or
	1325	9.59	2.5	7.25	19.9	8590	1.4	-105.2	12.0		*Standard groundwater sample:*
	1327	9.59	3.0	7.24	19.9	8590	1.4	-104.9	10.9		D) bailer due to limited column; or
	1330	9.59	3.5	7.24	19.8	8580	1.3	-103.8	9.8		E) recovery well cycling sample
	1332	9.59	4.0	7.23	19.8	8580	1.3	-103.5	9.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1335	MW-7A	9.59	7.23	19.8	8580	1.3	-103.5	9.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1200	DUP-EP-01	9.59	7.23	19.8	8580	1.3	-103.5	9.1	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1410	NA	9.26	0.0	52.56	47.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ Trip Blank - EP-02

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1420	NA	9.06	0.0	20.74	16.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

* Pad replaced prior to 1H18 event

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1425	9.51	0.5	7.20	21.4	10,880	2.9	-137.6	11.9	Clear/colorless w/	*Low-flow groundwater sample:*
	1427	9.66	1.0	7.13	20.7	10,910	2.0	-141.8	10.5	small orange particles	(A) peristaltic pump w/ ded tubing
	1430	9.73	1.5	7.09	20.5	10,940	1.8	-145.9	9.8		B) ded bladder pump
	1432	9.78	2.0	7.03	20.3	10,990	1.5	-149.3	9.0		C) non-ded bladder pump; or
	1435	9.80	2.5	7.00	20.2	10,990	1.4	-151.9	8.7		*Standard groundwater sample:*
	1437	9.82	3.0	6.98	20.2	11,000	1.4	-152.3	8.3		D) bailer due to limited column; or
	1440	9.83	3.5	6.97	20.1	11,010	1.3	-153.4	8.0		E) recovery well cycling sample
	1442	9.83	4.0	6.96	20.1	11,010	1.3	-153.9	7.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1445	OCD-8A	9.83	6.96	20.1	11,010	1.3	-153.9	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD- 8B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern:

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in ; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1500	NA	9.15	0.0	56.65	51.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Do not gauge or sample, Spring 2018]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-P4
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; Short stickup) Initials: BZH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-25
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1105	NA	13.89	0.0	28.18	23.2	Yes	Yes	Yes	Yes		Weather: Sunny, 50s
4-4-18	1135	NA	13.91	0.0								

Well Purging Record

*gravel placed under pad for subsidence issue

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1140	14.28	0.5	7.76	19.2	6420	1.8	35.8	6.2	Colorless, clear	*Low-flow groundwater sample:*
	1143	14.32	1.0	7.50	19.2	6300	1.2	37.5	4.8		(A) peristaltic pump w/ ded tubing
	1145	14.32	1.5	7.31	19.3	6180	1.0	39.6	4.1		B) ded bladder pump
	1148	14.32	2.0	7.19	19.4	6040	0.8	41.0	3.6		C) non-ded bladder pump; or
	1150	14.32	2.5	7.07	19.3	5950	0.7	42.3	3.3		*Standard groundwater sample:*
	1153	14.32	3.0	7.04	19.2	5880	0.6	43.8	3.0		D) bailer due to limited column; or
	1155	14.32	3.5	7.03	19.2	5850	0.6	44.1	2.9		E) recovery well cycling sample
	1158	14.32	4.0	7.01	19.2	5830	0.6	44.7	2.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1200	MW-25	14.32	7.01	19.2	5830	0.6	44.7	2.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-8 (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1055	NA	12.82	0.0	14.95	NS	Yes	Issue	Yes	Yes		Weather: Sunny, 70s
					↳ Blockage, will not pass							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		PVC riser added to TOC for easier gauging.						A) peristaltic pump w/ ded tubing
			1.5		New TOC data needed.						B) ded bladder pump
			2.0		Blockage at 14.95' TOC will not allow						C) non-ded bladder pump; or
			2.5		probe to pass for accurate TD.						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5		well to possibly be PtA pending						E) recovery well cycling sample
			4.0		HWB approval per SESI Scope.						F) irrigation well grab sample
					If not PtA well will need						
					new pad installed.						

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-1R
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1115	NA	11.10	0.0	20.63	15.6	Yes	Issue	Yes	Yes		Weather: Sunny, 50s
4-4-18	1220	NA	11.12	0.0				↳				

↳ casing + lid are bent making closure difficult, well still locks + is functional. Gravel added to prevent subsidence.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1225	11.28	0.5	7.02	18.0	8470	1.6	-107.8	3.1	Colorless, clear	*Low-flow groundwater sample:*
	1228	11.28	1.0	6.98	17.9	8550	1.1	-108.4	2.6		(A) peristaltic pump w/ ded tubing
	1230	11.28	1.5	6.95	17.8	8590	0.8	-109.8	2.2		B) ded bladder pump
	1233	11.28	2.0	6.91	17.6	8630	0.7	-110.1	1.9		C) non-ded bladder pump; or
	1235	11.28	2.5	6.88	17.5	8650	0.6	-110.6	2.0		*Standard groundwater sample:*
	1238	11.28	3.0	6.86	17.4	8660	0.6	-111.2	1.8		D) bailer due to limited column; or
	1240	11.28	3.5	6.85	17.4	8670	0.5	-111.9	1.4		E) recovery well cycling sample
	1243	11.28	4.0	6.84	17.3	8670	0.5	-112.3	1.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1245	MW-1R	11.28	6.84	17.3	8670	0.5	-112.3	1.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-15
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: BEH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1125	NA	12.09	0.0	21.70	17.7	Yes	Yes	Yes	Yes		Weather: Sunny, 50s
4-4-18	1305	NA	12.12	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1310	12.16	0.5	7.08	19.0	5090	1.9	18.4	10.2	colorless, clear	*Low-flow groundwater sample:*
	1313	12.16	1.0	7.00	19.0	4990	1.2	18.9	8.8		(A) peristaltic pump w/ ded tubing
	1315	12.16	1.5	6.94	18.9	4910	0.8	21.2	7.9		B) ded bladder pump
	1318	12.16	2.0	6.88	18.9	4870	0.7	24.6	7.4		C) non-ded bladder pump; or
	1320	12.16	2.5	6.84	18.9	4850	0.6	26.3	7.1		*Standard groundwater sample:*
	1323	12.16	3.0	6.82	18.8	4830	0.6	27.1	6.8		D) bailer due to limited column; or
	1325	12.16	3.5	6.81	18.8	4820	0.6	27.9	6.4		E) recovery well cycling sample
	1328	12.16	4.0	6.79	18.8	4810	0.6	28.3	6.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1330	MW-15	12.16	6.79	18.8	4810	0.6	28.3	6.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Cu,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Cu,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - EP-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-1R
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	925	NA	12.27	0.0	23.73	18.4	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-4-18	1355	NA	12.33	0.0								

Well Purging Record

*PVC cut down, allowing full closure of casing. well needs to be resurrected for TOC data.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1400	12.50	0.5	7.20	18.5	8210	1.5	58.0	4.7	Colorless, clear	*Low-flow groundwater sample:*
	1403	12.52	1.0	7.10	18.4	8510	1.1	58.4	3.9		(A) peristaltic pump w/ ded tubing
	1405	12.53	1.5	7.01	18.4	8730	0.9	57.8	3.6		B) ded bladder pump
	1408	12.53	2.0	6.97	18.3	8990	0.8	56.5	3.1		C) non-ded bladder pump; or
	1410	12.53	2.5	6.94	18.3	9000	0.7	54.9	3.1		*Standard groundwater sample:*
	1413	12.53	3.0	6.92	18.2	9010	0.7	52.6	2.9		D) bailer due to limited column; or
	1415	12.53	3.5	6.91	18.2	9030	0.6	51.3	2.8		E) recovery well cycling sample
	1418	12.53	4.0	6.90	18.2	9040	0.6	50.9	2.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1420	OCD-1R	12.53	6.90	18.2	9040	0.6	50.9	2.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	945	NA	12.48	0.0	27.58	22.3	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-4-18	1440	NA	12.52	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1445	15.64	0.5	7.27	19.2	5120	2.3	24.7	61.0	Colorless, clear w/	*Low-flow groundwater sample:*
↓	1448	15.65	1.0	7.22	19.0	5100	2.0	10.8	48.7	orange particles	(A) peristaltic pump w/ ded tubing
	1450	15.65	1.5	7.18	18.8	5090	1.9	-3.2	37.3	↓ ↓	B) ded bladder pump
	1453	15.65	2.0	7.13	18.7	5080	1.6	-7.9	39.2		C) non-ded bladder pump; or
	1455	15.65	2.5	7.10	18.6	5070	1.3	-11.7	38.1		*Standard groundwater sample:*
	1458	15.65	3.0	7.08	18.5	5060	1.1	-14.8	37.6		D) bailer due to limited column; or
	1500	15.65	3.5	7.07	18.4	5060	1.0	-16.1	37.3		E) recovery well cycling sample
↓	1503	15.65	4.0	7.06	18.4	5050	1.0	-17.3	36.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1505	OCD-2A	15.65	7.06	18.4	5050	1.0	-17.3	36.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	940	NA	11.72	0.0	50.39	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-3
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BF H

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1010	NA	12.83	0.0	25.20	20.2	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-4-18	1525	NA	12.85	0.0								

Well Purging Record

* PVC cut down & pad repaired. New TOC data needs to be added

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1530	12.89	0.5	6.92	19.0	7420	1.6	38.8	42.1	colorless, clear w/	*Low-flow groundwater sample:*
	1533	12.90	1.0	6.86	18.8	7460	1.3	28.2	30.7	orange particles	(A) peristaltic pump w/ ded tubing
	1535	12.90	1.5	6.80	18.7	7500	1.0	20.7	28.4		B) ded bladder pump
	1538	12.90	2.0	6.76	18.7	7520	0.7	13.8	26.3		C) non-ded bladder pump; or
	1540	12.90	2.5	6.74	18.7	7540	0.6	10.1	25.1		*Standard groundwater sample:*
	1543	12.90	3.0	6.72	18.6	7550	0.6	9.8	24.8		D) bailer due to limited column; or
	1545	12.90	3.5	6.71	18.6	7560	0.5	8.4	24.3		E) recovery well cycling sample
	1548	12.90	4.0	6.70	18.6	7560	0.5	7.5	23.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1550	OCD-3	12.90	6.70	18.6	7560	0.5	7.5	23.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-4
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BR-H

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1020	NA	12.33	0.0	25.42	20.1	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-4-18	1610	NA	12.37	0.0								

Well Purging Record

*Pad replaced

*confirmed SC

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1615	12.40	0.5	6.90	19.1	3220	1.9	71.6	21.7	colorless, clear	*Low-flow groundwater sample:*
↓	1618	12.40	1.0	6.85	19.0	3280	1.5	64.8	19.6	↓	(A) peristaltic pump w/ ded tubing
	1620	12.40	1.5	6.82	19.0	3320	1.2	59.0	17.5		B) ded bladder pump
	1623	12.40	2.0	6.79	18.9	3350	1.1	52.7	12.6		C) non-ded bladder pump; or
	1625	12.40	2.5	6.78	18.9	3360	1.1	48.4	11.1		*Standard groundwater sample:*
	1628	12.40	3.0	6.78	18.8	3370	1.0	46.1	10.3		D) bailer due to limited column; or
	1630	12.40	3.5	6.77	18.8	3370	1.0	43.5	9.7		E) recovery well cycling sample
↓	1633	12.40	4.0	6.77	18.8	3380	1.0	41.8	9.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1635	OCD-4	12.40	6.77	18.8	3380	1.0	41.8	9.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	955	NA	9.85	0.0	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-4-18	1735	NA	9.90	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1740	10.01	0.5	6.73	18.9	24,900	1.6	67.3	38.4	Colorless, clear w/	*Low-flow groundwater sample:*
	1743	10.01	1.0	6.70	18.7	25,100	1.2	57.2	30.7	orange particles	(A) peristaltic pump w/ ded tubing
	1745	10.01	1.5	6.67	18.6	25,200	1.0	50.8	24.8		B) ded bladder pump
	1748	10.01	2.0	6.64	18.5	25,300	0.9	44.5	22.6		C) non-ded bladder pump; or
	1750	10.01	2.5	6.63	18.5	25,400	0.8	41.4	18.7		*Standard groundwater sample:*
	1753	10.01	3.0	6.62	18.4	25,500	0.7	40.1	16.5		D) bailer due to limited column; or
	1755	10.01	3.5	6.61	18.4	25,600	0.7	39.6	16.1		E) recovery well cycling sample
	1758	10.01	4.0	6.60	18.4	25,600	0.7	38.7	15.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1800	MW-11A	10.01	6.60	18.4	25,600	0.7	38.7	15.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1000	NA	9.82	0.0	47.30	42.3	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-5
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1025	NA	10.48	0.0	25.41	20.6	Yes	Yes	Yes	Yes		Weather: Sunny, 70s
4-4-18	1655	NA	10.53	0.0								

* Pad replaced

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1700	10.60	0.5	6.85	18.5	14,610	1.8	61.4	98.0	orange tint, sl. cloudy	*Low-flow groundwater sample:*
	1703	10.60	1.0	6.81	18.5	14,630	1.3	50.9	67.0	w/ orange particles	(A) peristaltic pump w/ ded tubing
	1705	10.60	1.5	6.77	18.4	14,640	1.0	44.7	61.0		B) ded bladder pump
	1708	10.60	2.0	6.74	18.4	14,650	0.8	39.4	58.0		C) non-ded bladder pump; or
	1710	10.60	2.5	6.74	18.4	14,660	0.7	37.1	49.2		*Standard groundwater sample:*
	1713	10.60	3.0	6.73	18.3	14,670	0.6	35.0	48.1		D) bailer due to limited column; or
	1715	10.60	3.5	6.72	18.3	14,670	0.5	33.2	48.7		E) recovery well cycling sample
	1718	10.60	4.0	6.72	18.2	14,680	0.5	31.9	47.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1720	OCD-5	10.60	6.72	18.2	14,680	0.5	31.9	47.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-87
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; Stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1145	NA	8.74	0.0	20.39	15.1	Yes	Yes	Yes	Yes		Weather: Sunny, 40s
4-4-18	810	NA	8.80	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	815	8.92	0.5	7.69	14.5	14,870	2.0	-95.9	4.7	colorless, clear	*Low-flow groundwater sample:*
	818	8.97	1.0	7.42	15.0	14,930	1.4	-109.8	3.1		(A) peristaltic pump w/ ded tubing
	820	9.01	1.5	7.33	15.2	14,980	1.0	-120.0	2.6		B) ded bladder pump
	823	9.04	2.0	7.28	15.4	15,010	0.8	-127.3	2.2		C) non-ded bladder pump; or
	825	9.07	2.5	7.24	15.4	15,030	0.7	-130.7	2.1		*Standard groundwater sample:*
	828	9.10	3.0	7.21	15.5	15,040	0.7	-132.6	1.8		D) bailer due to limited column; or
	830	9.13	3.5	7.19	15.6	15,050	0.6	-133.9	1.4		E) recovery well cycling sample
	833	9.16	4.0	7.18	15.6	15,060	0.6	-135.1	1.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	835	MW-87	9.16	7.18	15.6	15,060	0.6	-135.1	1.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18A
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1155	NA	10.41	0.0	22.58	17.9	Yes	Yes	Yes	Yes		Weather: Sunny, 40s
4-4-18	900	NA	10.46	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	905	10.68	0.5	7.14	16.1	20,100	1.9	38.5	4.8	Colorless, clear	*Low-flow groundwater sample:*
	908	10.76	1.0	7.08	16.2	20,200	1.3	39.1	3.1		(A) peristaltic pump w/ ded tubing
	910	10.83	1.5	7.03	16.4	20,300	1.0	36.8	2.4		B) ded bladder pump
	913	10.88	2.0	6.98	16.5	20,400	0.8	35.4	2.1		C) non-ded bladder pump; or
	915	10.91	2.5	6.94	16.6	20,500	0.7	34.2	1.9		*Standard groundwater sample:*
	918	10.94	3.0	6.92	16.7	20,600	0.6	33.9	1.7		D) bailer due to limited column; or
	920	10.97	3.5	6.90	16.8	20,600	0.6	33.6	1.3		E) recovery well cycling sample
	923	11.00	4.0	6.89	16.8	20,700	0.5	33.1	1.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	925	MW-18A	11.00	6.89	16.8	20,700	0.5	33.1	1.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45~~ u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18B (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1200	NA	10.38	0.0	50.59	45.6	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18T (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1205	NA	10.45	0.0	50.58	NS	Yes	Yes	~~No~~ BRH Yes	Yes		Weather: Sunny, 70s

Well Purging Record

*New TOC data needed

*Top of PVC repaired w/ new riser. Cap & casing lid installed. well does not have a lock.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5			NS	Lock added on 4-4-18 by HMT.				*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-70
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1220	NA	8.27	0.0	22.05	16.8	Yes	Yes	Yes	Yes		Weather: Sunny, 50s
4-4-18	945	NA	8.33	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	950	8.40	0.5	7.32	15.6	7730	1.4	-52.7	26.4	colorless, clear w/	*Low-flow groundwater sample:*
	953	8.40	1.0	7.21	15.6	7480	1.0	-48.2	21.2	orange particles	(A) peristaltic pump w/ ded tubing
	955	8.40	1.5	7.14	15.7	7120	0.8	-44.8	18.6		B) ded bladder pump
	958	8.40	2.0	7.04	15.7	6930	0.7	-40.1	14.2		C) non-ded bladder pump; or
	1000	8.40	2.5	6.94	15.7	6790	0.7	-38.7	13.7		*Standard groundwater sample:*
	1003	8.40	3.0	6.91	15.8	6670	0.6	-35.4	10.8		D) bailer due to limited column; or
	1005	8.40	3.5	6.89	15.8	6640	0.6	-33.9	9.6		E) recovery well cycling sample
	1008	8.40	4.0	6.87	15.9	6620	0.6	-31.8	9.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1010	MW-70	8.40	6.87	15.9	6620	0.6	-31.8	9.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-02 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-124
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1230	NA	8.79	0.0	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Sunny, 50s
4-4-18	1030	NA	8.85	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-4-18	1035	8.89	0.5	6.98	16.8	11,080	1.8	-92.0	15.2	Colorless, clear	*Low-flow groundwater sample:*
	1038	8.90	1.0	6.92	16.9	11,320	1.1	-94.3	12.6		(A) peristaltic pump w/ ded tubing
	1040	8.90	1.5	6.87	16.9	11,590	0.9	-95.7	10.4		B) ded bladder pump
	1043	8.90	2.0	6.83	16.8	11,800	0.7	-93.8	7.8		C) non-ded bladder pump; or
	1045	8.90	2.5	6.80	16.8	11,920	0.6	-90.4	7.2		*Standard groundwater sample:*
	1048	8.90	3.0	6.78	16.8	11,970	0.5	-89.2	6.8		D) bailer due to limited column; or
	1050	8.90	3.5	6.77	16.8	11,980	0.5	-88.1	6.4		E) recovery well cycling sample
	1053	8.90	4.0	6.76	16.8	11,990	0.5	-87.6	6.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-4-18	1055	MW-124	8.90	6.76	16.8	11,990	0.5	-87.6	6.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Cu,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1115	EB-EP-02	NA							Same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Driveway near bldg A/C unit

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-52
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; at-grade) Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1815	NA	19.14	0.0	34.67	29.5	Yes	Yes	Yes	Yes		Weather: Sunny 50's
4/5/18	840	NA	19.02	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	845	19.06	0.5	7.28	19.0	2530	3.4	47.8	10.6	Clear, Colorless	*Low-flow groundwater sample:*
	848	19.07	1.0	7.14	19.4	2657	2.1	69.7	8.2	" "	(A) peristaltic pump w/ ded tubing
	850	19.07	1.5	7.02	19.7	2681	1.8	82.6	6.0	" "	B) ded bladder pump
	853	19.07	2.0	6.98	19.8	2693	1.5	85.3	4.7	" "	C) non-ded bladder pump; or
	855	19.07	2.5	6.96	19.8	2698	1.4	86.7	3.5	" "	*Standard groundwater sample:*
	858	19.07	3.0	6.95	19.8	2704	1.3	87.2	3.1	" "	D) bailer due to limited column; or
	900	19.07	3.5	6.95	19.8	2706	1.3	88.1	2.9	" "	E) recovery well cycling sample
	903	19.07	4.0	6.94	19.8	2707	1.2	88.5	2.8	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	905	MW-52	19.07	6.94	19.8	2707	1.2	88.5	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

E. side of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-109
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1810	NA	17.74	0.0	29.48	25.5	Yes	Yes	Yes	Yes		Weather: Sunny, 50s
4-5-18	840	NA	17.58	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-5-18	845	17.74	0.5	6.65	18.8	4310	1.9	-343.6	7.5	colorless, clear, odor	*Low-flow groundwater sample:*
	848	17.80	1.0	6.52	19.1	3980	1.2	-350.7	6.1		(A) peristaltic pump w/ ded tubing
	850	17.85	1.5	6.49	19.3	3710	1.0	-355.1	4.8		B) ded bladder pump
	853	17.87	2.0	6.44	19.5	3580	0.9	-358.5	4.3		C) non-ded bladder pump; or
	855	17.89	2.5	6.42	19.7	3520	0.8	-360.2	4.1		*Standard groundwater sample:*
	858	17.90	3.0	6.39	19.8	3480	0.7	-361.4	3.7		D) bailer due to limited column; or
	900	17.91	3.5	6.38	19.8	3460	0.7	-362.9	3.6		E) recovery well cycling sample
	903	17.92	4.0	6.37	19.9	3440	0.7	-363.7	3.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-5-18	905	MW-109	17.92	6.37	19.9	3440	0.7	-363.7	3.4	DRO	HCL	Lab: ESC Lab Sciences, Mt. Juliet, TN 8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* west-side driveway of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-110
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1805	NA	15.79	0.0	29.74	24.7	Yes	Yes	Yes	Yes		Weather: Sunny, 50s
4-5-18	920	NA	15.66	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-5-18	925	15.80	0.5	6.64	19.9	1828	1.6	-350.2	72.0	sl.cloudy, colorless,	*Low-flow groundwater sample:*
	928	15.86	1.0	6.56	20.1	1754	1.0	-355.1	60.0	odor	(A) peristaltic pump w/ ded tubing
	930	15.91	1.5	6.51	20.3	1716	0.7	-358.3	49.7		B) ded bladder pump
	933	15.94	2.0	6.46	20.5	1657	0.6	-362.7	48.1		C) non-ded bladder pump; or
	935	15.96	2.5	6.44	20.6	1640	0.6	-364.1	49.8		*Standard groundwater sample:*
	938	15.97	3.0	6.43	20.6	1637	0.5	-364.9	52.0		D) bailer due to limited column; or
	940	15.98	3.5	6.43	20.7	1636	0.5	-366.2	49.6		E) recovery well cycling sample
	943	15.99	4.0	6.42	20.7	1636	0.5	-367.5	49.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-5-18	945	MW-110	15.99	6.42	20.7	1636	0.5	-367.5	49.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Cu,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Cu,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13 (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1355	NA	12.57	0.0	21.10	Not Sampled	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-69 (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern:

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; Stickup) Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1350	NA	11.41	0.0	22.50	Not Sampled	Yes	Yes	Yes	Yes		Weather: Pt-Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12 (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup) Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1345	NA	10.68	0.0	17.93	Not Sampled	Yes	Yes	Yes	Yes		Weather: Pt-Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location E. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-24 (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1320	NA	12.46	0.0	23.51	Not Sampled	Yes	Yes	Issue	Yes		Weather: Pt. Cloudy, 80s

↳ Broken hasp/hinge... well is locked but will not close securely.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-14 (Gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-3-18	1325	NA	11.86	NM	11.86	Not Sampled	Yes	Issue	Yes	Yes		Weather: Pt. Cloudy, 80s

Well Purging Record

*Blockage at 11.86' TOC

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Bag tube]

Recently off, due to water rights issues

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Sample part if RW is active]

Well: RW-12R
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Above-grade recovery vault
12-in well casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	828	NA	25.11	0.0	NM	Top of Pump	Yes	Yes	Yes	Yes		Weather: Sunny, 50's
4/4/18	1135	NA	25.11	0.0		(If not running)						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1140	25.13	0.5	8.38	20.1	2564	1.2	-183.6	12.2	{clear, colorless}	*Low-flow groundwater sample:*
	1143	25.13	1.0	8.03	19.8	2762	0.8	-265.3	9.8	{strong H2S odor}	(A) peristaltic pump w/ ded tubing
	1145	25.13	1.5	7.96	19.7	2824	0.6	-279.8	8.7	"	B) ded bladder pump
	1148	25.13	2.0	7.73	19.5	2841	0.5	-267.2	8.3	"	C) non-ded bladder pump; or
	1150	25.13	2.5	7.51	19.4	2848	0.4	-262.1	7.9	"	*Standard groundwater sample:*
	1153	25.13	3.0	7.48	19.4	2854	0.4	-258.3	7.5	"	D) bailer due to limited column; or
	1155	25.13	3.5	7.46	19.4	2858	0.3	-256.4	7.3	"	E) recovery well cycling sample
	1158	25.13	4.0	7.44	19.3	2861	0.3	-254.8	7.2	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1200	RW-12R	25.13	7.44	19.3	2861	0.3	-254.8	7.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500-~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ DUP-REST-01
+ EB-REST-01
(both for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-113
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	832	NA	24.76	0.10	37.80	33.8	Yes	Yes	Yes	Yes		Weather: Sunny 50's
4/4/18	1035	NA	24.77	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1040	24.80	0.5	7.01	19.5	2415	2.8	-33.4	9.3	clear, colorless	*Low-flow groundwater sample:*
	1043	24.82	1.0	6.97	19.3	2828	2.5	-46.2	7.9	" "	(A) peristaltic pump w/ ded tubing
	1045	24.83	1.5	6.95	19.3	2833	2.3	-50.3	7.0	" "	B) ded bladder pump
	1048	24.83	2.0	6.93	19.3	2836	1.9	-53.6	6.2	" "	C) non-ded bladder pump; or
	1050	24.83	2.5	6.92	19.2	2840	1.7	-55.2	4.7	" "	*Standard groundwater sample:*
	1053	24.83	3.0	6.90	19.2	2842	1.5	-56.5	4.4	" "	D) bailer due to limited column; or
	1055	24.83	3.5	6.89	19.2	2845	1.4	-56.9	4.2	" "	E) recovery well cycling sample
	1058	24.83	4.0	6.89	19.2	2847	1.4	-57.2	4.2	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1100	MW-113	24.83	6.89	19.2	2847	1.4	-57.2	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1000	DUP-REST-01	24.83	6.89	19.2	2847	1.4	-57.2	4.2	same analysis	Same	Same
	1110	EB-REST-01	NA							same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KwB-8
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1230	24.42	27.57	3.15	35.80	30.8	Yes	Yes	Yes	Yes		Weather: Clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED DUE TO LNAPL ≥ 0.03'						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		KwB-8								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-22
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (screen 11.5-39) Above-grade recovery vault 12-in casing diameter Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1245	25.16	25.31	0.15	NM	Sample pt w/ active RW	Yes	Yes	Yes	Yes		Weather: clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED DUE TO				LNAPL	≥ 0.03'	B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-22								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Metal Roof Canopy — RW-20A — ☐ Vault — RW-20B

Well: RW-20A
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

At-grade vault
6-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ

Well Inspection Information

Date	Time	* Depth to LNAPL (Ft-TOC)	* Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1205	>20.10	—	* NM	NM	NA (sample port)	Yes (NA)	Yes	Yes	Yes		Weather: Fly Cloudy 80's

* top of pump

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		Top of gauging	pump prevented LNAPL		(potential LNAPL)			B) ded bladder pump
			2.0			LNAPL present historically.					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5			NOT SAMPLED DUE TO HISTORICAL					(E) recovery well cycling sample
			4.0			LNAPL ≥ 0.03'					F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-20A								DRO	HCL	8015M
										~~CRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-20B
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Metal Roof Canopy — RW-20A - - - - - vault — RW-20B

At-grade vault
6-in casing diameter

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1215	>19.40*	—	* NM	NM	NA (sample port)	Yes (NA)	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record * top of pump

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		Top of pump prevented LNAPL (potential LNAPL						B) ded bladder pump
			2.0		gauging. LNAPL present historically						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0		[NOT SAMPLED DUE TO HISTORICAL						D) bailer due to limited column; or
			3.5		LNAPL ≥ 0.03']						(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-20B								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Bagged and labeled tube is stored inside the above-grade vault]

(Historical LNAPL)

Monitoring Well Purging and Sampling Record

flow-flow sampled in 1H18 as active recovery well was non-operational.

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-13R
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Above-grade vault
12-in casing diameter
Initials: RB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	13.25	NA	23.14	0.0	NM	NA	Yes	Yes	Yes	Yes		Weather: Sunny 50's
4/4/18	1225	NA	23.17	0.0	(pump in well)	(sample port)						

Well Purging Record

* UNMEASURABLE SHEEN ON PROBE → 30.0' TOC (DEDICATED TUBE IN RECOVERY VAULT)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1230	23.18	0.5	7.24	17.7	2410	4.3	-191.1	5.7	colorless/clear	*Low-flow groundwater sample:*
	1233	23.18	1.0	7.08	17.7	2320	2.4	-202.8	4.8		A) peristaltic pump w/ ded tubing
	1235	23.18	1.5	7.02	17.8	2290	1.8	-206.5	4.3		B) ded bladder pump
	1238	23.18	2.0	6.99	17.8	2280	1.5	-214.0	4.1		C) non-ded bladder pump; or
	1240	23.18	2.5	6.95	17.8	2250	1.3	-220.1	3.9		*Standard groundwater sample:*
	1243	23.18	3.0	6.98	17.7	2230	1.3	-228.6	3.9		D) bailer due to limited column; or
	1245	23.18	3.5	6.96	17.7	2230	1.3	-231.8	3.6		~~E) recovery well cycling sample~~
	1249	23.18	4.0	6.93	17.7	2220	1.2	-234.6	3.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1250	RW-13R	23.18	6.93	17.7	2220	1.2	-234.6	3.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-14R
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Above-grade vault
12-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	820	20.29	21.72	1.43	NM	NA	yes	yes	yes	yes		Weather: Sunny 70's
						(Sample port)						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	not	sampled	due to	LNAPL				A) peristaltic pump w/ ded tubing
			1.5	≥0.03							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-14R								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-133
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	828	19.90	20.16	0.26	37.64	27.9	Yes	Yes	Yes	Yes		Weather: Sunny 70s
					Soft							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not Sampled			due to LNAPL				(A) peristaltic pump w/ ded tubing
			1.5				≥ 0.03				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-133								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Trip Blank- Rest-01 | + Dup-Rest-03 + EB-Rest-03 (both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-134
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	836	NA	15.35	0.0	32.95	28.4	Yes	Yes	Yes	Yes		Weather: Sunny 50's
4/4/18	945	NA	15.33	0.0	~~32.95~~							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	950	15.35	0.5	6.96	18.1	4653	2.8	80.4	10.2	Clear, colorless	*Low-flow groundwater sample:*
	953	15.35	1.0	6.90	18.0	5008	1.9	84.6	8.6	" "	(A) peristaltic pump w/ ded tubing
	955	15.35	1.5	6.86	17.9	5048	1.6	86.9	5.3	" "	B) ded bladder pump
	958	15.35	2.0	6.82	17.9	5062	1.5	87.7	4.5	" "	C) non-ded bladder pump; or
	1000	15.35	2.5	6.78	17.9	5071	1.4	88.4	3.7	" "	*Standard groundwater sample:*
	1003	15.35	3.0	6.76	18.0	5078	1.4	89.2	3.3	" "	D) bailer due to limited column; or
	1005	15.35	3.5	6.74	18.0	5084	1.3	89.5	3.1	" "	E) recovery well cycling sample
	1008	15.35	4.0	6.73	18.0	5090	1.3	90.1	3.0	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1010	MW-134	15.35	6.73	18.0	5090	1.3	90.1	3.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1200	Dup-Rest-03	15.35	6.73	18.0	5090	1.3	90.1	3.0	same analysis	same	same
	1020	EB-Rest-03	NA							same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, block bldg.
No purge
Sample port (faucet)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4798
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 840 - 850 ft-bgs

Initials: BD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1335	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Ptly cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0							Clear, colorless	A) peristaltic pump w/ ded tubing
			1.5	No purge active well with							B) ded bladder pump
			2.0	sample port.							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1335	RA-4798	NA	6.99	19.4	1208	1.9	43.6	1.1	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~*Short List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~*Long List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, blocke bldg.
No purge
Sample port (faucet)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4196
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 280-292 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1305	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Partly Cdy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Clear; Colorless	*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	No purge, active Well with							B) ded bladder pump
			2.0	Sample port							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1305	RA-4196	NA	6.97	23.2	2434	2.1	18.6	1.3	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~*Short List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~*Long List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Do not address - Removed from program by Navajo, 4-13-15

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-1227
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Irrigation well removed from program

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 194-246 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		DO NOT ADDRESS						A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Irrigation well / No purge / Sample port

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-3156
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/4/18	805	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather Sunny 40's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	805	NA	0.5								*Low-flow groundwater sample:*
			1.0	Active water well with sample port							A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0							Clear/Colorless	C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	805	RA-3156	NA	6.89	20.2	1821	3.8	18.6	10.6	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO3	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

East of MW-101, across the street

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-313
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Irrigation & water supply role, per Navajo Shift foreman, Doug Collins, 1H16

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 904-1157 ft-bgs

Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/4/18	1830	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Sunny 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	By tank		465	Sample port			Clear; colorless	A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1830	RA-313	NA	6.89	22.2	1103	3.1	-29.9	8.2	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KwB-7
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1050	24.34	24.60	0.26	34.83	30.6	YES	YES	Yes	YES	new pad	Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED	DUE TO	LNAPL	> 0.03			B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		KwB-7								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* HM1 - dedicated bladder pump

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-135
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1110	NA	29.13	0.0	65.55	50.0	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1115	29.15	0.5	7.08	21.1	6385	4.4	29.6	96.2	clear (tiny white particles)	*Low-flow groundwater sample:*
	1118	29.15	1.0	7.01	20.4	6634	3.0	34.8	73.8	" "	A) peristaltic pump w/ ded tubing
	1120	29.15	1.5	7.91	20.1	6651	2.6	39.2	71.2	" "	(B) ded bladder pump
	1123	29.15	2.0	7.82	19.9	6658	2.3	45.6	59.8	" "	C) non-ded bladder pump; or
	1125	29.15	2.5	7.76	19.8	6667	2.1	48.2	54.7	" "	*Standard groundwater sample:*
	1128	29.15	3.0	7.74	19.7	6672	2.0	51.3	52.4	" "	D) bailer due to limited column; or
	1130	29.15	3.5	7.72	19.7	6676	2.0	52.6	51.8	" "	E) recovery well cycling sample
	1133	29.15	4.0	7.71	19.6	6679	1.9	53.2	51.3	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1135	MW-135	29.15	7.71	19.6	6679	1.9	53.2	51.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500-~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-20
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	816	NA	10.65	0.0	26.66	21.9	Yes	Yes	Yes	Yes		Weather: Sunny 50's
4/4/18	1315	NA	10.69	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1320	10.72	0.5	7.18	21.9	4978	3.1	-59.6	9.7	Clear, colorless	*Low-flow groundwater sample:*
	1323	10.74	1.0	7.07	20.4	5079	2.2	-41.8	7.4	" "	(A) peristaltic pump w/ ded tubing
	1325	10.74	1.5	7.03	20.2	5098	1.9	-35.2	6.2	" "	B) ded bladder pump
	1328	10.74	2.0	7.01	20.5	5109	1.7	-29.8	4.9	" "	C) non-ded bladder pump; or
	1330	10.74	2.5	6.99	20.0	5114	1.6	-26.2	4.1	" "	*Standard groundwater sample:*
	1333	10.74	3.0	6.99	19.9	5119	1.6	-24.9	3.6	" "	D) bailer due to limited column; or
	1335	10.74	3.5	6.98	19.9	5122	1.5	-23.2	3.3	" "	E) recovery well cycling sample
	1338	10.74	4.0	6.97	19.8	5124	1.5	-22.8	3.2	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1340	MW-20	10.74	6.97	19.8	5124	1.5	-22.8	3.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-3
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: BS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	844	NA	11.95	0.00	21.59	Not Sampled	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-4 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	840	NA	21.66	0.0	36.98	Not Sampled	yes	yes	yes	yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-2 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	847	NA	13.94	0.0	21.49	Not sampled	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-1
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	850	NA	15.98	0.0	21.88	19.6	Yes	Yes	Yes	Yes		Weather: Sunny 40's
4/4/18	855	NA	15.97	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	900	15.99	0.5	7.02	16.9	4520	3.6	41.7	5.8	Clear, Colorless	*Low-flow groundwater sample:*
	903	15.99	1.0	6.96	17.3	4561	3.1	57.3	3.9	" "	(A) peristaltic pump w/ ded tubing
	905	15.99	1.5	6.93	17.3	4564	2.7	70.4	2.7	" "	B) ded bladder pump
	908	15.99	2.0	6.91	17.3	4567	2.3	74.6	2.2	" "	C) non-ded bladder pump; or
	910	15.99	2.5	6.89	17.2	4569	2.0	75.9	1.8	" "	*Standard groundwater sample:*
	913	15.99	3.0	6.88	17.2	4570	1.8	76.4	1.5	" "	D) bailer due to limited column; or
	915	15.99	3.5	6.87	17.3	4572	1.7	77.1	1.4	" "	E) recovery well cycling sample
	918	15.99	4.0	6.87	17.4	4573	1.7	77.3	1.4	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	920	NP-1	15.99	6.87	17.4	4573	1.7	77.3	1.4	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-6 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	850	NA	13.64	0.0	20.35	15.4	Yes	Yes	Yes	Yes		Weather: Sunny; 70s.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-8
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

New TD & sample intake (2-in; stickup)

Initials: RS / GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	851	NA	14.43	0.0	23.30	18.3	Yes	Yes	NO	Yes		Weather: Sunny 80's
4/4/18	1405	NA	14.46	0.0					needs lock → (Formerly)			

↳ ok; ADDED lock on 4/4/18

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1410	14.48	0.5	7.67	16.7	4130	3.7	-17.7	6.7	Colorless / clear	*Low-flow groundwater sample:*
	1413	14.48	1.0	7.53	16.5	4150	2.9	-13.8	6.1		(A) peristaltic pump w/ ded tubing
	1415	14.48	1.5	7.43	16.3	4170	2.7	-12.4	5.7		B) ded bladder pump
	1418	14.48	2.0	7.38	16.3	4150	2.1	-11.7	5.7		C) non-ded bladder pump; or
	1420	14.48	2.5	7.33	16.1	4160	1.9	-10.4	5.2		*Standard groundwater sample:*
	1423	14.48	3.0	7.27	16.1	4160	1.8	-9.5	4.9		D) bailer due to limited column; or
	1425	14.48	3.5	7.24	16.1	4150	1.7	-9.0	4.4		E) recovery well cycling sample
	1428	14.48	4.0	7.21	16.1	4150	1.7	-8.6	4.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1430	MW-8	14.48	7.21	16.1	4150	1.7	-8.6	4.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - TMD-01 - 4/4/18

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-21
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: BS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1148	NA	13.62	0.0	25.12	19.9	YES	YES	YES	YES		Weather: Sunny, 60's
4/4/18	1655	NA	13.65	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1700	13.73	0.5	7.36	17.1	4930	4.0	7.8	4.7	colorless / clear	*Low-flow groundwater sample:*
	1703	13.75	1.0	7.30	16.8	4970	3.4	8.7	4.5		(A) peristaltic pump w/ ded tubing
	1705	13.75	1.5	7.22	16.5	4990	2.8	9.7	4.0		B) ded bladder pump
	1707	13.75	2.0	7.17	16.4	5000	2.7	10.5	3.7		C) non-ded bladder pump; or
	1710	13.75	2.5	7.14	16.4	4990	2.6	10.5	3.4		*Standard groundwater sample:*
	1713	13.75	3.0	7.10	16.3	5000	2.6	10.3	3.3		D) bailer due to limited column; or
	1715	13.75	3.5	7.09	16.3	5000	2.5	10.7	3.6		E) recovery well cycling sample
↓	1717	13.75	4.0	7.08	16.3	5000	2.5	10.8	3.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1720	MW-21	13.75	7.08	16.3	5000	2.5	10.8	3.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-9 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

*New TD

(2-in; stickup) Initials: BD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total * Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	855	NA	15.06	0.0	22.25	NA	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

(New pad; surface completion upgrade since 2H17)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-71
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: RJD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	848	NA	15.64	0.0	21.67	16.9	Yes	Yes	Yes	Yes		Weather: Sunny 40's
4/4/18	830	NA	15.66	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	835	15.68	0.5	7.17	16.4	6084	3.8	45.1	8.2	Clear, colorless	*Low-flow groundwater sample:*
	838	15.68	1.0	7.02	16.8	6291	2.8	63.3	6.4	" "	(A) peristaltic pump w/ ded tubing
	840	15.68	1.5	6.98	16.9	6337	2.6	79.8	4.1	" "	B) ded bladder pump
	843	15.68	2.0	6.95	17.0	6359	2.5	85.2	3.5	" "	C) non-ded bladder pump; or
	845	15.68	2.5	6.93	17.0	6372	2.5	88.3	3.2	" "	*Standard groundwater sample:*
	848	15.68	3.0	6.92	17.1	6384	2.4	90.3	2.9	" "	D) bailer due to limited column; or
	850	15.68	3.5	6.92	17.1	6391	2.4	91.8	2.7	" "	E) recovery well cycling sample
	853	15.68	4.0	6.91	17.2	6395	2.3	92.6	2.6	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	855	MW-71	15.68	6.91	17.2	6395	2.3	92.6	2.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	HNO3	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-68
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample *Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1830	NA	22.34	0.0	26.52	21.5	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

*Lowered intake to 23.5 due to DTW being greater than intake.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1835	22.36	0.5	7.19	21.6	2772	2.7	93.6	8.4	Clear, colorless	*Low-flow groundwater sample:*
	1838	22.37	1.0	7.02	21.4	2818	2.1	101.3	7.2	" "	(A) peristaltic pump w/ ded tubing
	1840	22.37	1.5	6.99	21.2	2827	1.6	106.2	6.8	" "	B) ded bladder pump
	1843	22.37	2.0	6.97	21.1	2836	1.4	111.3	5.9	" "	C) non-ded bladder pump; or
	1845	22.37	2.5	6.96	21.1	2842	1.1	113.8	4.7	" "	*Standard groundwater sample:*
	1848	22.37	3.0	6.95	21.0	2847	0.9	115.2	4.4	" "	D) bailer due to limited column; or
	1850	22.37	3.5	6.94	21.0	2851	0.8	116.7	4.2	" "	E) recovery well cycling sample
	1853	22.37	4.0	6.93	21.0	2853	0.8	117.2	4.1	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1855	MW-68	22.37	6.93	21.0	2853	0.8	117.2	4.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-27
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BT

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1740	NA	19.20	0.0	30.28	25.0	Yes	Yes	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1745	19.22	0.5	6.93	22.3	2214	3.3	103.4	8.4	Clear, colorless	*Low-flow groundwater sample:*
	1748	19.23	1.0	6.68	22.1	2047	2.4	104.2	7.3	" "	(A) peristaltic pump w/ ded tubing
	1750	19.23	1.5	6.64	21.9	2085	2.2	104.8	6.9	" "	B) ded bladder pump
	1753	19.23	2.0	6.61	21.7	2081	1.9	105.1	6.2	" "	C) non-ded bladder pump; or
	1755	19.23	2.5	6.59	21.6	2079	1.6	105.3	4.9	" "	*Standard groundwater sample:*
	1758	19.23	3.0	6.57	21.6	2078	1.4	105.7	4.5	" "	D) bailer due to limited column; or
	1800	19.23	3.5	6.56	21.5	2078	1.3	106.0	4.3	" "	E) recovery well cycling sample
	1803	19.23	4.0	6.56	21.4	2077	1.3	106.2	4.3	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1805	MW-27	19.23	6.56	21.4	2077	1.3	106.2	4.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-89
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1650	NA	13.28	0.0	20.38	15.2	Yes	Yes	Yes	Yes		Weather: Plty Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1655	13.31	0.5	7.35	19.7	3064	3.3	63.2	9.8	Clear, colorless	*Low-flow groundwater sample:*
	1658	13.31	1.0	7.19	19.3	3036	2.9	60.8	8.3	" "	(A) peristaltic pump w/ ded tubing
	1700	13.31	1.5	7.10	19.0	3018	2.6	58.6	7.4	" "	B) ded bladder pump
	1703	13.31	2.0	7.03	18.9	3011	2.5	56.3	6.8	" "	C) non-ded bladder pump; or
	1705	13.32	2.5	7.00	18.9	3004	2.4	55.2	6.3	" "	*Standard groundwater sample:*
	1708	13.32	3.0	6.98	18.8	3001	2.4	54.8	6.1	" "	D) bailer due to limited column; or
	1710	13.32	3.5	6.97	18.8	2998	2.3	54.3	6.2	" "	E) recovery well cycling sample
	1713	13.32	4.0	6.96	18.8	2996	2.3	53.7	6.1	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1715	MW-89	13.32	6.96	18.8	2996	2.3	53.7	6.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-16
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: BM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1600	na	11.19	0.0	21.24	16.2	Yes	Yes	Yes	Yes		Weather: Pt cldy 80's

Well Purging Record

* Double checked against another meter

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1605	11.19	0.5	7.39	18.6	5899	3.0	79.0	10.3	clear, colorless	*Low-flow groundwater sample:*
	1608	11.19	1.0	7.06	18.3	5854	2.5	85.5	8.2	" "	(A) peristaltic pump w/ ded tubing
	1610	11.19	1.5	6.92	18.1	5833	2.2	89.4	7.0	" "	B) ded bladder pump
	1613	11.19	2.0	6.85	18.0	5826	1.7	93.6	5.9	" "	C) non-ded bladder pump; or
	1615	11.19	2.5	6.80	18.3	5820	1.4	96.2	4.8	" "	*Standard groundwater sample:*
	1618	11.19	3.0	6.78	18.5	5816	1.2	98.3	4.6	" "	D) bailer due to limited column; or
	1620	11.19	3.5	6.77	18.6	5813	1.1	99.0	4.6	" "	E) recovery well cycling sample
	1623	11.19	4.0	6.76	18.6	5810	1.1	99.7	4.5	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1625	MW-16	11.19	6.76	18.6	5810	1.1	99.7	4.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-26
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1510	NA	12.33	0.0	27.58	22.6	Yes	Yes	Yes	Yes		Weather: Pt1y Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity		
4/3/18	1515	12.40	0.5	7.30	19.4	7240	2.2	20.8	7.2	clear, colorless		*Low-flow groundwater sample:*
	1518	12.42	1.0	7.09	18.9	7901	1.9	28.6	5.9	"	"	(A) peristaltic pump w/ ded tubing
	1520	12.42	1.5	7.01	18.8	7853	1.7	38.2	4.7	"	"	B) ded bladder pump
	1523	12.42	2.0	7.00	18.7	7892	1.6	46.3	3.9	"	"	C) non-ded bladder pump; or
	1525	12.42	2.5	6.98	18.6	7926	1.5	49.3	3.5	"	"	*Standard groundwater sample:*
	1528	12.42	3.0	6.96	18.6	7935	1.5	51.2	3.2	"	"	D) bailer due to limited column; or
	1530	12.42	3.5	6.95	18.5	7941	1.4	52.8	3.0	"	"	E) recovery well cycling sample
	1533	12.42	4.0	6.95	18.5	7945	1.4	53.1	2.9	"	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1535	MW-26	12.42	6.95	18.5	7945	1.4	53.1	2.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45~~-u
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Pecan grove-access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11A
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	915	~~Trace~~	25.37	0.0	42.27	37.0	yes	yes	yes	yes		Weather: Clear 70's

↳ unmeasurable product on probe (dark brown/low viscosity

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	920	25.40	0.5	6.96	20.8	3729	2.6	-34.2	5.8	clear, colorless	*Low-flow groundwater sample:*
	923	25.40	1.0	6.82	20.1	4362	1.8	-55.0	5.1	" "	(A) peristaltic pump w/ ded tubing
	925	25.40	1.5	6.78	19.8	4583	1.5	-60.2	4.2	" "	B) ded bladder pump
	928	25.40	2.0	6.76	19.6	4702	1.3	-61.8	3.7	" "	C) non-ded bladder pump; or
	930	25.40	2.5	6.75	19.5	4738	1.2	-62.7	2.8	" "	*Standard groundwater sample:*
	933	25.40	3.0	6.75	19.5	4761	1.1	-63.4	2.5	" "	D) bailer due to limited column; or
	935	25.40	3.5	6.74	19.4	4783	1.0	-63.9	2.4	" "	E) recovery well cycling sample
	938	25.40	4.0	6.74	19.4	4786	1.0	-64.2	2.4	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	940	KWB-11A	25.40	6.74	19.4	4786	1.0	-64.2	2.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Pecan grove - access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11B
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1000	NA	26.09	0.0	72.45	62.2	Yes	Yes	Yes	Yes	* X	Weather: Sunny 70's

(Severely-cracked pad) * needs new pad (see photo)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1005	26.18	0.5	6.98	20.8	2347	3.4	-19.6	4.7	Clear, colorless	*Low-flow groundwater sample:*
	1008	26.20	1.0	6.95	20.6	2518	2.0	-8.3	3.0	" "	(A) peristaltic pump w/ ded tubing
	1010	26.21	1.5	6.93	20.5	2579	1.6	+7.6	2.3	" "	B) ded bladder pump
	1013	26.21	2.0	6.92	20.5	2614	1.3	13.8	1.9	" "	C) non-ded bladder pump; or
	1015	26.21	2.5	6.92	20.4	2630	1.2	15.9	1.5	" "	*Standard groundwater sample:*
	1018	26.21	3.0	6.91	20.3	2638	1.1	16.2	1.3	" "	D) bailer due to limited column; or
	1020	26.21	3.5	6.91	20.3	2642	1.0	16.8	1.3	" "	E) recovery well cycling sample
V	1023	26.21	4.0		20.2	2645	1.0	17.2	1.2	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1025	KWB-11B	26.21	6.91	20.2	2645	1.0	17.2	1.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Historically not addressed, per Navajo, 4-13-15

Jack Joy (farmer)
575-365-6042

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-3AR
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

ATV - S. Field RO-reject water field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-115
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	835	NA	5.88	0.0	27.50	19.8	Yes	Yes	Yes	Yes		Weather: Sunny 60's
4/4/18	1530	nA	5.86	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1535	5.88	0.5	6.96	18.3	4715	4.0	22.6	4.3	Clear, Colorless	*Low-flow groundwater sample:*
	1538	5.89	1.0	6.88	17.9	4716	3.2	29.7	3.1	" "	(A) peristaltic pump w/ ded tubing
	1540	5.89	1.5	6.81	17.6	4717	2.6	34.3	2.7	" "	B) ded bladder pump
	1543	5.89	2.0	6.75	17.4	4723	2.2	38.2	1.9	" "	C) non-ded bladder pump; or
	1545	5.89	2.5	6.73	17.3	4726	1.9	41.6	1.6	" "	*Standard groundwater sample:*
	1548	5.89	3.0	6.71	17.3	4728	1.8	43.8	1.4	" "	D) bailer due to limited column; or
	1550	5.89	3.5	6.70	17.3	4730	1.8	45.1	1.4	" "	E) recovery well cycling sample
	1553	5.89	4.0	6.70	17.3	4731	1.7	45.9	1.3	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1555	MW-115	5.89	6.70	17.3	4731	1.7	45.9	1.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

ATV - S. Field RO-reject water field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-114
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	8330	NA	9.01	0.0	38.25	30.5	Yes	Yes	Yes	Yes		Weather: Sunny 60's
4/4/18	1625	NA	9.00	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1630	9.03	0.5	7.03	19.3	3800	2.9	64.4	9.6	clear, colorless	*Low-flow groundwater sample:*
	1633	9.03	1.0	6.96	19.2	3821	2.4	69.5	7.4	" "	(A) peristaltic pump w/ ded tubing
	1635	9.03	1.5	6.93	19.2	3815	1.8	72.3	5.3	" "	B) ded bladder pump
	1638	9.03	2.0	6.91	19.1	3810	1.6	75.6	4.7	" "	C) non-ded bladder pump; or
	1640	9.03	2.5	6.88	19.1	3803	1.5	77.2	4.2	" "	*Standard groundwater sample:*
	1643	9.03	3.0	6.86	19.0	3800	1.4	78.9	3.9	" "	D) bailer due to limited column; or
	1645	9.03	3.5	6.85	19.0	3797	1.4	79.4	3.7	" "	E) recovery well cycling sample
	1648	9.03	4.0	6.85	19.0	3795	1.4	80.1	3.6	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1650	MW-114	9.03	6.85	19.0	3795	1.4	80.1	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-117
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; Stickup) Initials: GMS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1614	NA	9.84	0.0	27.22	19.7	YES	YES	YES	YES		Weather: Sunny, 40's
4/4/18	825	NA	9.91									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	830	9.93	0.5	7.40	11.7	3310	4.3	22.0	29.1	Colorless / clear	*Low-flow groundwater sample:*
	833	9.93	1.0	7.14	12.5	3310	2.8	33.0	20.6		(A) peristaltic pump w/ ded tubing
	835	9.93	1.5	7.03	12.8	3320	2.0	36.2	17.1		B) ded bladder pump
	837	9.93	2.0	6.95	13.0	3310	1.9	39.3	13.9		C) non-ded bladder pump; or
	840	9.93	2.5	6.91	13.0	3320	1.9	42.5	11.6		*Standard groundwater sample:*
	843	9.93	3.0	6.86	13.0	3320	1.8	45.7	10.2		D) bailer due to limited column; or
	845	9.93	3.5	6.83	12.9	3320	1.8	47.3	9.4		E) recovery well cycling sample
	847	9.93	4.0	6.82	12.9	3310	1.7	48.3	8.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	850	MW-117	9.93	6.82	12.9	3310	1.7	48.3	8.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-118
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GK

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1920	NA	10.73	0.0	28.29	21.0	YES	YES	YES	YES		Weather: Sunny, 40's
4/4/18	910	NA	10.77									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	915	10.80	0.5	7.19	12.1	3750	4.3	54.9	61.6	colorless / sl. cloudy	*Low-flow groundwater sample:*
	917	10.81	1.0	7.10	12.5	3780	3.9	54.3	41.1	↓ ↓	(A) peristaltic pump w/ ded tubing
	920	10.81	1.5	7.01	12.7	3790	3.6	54.5	29.0		B) ded bladder pump
	923	10.81	2.0	6.97	12.8	3800	3.5	55.1	17.3	colorless / clear	C) non-ded bladder pump; or
	925	10.81	2.5	6.95	12.8	3800	3.5	55.3	12.9		*Standard groundwater sample:*
	927	10.81	3.0	6.93	12.9	3800	3.4	55.7	9.9		D) bailer due to limited column; or
	930	10.81	3.5	6.92	12.9	3810	3.4	55.8	9.0		E) recovery well cycling sample
↓	933	10.81	4.0	6.92	12.9	3810	3.3	55.8	7.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	935	MW-118	10.81	6.92	12.9	3810	3.3	55.8	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-9 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1824	NA	9.10	0.0	25.65	Not Sampled	Yes	Yes	Yes	Yes		Weather: Sunny, 40's

Well Purging Record * well prot. casing has been repaired; New casing lid was installed. See field photo

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-119
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1830	NA	10.09	0.0	28.11	20.8	Y	Y	Y	Y	N	Weather: Sunny, 40's
4/4/18	955	NA	10.12									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1000	10.13	0.5	7.68	14.1	3540	4.2	51.2	20.8	Colorless / Clear	*Low-flow groundwater sample:*
	1003	10.13	1.0	7.50	14.1	3530	2.6	52.5	16.0		(A) peristaltic pump w/ ded tubing
	1005	10.13	1.5	7.30	14.1	3520	1.8	52.3	14.4		B) ded bladder pump
	1007	10.13	2.0	7.17	14.2	3510	1.6	54.5	11.1		C) non-ded bladder pump; or
	1010	10.13	2.5	7.11	14.2	3500	1.5	54.1	10.0		*Standard groundwater sample:*
	1013	10.13	3.0	7.05	14.1	3510	1.5	55.1	9.3		D) bailer due to limited column; or
	1015	10.13	3.5	7.03	14.1	3500	1.5	56.3	9.0		E) recovery well cycling sample
	1017	10.13	4.0	7.00	14.2	3490	1.4	56.0	9.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1020	MW-119	10.13	7.00	14.2	3490	1.4	56.0	9.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Cross- Gradient

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-5 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1711	NA	12.83	0.0	25.09	20.0	YES	YES	YES	YES		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Cross-Gradient; N of RO-reject Field
Well installed 7-28-14

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-136
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup) Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1725	NA	11.46	0.0	27.90	23.0	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
					↳ Soft	↳ Base						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1730	11.53	0.5	7.56	17.8	3930	4.6	-13.7	63.0	colorless / sl. cloudy	Low-flow groundwater sample:
	1733	11.53	1.0	7.32	17.1	3940	3.2	-1.7	40.3	↓	(A) peristaltic pump w/ ded tubing
	1735	11.53	1.5	7.15	16.8	3950	2.9	5.9	27.2	↓	B) ded bladder pump
	1737	11.53	2.0	7.07	16.7	3950	2.8	8.0	17.9	colorless / clear	C) non-ded bladder pump; or
	1740	11.53	2.5	7.02	16.6	3960	2.8	9.0	15.4	↓	Standard groundwater sample:
	1743	11.53	3.0	6.99	16.6	3950	2.7	10.0	12.0	↓	D) bailer due to limited column; or
	1745	11.53	3.5	6.96	16.6	3950	2.7	11.1	11.3	↓	E) recovery well cycling sample
↓	1747	11.53	4.0	6.94	16.6	3950	2.7	10.8	10.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1750	MW-136	11.53	6.94	16.6	3950	2.7	10.8	10.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126A
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GOS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1330	NA	15.42	0.0	37.51	29.5	Yes	Yes	Yes	Yes		Weather: SUNNY, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1335	15.45	0.5	7.29	22.6	3040	4.9	-106.0	43.9	Colorless / sl. Cloudy	*Low-flow groundwater sample:*
	1337	15.45	1.0	7.05	21.3	3100	4.1	-106.0	34.1	↓	(A) peristaltic pump w/ ded tubing
	1340	15.45	1.5	6.97	20.3	3130	3.8	-108.4	29.0	↓	B) ded bladder pump
	1343	15.45	2.0	6.93	19.9	3140	3.6	-110.8	20.6	clear	C) non-ded bladder pump; or
	1345	15.45	2.5	6.90	19.8	3130	3.6	-111.8	15.9	↓	*Standard groundwater sample:*
	1347	15.45	3.0	6.86	19.5	3140	3.5	-113.6	9.9	↓	D) bailer due to limited column; or
	1350	15.45	3.5	6.83	19.4	3150	3.4	-111.1	7.5	↓	E) recovery well cycling sample
↓	1353	15.45	4.0	6.81	19.5	3150	3.4	-109.9	6.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1355	MW-126A	15.45	6.81	19.5	3150	3.4	-109.9	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126B
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1410	NA	15.30	0.0	51.43	48.4	YES	YES	YES	YES		Weather: Partly cloudy, 70's
					by SOFT	BASE						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1415	15.40	0.5	7.10	20.4	3550	4.7	-51.6	7.3	Colorless / clear	*Low-flow groundwater sample:*
	1417	15.41	1.0	6.99	19.5	3560	4.0	-49.2	6.2		(A) peristaltic pump w/ ded tubing
	1420	15.41	1.5	6.88	18.7	3550	3.3	-52.3	4.1		B) ded bladder pump
	1423	15.41	2.0	6.83	18.5	3550	3.2	-50.8	3.8		C) non-ded bladder pump; or
	1425	15.41	2.5	6.81	18.6	3550	3.2	-53.0	4.4		*Standard groundwater sample:*
	1427	15.41	3.0	6.79	18.5	3550	3.1	-54.8	3.9		D) bailer due to limited column; or
	1430	15.41	3.5	6.77	18.5	3550	3.1	-55.6	3.4		E) recovery well cycling sample
	1433	15.41	4.0	6.78	18.5	3550	3.1	-56.0	3.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1435	MW-126B	15.41	6.78	18.5	3550	3.1	-56.0	3.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					HNO_3	Field filtered 0.45-u
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-127
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1245	NA	19.89	0.0	53.21	38.4	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1250	19.91	0.5	7.24	22.8	2370	4.5	-204.9	57.8	sl. cloudy / colorless	*Low-flow groundwater sample:*
	1253	19.91	1.0	7.05	22.2	2340	3.0	-208.7	31.9	↓	(A) peristaltic pump w/ ded tubing
	1255	19.91	1.5	6.97	21.6	2340	3.1	-216.1	25.8	↓	B) ded bladder pump
	1257	19.91	2.0	6.92	21.1	2340	2.8	-230.1	14.9	↓	C) non-ded bladder pump; or
	1300	19.91	2.5	6.88	20.9	2330	2.6	-241.2	10.8	colorless / clear	*Standard groundwater sample:*
	1303	19.91	3.0	6.87	20.8	2330	2.7	-255.3	8.9	↓	D) bailer due to limited column; or
	1305	19.91	3.5	6.87	20.7	2330	2.6	-260.4	8.1	↓	E) recovery well cycling sample
↓	1307	19.91	4.0	6.86	20.8	2320	2.6	-264.3	7.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1310	MW-127	19.91	6.86	20.8	2320	2.6	-264.3	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

(Historical LNAPL)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-129
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1156	NA	22.61	0.0	53.08	38.2	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

4 DTP CONFIRMED; NO Measured LNAPL, but unmeasurable sheen on probe

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1200	22.64	0.5	7.15	24.6	2160	4.8	-114.4	29.9	Colorless / clear	*Low-flow groundwater sample:*
	1203	22.64	1.0	6.97	23.9	2050	4.4	-102.2	28.1		(A) peristaltic pump w/ ded tubing
	1205	22.64	1.5	6.88	23.4	2010	4.1	-95.1	30.6		B) ded bladder pump
	1207	22.64	2.0	6.81	23.3	1983	4.0	-89.7	25.6		C) non-ded bladder pump; or
	1210	22.64	2.5	6.76	23.0	1959	4.0	-86.0	21.3		*Standard groundwater sample:*
	1213	22.64	3.0	6.75	22.9	1949	3.9	-85.6	18.6		D) bailer due to limited column; or
	1215	22.64	3.5	6.72	22.7	1942	3.9	-86.1	17.3		E) recovery well cycling sample
	1217	22.64	4.0	6.70	22.7	1941	3.9	-86.4	16.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1220	MW-129	22.64	6.70	22.7	1941	3.9	-86.4	16.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500.~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#18A
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: AOS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1055	NA	10.75	0.0	17.78	12.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1100	10.76	0.5	7.47	18.7	3630	2.8	45.4	4.3	colorless / clear	*Low-flow groundwater sample:*
	1103	10.76	1.0	7.37	18.2	3620	2.3	46.0	3.8		(A) peristaltic pump w/ ded tubing
	1105	10.76	1.5	7.29	17.7	3610	2.0	47.0	3.5		B) ded bladder pump
	1107	10.76	2.0	7.23	17.4	3600	2.0	50.3	3.4		C) non-ded bladder pump; or
	1110	10.76	2.5	7.14	17.3	3590	1.8	50.8	3.6		*Standard groundwater sample:*
	1113	10.76	3.0	7.09	17.4	3590	1.7	50.5	3.3		D) bailer due to limited column; or
	1115	10.76	3.5	7.06	17.4	3590	1.7	49.4	3.1		E) recovery well cycling sample
	1117	10.76	4.0	7.05	17.3	3590	1.6	50.0	3.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1120	RW-#18A	10.76	7.05	17.3	3590	1.6	50.0	3.2	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1A
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1010	NA	13.95	0.0	33.50	25.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1015	13.99	0.5	7.39	20.6	4210	3.3	18.7	21.3	colorless / clear	*Low-flow groundwater sample:*
	1017	13.99	1.0	7.21	19.9	4220	2.8	24.8	10.9		(A) peristaltic pump w/ ded tubing
	1020	13.99	1.5	7.06	19.1	4280	2.3	33.7	7.2		B) ded bladder pump
	1023	13.99	2.0	7.00	18.9	4280	2.2	37.6	5.6		C) non-ded bladder pump; or
	1025	13.99	2.5	6.89	18.6	4290	1.9	41.1	5.2		*Standard groundwater sample:*
	1027	13.99	3.0	6.87	18.6	4290	1.8	42.6	3.9		D) bailer due to limited column; or
	1030	13.99	3.5	6.83	18.6	4300	1.8	45.6	4.1		E) recovery well cycling sample
	1033	13.99	4.0	6.81	18.7	4300	1.8	47.2	3.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1035	KWB-1A	13.99	6.81	18.7	4300	1.8	47.2	3.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1B (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1006	NA	15.64	0.0	33.92	NOT SAMPLED	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1C (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1008	NA	16.22	0.0	52.71	42.7	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Located ~25' N. of original KWB-10 pad

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-10R
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	920	17.30	17.31	0.01	29.46	22.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60's

Well Purging Record * Removed LNAPL prior to purge/sample

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	925	17.40	0.5	6.86	20.7	1615	3.4	-101.4	17.4	colorless / clear / odor	*Low-flow groundwater sample:*
	927	17.41	1.0	6.65	20.7	1615	3.0	-90.7	16.2		(A) peristaltic pump w/ ded tubing
	930	17.44	1.5	6.63	20.5	1602	2.9	-92.0	15.8		B) ded bladder pump
	933	17.44	2.0	6.62	20.5	1585	2.8	-98.6	16.0		C) non-ded bladder pump; or
	935	17.44	2.5	6.62	20.6	1574	2.8	-98.6	15.3		*Standard groundwater sample:*
	937	17.44	3.0	6.62	20.7	1571	2.7	-99.7	14.7		D) bailer due to limited column; or
	940	17.44	3.5	6.62	20.7	1569	2.7	-100.1	14.7		E) recovery well cycling sample
	943	17.44	4.0	6.62	20.7	1568	2.7	-100.6	14.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	950	KWB-10R	17.44	6.62	20.7	1568	2.7	-100.6	14.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-131
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1151	23.71	23.92	0.21	53.35	38.1	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT Sampled due to well						C) non-ded bladder pump; or
			2.5		having LNAPL thickness ≥ 0.03'						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-131								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-5
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; Stickup) Initials: GPS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1455	NA	23.96	0.0	37.68	30.7	Yes	Yes	Yes	Yes		Weather: Sunny, 50's
4/4/18	1100	NA	24.01									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1105	24.05	0.5	7.07	16.1	2560	3.7	-97.4	9.1	colorless / clear	*Low-flow groundwater sample:*
	1107	24.05	1.0	6.94	16.2	2530	3.1	-96.7	7.2		(A) peristaltic pump w/ ded tubing
	1110	24.05	1.5	6.87	16.4	2510	2.7	-102.4	6.4		B) ded bladder pump
	1113	24.05	2.0	6.81	16.4	2500	2.5	-107.9	5.9		C) non-ded bladder pump; or
	1115	24.05	2.5	6.78	16.5	2490	2.3	-113.1	5.3		*Standard groundwater sample:*
	1117	24.05	3.0	6.75	16.6	2470	2.3	-118.0	4.9		D) bailer due to limited column; or
	1120	24.05	3.5	6.74	16.7	2470	2.2	-119.9	4.7		E) recovery well cycling sample
	1123	24.05	4.0	6.73	16.6	2470	2.2	-120.6	5.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1125	KWB-5	24.05	6.73	16.6	2470	2.2	-120.6	5.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-111
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1458	NA	25.07	0.0	40.83	35.8	YES	YES	YES	YES		Weather: Sunny, 50's
4/4/18	1145	NA	25.11									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1150	25.19	0.5	6.99	17.7	2520	3.4	-79.1	36.0	colorless / sl. cloudy	Low-flow groundwater sample:
	1153	25.19	1.0	6.83	17.7	2520	3.0	-63.9	35.5	↓	(A) peristaltic pump w/ ded tubing
	1155	25.19	1.5	6.74	17.8	2510	2.8	-55.8	28.9	↓	B) ded bladder pump
	1157	25.19	2.0	6.71	17.8	2510	2.8	-52.4	24.3	clear	C) non-ded bladder pump; or
	1200	25.19	2.5	6.68	17.8	2510	2.7	-49.0	22.3	↓	Standard groundwater sample:
	1203	25.19	3.0	6.67	17.9	2510	2.6	-46.2	21.6	↓	D) bailer due to limited column; or
	1205	25.19	3.5	6.65	17.9	2510	2.6	-44.2	20.9	↓	E) recovery well cycling sample
↓	1207	25.19	4.0	6.64	17.9	2510	2.6	-41.9	21.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1210	MW-111	25.19	6.64	17.9	2510	2.6	-41.9	21.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-6
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1503	NA	22.75	0.0	36.44	27.4	Yes	Yes	Yes	Yes		Weather: Sunny, 50's
4/4/18	1235	NA	22.80									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1240	22.83	0.5	7.13	17.7	2120	3.6	-224.9	18.1	Black tint / clear / odor	*Low-flow groundwater sample:*
	1243	22.83	1.0	7.00	17.6	2070	3.4	-236.6	19.2		(A) peristaltic pump w/ ded tubing
	1245	22.83	1.5	6.94	17.5	2070	2.6	-246.4	20.6		B) ded bladder pump
	1247	22.83	2.0	6.91	17.4	2050	2.0	-250.2	16.1		C) non-ded bladder pump; or
	1250	22.83	2.5	6.90	17.4	2040	1.7	-254.2	14.8		*Standard groundwater sample:*
	1253	22.83	3.0	6.88	17.5	2030	1.6	-259.7	15.2		D) bailer due to limited column; or
	1255	22.83	3.5	6.87	17.4	2030	1.6	-262.6	14.3		E) recovery well cycling sample
	1257	22.83	4.0	6.86	17.5	2020	1.5	-265.1	13.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1300	KWB-6	22.83	6.86	17.5	2020	1.5	-265.1	13.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-112
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: GRS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1145	21.37	24.19	2.82	37.54	32.5	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record † DTP CONFIRMED

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED	Due to	well				B) ded bladder pump
			2.0		having	LNAPL	thickness				C) non-ded bladder pump; or
			2.5			≥ 0.03'					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-112								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Cyanide	NaOH	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-132
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1507	19.80	21.60	1.80	42.66	NA	YES	YES	YES	YES		Weather: Partly cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		Not sampled due to well						C) non-ded bladder pump; or
			2.5		having LNAPL thickness				≥ 0.03'		*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-132								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Located inside yellow vault; furthest south

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-57
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; at-grade) Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1648	NA	24.19	0.0	34.32	32.8	YES	YES	YES	YES		Weather: Sunny, 50's
4/4/18	1325	NA	24.18									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1330	24.28	0.5	7.23	18.6	3710	4.5	-56.4	12.4	colorless / clear	*Low-flow groundwater sample:*
↓	1333	24.30	1.0	7.15	18.2	3730	3.9	-49.2	10.6	↓	(A) peristaltic pump w/ ded tubing
	1335	24.32	1.5	7.02	17.8	3760	3.3	-42.5	9.0		B) ded bladder pump
	1337	24.35	2.0	6.99	17.5	3790	3.0	-39.8	7.5		C) non-ded bladder pump; or
	1340	24.37	2.5	6.89	17.4	3800	2.9	-39.5	6.9		*Standard groundwater sample:*
	1343	24.38	3.0	6.85	17.3	3800	2.7	-38.4	7.1		D) bailer due to limited column; or
	1345	24.39	3.5	6.82	17.3	3800	2.7	-38.1	6.6		E) recovery well cycling sample
↓	1347	24.40	4.0	6.80	17.3	3800	2.6	-37.7	6.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1350	MW-57	24.40	6.80	17.3	3800	2.6	-37.7	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Be,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,Li)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,Li)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

~ 32" corrugated stickup

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#11-O
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1651	Dry	Dry	Dry	22.20	NA	YES	YES	YES	YES		Weather: Sunny, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			NOT SAMPLED DUE TO					C) non-ded bladder pump; or
			2.5			well being dry					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* Until further notice, do not address well in any way, per Navajo, 4-26-16

Jack Joy (Farmer)
575-365-6042

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-9
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Historically - well casing obstructed @ 15.11' (2-in; stickup)) Initials: GMS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1653	NM	NM	NM	NM	NA	NM	NM	NM	NM		Weather: Sunny, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12A
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1659	DRY	DRY	DRY	25.03	24.9	Y/B	Y/B	Y/B	Y/B		Weather: SUNNY, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT SAMPLED DUE TO WELL						C) non-ded bladder pump; or
			2.5		being DRY						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		KWB-12A								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[* HMI - dedicated bladder pump]

+ Trip Blank - Rest-02 4/4/18

[+ Dup - Rest- 05
+ EB - Rest- 05
(both for same analyses)]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12B
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: ADS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1703	NA	26.65	0.0	39.39	35.2	Yes	Yes	Yes	Yes		Weather: Sunny, 50's
4/4/18	1410	NA	26.66	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1415	26.68	0.5	7.38	17.8	3280	5.0	-32.0	5.8	colorless / clear	*Low-flow groundwater sample:*
	1417	26.68	1.0	7.25	16.9	3250	4.3	-18.1	5.9		A) peristaltic pump w/ ded tubing
	1420	26.68	1.5	7.07	16.4	3240	3.8	-8.7	6.4		(B) ded bladder pump
	1423	26.68	2.0	6.97	16.3	3230	3.6	-6.0	5.7		C) non-ded bladder pump; or
	1425	26.68	2.5	6.93	16.3	3230	3.4	-4.9	5.2		*Standard groundwater sample:*
	1427	26.68	3.0	6.92	16.4	3220	3.3	-4.2	4.8		D) bailer due to limited column; or
	1430	26.68	3.5	6.91	16.3	3230	3.3	-3.7	4.4		E) recovery well cycling sample
	1433	26.68	4.0	6.91	16.3	3220	3.2	-3.2	4.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1435	KWB-12B	26.68	6.91	16.3	3220	3.2	-3.2	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
	1200	DUP-Rest-05	26.68	6.91	16.3	3220	3.2	-3.2	4.1	same analyses	same	same
	1450	EB-Rest-05	NA							same analyses	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-2R
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) Initials: AJS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1640	NM	NM	NM	NM	NA	*NO	*NO	*NO	*NO		Weather: Sunny, 80's

* unable to locate well. Most likely covered / destroyed by road construction.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			NOT SAMPLED;	UNABLE TO				C) non-ded bladder pump; or
			2.5			LOCATE					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		KWB-2R								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-58
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1610	21.74	21.76	0.02	33.06	25.6	YES	*YES	YES	YES		Weather: SUNNY, 80's

* REMOVED LNAPL prior to purge/sample

* ROAD construction being conducted ADJACENT TO MW-58. AT-grade well covered by ≈ 6" OF DIRT FROM CONSTRUCTION. Well integrity ok.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1615	21.80	0.5	7.09	21.0	1898	4.8	-158.1	102.7	Colorless / Cloudy / ODOR	*Low-flow groundwater sample:*
↓	1617	21.81	1.0	6.98	20.8	1845	3.0	-160.0	64.0	↓	(A) peristaltic pump w/ ded tubing
	1620	21.81	1.5	6.89	20.4	1804	2.3	-161.7	20.3	Colorless / Clear / odor	B) ded bladder pump
	1623	21.81	2.0	6.84	20.0	1780	2.0	-164.7	14.7		C) non-ded bladder pump; or
	1625	21.81	2.5	6.81	19.9	1763	1.8	-166.9	10.1		*Standard groundwater sample:*
	1627	21.81	3.0	6.81	19.8	1762	1.7	-166.8	8.8		D) bailer due to limited column; or
	1630	21.81	3.5	6.81	19.9	1755	1.7	-167.0	7.4		E) recovery well cycling sample
↓	1633	21.81	4.0	6.80	19.9	1752	1.6	-167.3	6.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1635	MW-58	21.81	6.80	19.9	1752	1.6	-167.3	6.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* HMI - dedicated bladder pump

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-13
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; at-grade) Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1521	NA	26.29	0.0	33.10	30.1	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1525	26.30	0.5	7.72	17.2	3420	6.1	-26.3	7200	Colorless / cloudy	*Low-flow groundwater sample:*
	1527	26.30	1.0	7.47	16.1	3390	5.8	-11.1	7200		A) peristaltic pump w/ ded tubing
	1530	26.30	1.5	7.30	16.1	3390	5.6	-7.9	7200		(B) ded bladder pump
	1533	26.30	2.0	7.21	16.1	3390	5.6	-6.0	7200		C) non-ded bladder pump; or
	1535	26.30	2.5	7.12	16.0	3380	5.5	-3.8	7200		*Standard groundwater sample:*
	1537	26.30	3.0	7.07	15.9	3390	5.5	-2.2	7200		D) bailer due to limited column; or
	1540	26.30	3.5	7.03	16.0	3380	5.4	-2.4	7200		E) recovery well cycling sample
	1543	26.30	4.0	7.01	15.9	3390	5.4	-1.6	7200		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1545	KWB-13	26.30	7.01	15.9	3390	5.4	-1.6	>200	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Sign in @ S. Crude Control Room
Permit per Darla Vernon

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-103
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: SLM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1120	NP	18.68	0.0	25.22	22.2	Yes	Yes	Yes	Yes		Weather: Clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1240	18.80	0.5	7.29	31.6	22,300	3.3	-323.0	6.9	colorless; clear	*Low-flow groundwater sample:*
↓	1242	18.86	1.0	7.26	31.4	22,400	2.8	-330.2	5.6	↓ ↓	(A) peristaltic pump w/ ded tubing
	1245	18.92	1.5	7.25	31.4	22,500	2.5	-334.6	5.4		B) ded bladder pump
	1247	18.96	2.0	7.23	31.2	22,500	2.4	-337.0	5.3		C) non-ded bladder pump; or
	1250	18.99	2.5	7.21	31.2	22,500	2.4	-338.3	5.1		*Standard groundwater sample:*
	1252	19.02	3.0	7.21	31.1	22,500	2.4	-338.9	5.0		D) bailer due to limited column; or
	1255	19.05	3.5	7.22	31.0	22,500	2.4	-339.9	4.8		E) recovery well cycling sample
↓	1257	19.08	4.0	7.21	31.0	22,400	2.4	-340.7	4.8	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1300	MW-103	19.08	7.21	31.0	22,400	2.4	-340.7	4.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO_3	~~Field filtered 0.45-u~~
										~~Cyanide~~	NaOH	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Sign in @ 5. Chief Control Room

Permit per Darla Vernon

+ Dup-Rest-02
+ EB-Rest-02
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-104
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1123	NP	17.84	0.0	21.97	19.0	Yes	Yes	Yes	Yes		Weather: Clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1130	17.98	0.5	6.81	24.9	3246	2.0	-296.4	3.6	colorless; clear	*Low-flow groundwater sample:*
	1132	18.04	1.0	6.80	24.7	2840	1.9	-298.5	3.5		(A) peristaltic pump w/ ded tubing
	1135	18.10	1.5	6.79	24.4	2530	1.8	-300.3	3.3		B) ded bladder pump
	1137	18.15	2.0	6.78	24.3	2140	1.7	-300.8	3.2		C) non-ded bladder pump; or
	1140	18.18	2.5	6.78	24.3	2100	1.7	-300.7	3.0		*Standard groundwater sample:*
	1142	18.21	3.0	6.78	24.2	2100	1.7	-301.1	2.8		D) bailer due to limited column; or
	1145	18.24	3.5	6.78	24.2	2080	1.6	-301.3	2.8		E) recovery well cycling sample
↓	1147	18.27	4.0	6.79	24.2	2070	1.6	-301.5	2.7	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1200	MW-104	18.27	6.79	24.2	2070	1.6	-301.5	2.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
									2.7	~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1300	DUP-Rest-02	18.27	6.79	24.2	2070	1.6	-301.5	2.7	same analysis	same	same
↓	1220	EB-Rest-02	NA	—	—	—	—	—	→	same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

(Bagged tube; stretch outside of berm
Removed & replaced absorbent sock)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-64
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Lubricated 2-0-1-3 lock

(4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1330	NP	19.71	0.0	34.08	26.6	Yes	Yes	Yes	Yes		Weather: clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1335	19.91	0.5	6.99	30.0	2730	1.6	-307.3	4.0	colorless; clear	*Low-flow groundwater sample:*
	1337	20.00	1.0	6.97	29.9	2730	1.6	-309.8	3.5		(A) peristaltic pump w/ ded tubing
	1340	20.04	1.5	6.96	29.9	2740	1.4	-313.4	3.3		B) ded bladder pump
	1342	20.06	2.0	6.95	29.8	2750	1.3	-317.1	3.2		C) non-ded bladder pump; or
	1345	20.07	2.5	6.95	29.7	2760	1.2	-319.5	3.1		*Standard groundwater sample:*
	1347	20.08	3.0	6.95	29.6	2760	1.2	-321.5	3.0		D) bailer due to limited column; or
	1350	20.09	3.5	6.96	29.6	2760	1.1	-322.3	2.9		E) recovery well cycling sample
↓	1352	20.10	4.0	6.96	29.6	2770	1.1	-322.8	2.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1355	MW-64	20.10	6.96	29.6	2770	1.1	-322.8	2.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Bagged tube; Located in Front of Navajo storage shed area]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-65
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: SLy

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1425	NP	16.22	0.0	28.78	23.8	Yes	Yes	Yes	Yes		Weather: clear, 80s

Well Purging Record New pad & at-grade canister - well done.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1430	16.24	0.5	6.84	28.7	2330	2.16	-239.9	7.0	colorless; clear	*Low-flow groundwater sample:*
↓	1432	16.25	1.0	6.79	28.3	2350	2.1	-241.8	7.0	small black particles	A) peristaltic pump w/ ded tubing
	1435	16.26	1.5	6.78	28.0	2350	2.0	-244.2	7.1		B) ded bladder pump
	1437	16.26	2.0	6.77	27.8	2350	2.0	-246.4	7.2		C) non-ded bladder pump; or
	1440	16.26	2.5	6.76	27.6	2350	2.0	-248.0	7.2		*Standard groundwater sample:*
	1442	16.26	3.0	6.76	27.5	2340	2.0	-250.3	7.3		D) bailer due to limited column; or
	1445	16.26	3.5	6.75	27.4	2340	2.0	-251.7	7.3		E) recovery well cycling sample
↓	1447	16.26	4.0	6.75	27.3	2340	2.0	-252.2	7.3		F) irrigation well grab sample
										HC odor; Free LNAPL	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1450	MW-65	16.26	6.75	27.3	2340	2.0	-252.2	7.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[gauge to top of guide-pipe]

Well: RW-5R
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Active RW; above-grade vault; sampled by part, when sampled

Initials: BCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1520	18.22	18.33	0.11	NM (pumps in well)	24.0	yes	yes	yes	yes		Weather: clear, 80s
					Formerly-reported TD = 35.30 ft-toc							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		No Sample						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5				due to				*Standard groundwater sample:*
			3.0					LNAPL			D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample
									LNAPL = 0.03'		

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-5R								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Bagged tube; do not dedicate.]

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-102
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1530	NP	15.90	0.0	26.45	21.3	Yes	Yes	Yes	Yes		Weather: clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1535	15.93	0.5	6.77	26.2	2500	1.9	-314.9	7.9	colorless; clear	*Low-flow groundwater sample:*
	1537	15.93	1.0	6.81	26.0	2510	1.9	-317.6	7.6		(A) peristaltic pump w/ ded tubing
	1540	15.93	1.5	6.82	25.6	2520	1.9	-317.2	7.5		B) ded bladder pump
	1542	15.93	2.0	6.81	25.6	2520	1.9	-317.2	7.4		C) non-ded bladder pump; or
	1545	15.93	2.5	6.82	26.5	2520	1.9	-316.3	7.2		*Standard groundwater sample:*
	1547	15.93	3.0	6.82	25.3	2520	1.9	-317.5	7.2		D) bailer due to limited column; or
	1550	15.93	3.5	6.82	25.2	2520	1.9	-316.8	7.0		E) recovery well cycling sample
	1552	15.93	4.0	6.81	25.3	2520	1.9	-317.6	7.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1555	MW-102	15.93	6.81	25.3	2520	1.9	-317.6	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

(Bagged tubing)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Gauge / Sample through labeled guide-pipe]

Well: RW-4
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest
Active RW in covered doghouse

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1730	NP	14.40	0.0	36.62	31.6	Yes	Yes	Yes	Yes		Weather: clear, 80s
4/4/18	830											clear, 40's

Well Purging Record * Drawdown not measured; narrow diam. guide-tube

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	835	NM*	0.5	6.79	21.2	2360	1.7	-273.7	3.3	colorless; clear	*Low-flow groundwater sample:*
	837		1.0	6.81	21.6	2280	1.3	-286.0	3.4		(A) peristaltic pump w/ ded tubing
	840		1.5	6.84	21.7	2300	0.9	-287.5	3.4		B) ded bladder pump
	842		2.0	6.85	21.8	2300	0.9	-288.7	3.5		C) non-ded bladder pump; or
	845		2.5	6.88	21.7	2290	0.9	-289.3	3.4		*Standard groundwater sample:*
	847		3.0	6.90	21.7	2300	1.0	-289.4	3.4		D) bailer due to limited column; or
	850		3.5	6.91	21.7	2300	1.0	-289.7	3.3		E) recovery well cycling sample
	852		4.0	6.91	21.7	2290	0.9	-289.9	3.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	855	RW-4	NM*	6.91	21.7	2290	0.9	-289.9	3.3	DRO	HCL	8015M
										~~DRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

(Bagged tubing)

[historical LNAPL]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Gauge/sample through labeled guide-pipe]

Well: RW-6
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest
Active RW in covered doghouse

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCU

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1720	NP	15.42	0.0	34.90	30.0	Yes	Yes	Yes	Yes		Weather: Clear, 80s
4/4/18	915											clear, 40s

Well Purging Record * Drawdown not measured; narrow diam. guide-tube

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	920	NM *	0.5	6.75	22.2	2630	2.5	-234.0	4.9	colorless; clear	*Low-flow groundwater sample:*
	922		1.0	6.69	22.0	2640	1.8	-237.2	4.7		(A) peristaltic pump w/ ded tubing
	925		1.5	6.67	21.9	2640	1.5	-247.6	4.6		B) ded bladder pump
	927		2.0	6.65	21.9	2640	1.4	-253.5	4.4		C) non-ded bladder pump; or
	930		2.5	6.65	21.9	2640	1.3	-261.6	3.9		*Standard groundwater sample:*
	932		3.0	6.64	21.9	2630	1.2	-267.1	3.6		D) bailer due to limited column; or
	935		3.5	6.63	21.9	2630	1.2	-269.9	3.5		E) recovery well cycling sample
	937		4.0	6.63	21.9	2630	1.2	-272.9	3.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	940	RW-6	NM *	6.63	21.9	2630	1.2	-272.9	3.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Position marked on adjacent fence; ~4' N. of fence; may be covered by silt/gravel]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-99
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SW

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1740	NP	17.97	0.0	27.80	22.8	Yes	Yes	Yes	Yes		Weather: clear, 70s
4/4/18	945	NP	18.05	0.0								clear, 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	950	18.13	0.5	6.75	21.5	2400	2.2	-300.8	7.1	colorless; clear	*Low-flow groundwater sample:*
	952	18.15	1.0	6.74	21.6	2400	2.0	-303.1	5.9		(A) peristaltic pump w/ ded tubing
	955	18.16	1.5	6.72	21.6	2400	1.9	-306.4	5.8		B) ded bladder pump
	957	18.17	2.0	6.71	21.6	2400	1.8	-309.5	5.6		C) non-ded bladder pump; or
	1000	18.17	2.5	6.71	21.7	2400	1.7	-312.0	4.5		*Standard groundwater sample:*
	1002	18.17	3.0	6.72	21.9	2400	1.8	-314.4	4.2		D) bailer due to limited column; or
	1005	18.17	3.5	6.72	21.9	2400	1.8	-314.8	4.2		E) recovery well cycling sample
	1007	18.17	4.0	6.71	21.8	2400	2.0	-315.0	4.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1010	MW-99	18.17	6.71	21.8	2400	2.0	-315.0	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-66
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; at-grade) Initials: SCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1750	NP	17.09	0.0	29.80	24.6	Yes	Yes	Yes	Yes	(cracked pad)	Weather: clear, 70s
4/4/18	1040	NP	17.12	0.0								clear, 50s

One corner cracked; pad is fully functional

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1045	17.27	0.5	6.79	21.4	1961	1.9	-234.1	4.8	colorless; clear	*Low-flow groundwater sample:*
	1047	17.32	1.0	6.76	21.4	1960	1.5	-231.8	4.6		(A) peristaltic pump w/ ded tubing
	1050	17.35	1.5	6.75	21.4	1955	1.3	-230.0	4.1		B) ded bladder pump
	1052	17.37	2.0	6.75	21.4	1953	1.2	-229.3	3.9		C) non-ded bladder pump; or
	1055	17.38	2.5	6.74	21.4	1948	1.0	-228.3	3.5		*Standard groundwater sample:*
	1057	17.38	3.0	6.73	21.4	1945	0.9	-228.5	3.3		D) bailer due to limited column; or
	1100	17.38	3.5	6.73	21.4	1944	0.8	-229.8	3.3		E) recovery well cycling sample
	1102	17.38	4.0	6.73	21.5	1942	0.8	-230.6	3.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1105	MW-66	17.38	6.73	21.5	1942	0.8	-230.6	3.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Retrieve & bag tube in prep for Navajo well completion upgrade) (-sca -4-4-18)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-28
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(Extends through gravel berm; No pad or locks possible) Initials: Scw

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1800	NP	22.81	0.0	34.55	30.2	yes	Issue)	Issue)	yes		Weather: clear, 70s
4/4/18	1140	NP	22.95	0.0								clear, 60s

Well Purging Record

(6-in PVC (shattered at top w) 0.65-ft slip collar over it)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1145	23.00	0.5	6.67	21.1	3270	2.1	-300.4	5.6	colorless; clear	*Low-flow groundwater sample:*
↓	1147	23.05	1.0	6.68	21.4	3290	2.0	-309.3	4.9	↓ ↓	(A) peristaltic pump w/ ded tubing
	1150	23.09	1.5	6.70	21.5	3240	1.5	-310.1	4.4		B) ded bladder pump
	1152	23.11	2.0	6.71	21.5	3170	1.3	-311.8	3.9		C) non-ded bladder pump; or
	1155	23.13	2.5	6.72	21.5	3120	1.2	-312.6	3.7		*Standard groundwater sample:*
	1157	23.15	3.0	6.72	21.4	3080	1.2	-313.0	3.5		D) bailer due to limited column; or
	1200	23.17	3.5	6.73	21.3	3060	1.1	-313.6	3.5		E) recovery well cycling sample
↓	1202	23.19	4.0	6.73	21.3	3050	1.1	-313.5	3.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1205	MW-28	23.19	6.73	21.3	3050	1.1	-313.5	3.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-59
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1805	NP	10.51	0.0	32.72	25.3	Yes	Yes	Yes	Yes		Weather: clear, 70s
4/4/18	1235	NP	10.48	0.0								clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1246	10.51	0.5	6.86	22.1	3450	2.6	-256.7	3.2	colorless, clear	*Low-flow groundwater sample:*
	1242	10.51	1.0	6.83	22.1	3470	1.7	-259.6	1.8		(A) peristaltic pump w/ ded tubing
	1245	10.51	1.5	6.84	22.1	3470	1.5	-262.1	1.5		B) ded bladder pump
	1247	10.51	2.0	6.83	22.0	3480	1.4	-262.5	1.4		C) non-ded bladder pump; or
	1250	10.51	2.5	6.82	22.1	3480	1.3	-264.5	1.3		*Standard groundwater sample:*
	1252	10.51	3.0	6.81	22.1	3480	1.2	-265.1	1.3		D) bailer due to limited column; or
	1255	10.51	3.5	6.81	22.2	3490	1.1	-266.0	1.3		E) recovery well cycling sample
	1257	10.51	4.0	6.80	22.2	3490	1.1	-266.2	1.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1300	MW-59	10.51	6.80	22.2	3490	1.1	-266.2	1.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Dup - Rest - 04
+ EB - Rest - 04
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-60
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: S cm

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1815	NP	11.63	0.0	37.78	26.7	Yes	Yes	Yes	Yes		Weather: clear, 70s
4/4/18	1325	NP	11.60	0.0								clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1330	11.77	0.5	6.86	22.4	4120	4.5	-284.9	4.5	colorless; clear	*Low-flow groundwater sample:*
|	1332	11.83	1.0	6.84	22.3	4130	3.9	-288.6	4.3	|	(A) peristaltic pump w/ ded tubing
|	1335	11.88	1.5	6.83	22.3	4140	4.5	-291.1	4.1	|	B) ded bladder pump
|	1337	11.89	2.0	6.82	22.3	4140	4.8	-294.3	4.0	|	C) non-ded bladder pump; or
|	1340	11.90	2.5	6.82	22.2	4150	4.1	-297.0	3.8	|	*Standard groundwater sample:*
|	1342	11.90	3.0	6.81	22.2	4150	3.7	-298.5	3.7	|	D) bailer due to limited column; or
|	1345	11.90	3.5	6.80	22.2	4150	3.7	-299.9	3.7	|	E) recovery well cycling sample
↓	1347	11.90	4.0	6.80	22.1	4150	3.8	-300.1	3.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1350	MW-60	11.90	6.80	22.1	4150	3.8	-300.1	3.7	DRO	HCL	8015M
|										GRO	HCL	8015M
|										VOC	HCL	8260
|										Anions (Chloride,Fluoride,Sulfate)	Neat	300
|										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
|										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
|										TDS	Neat	2540C
|										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
|										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
|										***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
|										***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
|										Cyanide	NaOH	SM4500
|	1100	DUP-REST-04	11.90	6.80	22.1	4150	3.8	-300.1	3.7	same analyses	same	same
↓	1415	EB-REST-04	NA							same analyses	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-107
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; at-grade)

Initials: SCW

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1820	NP	13.20	0.0	19.05	17.1	Yes	Yes	Yes	Yes		Weather: clear, 70s
4/4/18	1450	NP	13.19	0.0								clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1500	13.36	0.5	6.83	23.8	2390	1.7	-196.4	7.1	colorless; clear	*Low-flow groundwater sample:*
	1502	13.44	1.0	6.84	23.5	2350	1.5	-195.5	5.2		(A) peristaltic pump w/ ded tubing
	1505	13.47	1.5	6.83	23.2	2300	1.4	-195.4	4.1		B) ded bladder pump
	1507	13.50	2.0	6.82	23.2	2270	1.4	-195.2	3.7		C) non-ded bladder pump; or
	1510	13.52	2.5	6.81	23.0	2246	1.3	-194.6	3.5		*Standard groundwater sample:*
	1512	13.54	3.0	6.81	23.0	2230	1.3	-194.1	3.4		D) bailer due to limited column; or
	1515	13.56	3.5	6.81	23.0	2216	1.3	-194.1	3.3		E) recovery well cycling sample
↓	1517	13.58	4.0	6.81	23.0	2210	1.3	-194.1	3.2	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1520	MW-107	13.58	6.81	23.0	2210	1.3	-194.1	3.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Located 15' NW of NW corner of berm, if buried in future events]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-128
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in, at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1830	NP	15.63	0.0	35.35	25.4	Yes	Yes	Yes	Yes		Weather: clear, 70s
4/4/18	1610	NP	15.57	0.0								clear 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1620	15.60	0.5	6.70	23.7	2020	4.9	-41.4	58.5	colorless; sl. cloudy	Low-flow groundwater sample:
	1622	15.60	1.0	6.69	23.6	2020	4.8	-41.9	51.4		(A) peristaltic pump w/ ded tubing
	1625	15.60	1.5	6.68	23.5	2030	4.7	-42.9	48.7		B) ded bladder pump
	1627	15.60	2.0	6.67	23.4	2030	4.5	-45.8	41.3		C) non-ded bladder pump; or
	1630	15.60	2.5	6.66	23.3	2030	4.3	-46.3	36.4	clear	Standard groundwater sample:
	1632	15.60	3.0	6.65	23.3	2030	4.2	-46.8	32.1		D) bailer due to limited column; or
	1635	15.60	3.5	6.65	23.3	2030	4.1	-47.2	28.1		E) recovery well cycling sample
	1637	15.60	4.0	6.66	23.3	2030	4.1	-47.6	25.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1640	MW-128	15.60	6.66	23.3	2030	4.1	-47.6	25.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-125
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: JCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	910	NP	10.92	0.0	28.31	23.5	yes	yes	yes	yes		Weather: clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	915	10.98	0.5	6.99	23.5	4740	3.2	180.1	3.1	colorless; clear	*Low-flow groundwater sample:*
	917	10.98	1.0	6.92	23.2	4760	2.6	182.2	3.1		(A) peristaltic pump w/ ded tubing
	920	10.98	1.5	6.85	23.1	4790	2.5	182.9	3.0		B) ded bladder pump
	922	10.98	2.0	6.82	22.9	4830	2.3	183.6	3.0		C) non-ded bladder pump; or
	925	10.98	2.5	6.79	22.8	4850	2.2	183.4	2.8		*Standard groundwater sample:*
	927	10.98	3.0	6.76	22.7	4860	2.2	183.2	2.8		D) bailer due to limited column; or
	930	10.98	3.5	6.76	22.6	4870	2.2	183.2	2.8		E) recovery well cycling sample
	932	10.98	4.0	6.77	22.6	4876	2.2	183.1	2.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	935	MW-125	10.98	6.77	22.6	4870	2.2	183.1	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Bagged tube extension]

+ Trip Blank - Rest-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-116
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCU

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	950	NP	6.62	0.0	27.63	20.0	Yes	Yes	Yes	Yes		Weather: Clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	955	6.64	0.5	7.03	21.7	3450	2.5	166.2	11.2	colorless; clear	*Low-flow groundwater sample:*
	957	6.64	1.0	6.97	21.5	3960	2.3	167.5	7.9		(A) peristaltic pump w/ ded tubing
	1000	6.64	1.5	6.92	21.1	3960	2.2	169.1	6.9		B) ded bladder pump
	1002	6.64	2.0	6.90	20.9	3960	2.2	169.9	6.2		C) non-ded bladder pump; or
	1005	6.64	2.5	6.88	20.8	3950	2.2	171.7	5.8		*Standard groundwater sample:*
	1007	6.64	3.0	6.87	20.7	3940	2.1	172.5	5.6		D) bailer due to limited column; or
	1010	6.64	3.5	6.86	20.6	3940	2.1	173.0	5.6		E) recovery well cycling sample
	1012	6.64	4.0	6.86	20.5	3940	2.1	173.4	5.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1015	MW-116	6.64	6.86	20.5	3940	2.1	173.4	5.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

N. side of dirt road; in-line with westernmost row of pecan trees; position labeled on fence pole (12' from fenceline)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-46R
Event: Spring 2018 (Non-Biennial)
Area of Concern: TMP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) Initials: SCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1035	NP	4.22	0.0	19.36	14.1	Yes	Yes	Yes	Yes		Weather: clear, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1040	4.24	0.5	6.72	23.8	4340	2.3	205.1	5.4	colorless; clear	*Low-flow groundwater sample:*
↓	1042	4.24	1.0	6.70	23.7	4350	2.1	199.1	4.6	↓	(A) peristaltic pump w/ ded tubing
	1045	4.24	1.5	6.75	23.7	4340	2.2	194.7	4.4		B) ded bladder pump
	1047	4.24	2.0	6.77	23.7	4340	2.1	194.2	4.2		C) non-ded bladder pump; or
	1050	4.24	2.5	6.79	23.6	4340	2.1	193.7	4.1		*Standard groundwater sample:*
	1052	4.24	3.0	6.81	23.5	4340	2.2	193.4	4.1		D) bailer due to limited column; or
	1055	4.24	3.5	6.81	23.6	4330	2.2	190.1	4.0		E) recovery well cycling sample
↓	1057	4.24	4.0	6.81	23.5	4340	2.2	190.5	4.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1100	MW-46R	4.24	6.81	23.5	4340	2.2	190.5	4.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

AMI - dedicated bladder pump

Monitoring Well Purging and Sampling Record (Furthest west "city well")

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico (Upgradient)

Well: UG-3R
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCU

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/2/18	1630	NP	22.78	0.0	38.58	35.6	Yes	Yes	Yes	Yes		Weather: clear, 80s
4/3/18	1655	NP	22.81	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/2/18	1640	22.78	0.5	6.51	26.0	2450	5.3	210.5	3.7	colorless, clear	*Low-flow groundwater sample:*
↓	1642	22.79	1.0	6.56	26.1	2560	5.1	209.7	3.5	↓	A) peristaltic pump w/ ded tubing
	1645	22.79	1.5	6.63	26.5	2580	5.3	208.2	3.4		(B) ded bladder pump
	1647	22.80	2.0	6.68	26.7	2580	5.4	208.2	3.6		C) non-ded bladder pump; or
	1650	22.80	2.5	6.70	26.8	2590	5.4	207.9	3.6		*Standard groundwater sample:*
	1652	22.80	3.0	6.71	26.9	2590	5.4	207.4	3.6		D) bailer due to limited column; or
	1655	22.80	3.5	6.72	26.9	2590	5.6	207.3	3.5		E) recovery well cycling sample
↓	1657	22.80	4.0	6.72	26.9	2590	5.5	207.1	3.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/2/18	1700	UG-3R	22.80	6.72	26.9	2590	5.5	207.1	3.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record (Near Park)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-4
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade) Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/2/18	1810	NP	20.07	0.0	39.24	34.5	YES	YES	YES	YES		Weather: clear, 80s
4/3/18	1715	NP	20.10	0.0								

Well Purging Record Screen: 19.5 - 39.5 ft-bgs

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/2/18	1815	20.24	0.5	7.04	24.3	4270	3.2	277.7	18.7	colorless; clear	*Low-flow groundwater sample:*
	1817	20.25	1.0	6.90	24.1	4310	3.1	277.0	14.9		(A) peristaltic pump w/ ded tubing
	1820	20.26	1.5	6.86	24.0	4320	3.0	276.3	14.4		B) ded bladder pump
	1822	20.27	2.0	6.85	23.8	4330	3.0	275.2	9.9		C) non-ded bladder pump; or
	1825	20.28	2.5	6.84	23.8	4330	3.0	274.2	6.7		*Standard groundwater sample:*
	1827	20.28	3.0	6.84	23.8	4330	2.9	273.4	3.9		D) bailer due to limited column; or
	1830	20.29	3.5	6.83	23.8	4330	3.1	273.2	3.6		E) recovery well cycling sample
↓	1832	20.29	4.0	6.83	23.8	4330	3.0	272.6	3.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/2/18	1835	UG-4	20.29	6.83	23.8	4330	3.0	272.6	3.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Upgradient

Monitoring Well Purging and Sampling Record (N. of elementary school)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-1
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; at-grade)

Initials: SLH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/2/18	1725	NP	13.33	0.0	24.08	19.1	Yes	Yes	Yes	Yes		Weather: clear, 80s
4/3/18	1705	NP	13.40	0.0								

Well Purging Record

* ORP double-checked

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV) *	Turbidity (NTU)	Water Color / Clarity	
4/2/18	1730	13.34	0.5	6.99	27.8	3150	5.1	579	1.8	colorless; clear	*Low-flow groundwater sample:*
|	1732	13.34	1.0	7.06	27.5	3170	4.8	581	1.9	| |	A) peristaltic pump w/ ded tubing
|	1735	13.34	1.5	7.05	27.1	3170	4.5	587	1.8	| |	B) ded bladder pump
|	1737	13.34	2.0	7.03	27.1	3170	4.4	588	1.7	| |	C) non-ded bladder pump; or
|	1740	13.34	2.5	7.00	27.1	3180	4.5	589	1.7	| |	*Standard groundwater sample:*
|	1742	13.34	3.0	6.98	27.1	3180	4.5	590	1.6	| |	D) bailer due to limited column; or
|	1745	13.34	3.5	6.96	27.1	3180	4.5	590	1.6	| |	E) recovery well cycling sample
↓	1747	13.34	4.0	6.96	27.1	3180	4.5	590	1.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/2/18	1750	UG-1	13.34	6.96	27.1	3180	4.5	590	1.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~*Short List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

E-W alley, immediately NW of Artesia Hotel

Upgradient

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-2
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/2/18	1855	NP	18.51	0.0	29.28	24.3	Yes	Yes	Yes	Yes		Weather: clear 80s
4/3/18	1720	NP	18.53	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/2/18	1905	18.59	0.5	7.40	25.4	2520	4.7	228.9	2.8	colorless; clear	*Low-flow groundwater sample:*
	1907	18.59	1.0	7.38	25.3	2490	4.6	230.4	2.7		(A) peristaltic pump w/ ded tubing
	1910	18.60	1.5	7.36	25.2	2480	4.5	231.4	2.5		B) ded bladder pump
	1912	18.60	2.0	7.30	25.2	246.1	4.6	232.4	2.3		C) non-ded bladder pump; or
	1915	18.61	2.5	7.28	25.1	245.0	4.6	232.8	2.2		*Standard groundwater sample:*
	1917	18.61	3.0	7.30	25.1	2450	4.6	233.3	2.2		D) bailer due to limited column; or
	1920	18.61	3.5	7.28	25.1	2440	4.5	233.5	2.1		E) recovery well cycling sample
↓	1922	18.61	4.0	7.29	25.1	2440	4.5	233.7	2.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/2/18	1925	UG-2	18.61	7.29	25.1	2440	4.5	233.7	2.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - Rest-04

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-101
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: ~~TA~~ BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1440	NP	14.84	0.0	26.85	23.5	yes	yes	yes	yes		Weather: pt cloudy 80s
4/4/18	845	NP	14.95	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	850	14.97	0.5	6.75	18.1	2120	3.5	-77.4	4.8	Clear; colorless	*Low-flow groundwater sample:*
	853	14.97	1.0	6.69	18.4	2010	2.8	-78.8	4.0		(A) peristaltic pump w/ ded tubing
	855	14.97	1.5	6.66	18.4	1930	2.5	-79.2	3.9		B) ded bladder pump
	857	14.97	2.0	6.64	18.4	1877	1.9	-80.7	3.7		C) non-ded bladder pump; or
	900	14.97	2.5	6.63	18.4	1870	1.8	-81.3	3.5		*Standard groundwater sample:*
	903	14.97	3.0	6.62	18.4	1869	1.7	-81.9	3.3		D) bailer due to limited column; or
	905	14.97	3.5	6.61	18.4	1868	1.6	-82.0	2.9		E) recovery well cycling sample
↓	907	14.97	4.0	6.62	18.4	1868	1.5	-82.2	2.2	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	910	MW-101	14.97	6.62	18.4	1868	1.5	-82.2	2.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-105
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/17	1430	NP	10.70	0.0	17.20	14.2	yes	yes	yes	yes		Weather: pt/cloudy, 80s
4/5/18	1000	NP	10.70	0.0			yes	yes	yes	yes		

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	1005	10.75	0.5	6.83	23.1	1835	1.2	-313.3	96.4	cloudy/grayish tint	*Low-flow groundwater sample:*
	1007	10.75	1.0	6.80	22.9	802	1.0	-322.5	90.2		(A) peristaltic pump w/ ded tubing
	1010	10.75	1.5	6.79	22.7	1797	0.9	-329.5	88.7		B) ded bladder pump
	1013	10.75	2.0	6.78	22.5	1777	0.8	-339.1	85.4		C) non-ded bladder pump; or
	1015	10.75	2.5	6.78	22.4	1764	0.7	-343.9	80.2		*Standard groundwater sample:*
	1017	10.75	3.0	6.78	22.4	1767	0.5	-350.0	79.9		D) bailer due to limited column; or
	1020	10.75	3.5	6.77	22.4	1768	0.5	-351.8	77.2		E) recovery well cycling sample
	1023	10.75	4.0	6.76	22.4	1767	0.4	-352.2	77.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	1025	MW-105	10.75	6.76	22.4	1767	0.4	-352.2	77.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge / Sample through labeled 1-in guide-pipe

Well: RW-2
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (Inside doghouse)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: ~~TAB~~ / CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1640	NP	12.40	0.0	36.13	31.1	yes	yes	yes	yes		Weather: pt/cloudy 86°
4.4.18	1650	NA	12.40	0.0	36.13	31.1						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1655	NM	0.5	6.83	24.1	3290	2.0	-358.1	43.8	yellow color;	*Low-flow groundwater sample:*
	1657		1.0	6.72	24.0	3280	1.6	-363.2	21.6	sl. cloudy; sheen;	(A) peristaltic pump w/ ded tubing
	1700		1.5	6.70	23.9	3290	1.4	-365.1	14.2	black particles;	B) ded bladder pump
	1702		2.0	6.68	23.8	3280	1.3	-367.5	11.4	odor	C) non-ded bladder pump; or
	1705		2.5	6.67	23.8	3290	1.2	-369.2	9.8	yellow color; clear;	*Standard groundwater sample:*
	1707		3.0	6.66	23.7	3300	1.1	-371.4	7.9	sheen; odor	D) bailer due to limited column; or
	1710		3.5	6.65	23.7	3310	1.0	-373.4	7.4		E) recovery well cycling sample
↓	1712	↓	4.0	6.64	23.7	3320	1.0	-375.1	6.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1715	RW-2	NM	6.64	23.7	3320	1.0	-375.1	6.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-61
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/2/18	1650	NP	12.77	0.0	29.30	24.30	yes	yes	yes	yes		Weather: PT/cloudy 80s
4/5/18	900	NP	12.70									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	905	12.88	0.5	6.95	21.4	2640	1.8	-341.5	7.9	clear colorless; odo	*Low-flow groundwater sample:*
	907	13.05	1.0	6.93	21.6	1630	1.5	-346.4	6.8		(A) peristaltic pump w/ ded tubing
	910	13.16	1.5	6.92	21.9	2620	1.0	-351.3	6.1		B) ded bladder pump
	913	13.24	2.0	6.91	22.2	2620	0.9	-357.5	4.7		C) non-ded bladder pump; or
	915	13.34	2.5	6.90	22.2	2620	0.7	-359.4	3.5		*Standard groundwater sample:*
	920	13.44	3.0	6.90	22.4	2610	0.5	-363.1	3.0		D) bailer due to limited column; or
	925	13.54	3.5	6.89	22.4	2610	0.4	-363.7	2.9		E) recovery well cycling sample
	930	13.57	4.0	6.89	22.4	2600	0.3	-365.1	2.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	935	MW-61	13.57	6.89	22.4	2600	0.3	-365.1	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-62
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1700	NP	13.72	0.0	29.50	21.3	yes	yes	yes	yes		Weather: PT/Cloudy 80s
4/5/18	800	NP	13.68	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/5/18	805	13.84	0.5	6.73	19.9	2810	2.3	-324.6	6.9	Clear; Colorless	*Low-flow groundwater sample:*
	807	13.94	1.0	6.67	19.5	2790	1.2	-345.7	6.0	0006	(A) peristaltic pump w/ ded tubing
	810	14.01	1.5	6.65	19.6	2820	0.9	-348.5	5.8		B) ded bladder pump
	813	14.06	2.0	6.63	20.0	2840	0.8	-358.1	5.3		C) non-ded bladder pump; or
	815	14.10	2.5	6.62	20.0	2840	0.7	-359.3	5.0		*Standard groundwater sample:*
	817	14.13	3.0	6.62	20.0	2850	0.6	-359.2	4.9		D) bailer due to limited column; or
	820	14.16	3.5	6.62	20.0	2850	0.5	-359.5	4.7		E) recovery well cycling sample
↓	823	14.20	4.0	6.61	20.1	2860	0.4	-359.4	4.4	↓ ↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/5/18	825	MW-62	14.20	6.61	20.1	2860	0.4	-359.4	4.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-93
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: TAB / CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1710	NP	8.15	0.0	20.23	15.9	yes	yes	yes	yes		Weather: PT/cloudy 80s
~~4.4.18~~	1735	NA	8.14	0.0	20.23	15.9						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1740	8.24	0.5	6.61	22.0	3070	1.8	-353.1	16.8	Colorless; Clear	*Low-flow groundwater sample:*
"	1742	8.31	1.0	6.55	22.2	3070	1.6	-360.1	14.0	sheen; odor	(A) peristaltic pump w/ ded tubing
"	1745	8.36	1.5	6.54	22.4	3060	1.5	-362.4	12.1	"	B) ded bladder pump
"	1747	8.40	2.0	6.52	22.5	3060	1.4	-364.1	10.3	"	C) non-ded bladder pump; or
"	1750	8.43	2.5	6.51	22.6	3050	1.3	-366.4	9.5	"	*Standard groundwater sample:*
"	1752	8.46	3.0	6.50	22.7	3050	1.2	-368.5	8.6	"	D) bailer due to limited column; or
"	1755	8.49	3.5	6.49	22.7	3050	1.2	-369.7	8.1	"	E) recovery well cycling sample
↓	1757	8.51	4.0	6.49	22.8	3040	1.2	-371.0	7.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1800	MW-93	8.51	6.49	22.8	3040	1.2	-371.0	7.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-43
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB / CJH

Well Inspection Information

(6-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1750	NP	10.19	0.0	19.67	16.5	yes	Issue*	yes	yes	No PAD	Weather: PT/cloudy 80s
4.4.18	1605	NA	10.15	0.0	19.67	16.5						

*(No protective outer casing)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1610	10.20	0.5	6.89	23.6	4420	1.9	-381.2	12.2	Colorless; clear;	*Low-flow groundwater sample:*
	1612	10.20	1.0	6.88	23.4	4690	1.6	-388.5	10.4	odor	(A) peristaltic pump w/ ded tubing
	1615	10.20	1.5	6.87	23.2	4620	1.5	-389.2	9.4		B) ded bladder pump
	1617	10.20	2.0	6.87	23.1	4640	1.4	-391.1	9.1		C) non-ded bladder pump; or
	1620	10.20	2.5	6.87	23.1	4660	1.3	-392.6	8.7		*Standard groundwater sample:*
	1622	10.20	3.0	6.86	23.0	4680	1.2	-393.4	8.3		D) bailer due to limited column; or
	1625	10.20	3.5	6.86	23.0	4690	1.2	-394.2	8.4		E) recovery well cycling sample
↓	1627	10.20	4.0	6.86	23.1	4700	1.2	-395.0	7.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1630	MW-43	10.20	6.86	23.1	4700	1.2	-395.0	7.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-137
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: TAT

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1730	N/A	8.47	0.0	29.60	24.6	yes	yes	yes	yes		Weather: PT/Cloudy, 70s
4.5.18	925	NA	8.45	0.0	29.60	24.6						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.5.18	930	8.45	0.5	6.64	25.1	4740	2.6	-380.1	11.2	Colorless; Clear;	*Low-flow groundwater sample:*
	932	8.45	1.0	6.68	25.3	4860	2.3	-384.5	9.8	odor	(A) peristaltic pump w/ ded tubing
	935	8.45	1.5	6.69	25.4	4960	2.2	-385.9	9.2		B) ded bladder pump
	937	8.45	2.0	6.70	25.5	5000	2.1	-385.5	8.7		C) non-ded bladder pump; or
	940	8.45	2.5	6.70	25.5	5020	2.1	-385.1	8.5		*Standard groundwater sample:*
	942	8.45	3.0	6.71	25.6	5040	2.0	-386.1	8.2		D) bailer due to limited column; or
	945	8.45	3.5	6.71	25.7	5050	2.0	-386.6	7.9		E) recovery well cycling sample
	947	8.45	4.0	6.71	25.7	5060	2.0	-387.2	7.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.5.18	950	MW-137	8.45	6.71	25.7	5060	2.0	-387.2	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-138
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade) Initials: TAB / CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1740	10.03	10.04	0.01	24.81	19.8	yes	yes	yes	yes		Weather: PT/Cloudy 80s
4.5.18	840	9.99	10.00	0.01	24.81	19.8						

Well Purging Record *Removed LNAPL w/ Sorbant Pad before Sampling.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.5.18	845	10.03	0.5	6.45	27.9	2990	3.1	-271.3	22.5	Colorless; Clear;	*Low-flow groundwater sample:*
↓	847	10.03	1.0	6.51	28.2	2960	2.7	-285.7	17.2	Odor; Sheen	(A) peristaltic pump w/ ded tubing
	850	10.03	1.5	6.56	28.4	2940	2.5	-293.7	14.5	Brown Color; Clear;	B) ded bladder pump
	852	10.03	2.0	6.57	28.5	2930	2.3	-297.1	12.0	Odor; Sheen	C) non-ded bladder pump; or
	855	10.03	2.5	6.58	28.6	2910	2.2	-300.1	10.6	↓	*Standard groundwater sample:*
	857	10.03	3.0	6.59	28.7	2900	2.1	-302.3	9.7		D) bailer due to limited column; or
	900	10.03	3.5	6.60	28.7	2890	2.0	-304.0	9.4		E) recovery well cycling sample
↓	902	10.03	4.0	6.60	28.8	2890	2.0	-305.6	9.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.5.18	905	MW-138	10.03	6.60	28.8	2890	2.0	-305.6	9.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-23
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information (6-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/2/18	1720	NP	13.52	0.0	23.10	17.9	yes	yes	yes	yes		Weather: pt/cloudy 80s
4/4/18	1835	NP	13.55	0.0								

Well Purging Record New metal prot. casing installed since 2Q17; new pad also (hairline cracks in pad)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1840	13.61	0.5	7.06	24.8	2740	1.4	-242.1	6.3	clear; colorless	*Low-flow groundwater sample:*
	1843	13.64	1.0	7.01	24.9	2650	1.2	-272.4	6.1		(A) peristaltic pump w/ ded tubing
	1845	13.67	1.5	7.00	25.0	2640	1.0	-276.4	6.3		B) ded bladder pump
	1847	13.69	2.0	7.00	25.0	2620	0.8	-280.9	6.4		C) non-ded bladder pump; or
	1850	13.71	2.5	7.00	25.0	2620	0.7	-287.3	6.5		*Standard groundwater sample:*
	1853	13.73	3.0	6.99	25.0	2610	0.6	-287.5	6.5		D) bailer due to limited column; or
	1855	13.75	3.5	6.99	25.0	2610	0.5	-288.1	6.6		E) recovery well cycling sample
	1857	13.77	4.0	6.98	24.9	2610	0.4	-289.4	6.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1900	MW-23	13.77	6.98	24.9	2610	0.4	-289.4	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500-~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ DUP-TEL-01 (for same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-4
Event: Spring 2018 (Non-Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	900	NP	9.48	0.0	27.27	22.2	yes	yes	yes	yes		Weather: pt/cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	905	9.64	0.5	6.48	21.2	4530	1.2	-147.9	13.4	clear/colorless	*Low-flow groundwater sample:*
	907	9.64	1.0	6.42	21.1	4510	1.1	-195.9	10.6	black particles	(A) peristaltic pump w/ ded tubing
	910	9.64	1.5	6.41	21.0	4520	0.8	-209.6	10.0		B) ded bladder pump
	913	9.64	2.0	6.38	20.9	4520	0.7	-219.9	9.8		C) non-ded bladder pump; or
	915	9.64	2.5	6.36	20.9	4520	0.6	-221.4	9.7		*Standard groundwater sample:*
	917	9.64	3.0	6.34	21.0	4530	0.5	-223.9	9.2		D) bailer due to limited column; or
	920	9.64	3.5	6.32	21.0	4530	0.5	-226.1	8.8		E) recovery well cycling sample
	923	9.64	4.0	6.30	21.1	4530	0.4	-226.7	8.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	925	TEL-4	9.64	6.30	21.1	4530	0.4	-226.7	8.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1000	DUP-TEL-01	9.64	6.30	21.1	4530	0.4	-226.7	8.9	Same analyses	Same	Same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ EB-TEL-01 (for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-3
Event: Spring 2018 (Non-Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1020	NP	9.19	0.0	27.19	22.2	yes	yes	yes	yes		Weather: pt/cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1025	9.32	0.5	6.72	22.7	3720	0.9	-188.8	11.8	clear/dark tint	*Low-flow groundwater sample:*
	1027	9.32	1.0	6.61	21.8	3550	0.7	-299.2	5.4	Light Sheen	(A) peristaltic pump w/ ded tubing
	1030	9.32	1.5	6.60	21.7	3440	0.5	-308.8	4.6		B) ded bladder pump
	1033	9.32	2.0	6.58	21.7	3430	0.5	-309.2	4.5		C) non-ded bladder pump; or
	1035	9.32	2.5	6.50	21.6	3360	0.4	-316.7	4.2		*Standard groundwater sample:*
	1037	9.32	3.0	6.48	21.6	3350	0.3	-318.3	3.9		D) bailer due to limited column; or
	1040	9.32	3.5	6.47	21.6	3340	0.3	-320.3	3.6		E) recovery well cycling sample
↓	1043	9.32	4.0	6.48	21.5	3340	0.3	-321.8	3.4	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1045	TEL-3	9.32	6.48	21.5	3340	0.3	-321.8	3.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1100	EB-TEL-01 NA								same analyses	same	same
		(collected over	decanted	ganging	probe)							

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-2
Event: Spring 2018 (Non-Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; Stickup) Initials: TA RB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1120	NP	9.91	0.0	27.20	22.1	yes	yes	yes	yes		Weather: pt cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1125	9.98	0.5	6.62	25.9	3140	0.9	-338.7	7.6	clear/colorless	*Low-flow groundwater sample:*
	1127	9.98	1.0	6.60	24.0	3200	0.7	-343.2	7.5		(A) peristaltic pump w/ ded tubing
	1130	9.98	1.5	6.60	23.7	3210	0.5	-344.2	6.6		B) ded bladder pump
	1133	9.98	2.0	6.59	23.6	3220	0.4	-345.5	6.3		C) non-ded bladder pump; or
	1135	9.98	2.5	6.59	23.4	3230	0.5	-346.4	6.0		*Standard groundwater sample:*
	1137	9.98	3.0	6.58	23.2	3240	0.5	-347.4	5.0		D) bailer due to limited column; or
	1140	9.98	3.5	6.58	23.2	3250	0.5	-349.7	4.6		E) recovery well cycling sample
	1143	9.98	4.0	6.58	23.2	3250	0.5	-350.6	4.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1145	TEL-2	9.98	6.58	23.2	3250	0.5	-350.6	4.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+Trip Blank-TEL-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-1
Event: Spring 2018 (Non-Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1210	NP	9.02	0.0	27.00	22.9	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1215	9.26	0.5	7.43	23.3	2780	1.0	-218.8	6.6	clear/colorless	*Low-flow groundwater sample:*
	1217	9.26	1.0	7.37	22.5	2760	0.8	-222.4	6.9		(A) peristaltic pump w/ ded tubing
	1220	9.26	1.5	7.32	22.3	2750	0.7	-224.2	6.0		B) ded bladder pump
	1223	9.26	2.0	7.28	22.6	2740	0.5	-226.0	5.8		C) non-ded bladder pump; or
	1225	9.26	2.5	7.26	22.6	2740	0.5	-226.4	5.2		*Standard groundwater sample:*
	1227	9.26	3.0	7.24	22.6	2730	0.4	-227.3	4.7		D) bailer due to limited column; or
	1230	9.26	3.5	7.22	22.6	2730	0.3	-228.6	4.0		E) recovery well cycling sample
↓	1233	9.26	4.0	7.20	22.5	2730	0.3	-229.9	3.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1235	TEL-1	9.26	7.20	22.5	2730	0.3	-229.9	3.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-39
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in stainless steel; short stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1455	NP	9.58	0.0	25.44	20.4	yes	yes	yes	yes		Weather: pt/cloudy 80s
4/4/18	1020	NP	9.65	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1025	9.75	0.5	7.16	18.2	3300	1.9	-325.7	10.2	Clear Black Tint	*Low-flow groundwater sample:*
	1027	9.77	1.0	7.14	18.2	3320	1.7	-327.5	9.3	ODor	(A) peristaltic pump w/ ded tubing
	1030	9.77	1.5	7.13	18.4	3330	1.5	-330.4	9.0		B) ded bladder pump
	1033	9.77	2.0	7.11	18.5	3370	1.3	-334.6	8.8		C) non-ded bladder pump; or
	1035	9.77	2.5	7.10	18.5	3400	1.2	-337.7	8.4		*Standard groundwater sample:*
	1037	9.77	3.0	7.09	18.4	3410	1.1	-338.5	8.2		D) bailer due to limited column; or
	1040	9.77	3.5	7.08	18.5	3420	1.1	-340.1	7.9		E) recovery well cycling sample
↓	1043	9.77	4.0	7.07	18.5	3430	1.0	-343.4	7.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1045	MW-39	9.77	7.07	18.5	3430	1.0	-343.4	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Prior to 2H16, this well was a Stickup completion; Area has since been backfilled with a couple feet of soil.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-98
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1255	NP	9.88	0.0	25.60	21.5	yes	yes	yes	yes		Weather: PT/Cloudy 80°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1300	9.94	0.5	6.69	23.5	2790	1.0	-365.6	4.4	clear/colorless	*Low-flow groundwater sample:*
	1303	9.94	1.0	6.67	23.4	2780	0.8	-369.5	3.0	odor	(A) peristaltic pump w/ ded tubing
	1305	9.94	1.5	6.67	23.1	2780	0.7	-373.1	2.4		B) ded bladder pump
	1307	9.94	2.0	6.65	23.1	2790	0.6	-373.3	2.5		C) non-ded bladder pump; or
	1310	9.94	2.5	6.64	23.1	2790	0.6	-373.9	2.2		*Standard groundwater sample:*
	1313	9.94	3.0	6.63	23.1	2790	0.5	-374.2	2.2		D) bailer due to limited column; or
	1315	9.94	3.5	6.63	23.2	2790	0.4	-374.4	2.0		E) recovery well cycling sample
↓	1317	9.94	4.0	6.62	23.0	3000	0.3	-374.8	1.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1320	MW-98	9.94	6.62	23.0	3000	0.3	-374.8	1.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

(old RW-10 permanently covered by heavy steel box. Current RW-10 is the stand-pipe located ~50' S. of former RW-10, per Navajo

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-10
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1630	NP	9.39	0.0	22.49	17.49	YES	YES	Issue*	YES		Weather: PT/cloudy 60's
4/4/18	1110	NP	9.43	0.0								

Well Purging Record

*PVC capon standpipe is unlockable

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1115	9.45	0.5	6.98	18.2	2990	1.4	-331.2	7.9	Clear/colorless	*Low-flow groundwater sample:*
	1117	9.45	1.0	6.92	18.2	2810	1.0	-341.2	5.8		(A) peristaltic pump w/ ded tubing
	1120	9.45	1.5	6.91	18.3	2790	0.8	-343.1	5.6		B) ded bladder pump
	1123	9.45	2.0	6.89	18.4	2750	0.7	-352.4	5.3		C) non-ded bladder pump; or
	1125	9.45	2.5	6.88	18.5	2740	0.5	-353.9	5.0		*Standard groundwater sample:*
	1127	9.45	3.0	6.88	18.5	2730	0.4	-355.2	4.7		D) bailer due to limited column; or
	1130	9.45	3.5	6.87	18.6	2720	0.3	-357.1	4.6		E) recovery well cycling sample
	1133	9.45	4.0	6.88	18.6	2710	0.2	-359.8	4.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1135	RW-10	9.45	6.88	18.6	2710	0.2	-359.8	4.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-40
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1505	NP	7.81	0.0	24.75	21.8	yes	yes	yes	yes		Weather: PT/Cloudy 80°
4/4/18	1155	NP	7.85	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1200	7.99	0.5	6.74	20.5	2540	1.5	-311.8	15.7	clear; colorless	*Low-flow groundwater sample:*
	1203	7.99	1.0	6.77	20.6	2500	1.2	-327.7	13.8		(A) peristaltic pump w/ ded tubing
	1205	7.99	1.5	6.79	20.7	2490	1.0	-334.8	12.2		B) ded bladder pump
	1207	7.99	2.0	6.80	20.6	2470	0.9	-342.9	10.1		C) non-ded bladder pump; or
	1210	7.99	2.5	6.81	20.6	2460	0.8	-348.9	9.7		*Standard groundwater sample:*
	1213	7.99	3.0	6.81	20.6	2450	0.7	-349.5	9.4		D) bailer due to limited column; or
	1215	7.99	3.5	6.80	20.7	2450	0.6	-351.5	8.8		E) recovery well cycling sample
	1217	7.99	4.0	6.80	20.7	2450	0.5	-351.9	7.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1220	MW-40	7.99	6.80	20.7	2450	0.5	-351.9	7.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-41
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1520	NP	7.27	0.0	21.56	18.6	yes	yes	yes	yes		Weather: PT/Cloudy 80s
4/4/18	1455	NP	7.31	0.0								PT/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1500	7.36	0.5	6.58	20.3	3720	1.3	-290.2	7.2	clear; colorless	*Low-flow groundwater sample:*
	1503	7.36	1.0	6.52	20.3	3920	1.1	-295.5	6.8		(A) peristaltic pump w/ ded tubing
	1505	7.36	1.5	6.51	20.3	3960	1.0	-297.0	6.4		B) ded bladder pump
	1507	7.36	2.0	6.50	20.2	4000	0.9	-298.4	5.7		C) non-ded bladder pump; or
	1510	7.36	2.5	6.47	20.2	4110	0.8	-303.9	5.5		*Standard groundwater sample:*
	1513	7.36	3.0	6.46	20.2	4120	0.7	-306.4	4.7		D) bailer due to limited column; or
	151	7.36	3.5	6.45	20.2	4130	0.6	-308.7	4.4		E) recovery well cycling sample
↓	1517	7.36	4.0	6.45	20.2	4140	0.5	-309.9	4.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1520	MW-41	7.36	6.45	20.2	4140	0.5	-309.9	4.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Old RW-9 permanently covered by heavy steel box. Current RW-9 location is the stand-pipe located ~50' E. at former RW-9, per Navajo.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-9
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1515	NP	9.38	0.0	21.83	16.8	yes	yes	issue *	yes		Weather: PM/Cloudy 80°
4/4/18	1355	NP	9.39	0.0								AM/Cloudy 50°

* PVC cap on standpipe; unlockable

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1400	9.40	0.5	6.76	20.2	3300	1.9	-325.8	6.9	clear/black tint odor	Low-flow groundwater sample:
	1403	9.40	1.0	6.75	20.1	3290	1.5	-335.9	6.0		A) peristaltic pump w/ ded tubing
	1405	9.40	1.5	6.74	20.0	3280	1.3	-344.9	5.7		B) ded bladder pump
	1407	9.40	2.0	6.73	20.0	3280	1.2	-351.2	5.3		C) non-ded bladder pump; or
	1410	9.40	2.5	6.73	20.0	3280	1.1	-351.5	5.2		Standard groundwater sample:
	1413	9.40	3.0	6.72	20.0	3270	1.0	-352.4	4.9		D) bailer due to limited column; or
	1415	9.40	3.5	6.71	20.0	3260	0.9	-353.9	4.8		E) recovery well cycling sample
	1417	9.40	4.0	6.70	20.0	3250	0.8	-356.7	4.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1420	RW-9	9.40	6.70	20.0	3250	0.8	-356.7	4.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-42
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: ~~TA~~ B

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1525	NP	10.00	0.0	24.32	21.3	yes	yes	yes	yes		Weather: pt/cloudy 80s
4/4/18	1545	NP	10.01	0.0								pt/cloudy 50s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1550	10.03	0.5	6.88	20.2	3690	1.5	-275.2	8.2	Clear; Colorless	*Low-flow groundwater sample:*
	1553	10.04	1.0	6.85	20.0	3640	1.0	-289.9	7.0		(A) peristaltic pump w/ ded tubing
	1555	10.04	1.5	6.84	19.9	3510	0.9	-302.1	5.8		B) ded bladder pump
	1557	10.04	2.0	6.84	19.8	3480	0.7	-306.9	5.6		C) non-ded bladder pump; or
	1600	10.04	2.5	6.83	19.8	3440	0.6	-313.4	5.5		*Standard groundwater sample:*
	1603	10.04	3.0	6.82	19.8	3430	0.5	-314.5	5.2		D) bailer due to limited column; or
	1605	10.04	3.5	6.81	19.8	3430	0.5	-315.8	5.0		E) recovery well cycling sample
↓	1607	10.04	4.0	6.82	19.8	3420	0.4	-317.7	4.7	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1610	MW-42	10.04	6.82	19.8	3420	0.4	-317.7	4.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-29
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

3.25-ft (6-in PVC; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1550	NP	13.70	0.0	24.22	19.22	yes	yes	yes	yes		Weather: PT/cloudy 80s
4/4/18	1300	NP	13.76	0.0								PT/cloudy 40s

(New completion 1H18)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1305	13.77	0.5	7.25	19.9	3570	2.4	-178.7	5.3	Clear; colorless	*Low-flow groundwater sample:*
	1307	13.78	1.0	7.19	19.9	3540	2.1	-178.2	3.9		(A) peristaltic pump w/ ded tubing
	1310	13.78	1.5	7.07	19.9	3550	1.5	-182.1	3.2		B) ded bladder pump
	1313	13.78	2.0	7.03	20.0	3560	1.4	-183.6	2.9		C) non-ded bladder pump; or
	1315	13.78	2.5	7.01	20.0	3570	1.3	-185.2	2.7		*Standard groundwater sample:*
	1317	13.78	3.0	6.99	20.0	3580	1.2	-189.1	2.6		D) bailer due to limited column; or
	1320	13.78	3.5	6.97	20.0	3590	1.1	-190.1	2.0		E) recovery well cycling sample
	1323	13.78	4.0	6.95	20.0	3590	1.0	-191.2	2.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1325	MW-29	13.78	6.95	20.0	3590	1.0	-191.2	2.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#163
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1600	NP	11.84	0.0	17.70	14.7	yes	yes	Issue	yes		Weather: PC. Cloudy 80s
4/4/18	1640	NP	11.84	0.0								PC/Cloudy 50s

Unable to lock; broken well pad

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1645	11.81	0.5	7.37	20.0	3510	1.4	-181.3	5.5	Clear - Colorless	*Low-flow groundwater sample:*
	1647	11.81	1.0	7.26	19.9	3510	1.3	-182.7	5.2		(A) peristaltic pump w/ ded tubing
	1650	11.81	1.5	7.14	19.7	3500	1.2	-185.0	5.0		B) ded bladder pump
	1653	11.81	2.0	7.08	19.6	3510	1.0	-186.4	4.6		C) non-ded bladder pump; or
	1655	11.81	2.5	7.06	19.6	3510	0.9	-187.3	4.4		*Standard groundwater sample:*
	1657	11.81	3.0	7.04	19.6	3510	0.8	-187.5	4.2		D) bailer due to limited column; or
	1700	11.81	3.5	7.03	19.6	3560	0.7	-187.9	3.9		E) recovery well cycling sample
	1703	11.81	4.0	7.02	19.6	3500	0.7	-188.1	3.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1705	RW-#163	11.81	7.02	19.6	3500	0.7	-188.1	3.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-30 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (stickup)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	16:20	NP	9.31	0.0	23.50	Not Sampled	Yes	yes	yes	yes		Weather: PT/Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) Irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-56
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1610	NP	10.50	0.0	26.50	21.4	yes	yes	yes	yes		Weather: PT/Cloudy 80°
4/4/18	1735	NP	10.53	0.0								PT/Cloudy 58°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	1740	10.56	0.5	6.90	22.5	3390	1.3	-197.6	3.5	clear; colorless	*Low-flow groundwater sample:*
	1743	10.56	1.0	6.81	22.5	3340	1.2	-184.9	2.4		(A) peristaltic pump w/ ded tubing
	1745	10.56	1.5	6.78	22.4	3330	1.1	-175.4	2.1		B) ded bladder pump
	1747	10.56	2.0	6.77	22.4	3320	1.0	-171.4	1.8		C) non-ded bladder pump; or
	1750	10.56	2.5	6.76	22.3	3300	0.9	-162.1	1.6		*Standard groundwater sample:*
	1753	10.56	3.0	6.75	22.3	3290	0.8	-157.4	1.4		D) bailer due to limited column; or
	1755	10.56	3.5	6.74	22.3	3280	0.8	-155.7	1.3		E) recovery well cycling sample
	1757	10.56	4.0	6.74	22.3	3280	0.7	-154.9	1.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	1800	MW-56	10.56	6.74	22.3	3280	0.7	-154.9	1.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Located under yellow barricade

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-49
Event: Spring 2018 (Non-Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; converted to at-grade 1H18) Initials: JA BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1450	NP	10.70	0.0	33.05	27.8	yes	yes	yes	yes		Weather: pt/cloudy 80°
4/4/18	930	NP	10.80	0.0								

Well Purging Record

* SOFT BOTTOM

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	935	10.94	0.5	6.57	20.3	2330	2.0	-319.9	8.4	clear/colorless/no odor	Low-flow groundwater sample:
	937	10.94	1.0	6.56	20.4	2360	1.6	-321.1	8.6		(A) peristaltic pump w/ ded tubing
	940	10.94	1.5	6.56	20.8	2450	1.0	-339.3	7.9		B) ded bladder pump
	943	10.94	2.0	6.55	20.9	2470	0.8	-342.3	7.7		C) non-ded bladder pump; or
	945	10.94	2.5	6.54	20.9	2510	0.7	-351.1	5.9		Standard groundwater sample:
	947	10.94	3.0	6.53	20.9	2520	0.7	-352.3	5.7		D) bailer due to limited column; or
	950	10.94	3.5	6.54	20.9	2530	0.6	-353.3	5.5		E) recovery well cycling sample
	953	10.94	4.0	6.55	21.0	2540	0.5	-353.5	5.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	955	MW-49	10.94	6.55	21.0	2540	0.5	-353.5	5.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Covered by gravel & relocated in 2H17

Well: MW-106
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; at-grade)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1350	NP	8.49	0.0	22.80	17.5	yes	yes	yes	yes		Weather: pt cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/3/18	1355	8.55	0.5	6.57	23.9	3000	1.1	-367.9	9.3	Clear Colorless	*Low-flow groundwater sample:*
	1357	8.54	1.0	6.54	24.0	3010	0.9	-370.7	6.9	odor	(A) peristaltic pump w/ ded tubing
	1400	8.55	1.5	6.54	24.0	3020	0.8	-371.3	5.5		B) ded bladder pump
	1403	8.57	2.0	6.53	24.1	3020	0.7	-371.7	4.5		C) non-ded bladder pump; or
	1405	8.59	2.5	6.53	24.2	3040	0.6	-372.1	3.0		*Standard groundwater sample:*
	1407	8.61	3.0	6.53	24.2	3040	0.5	-372.4	2.9		D) bailer due to limited column; or
	1410	8.63	3.5	6.52	24.1	3040	0.4	-372.4	2.8		E) recovery well cycling sample
↓	1413	8.65	4.0	6.52	24.1	3050	0.4	-372.5	2.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/3/18	1415	MW-106	8.65	6.52	24.1	3050	0.4	-372.5	2.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-45
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/3/18	1500	NP	4.41	0.0	15.05	12.3	yes	yes	yes	yes		Weather: PT/cloudy 40s
4/4/18	800	NP	4.41	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/4/18	805	4.67	0.5	6.39	16.8	4420	2.1	-8.6	8.0	clear colorless with	*Low-flow groundwater sample:*
	807	4.68	1.0	6.42	16.8	4410	1.9	-7.8	6.01	white part. yes	(A) peristaltic pump w/ ded tubing
	810	4.68	1.5	6.46	16.8	4420	1.8	-6.3	6.1		B) ded bladder pump
	813	4.66	2.0	6.55	16.9	4410	1.7	-3.3	5.7		C) non-ded bladder pump; or
	815	4.68	2.5	6.60	17.1	4420	1.7	-1.1	5.3		*Standard groundwater sample:*
	817	4.68	3.0	6.62	17.1	4420	1.6	-1.0	4.9		D) bailer due to limited column; or
	820	4.68	3.5	6.63	17.1	4430	1.5	-0.8	4.4		E) recovery well cycling sample
↓	823	4.68	4.0	6.63	17.1	4430	1.5	-0.6	4.4	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/4/18	825	MW-45	4.68	6.63	17.1	4430	1.5	-0.6	4.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Located within Artesia wool laydown yard, N. of the main warehouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-50
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1130	NA	15.68	0.0	28.22	24.1	yes	yes	yes	yes		Weather: Clear, 70's
					(soft)							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1135	15.69	0.5	6.98	24.4	6540	1.8	92.0	6.2	Colorless; clear	*Low-flow groundwater sample:*
↓	1137	15.69	1.0	7.01	24.2	6800	1.5	96.0	4.8	↓	(A) peristaltic pump w/ ded tubing
	1140	15.69	1.5	7.02	24.1	6810	1.4	97.3	4.4		B) ded bladder pump
	1142	15.69	2.0	7.02	24.0	6730	1.5	87.2	4.1		C) non-ded bladder pump; or
	1145	15.69	2.5	7.03	24.0	6670	1.5	72.1	3.9		*Standard groundwater sample:*
	1147	15.69	3.0	7.03	23.9	6640	1.5	69.4	3.5		D) bailer due to limited column; or
	1150	15.69	3.5	7.02	23.9	6620	1.4	67.1	2.8		E) recovery well cycling sample
↓	1152	15.69	4.0	7.02	23.8	6600	1.4	65.0	2.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1155	MW-50	15.69	7.02	23.8	6600	1.4	65.0	2.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~Field filtered 0.45~~ u
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-97
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; at-grade) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1215	10.13	11.72	1.59	21.20	(NS)	yes	yes	yes	yes		Weather: Clear, 80's
		*		*		5' off base as needed						

Well Purging Record * Product measurement Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5			Not Sampled	due to	presence			B) ded bladder pump
			2.0			of LNAPL ≥ 0.03'					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-97								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-92
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1230	12.21	12.29	0.08	22.60	17.6	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record

*HMJ removed tubing from well and discarded due to its deterioration. HMJ will install new tubing for future events if sampled.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not Sampled due to presence						(A) peristaltic pump w/ ded tubing
			1.5		of LNAPL ≥ 0.03'						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-92								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge/Sample through 1-in guide-pipe

Well: RW-1
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1245	NA	11.14	0.0	35.39	30.4	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1250	NM	0.5	6.94	24.8	3420	1.7	-325.1	18.2	Black color, clear,	*Low-flow groundwater sample:*
	1252		1.0	6.93	24.6	3330	1.5	-342.6	16.9	black particles,	(A) peristaltic pump w/ ded tubing
	1255		1.5	6.92	24.5	3300	1.4	-349.2	15.7	sheen & odor	B) ded bladder pump
	1257		2.0	6.91	24.4	3270	1.4	-356.7	15.9		C) non-ded bladder pump; or
	1300		2.5	6.90	24.4	3260	1.3	-361.4	15.6		*Standard groundwater sample:*
	1302		3.0	6.90	24.4	3250	1.3	-363.0	15.2		D) bailer due to limited column; or
	1305		3.5	6.89	24.5	3250	1.2	-364.7	15.4		E) recovery well cycling sample
	1307		4.0	6.89	24.5	3240	1.2	-365.8	15.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1310	RW-1	NM	6.89	24.5	3240	1.2	-365.8	15.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-91
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; Stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1330	NA	11.49	0.0	25.35	17.9	yes	yes	yes	yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1335	11.63	0.5	6.92	25.1	2860	1.8	-365.2	14.2	Black Color, Clear	*Low-flow groundwater sample:*
↓	1337	11.67	1.0	6.81	24.7	2820	2.1	-369.4	12.0	Odor ↓	(A) peristaltic pump w/ ded tubing
	1340	11.70	1.5	6.80	24.6	2800	2.0	-370.2	11.1		B) ded bladder pump
	1342	11.72	2.0	6.79	24.5	2780	1.9	-371.1	9.7		C) non-ded bladder pump; or
	1345	11.74	2.5	6.79	24.5	2770	1.8	-372.7	9.2		*Standard groundwater sample:*
	1347	11.75	3.0	6.78	24.4	2760	1.7	-373.2	8.8		D) bailer due to limited column; or
	1350	11.76	3.5	6.77	24.5	2750	1.7	-374.1	8.4		E) recovery well cycling sample
↓	1352	11.77	4.0	6.77	24.5	2740	1.7	-374.8	8.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1355	MW-91	11.77	6.77	24.5	2740	1.7	-374.8	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-90
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1410	NA	12.22	0.0	22.80	21.5	yes	yes	yes	yes		Weather: Clear, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1415	12.34	0.5	7.27	24.2	3220	2.2	-333.3	12.4	Colorless; Clear	*Low-flow groundwater sample:*
↓	1417	12.36	1.0	7.25	24.0	3220	1.6	-339.1	10.2	Odor ↓	(A) peristaltic pump w/ ded tubing
	1420	12.38	1.5	7.23	23.9	3230	1.4	-344.1	9.8		B) ded bladder pump
	1422	12.39	2.0	7.19	23.7	3240	1.5	-345.6	9.5		C) non-ded bladder pump; or
	1425	12.39	2.5	7.18	23.6	3240	1.5	-346.7	9.1		*Standard groundwater sample:*
	1427	12.40	3.0	7.17	23.6	3240	1.4	-347.3	8.7		D) bailer due to limited column; or
	1430	12.40	3.5	7.17	23.5	3230	1.4	-348.1	8.2		E) recovery well cycling sample
↓	1432	12.40	4.0	7.16	23.5	3240	1.4	-349.0	7.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1435	MW-90	12.40	7.16	23.5	3240	1.4	-349.0	7.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-96
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1450	NA	12.04	0.0	25.57	21.2	yes	*Issue	Needs lock	yes		Weather: Clear, 70's

Well Purging Record

*well has been struck prior to 2H17 event. Hinge is broken and well is not secure.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1455	12.05	0.5	7.23	23.3	2320	2.1	-347.2	14.6	Colorless; clear;	*Low-flow groundwater sample:*
	1457	12.05	1.0	7.12	23.1	2170	2.1	-350.1	12.1	white particles;	(A) peristaltic pump w/ ded tubing
	1500	12.05	1.5	7.03	23.0	2090	2.0	-353.7	10.0	odor	B) ded bladder pump
	1502	12.05	2.0	7.01	22.9	2070	1.9	-354.2	9.3		C) non-ded bladder pump; or
	1505	12.05	2.5	7.00	22.8	2060	1.9	-352.6	9.0		*Standard groundwater sample:*
	1507	12.05	3.0	6.99	22.8	2070	1.8	-352.1	8.7		D) bailer due to limited column; or
	1510	12.05	3.5	6.99	22.7	2080	1.8	-351.4	8.8		E) recovery well cycling sample
	1512	12.05	4.0	6.98	22.7	2080	1.8	-350.7	8.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1515	MW-96	12.05	6.98	22.7	2080	1.8	-350.7	8.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-94
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1530	12.79	12.99	0.20	23.45	16.0	yes	yes	yes	yes		Weather: Clear, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not sampled due to LNAPL						A) peristaltic pump w/ ded tubing
			1.5		≥ 0.03'						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-94								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (Ag,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Inside doghouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge | Sample through 1-in PVC guide-pipe

Well: RW-8
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1544	11.65	12.54	0.89	37.22	35.2	yes	yes	yes	yes		Weather: Clear, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not	sampled due	to Presence				(A) peristaltic pump w/ ded tubing
			1.5		of	LNAPL	≥0.03'				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-8								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-67
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest (4-in; at-grade) ✓

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1555	NA	9.98	0.0	27.30	19.9	yes	yes	yes	yes		Weather: Clear, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1600	10.12	0.5	7.43	24.6	2590	2.4	-336.2	9.6	Light yellow Color;	*Low-flow groundwater sample:*
↓	1602	10.15	1.0	7.37	24.3	2600	1.9	-346.1	9.2	Clear; odor; black	(A) peristaltic pump w/ ded tubing
	1605	10.17	1.5	7.34	24.1	2610	1.7	-349.0	8.7	Particles	B) ded bladder pump
	1607	10.19	2.0	7.32	24.0	2600	1.6	-351.0	8.4	↓	C) non-ded bladder pump; or
	1610	10.20	2.5	7.30	23.9	2590	1.6	-353.6	8.2		*Standard groundwater sample:*
	1612	10.21	3.0	7.29	23.9	2580	1.6	-354.9	7.5		D) bailer due to limited column; or
	1615	10.22	3.5	7.28	24.0	2580	1.7	-356.2	7.2		E) recovery well cycling sample
↓	1617	10.23	4.0	7.27	24.0	2570	1.7	-357.5	6.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1620	MW-67	10.23	7.27	24.0	2570	1.7	-357.5	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-95
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; 5 stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1640	NA	12.97	0.0	25.37	20.4	yes	yes	yes	yes		Weather: Clear, 40's
4.4.18	830	NA	13.09	0.0		20.4						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	835	13.13	0.5	6.62	21.4	2280	2.8	-247.2	8.4	Colorless; clear	*Low-flow groundwater sample:*
|	837	13.14	1.0	6.79	21.6	2260	2.4	-267.1	7.9	Odor	(A) peristaltic pump w/ ded tubing
|	840	13.14	1.5	6.86	21.8	2250	2.2	-271.4	7.5	|	B) ded bladder pump
|	842	13.14	2.0	6.87	21.9	2250	2.1	-275.2	7.1	|	C) non-ded bladder pump; or
|	845	13.14	2.5	6.88	22.0	2250	2.0	-277.9	6.9	|	*Standard groundwater sample:*
|	847	13.14	3.0	6.89	22.1	2240	1.9	-279.2	6.6	|	D) bailer due to limited column; or
|	850	13.14	3.5	6.89	22.2	2240	1.8	-281.1	6.2	|	E) recovery well cycling sample
↓	852	13.14	4.0	6.90	22.2	2240	1.8	-282.6	5.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	855	MW-95	13.14	6.90	22.2	2240	1.8	-282.6	5.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tube

Inside "doghouse"

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge | Sample through 1-in PVC guide-pipe

Well: RW-7
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1648	NA	11.84	0.0	37.00	32.00	yes	yes	yes	yes		Weather: Clear, 40's
4.4.18	915	NA	11.89	0.0	37.00	32.00						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	920	NM	0.5	6.81	21.6	2300	1.8	-298.1	19.0	Black Color; Clear;	*Low-flow groundwater sample:*
	922		1.0	6.71	21.9	2330	1.6	-314.2	16.5	Black Particles; Sheen;	(A) peristaltic pump w/ ded tubing
	925		1.5	6.67	22.2	2340	1.5	-326.1	14.7	Odor	B) ded bladder pump
	927		2.0	6.65	22.3	2340	1.5	-337.1	13.1		C) non-ded bladder pump; or
	930		2.5	6.62	22.4	2330	1.4	-346.4	11.8		*Standard groundwater sample:*
	932		3.0	6.60	22.5	2330	1.4	-349.0	10.2		D) bailer due to limited column; or
	935		3.5	6.59	22.6	2330	1.3	-351.8	9.7		E) recovery well cycling sample
↓	937	↓	4.0	6.58	22.6	2330	1.3	-353.7	9.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	940	RW-7	NM	6.58	22.6	2330	1.3	-353.7	9.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL -34A
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1657	NA	11.02	0.0	*19.26	16.8	yes	yes	yes	yes		Weather: Clear, 40's
4.4.18	1000	NA	11.09	0.0	*19.26	16.8						

Well Purging Record

*PVC casing has been slightly cut down; well cap now fits with the Prot. lid closed. HMI took new TD.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1005	11.23	0.5	6.84	21.0	2130	2.7	-330.2	8.4	Colorless; Clear	*Low-flow groundwater sample:*
↓	1007	11.26	1.0	6.62	21.6	2130	2.4	-349.1	8.0	Sheen; Odor	(A) peristaltic pump w/ ded tubing
	1010	11.26	1.5	6.58	21.9	2120	2.2	-351.6	7.3	↓	B) ded bladder pump
	1012	11.26	2.0	6.56	22.1	2120	2.1	-353.7	7.0		C) non-ded bladder pump; or
	1015	11.26	2.5	6.55	22.2	2110	2.0	-355.2	6.7		*Standard groundwater sample:*
	1017	11.26	3.0	6.54	22.2	2110	2.0	-356.1	6.2		D) bailer due to limited column; or
	1020	11.26	3.5	6.54	22.3	2100	1.9	-356.9	5.9		E) recovery well cycling sample
↓	1022	11.26	4.0	6.53	22.3	2100	1.9	-357.8	5.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1025	NCL-34A	11.26	6.53	22.3	2100	1.9	-357.8	5.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-33
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in stickup) ✓ Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1707	NA	9.42	0.0	19.60	17.7	yes	yes	yes	yes		Weather: Clear, 50's
4.4.18	1040	NA	9.48	0.0	19.60	17.7						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1045	9.58	0.5	7.16	22.6	2960	2.3	-249.7	10.1	Colorless; Clear	*Low-flow groundwater sample:*
↓	1047	9.64	1.0	7.03	22.8	2980	2.1	-251.2	9.2	↓ ↓	(A) peristaltic pump w/ ded tubing
	1050	9.69	1.5	6.93	23.0	3000	2.0	-253.1	8.8		B) ded bladder pump
	1052	9.72	2.0	6.89	23.1	3010	1.9	-254.2	8.1		C) non-ded bladder pump; or
	1055	9.75	2.5	6.84	23.2	3030	1.8	-254.6	7.7		*Standard groundwater sample:*
	1057	9.77	3.0	6.82	23.2	3040	1.8	-254.2	7.3		D) bailer due to limited column; or
	1100	9.79	3.5	6.81	23.3	3050	1.8	-254.0	6.8		E) recovery well cycling sample
↓	1102	9.81	4.0	6.80	23.3	3060	1.8	-253.8	6.5	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1105	NCL-33	9.81	6.80	23.3	3060	1.8	-253.8	6.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-44
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1754	NA	9.42	0.0	*21.34	16.3	yes	yes	yes	yes		Weather: Clear, 60's
4.4.18	1345	NA	9.41	0.0	(soft)	16.3						

Well Purging Record *Issue resolved, Prot. lid can close with well cap present. PVC casing was slightly cut down.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1350	9.44	0.5	6.86	21.7	2680	2.4	-251.7	9.2	Colorless; Clear	*Low-flow groundwater sample:*
	1352	9.44	1.0	6.81	22.5	2680	2.0	-262.4	8.7		(A) peristaltic pump w/ ded tubing
	1355	9.44	1.5	6.77	22.7	2680	1.9	-273.6	8.4		B) ded bladder pump
	1357	9.44	2.0	6.75	22.8	2680	1.7	-278.1	7.8		C) non-ded bladder pump; or
	1400	9.44	2.5	6.74	23.0	2670	1.6	-280.2	7.1		*Standard groundwater sample:*
	1402	9.44	3.0	6.73	23.1	2670	1.6	-281.1	6.2		D) bailer due to limited column; or
	1405	9.44	3.5	6.73	23.2	2670	1.5	-282.4	5.6		E) recovery well cycling sample
↓	1407	9.44	4.0	6.72	23.3	2670	1.5	-283.2	5.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1410	NCL-44	9.44	6.72	23.3	2670	1.5	-283.2	5.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-NCL-01 (for same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-32
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1745	NA	10.19	0.0	20.06	18.1	yes	yes	yes	yes		Weather: clear, 50's
4.4.18	1255	NA	10.07	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1300	10.18	0.5	7.28	22.6	2630	1.9	-208.6	28.0	Colorless; clear	*Low-flow groundwater sample:*
	1302	10.19	1.0	7.15	22.8	2630	1.7	-214.4	21.1		(A) peristaltic pump w/ ded tubing
	1305	10.19	1.5	7.10	23.0	2630	1.6	-216.2	16.4		B) ded bladder pump
	1307	10.19	2.0	7.08	23.2	2620	1.5	-218.1	12.5		C) non-ded bladder pump; or
	1310	10.19	2.5	7.07	23.2	2620	1.3	-220.3	10.7		*Standard groundwater sample:*
	1312	10.19	3.0	7.06	23.2	2620	1.2	-221.7	9.2		D) bailer due to limited column; or
	1315	10.19	3.5	7.05	23.3	2610	1.1	-222.8	8.5		E) recovery well cycling sample
↓	1317	10.19	4.0	7.05	23.4	2610	1.1	-223.5	7.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1320	NCL-32	10.19	7.05	23.4	2610	1.1	-223.5	7.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1335	EB-NCL-01	NA	→	→	→	→	→	→	Same analyses	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* Access by foot

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-108
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1736	NA	13.61	0.0	27.74	22.5	yes	yes	yes	yes		Weather: Clear, 50's
4.4.18	1125	NA	13.64	0.0	27.74	22.5						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1130	13.75	0.5	7.61	24.0	2770	2.1	-319.2	15.6	yellow color;	*Low-flow groundwater sample:*
	1132	13.82	1.0	7.45	23.7	2940	1.9	-327.4	13.1	clear; odor	A) peristaltic pump w/ ded tubing
	1135	13.87	1.5	7.34	23.5	2990	1.8	-334.5	11.4		B) ded bladder pump
	1137	13.91	2.0	7.31	23.3	3020	1.7	-338.9	10.1		C) non-ded bladder pump; or
	1140	13.94	2.5	7.28	23.2	3040	1.7	-341.2	9.7		*Standard groundwater sample:*
	1142	13.96	3.0	7.26	23.1	3060	1.6	-343.6	9.4		D) bailer due to limited column; or
	1145	13.98	3.5	7.24	23.1	3070	1.6	-345.1	9.1		E) recovery well cycling sample
	1147	14.00	4.0	7.22	23.1	3080	1.6	-347.0	8.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1150	MW-108	14.00	7.22	23.1	3080	1.6	-347.0	8.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

SW of NCL Field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-31
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1718	NA	11.41	0.0	20.16	17.4	*Issue	yes	yes	yes		Weather: Clear, 50's
4.4.18	1210	NA	11.41	0.0		17.4						

*Cannot fit Cap and close prot. Casing simultaneously.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1215	11.61	0.5	7.51	21.2	2720	2.4	-243.8	8.3	Colorless; clear	*Low-flow groundwater sample:*
	1217	11.64	1.0	7.32	21.8	2710	1.8	-247.1	8.0		(A) peristaltic pump w/ ded tubing
	1220	11.64	1.5	7.22	22.4	2690	1.6	-252.3	7.7		B) ded bladder pump
	1222	11.64	2.0	7.18	22.6	2680	1.4	-254.1	7.3		C) non-ded bladder pump; or
	1225	11.64	2.5	7.15	22.8	2680	1.3	-257.0	6.9		*Standard groundwater sample:*
	1227	11.64	3.0	7.12	22.9	2670	1.2	-260.0	6.5		D) bailer due to limited column; or
	1230	11.64	3.5	7.09	23.0	2660	1.1	-262.1	6.2		E) recovery well cycling sample
↓	1232	11.64	4.0	7.07	23.1	2660	1.1	-263.9	5.2	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1235	NCL-31	11.64	7.07	23.1	2660	1.1	-263.9	5.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-19 (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1726	NA	11.79	0.0	22.08	Not Sampled	yes	yes	*Issue	yes		Weather: clear, 70's

*NO prot. casing, just exposed PVC, well cannot be secured.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-55
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1810	NA	11.03	0.0	*26.85	21.7	yes	yes	yes	yes		Weather: Clear, 60's
4.4.18	1515	NA	11.01	0.0	26.85	21.7						

Well Purging Record

*TD confirmed, 1/2" tubing is laying next well upon arrival. Possibly this was in the bottom of the well distorting historic TD's. See pics.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1520	11.04	0.5	6.98	21.6	3680	2.5	-81.3	11.2	Colorless; Clear	*Low-flow groundwater sample:*
↓	1522	11.04	1.0	6.91	22.2	3780	1.8	-79.5	9.6	↓	(A) peristaltic pump w/ ded tubing
	1525	11.04	1.5	6.85	22.6	3800	1.6	-75.7	9.1		B) ded bladder pump
	1527	11.04	2.0	6.80	22.9	3800	1.4	-76.1	8.8		C) non-ded bladder pump; or
	1530	11.04	2.5	6.81	23.1	3810	1.3	-76.3	8.4		*Standard groundwater sample:*
	1532	11.04	3.0	6.77	23.2	3820	1.3	-76.9	8.2		D) bailer due to limited column; or
	1535	11.04	3.5	6.75	23.2	3830	1.3	-77.3	7.5		E) recovery well cycling sample
↓	1537	11.04	4.0	6.73	23.3	3830	1.3	-77.6	7.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1540	MW-55	11.04	6.73	23.3	3830	1.3	-77.6	7.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#17A
Event: Spring 2018 (Non-Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1820	NA	10.63	0.0	16.01	14.0	Yes	Yes	Yes	yes		Weather: Clear, 70's
					(Soft)							

(PVC bolted-shaped stickup w/ PVC slip cap)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1825	10.64	0.5	6.85	23.6	5280	2.3	-181.4	12.2	Colorless; Clear	*Low-flow groundwater sample:*
↓	1827	10.64	1.0	6.86	23.2	5340	1.6	-181.8	9.8	↓	(A) peristaltic pump w/ ded tubing
	1830	10.64	1.5	6.83	23.0	5400	1.4	-182.6	9.1		B) ded bladder pump
	1832	10.64	2.0	6.80	22.9	5430	1.4	-183.5	8.6		C) non-ded bladder pump; or
	1835	10.64	2.5	6.79	22.8	5450	1.5	-183.9	8.2		*Standard groundwater sample:*
	1837	10.64	3.0	6.78	22.7	5460	1.5	-184.5	7.9		D) bailer due to limited column; or
	1840	10.64	3.5	6.77	22.7	5460	1.6	-185.4	7.7		E) recovery well cycling sample
↓	1842	10.64	4.0	6.77	22.7	5460	1.6	-186.2	7.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1845	RW-#17A	10.64	6.77	22.7	5460	1.6	-186.2	7.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1802	NA	11.03	0.0	*22.20	20.2	yes	yes	yes	yes		Weather: Clear, 60's
4.4.18	1430	NA	11.21	0.0	22.20	20.2						

Well Purging Record

*TD Confirmed, no changes have been made to well, currently there are no issues.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.4.18	1435	11.25	0.5	7.04	22.8	3130	2.2	-191.5	7.2	Colorless; Clear	*Low-flow groundwater sample:*
	1437	11.25	1.0	7.01	23.2	3140	2.0	-195.0	6.5		(A) peristaltic pump w/ ded tubing
	1440	11.25	1.5	6.99	23.4	3140	1.9	-196.1	6.2		B) ded bladder pump
	1442	11.25	2.0	6.98	23.6	3150	1.8	-196.3	5.9		C) non-ded bladder pump; or
	1445	11.25	2.5	6.96	23.7	3150	1.8	-195.5	5.4		*Standard groundwater sample:*
	1447	11.25	3.0	6.95	23.8	3160	1.7	-194.4	5.2		D) bailer due to limited column; or
	1450	11.25	3.5	6.94	23.8	3160	1.7	-193.5	4.8		E) recovery well cycling sample
	1452	11.25	4.0	6.94	23.7	3160	1.7	-192.7	4.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.4.18	1455	MW-18	11.25	6.94	23.7	3160	1.7	-192.7	4.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54A
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	910	NA	12.04	0.0	31.30	23.6	yes	yes	yes	yes		Weather: Partly Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	915	12.07	0.5	6.78	22.5	2290	2.8	78.2	7.5	Colorless; Clear	*Low-flow groundwater sample:*
↓	917	12.07	1.0	6.65	22.4	2270	2.2	84.4	7.1	↓	(A) peristaltic pump w/ ded tubing
	920	12.07	1.5	6.58	22.4	2260	2.0	90.1	6.7		B) ded bladder pump
	922	12.07	2.0	6.55	22.3	2260	1.9	94.8	6.3		C) non-ded bladder pump; or
	925	12.07	2.5	6.54	22.3	2250	1.8	97.2	6.5		*Standard groundwater sample:*
	927	12.07	3.0	6.53	22.2	2250	1.7	99.2	5.7		D) bailer due to limited column; or
	930	12.07	3.5	6.52	22.3	2240	1.7	100.8	5.2		E) recovery well cycling sample
↓	932	12.07	4.0	6.52	22.3	2240	1.7	101.5	4.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	935	MW-54A	12.07	6.52	22.3	2240	1.7	101.5	4.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54B (gauge only)
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL (2-in; stickup) ✓

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	948	NA	12.09	0.0	46.80	41.8	yes	yes	yes	yes		Weather: Partly Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ DUP-NCL-01 (for same analysis)
+ Trip Blank-NCL-01

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-49
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	955	NA	16.26	0.0	32.18	41.8	yes	yes	yes	yes		Weather: Clear, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1000	16.29	0.5	6.91	24.1	3380	2.5	87.5	9.0	Colorless; Clear	*Low-flow groundwater sample:*
	1002	16.29	1.0	6.94	24.4	3440	2.1	90.3	8.7		(A) peristaltic pump w/ ded tubing
	1005	16.29	1.5	6.94	24.6	3450	2.0	91.8	8.2		B) ded bladder pump
	1007	16.29	2.0	6.94	24.7	3470	2.0	94.0	7.6		C) non-ded bladder pump; or
	1010	16.29	2.5	6.95	24.8	3470	1.9	96.1	7.1		*Standard groundwater sample:*
	1012	16.29	3.0	6.95	24.9	3480	1.9	97.9	6.2		D) bailer due to limited column; or
	1015	16.29	3.5	6.95	24.9	3480	1.8	99.1	5.6		E) recovery well cycling sample
↓	1017	16.29	4.0	6.95	24.8	3480	1.8	100.2	5.0	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1020	NCL-49	16.29	6.95	24.8	3480	1.8	100.2	5.0	DRO	HCL	8015M
↓										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1000	DUP-NCL-01	16.29	6.95	24.8	3480	1.8	100.2	5.0	same analyses	same	same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

~15' S. of 70 mile marker (285 Northbound)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-53
Event: Spring 2018 (Non-Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.3.18	1045	NA	12.08	0.0	23.60	19.6	yes	yes	yes	yes		Weather: Clear, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.3.18	1050	12.21	0.5	6.97	25.1	2560	2.0	80.5	4.8	Colorless / Clear	*Low-flow groundwater sample:*
↓	1052	12.23	1.0	7.05	25.0	2500	1.6	81.5	4.3	↓	(A) peristaltic pump w/ ded tubing
↓	1055	12.23	1.5	7.07	25.0	2450	1.4	82.8	4.0	↓	B) ded bladder pump
↓	1057	12.23	2.0	7.08	24.9	2420	1.3	83.6	3.8	↓	C) non-ded bladder pump; or
↓	1100	12.23	2.5	7.08	24.8	2410	1.3	84.5	3.7	↓	*Standard groundwater sample:*
↓	1102	12.23	3.0	7.08	24.7	2400	1.2	85.3	3.1	↓	D) bailer due to limited column; or
↓	1105	12.23	3.5	7.09	24.7	2400	1.2	86.0	2.9	↓	E) recovery well cycling sample
↓	1107	12.23	4.0	7.09	24.7	2390	1.2	86.8	3.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.3.18	1110	MW-53	12.23	7.09	24.7	2390	1.2	86.8	3.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Instrument Calibration Log

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Hydrologic Monitoring
for TRC
Houston, Texas

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)	PID Thermo Environmental 100 ppm Isobutylene	Initials / Comments
4/2/18	0635	4.01 / 7.00	1,000	100%	10.0	240.1	NA	SCH
4/3/18	0625	4.01 / 7.00	1,000	100%	10.0	238.5	NA	SCH
4/3/18	0628	4.01 / 7.00	1,000	100%	10.0	249.2	NA	BB
4/3/18	0630	4.01 / 7.00	1,000	100%	10.0	238.9	NA	SCD
4/3/18	0634	4.01 / 7.00	1,000	100%	10.0	231.7	NA	BRH
4/3/18	0635	4.01 / 7.00	1,000	100%	10.0	250.8	NA	TAB
4.3.18	0637	4.01 / 7.00	1,000	100 %	10.0	246.2	NA	CJH
4/3/18	0644	4.01 / 7.00	1,000	100 %	10.0	230.9	NA	GDS
4/4/18	0645	4.01 / 7.00	1,000	100%	10.0	242.4	NA	SCH
4/4/18	0647	4.01 / 7.00	1,000	100%	10.0	241.2	NA	BB
4/4/18	0650	4.01 / 7.00	1,000	100 %	10.0	237.5	NA	SCD
4/4/18	0652	4.01 / 7.00	1,000	100%	10.0	229.8	NA	BRH
4/4/18	0655	4.01 / 7.00	1,000	100%	10.0	238.9	NA	TAB
4.4.18	0657	4.01 / 7.00	1,000	100 %	10.0	248.9	NA	CJH
4/4/18	0702	4.01 / 7.00	1,000	100%	10.0	233.9	NA	GDS
4/5/18	0700	4.01 / 7.00	1,000	100%	10.0	241.9	NA	SCH
4/5/18	0704	4.01 / 7.00	1,000	100%	10.0	233.6	NA	BB
4/5/18	0706	4.01 / 7.00	1,000	100%	10.0	240.2	NA	TAB
4.5.18	0709	4.01 / 7.00	1,000	100%	10.0	245.0	NA	CJH
4-5-18	0712	4.01 / 7.00	1,000	100%	10.0	242.3	NA	SCD
4-5-18	0715	4.01 / 7.00	1,000	100%	10.0	239.7	NA	BRH
4/5/18	0719	4.01 / 7.00	1,000	100%	10.0	244.1	NA	GDS

Chain of Custody Page 1 of 1

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L982870

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170

Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 119503

Collected by (signature):

Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide	Rem./Contaminant	Sample # (lab only)
UG-1	Grab	GW		4/2/18	1750		✓	✓	✓		✓	✓	✓	✓	✓		-05
UG-2	Grab	GW		4/2/18	1925		✓	✓	✓		✓	✓	✓	✓	✓		03
UG-3R	Grab	GW		4/2/18	1700		✓	✓	✓		✓	✓	✓	✓	✓		04
UG-4	Grab	GW		4/2/18	1835		✓	✓	✓		✓	✓	✓	✓	✓		06
MW-116	Grab	GW		4/3/18	1015		✓	✓	✓	✓		✓	✓	✓			02
MW-125	Grab	GW		4/3/18	935		✓	✓	✓	✓		✓	✓	✓			01
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Flow _____ Other _____

Hold #

Remarks: Diss. metals are field-filtered.

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/3/18	1215	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____

Temp: 3.4 °C Bottles Received:

Date: 4/4/18 Time: 845

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			
RW-1	Grab	GW		4/3/18	1310		✓	✓	✓	✓		✓	✓	✓				
RW-#17A	Grab	GW		4/3/18	1845		✓	✓	✓	✓		✓	✓	✓				
MW-50	Grab	GW		4/3/18	1155		✓	✓		✓		✓	✓	✓				
MW-67	Grab	GW		4/3/18	1620		✓	✓	✓		✓	✓	✓	✓	✓			
MW-90	Grab	GW		4/3/18	1435		✓	✓	✓	✓		✓	✓	✓				
MW-91	Grab	GW		4/3/18	1355		✓	✓	✓	✓		✓	✓	✓				
MW-96	Grab	GW		4/3/18	1515		✓	✓	✓	✓		✓	✓	✓				
RA-4196	Grab	GW		4/3/18	1305		✓					✓	✓	✓				
RA-4798	Grab	GW		4/3/18	1335		✓					✓	✓	✓				
KWB-11A	Grab	GW		4/3/18	940		✓	✓	✓		✓	✓	✓	✓	✓			

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page 1 of 4

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L983365
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:
Rem./Contaminant | Sample # (lab only)

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 0.5 °C Bottles Received:
Date: 4/5/18 Time: 845

Condition: (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
KwB-11B	Grab	GW		4/3/18	1025		✓	✓	✓		✓	✓	✓	✓	✓			
MW-135	Grab	GW		4/3/18	1135		✓	✓	✓	✓		✓	✓	✓				
MW-64	Grab	GW		4/3/18	1355		✓	✓	✓	✓		✓	✓	✓				
MW-65	Grab	GW		4/3/18	1450		✓	✓	✓	✓		✓	✓	✓				
MW-102	Grab	GW		4/3/18	1555		✓	✓	✓	✓		✓	✓	✓				
MW-103	Grab	GW		4/3/18	1300		✓	✓	✓	✓		✓	✓	✓				
MW-104	Grab	GW		4/3/18	1200		✓	✓	✓	✓		✓	✓	✓				
DUP-Rest-02	Grab	GW		4/3/18	1300		✓	✓	✓	✓		✓	✓	✓				
EB-Rest-02	Grab	GW		4/3/18	1220		✓	✓	✓	✓		✓	✓	✓				
MW-98	Grab	GW		4/3/18	1320		✓	✓	✓	✓		✓	✓	✓				

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page 2 of 4

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L983365
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 0.5 °C Bottles Received:
Date: 4/5/18 Time: 845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 3 of 4

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L983365
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-106	Grab	GW		4/3/18	1415		✓	✓	✓	✓		✓	✓	✓				
KWB-1A	Grab	GW		4/3/18	1035		✓	✓			✓	✓	✓	✓	✓			
KWB-10R	Grab	GW		4/3/18	950		✓	✓		✓		✓	✓	✓				
KWB-13	Grab	GW		4/3/18	1545		✓	✓			✓	✓	✓	✓	✓			
MW-58	Grab	GW		4/3/18	1635		✓	✓			✓	✓	✓	✓	✓			
MW-126A	Grab	GW		4/3/18	1355		✓	✓	✓	✓		✓	✓	✓				
MW-126B	Grab	GW		4/3/18	1435		✓	✓	✓	✓		✓	✓	✓				
MW-127	Grab	GW		4/3/18	1310		✓	✓	✓	✓		✓	✓	✓				
MW-129	Grab	GW		4/3/18	1220		✓	✓	✓	✓		✓	✓	✓				
MW-136	Grab	GW		4/3/18	1750		✓	✓	✓		✓	✓	✓	✓	✓			

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____
Flow _____ Other _____

Remarks: Diss. metals are field-filtered.

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 0.5 °C Bottles Received:
Date: 4/5/18 Time: 845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
RW - #18A	Grab	GW		4/3/18	1120		✓			✓		✓	✓	✓				
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____
Flow _____ Other _____

Remarks: Diss. metals are field-filtered.

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 0.8 °C Bottles Received:
Date: 4/5/18 Time: 845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 4 of 4

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L983365
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Chain of Custody Page 1 of 2

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide	Rem./Contaminant	Sample # (lab only)
MW-48	Grab	GW		4/5/18	955		✓	✓	✓	✓		✓	✓	✓			
RW-#15C	Grab	GW		4/5/18	905		✓	✓		✓		✓	✓	✓			
MW-52	Grab	GW		4/5/18	905		✓	✓	✓		✓	✓	✓	✓	✓		
MW-109	Grab	GW		4/5/18	905		✓	✓	✓	✓		✓	✓	✓			
MW-110	Grab	GW		4/5/18	945		✓	✓	✓	✓		✓	✓	✓			
MW-130	Grab	GW		4/5/18	955		✓	✓	✓	✓		✓	✓	✓			
MW-137	Grab	GW		4/5/18	950		✓	✓	✓		✓	✓	✓	✓	✓		
MW-138	Grab	GW		4/5/18	905		✓	✓	✓			✓	✓	✓	✓		
MW-61	Grab	GW		4/5/18	935		✓	✓	✓	✓		✓	✓	✓			
MW-62	Grab	GW		4/5/18	825		✓	✓	✓	✓		✓	✓	✓			

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____

Flow _____ Other _____

Hold #

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ _____

Condition: (lab use only)

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18 GS per email	17:20 GS	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Temp: See attached °C Bottles Received: 573

Date: 4/6/18 Time: 0845

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			
MW-105	Grab	GW		4/5/18	1025		✓	✓	✓	✓		✓	✓	✓				
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

Chain of Custody Page 2 of 2

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Rem./Contaminant	Sample # (lab only)

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18 GS per email	17:20 GS	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 5 °C Bottles Received: 57
Date: 4/6/18 Time: 0845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 119503

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			
mw-23	Grab	GW		4/4/18	1900		✓	✓	✓	✓		✓	✓	✓				
mw-28	Grab	GW		4/4/18	1205		✓	✓	✓		✓	✓	✓	✓	✓			
mw-29	Grab	GW		4/4/18	1325		✓	✓	✓	✓		✓	✓	✓				
mw-39	Grab	GW		4/4/18	1045		✓	✓	✓	✓		✓	✓	✓				
mw-40	Grab	GW		4/4/18	1220		✓	✓	✓	✓		✓	✓	✓				
mw-41	Grab	GW		4/4/18	1520		✓	✓	✓	✓		✓	✓	✓				
mw-42	Grab	GW		4/4/18	1610		✓	✓	✓	✓		✓	✓	✓				
mw-43	Grab	GW		4/4/18	1630		✓	✓	✓		✓	✓	✓	✓	✓			
mw-57	Grab	GW		4/4/18	1350		✓	✓	✓	✓		✓	✓	✓				
mw-59	Grab	GW		4/4/18	1300		✓	✓	✓	✓		✓	✓	✓				

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____

Flow _____ Other _____

Chain of Custody Page 1 of 2

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Rem./Contaminant | Sample # (lab only)

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 5°C Bottles Received: 573

Date: 4/6/18 Time: 825

Condition: (lab use only)

COC Seal Intact: ____ Y ____ N ____ NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide	Rem./Contaminant	Sample # (lab only)
MW-60	Grab	GW		4/4/18	1350		✓	✓	✓		✓	✓	✓	✓	✓		
DUP-Rest-04	Grab	GW		4/4/18	1100		✓	✓	✓		✓	✓	✓	✓	✓		
EB-Rest-04	Grab	GW		4/4/18	1415		✓	✓	✓		✓	✓	✓	✓	✓		
MW-66	Grab	GW		4/4/18	1105		✓	✓	✓		✓	✓	✓	✓	✓		
MW-93	Grab	GW		4/4/18	1800		✓	✓	✓	✓		✓	✓	✓			
MW-95	Grab	GW		4/4/18	855		✓	✓	✓	✓		✓	✓	✓			
MW-99	Grab	GW		4/4/18	1010		✓	✓	✓	✓		✓	✓	✓			
MW-101	Grab	GW		4/4/18	910		✓	✓	✓	✓		✓	✓	✓			
Trip Blank-Rest-04	Grab	GW		4/4/18	—		✓										
MW-107	Grab	GW		4/4/18	1520		✓	✓	✓	✓		✓	✓	✓			

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 5.0 °C Bottles Received: 53
Date: 4/6/18 Time: 8:15

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 2 of 6

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 119503

Collected by (signature):

Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			Rem./Contaminant	Sample # (lab only)
MW-111	Grab	GW		4/4/18	1210		✓	✓	✓	✓		✓	✓	✓					
MW-113	Grab	GW		4/4/18	1100		✓	✓	✓	✓		✓	✓	✓					
DUP-REST-01	Grab	GW		4/4/18	1000		✓	✓	✓	✓		✓	✓	✓					
EB-REST-01	Grab	GW		4/4/18	1110		✓	✓	✓	✓		✓	✓	✓					
MW-114	Grab	GW		4/4/18	1650		✓	✓	✓	✓		✓	✓	✓					
MW-115	Grab	GW		4/4/18	1555		✓	✓	✓	✓		✓	✓	✓					
MW-117	Grab	GW		4/4/18	850		✓	✓	✓	✓		✓	✓	✓					
MW-118	Grab	GW		4/4/18	935		✓	✓	✓	✓		✓	✓	✓					
MW-119	Grab	GW		4/4/18	1020		✓	✓	✓	✓		✓	✓	✓					
MW-128	Grab	GW		4/4/18	1640		✓	✓	✓	✓		✓	✓	✓					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____

Temp: 5 °C Bottles Received: 57

Date: 4/6/18 Time: 0845

Hold #

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Chain of Custody Page 3 of 12

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Chain of Custody Page 4 of 6

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide	Rem./Contaminant	Sample # (lab only)
MW-134	Grab	GW		4/4/18	1010		✓	✓	✓	✓		✓	✓	✓			
Dup-Rest-03	Grab	GW		4/4/18	1200		✓	✓	✓	✓		✓	✓	✓			
EB-Rest-03	Grab	GW		4/4/18	1020		✓	✓	✓	✓		✓	✓	✓			
Trip Blank-Rest-01	Grab	GW		4/4/18	—		✓										
KWB-5	Grab	GW		4/4/18	1125		✓	✓		✓		✓	✓	✓			
KWB-6	Grab	GW		4/4/18	1300		✓	✓		✓		✓	✓	✓			
KWB-12B	Grab	GW		4/4/18	1435		✓	✓	✓		✓	✓	✓	✓	✓		
Dup-Rest-05	Grab	GW		4/4/18	1200		✓	✓	✓		✓	✓	✓	✓	✓		
EB-Rest-05	Grab	GW		4/4/18	1450		✓	✓	✓		✓	✓	✓	✓	✓		
Trip Blank-Rest-02	Grab	GW		4/4/18	—		✓										

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 5°C Bottles Received: 57
Date: 4/6/18 Time: 0840

Condition: (lab use only)
COC Seal Intact: ____Y ____N ____NA
pH Checked: NCF:

Chain of Custody Page 5 of 6

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			Rem./Contaminant	Sample # (lab only)
RA-313	Grab	GW		4/4/18	1830		✓					✓	✓	✓					
RA-3156	Grab	GW		4/4/18	805		✓					✓	✓	✓					
RW-2	Grab	GW		4/4/18	1715		✓	✓	✓	✓		✓	✓	✓					
RW-4	Grab	GW		4/4/18	855		✓	✓		✓		✓	✓	✓					
RW-6	Grab	GW		4/4/18	940		✓	✓		✓		✓	✓	✓					
RW-7	Grab	GW		4/4/18	940		✓	✓	✓	✓		✓	✓	✓					
RW-9	Grab	GW		4/4/18	1420		✓	✓	✓	✓		✓	✓	✓					
RW-10	Grab	GW		4/4/18	1135		✓	✓	✓	✓		✓	✓	✓					
RW-12R	Grab	GW		4/4/18	1200		✓	✓		✓		✓	✓	✓					
RW-13R	Grab	GW		4/4/18	1250		✓	✓		✓		✓	✓	✓					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: Diss. metals are field-filtered.

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ ___
Temp: 5.0 °C Bottles Received: 573
Date: 4/6/18 Time: 0845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 6 of 6

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			Rem./Contaminant	Sample # (lab only)
RW-#16B	Grab	GW		4/4/18	1705		✓	✓		✓		✓	✓	✓					
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: Diss. metals are field-filtered.

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ ___
Temp: 5.1 °C Bottles Received: 5+3
Date: 4/6/18 Time: 0845

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 1 of 1

ESC LAB SCIENCES — YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L983352

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: TEL Spring 2018	City/State Collected: Artesia, NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: TEL (Navajo - Artesia)	P.O. #: 119503
Collected by (signature):	***Rush?*** (Lab MUST Be Notified) ___ Same Day ....200% ___ Next Day ....100% ___ Two Day ....50% ___ Three Day 25%	Date Results Needed Email? ___No ✔Yes FAX? ___No ___Yes
Immediately Packed on Ice N ___ Y ✔		

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			Rem./Contaminant	Sample # (lab only)
TEL-1	Grab	GW		4/3/18	1235		✓	✓	✓	✓		✓	✓	✓					04
Trip Blank-TEL-01	Grab	GW		4/3/18	—		✓												07
TEL-2	Grab	GW		4/3/18	1145		✓	✓	✓	✓		✓	✓	✓					03
TEL-3	Grab	GW		4/3/18	1045		✓	✓	✓	✓		✓	✓	✓					02
EB-TEL-01	Grab	GW		4/3/18	1100		✓	✓	✓	✓		✓	✓	✓					06
TEL-4	Grab	GW		4/3/18	925		✓	✓	✓	✓		✓	✓	✓					01
DUP-TEL-01	Grab	GW		4/3/18	1000		✓	✓	✓	✓		✓	✓	✓					05
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____

Temp: 0.5 °C Bottles Received:

Date: 4/5/18 Time: 845

Condition: (lab use only) OK

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: TEL Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: TEL (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-49	Grab	GW		4/4/18	955		✓	✓	✓		✓	✓	✓	✓	✓			01
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 983842
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: Sai °C Bottles Received: 11
Date: 4/6/18 Time: 845

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: EP Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

ESC LABS SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L983397
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-4A	Grab	GW		4/3/18	1640		✓	✓	✓	✓		✓	✓	✓				
MW-5A	Grab	GW		4/3/18	1535		✓	✓	✓	✓		✓	✓	✓				
EB-EP-03	Grab	GW		4/3/18	1550		✓	✓	✓	✓		✓	✓	✓				
MW-7A	Grab	GW		4/3/18	1335		✓	✓	✓	✓		✓	✓	✓				
DUP-EP-01	Grab	GW		4/3/18	1200		✓	✓	✓	✓		✓	✓	✓				
MW-10	Grab	GW		4/3/18	1205		✓	✓	✓	✓		✓	✓	✓				
MW-22A	Grab	GW		4/3/18	1100		✓	✓	✓	✓		✓	✓	✓				
DUP-EP-02	Grab	GW		4/3/18	1000		✓	✓	✓	✓		✓	✓	✓				
MW-75	Grab	GW		4/3/18	1725		✓	✓	✓	✓		✓	✓	✓				
MW-77	Grab	GW		4/3/18	1810		✓	✓	✓	✓		✓	✓	✓				

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____
Flow _____ Other _____

Remarks: Diss. metals are field-filtered.

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 0.0 °C Bottles Received:
Date: 4/5/18 Time: 845

Condition: (lab use only) OK
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: EP Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			
MW-88	Grab	GW		4/3/18	1015		✓	✓	✓	✓		✓	✓	✓				
MW-123	Grab	GW		4/3/18	1250		✓	✓	✓	✓		✓	✓	✓				
OCD-8A	Grab	GW		4/3/18	1445		✓	✓	✓		✓	✓	✓	✓	✓			
Trip Blank-EP-02	Grab	GW		4/3/18	—		✓											
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 0.5 °C Bottles Received:
Date: 4/5/18 Time: 645

Chain of Custody Page 2 of 2

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L903397
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Rem./Contaminant | Sample # (lab only)

Hold #
Condition: (lab use only) OK
COC Seal Intact: ✔ Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: EP Spring 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: EP (Navajo - Artesia)

P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 4

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L#

Table #

Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-1R	Grab	GW		4/4/18	1245		✓	✓		✓		✓	✓	✓				
MW-3	Grab	GW		4/4/18	1225		✓	✓	✓	✓		✓	✓	✓				
DUP-EP-03	Grab	GW		4/4/18	1100		✓	✓	✓	✓		✓	✓	✓				
MW-11A	Grab	GW		4/4/18	1800		✓	✓	✓	✓		✓	✓	✓				
MW-15	Grab	GW		4/4/18	1330		✓	✓	✓	✓		✓	✓	✓				
MW-18A	Grab	GW		4/4/18	925		✓	✓			✓	✓	✓	✓	✓			
MW-70	Grab	GW		4/4/18	1010		✓	✓	✓	✓		✓	✓	✓				
MW-72	Grab	GW		4/4/18	1710		✓	✓	✓	✓		✓	✓	✓				
MW-73	Grab	GW		4/4/18	840		✓	✓	✓	✓		✓	✓	✓				
Trip Blank-EP-01	Grab	GW		4/4/18	—		✓											

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 3.7 °C Bottles Received: 32
Date: 4/6/18 Time: 0845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: EP Spring 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: EP (Navajo - Artesia)

P.O. #: 119503

Collected by (signature):

Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 2 of 4

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-74	Grab	GW		4/4/18	925		✓	✓	✓	✓		✓	✓	✓				
EB-EP-01	Grab	GW		4/4/18	935		✓	✓	✓	✓		✓	✓	✓				
MW-76	Grab	GW		4/4/18	1055		✓	✓	✓	✓		✓	✓	✓				
MW-78	Grab	GW		4/4/18	1010		✓	✓	✓	✓		✓	✓	✓				
MW-79	Grab	GW		4/4/18	1625		✓	✓	✓	✓		✓	✓	✓				
EB-EP-04	Grab	GW		4/4/18	1635		✓	✓	✓	✓		✓	✓	✓				
MW-80	Grab	GW		4/4/18	1540		✓	✓	✓	✓		✓	✓	✓				
MW-81	Grab	GW		4/4/18	1455		✓	✓	✓	✓		✓	✓	✓				
MW-82	Grab	GW		4/4/18	1325		✓	✓	✓	✓		✓	✓	✓				
MW-83	Grab	GW		4/4/18	1140		✓	✓	✓	✓		✓	✓	✓				

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks: Diss. metals are field-filtered.

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____

Temp: 3.6 °C Bottles Received: 32

Date: 4/6/18 Time: 0845

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: EP Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-84	Grab	GW		4/4/18	1410		✓	✓	✓	✓		✓	✓	✓				
MW-87	Grab	GW		4/4/18	835		✓	✓	✓	✓		✓	✓	✓				
MW-124	Grab	GW		4/4/18	1055		✓	✓	✓	✓		✓	✓	✓				
EB-EP-02	Grab	GW		4/4/18	1115		✓	✓	✓	✓		✓	✓	✓				
OCD-1R	Grab	GW		4/4/18	1420		✓	✓	✓	✓		✓	✓	✓				
Trip Blank-EP-03	Grab	GW		4/4/18	—		✓											
OCD-2A	Grab	GW		4/4/18	1505		✓	✓	✓	✓		✓	✓	✓				
OCD-3	Grab	GW		4/4/18	1550		✓	✓	✓	✓		✓	✓	✓				
OCD-4	Grab	GW		4/4/18	1635		✓	✓	✓	✓		✓	✓	✓				
OCD-5	Grab	GW		4/4/18	1720		✓	✓	✓	✓		✓	✓	✓				

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____
Flow _____ Other _____

Remarks: Diss. metals are field-filtered.

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 5.7 °C Bottles Received: 32
Date: 4/6/18 Time: 0845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 3 of 4

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: EP Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			
OCD-6	Grab	GW		4/4/18	1755		✓	✓	✓	✓		✓	✓	✓				
OCD-7AR	Grab	GW		4/4/18	1840		✓	✓	✓	✓		✓	✓	✓				
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page 4 of 4

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Rem./Contaminant	Sample # (lab only)

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.4 °C Bottles Received: 3x7
Date: 4/6/18 Time: 0945

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com
Project Description: EP Spring 2018
City/State Collected: Artesia, NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #
Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 119503
Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-2A	Grab	GW		4/5/18	1005		✓	✓	✓	✓		✓	✓	✓				
MW-6A	Grab	GW		4/5/18	930		✓	✓	✓	✓		✓	✓	✓				
MW-120	Grab	GW		4/5/18	1015		✓	✓	✓	✓		✓	✓	✓				
MW-121	Grab	GW		4/5/18	1100		✓	✓	✓	✓		✓	✓	✓				
MW-122	Grab	GW		4/5/18	920		✓	✓	✓	✓		✓	✓	✓				
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:
Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18 GS	17:20 GS	
Relinquished by : (Signature)	Date: per email	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 5.5 °C Bottles Received: 32
Date: 4/6/18 Time: 0745

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: speer@trcwsolutions.com

Project Description: TMD Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: TMD (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle) x2	Anions, TDS	NO2NO3 x2	Cyanide			Rem./Contaminant	Sample # (lab only)
MW-46R	Grab	GW		4/3/18	1100		✓	✓	✓	✓		✓	✓	✓					-01
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/3/18	1215	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: 0.4 °C Bottles Received:
Date: 4/4/18 Time: 845

Hold #
Condition: (lab use only)
COC Seal Intact: ✔ Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L982876
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: TMD Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: TMD (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L983360
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-16	Grab	GW		4/3/18	1625		✓	✓		✓		✓	✓	✓				04
MW-26	Grab	GW		4/3/18	1535		✓	✓		✓		✓	✓	✓				05
MW-27	Grab	GW		4/3/18	1805		✓	✓		✓		✓	✓	✓				02
MW-68	Grab	GW		4/3/18	1855		✓	✓		✓		✓	✓	✓				01
MW-89	Grab	GW		4/3/18	1715		✓	✓		✓		✓	✓	✓				03
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 0.2 °C Bottles Received:
Date: 4/5/18 Time: 845

Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: TMD Spring 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: TMD (Navajo - Artesia)
P.O. #: 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide			Rem./Contaminant	Sample # (lab only)
mw-8	Grab	GW		4/4/18	1430		✓	✓	✓	✓		✓	✓	✓					04
mw-21	Grab	GW		4/4/18	1720		✓	✓	✓	✓		✓	✓	✓					05
mw-25	Grab	GW		4/4/18	1200		✓	✓		✓		✓	✓	✓					01
Trip Blank-TMD-01	Grab	GW		4/4/18	—		✓												07
NP-1	Grab	GW		4/4/18	920		✓					✓	✓	✓					02,12
mw-20	Grab	GW		4/4/18	1340		✓	✓		✓		✓	✓	✓					02
mw-71	Grab	GW		4/4/18	855		✓	✓			✓	✓	✓	✓	✓				06
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

Remarks: Diss. metals are field-filtered.

pH ___ Temp ___
Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ ___
Temp After °C Bottles Received: 45
Date: 4/6/18 Time: 0845

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 923845
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: NCL Spring 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: NCL (Navajo - Artesia)

P.O. #: 119503

Collected by (signature):

Immediately Packed on Ice N ____ Y ✔

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L983354

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
NCL-49	Grab	GW		4/3/18	1020		✓	✓		✓		✓	✓	✓				-02
DUP-NCL-01	Grab	GW		4/3/18	1000		✓	✓		✓		✓	✓	✓				04
Trip Blank-NCL-01	Grab	GW		4/3/18	—		✓											05
MW-53	Grab	GW		4/3/18	1110		✓	✓		✓		✓	✓	✓				03
MW-54A	Grab	GW		4/3/18	935		✓	✓		✓		✓	✓	✓				-01
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/4/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____

Temp: 0.5 °C Bottles Received:

Date: 4/4/18 Time: 845

Condition: (lab use only) OK

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

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Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total AND Dissolved)	Long List Metals (Total AND Dissolved)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-18	Grab	GW		4/4/18	1455		✓	✓			✓	✓	✓	✓	✓			10
NCL-31	Grab	GW		4/4/18	1235		✓	✓		✓		✓	✓	✓				08
NCL-32	Grab	GW		4/4/18	1320		✓	✓		✓		✓	✓	✓				06
EB-NCL-01	Grab	GW		4/4/18	1335		✓	✓		✓		✓	✓	✓				12
NCL-33	Grab	GW		4/4/18	1105		✓	✓		✓		✓	✓	✓				01
NCL-34A	Grab	GW		4/4/18	1025		✓	✓		✓		✓	✓	✓				03
NCL-44	Grab	GW		4/4/18	1410		✓	✓		✓		✓	✓	✓				05
MW-45	Grab	GW		4/4/18	825		✓	✓			✓	✓	✓	✓	✓			02
MW-55	Grab	GW		4/4/18	1540		✓	✓	✓	✓	✓	✓	✓	✓	✓			09
MW-56	Grab	GW		4/4/18	1800		✓	✓				✓	✓	✓				11
MW-108	Grab	GW		4/4/18	1150		✓	✓		✓		✓	✓	✓				07

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: Diss. metals are field-filtered.

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/5/18	1000	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Temp: Attach °C Bottles Received: 93
Date: 4/6/18 Time: 0845

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
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L # 937855
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/08/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 3366 ft. Lat: 32.7547° N Lon: -104.3835° W

Station: **ARTESIA 6 S, NM US USC00290600**

Observation Time Temperature: 0730 Observation Time Precipitation: 0730

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Observation	24 Hour Amounts Ending at Observation Time				At Obs. Time			4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2018	10	01	76	52	55	0.00		0.0		0.0		0.14	5	69	69			
2018	10	02	73	54	56	0.00		0.0		0.0		0.49	5	70	69			
2018	10	03	73	55	64	0.00		0.0		0.0		0.29	5	71	69			
2018	10	04	76	51	51	0.00		0.0		0.0		0.40	5	71	70			
2018	10	05	77	51	51	0.00		0.0		0.0		0.19	5	70	69			
2018	10	06	75	51	53	0.00		0.0		0.0		0.35	5	71	70			
2018	10	07	77	53	55	0.08		0.0		0.0		0.18	5	70	69			
2018	10	08	71	55	58	0.40		0.0		0.0		0.48	5	70	68			
2018	10	09	75	49	50	0.38		0.0		0.0		0.24	5	68	64			
2018	10	10	74	43	43	0.03		0.0		0.0		0.23	5	64	62			
2018	10	11	74	43	53	0.00		0.0		0.0		0.17	5	63	61			
2018	10	12	74	47	62	0.00		0.0		0.0		0.14	5	61	60			
2018	10	13	69	57	57	0.18		0.0		0.0		0.25	5	61	61			
2018	10	14	78	57	59	0.00		0.0		0.0		0.25	5	63	62			
2018	10	15	79	36	36	0.00		0.0		0.0		0.28	5	63	59			
2018	10	16	46	36	42	0.00		0.0		0.0		0.15	5	63	55			
2018	10	17	49	42	44	0.00		0.0		0.0		0.00	5	63	53			
2018	10	18	49	42	45	0.27		0.0		0.0		0.40	5	63	53			
2018	10	19	49	44	47	0.25		0.0		0.0		0.00	5	62	53			
2018	10	20	66	47	55	0.00		0.0		0.0		0.11	5	62	54			
2018	10	21	72	52	52	0.05		0.0		0.0		0.24	5	61	57			
2018	10	22	66	46	47	0.00		0.0		0.0		0.18	5	57	55			
2018	10	23	73	47	54	0.00		0.0		0.0		0.11	5	55	55			
2018	10	24	73	47	49	1.34		0.0		0.0		0.17	5	57	56			
2018	10	25	55	49	53	0.00		0.0		0.0		0.15	5	56	55			
2018	10	26	75	44	48	0.00		0.0		0.0		0.06	5	55	54			
2018	10	27	76	43	43	0.00		0.0		0.0			5	55	54			
2018	10	28	77	43	46	0.00		0.0		0.0			5	56	55			
2018	10	29	72	43	46	0.00		0.0		0.0			5	56	54			
2018	10	30	85	46	62	0.00		0.0		0.0		0.25	5	58	56			
2018	10	31	72	48	49	0.03		0.0		0.0		0.14	5	58	56			
		Summary	70	48		3.01		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests.

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

October 21, 2018

Ms. Julie Speer, P.G., EIT
Associate Project Manager
TRC
505 East Huntland Drive, Suite 250
Austin, Texas 78752

Subject: October 2018 (Non-Biennial Spring) Groundwater Monitoring
Sitewide Gauging, October 2, 2018
Groundwater Sampling, October 2-3, 2018
Navajo Refining Company, Artesia, New Mexico

Dear Ms. Speer:

This document summarizes groundwater monitoring field activities conducted by Hydrologic Monitoring, LLC (HMI) on behalf of TRC at the Navajo Refining Company, Artesia Refinery, Artesia, New Mexico.

Contents

Field Activities Narrative
Table 1: (Gauging Data, Groundwater Field Parameters, Well Inspections, & Analytical Program)
Groundwater Sampling SOP Memo
Groundwater Sampling Forms and Field Instrument Calibration Log
(provided in three emails, with wells in geographic-based order, per Table 1)
Chain-of-Custody Forms (provided in one email)

Field Activities Narrative

1. HMI conducted the *October 2018 (Fall) Groundwater Monitoring Event* (including only the "SA" designations on the attached scoping table for the Navajo Refinery in Artesia, New Mexico. Sitewide gauging was conducted October 2, 2018. Groundwater sampling (107 wells sampled) was conducted October 2-3, 2018.

2. Groundwater sampling was conducted in accordance with the Site Sampling and Analysis Plan, EPA guidance, and the attached Memorandum - Low-Flow Groundwater Monitoring Standard Operating Procedures, Navajo Refining Co. - Artesia, New Mexico. Per regulatory request, if measured LNAPL thickness was *less than* 0.03 feet, in any well scheduled for groundwater sampling, the LNAPL was removed, and the well was sampled. And if LNAPL thickness was equal to, or greater than 0.03 feet in any well scheduled for sampling, the well was not sampled. Gauging data, groundwater field parameters, and well inspection information is summarized in Table 1. Samples were shipped overnight FedEx to Pace National, Mt. Juliet, TN. The groundwater sampling process is documented on the attached groundwater sampling forms.

3. Field QA/QC Sampling (per Refinery Area):

   <u>Evaporation Ponds</u>
   Duplicates:
   Dup-EP-01 at MW-7A
   Dup-EP-02 at MW-22A
   Dup-EP-03 at MW-3
   Equipment Blanks:
   EB-EP-01 collected over decontaminated gauging probe after sampling at MW-74
   EB-EP-02 collected over decontaminated gauging probe after sampling at MW-124
   EB-EP-03 collected over decontaminated gauging probe after sampling at MW-5A
   EB-EP-04 collected over decontaminated gauging probe after sampling at MW-79
   Trip Blank-EP-01
   Trip Blank-EP-02
   Trip Blank-EP-03

   <u>NCL</u>
   Duplicate:
   Dup-NCL-01 at NCL-49
   Equipment Blank:
   EB-NCL-01 collected over decontaminated gauging probe after sampling at NCL-32
   Trip Blank-NCL-01

TEL
Duplicate:
Dup-TEL-01 at TEL-4
Equipment Blank:
EB-TEL-01 collected over decontaminated gauging probe after sampling at TEL-2
Trip Blank-TEL-01

TMD
Trip Blank-TMD-01

REST ("rest" of the site)
Duplicates:
Dup-REST-01 at MW-113
Dup-REST-02 at MW-104
Dup-REST-03 at MW-134
Dup-REST-04 at MW-60
Dup-REST-05 at KWB-12B
Equipment Blanks:
EB-REST-01 collected over decontaminated gauging probe after sampling at MW-113
EB-REST-02 collected over decontaminated gauging probe after sampling at MW-104
EB-REST-03 collected over decontaminated gauging probe after sampling at MW-134
EB-REST-04 collected over decontaminated gauging probe after sampling at MW-60
EB-REST-05 collected over decontaminated gauging probe after sampling at KWB-12B
Trip Blank-REST-01
Trip Blank-REST-02
Trip Blank-REST-03
Trip Blank-REST-04

4. Notes:
1H18 – At badge reactivation, HMI was notified of additional "LPS" approx. 30-minute class that is required – now available through HASC.
Beginning 2H17, "24HFNAV HOLLYFRONTIER SITE SPECIFIC ORIENTATION ARTESIA-NM" is taken annually (December cycle) by HMI at HASC.
HMI's DISA 2-yr backgound check/drug/alcohol requirements were approved by onsite safety-trailer personnel on 10-3-17, as reported through HASC system.
Per Navajo, purgewater is disposed in the pad sump, inside, and to the left of the Main Gate entrance. Alternately, North Bundle Pad sump, as previously (fenced area of drums, etc.), notifying FCC control room for entrance.
Sitewide well and gate lock combinations are "2013" (less often "2002").
With suggested telephone notification, FedEx pickup from locked shed (35-25-39 combination) no earlier than approximately 14:00 daily, across from Artesia Wool Co (access area from "inside" Refinery).
North side of Hwy 82, east of site, gate with cable and combination lock (8810).
POTW bldg, check-in as needed, to borrow a key or get gate unlocked.
Navajo's Mr. Robert Combs or Mr. Richard Orosco for daily permits, per team member.
Navajo-well locks were fully-deployed as possible, in 2H16, with four locks added 1H18.

As first noted in 1H18, Navajo is making well surface completion upgrades as needed, in a phased-approach. HMI's well inspections are documented on respective well gauging and sampling forms (and are summarized in Table 1). Well inspection items of potential concern (i.e., "Issues") are highlighted in yellow-color in Table 1.

HMI appreciates the opportunity to assist TRC with this project. If you have any questions or would like additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude

Scott C. Ude, P.G.

The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on October 21, 2018.

Attachments

cc: Bryan Gilbert, P.G., TRC-Austin

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-6A	Monitoring	M/R sd/bh		EP	2-Oct	12:05	NA	13.14	0.00	19.04										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-6B	Monitoring	M/R sd/bh		EP	2-Oct	12:08	NA	13.01	0.00	52.28										Yes	Closure	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-85	Monitoring	M/R sd/bh	1	EP	2-Oct	12:15	10.47	10.60	0.13	20.34			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-86	Monitoring	M/R sd/bh	2	EP	2-Oct	12:20	10.24	10.28	0.04	19.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-120	Monitoring	M/R sd/bh	3	EP	2-Oct	12:25	NA	12.82	0.00	28.00	3-Oct	9:10	7.25	24.5	7,900	0.9	-94.6	4.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-121	Monitoring	M/R sd/bh	4	EP	2-Oct	12:29	NA	12.51	0.00	27.31	3-Oct	9:55	7.16	24.4	5,780	1.4	-22.5	9.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-84	Monitoring	M/R sd/bh	5	EP	2-Oct	12:33	NA	9.40	0.00	20.56	3-Oct	12:10	7.23	24.5	9,710	1.2	-95.1	4.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-122	Monitoring	M/R sd/bh	6	EP	2-Oct	12:38	NA	10.79	0.00	23.32	3-Oct	10:40	7.19	23.6	5,880	1.1	-110.4	9.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-81	Monitoring	M/R sd/bh		EP	2-Oct	12:43	NA	11.13	0.00	18.62										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-80	Monitoring	M/R sd/bh		EP	2-Oct	12:47	NA	9.19	0.00	19.69										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-79	Monitoring	M/R sd/bh	7	EP	2-Oct	12:51	NA	10.25	0.00	19.24	3-Oct	13:50	6.66	24.2	6,770	1.3	-29.4	8.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-82	Monitoring	M/R sd/bh		EP	2-Oct	12:56	NA	9.95	0.00	20.02										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-74	Monitoring	M/R sd/bh	8	EP	2-Oct	13:03	NA	9.52	0.00	20.19	3-Oct	12:55	6.94	24.0	10,280	1.2	14.9	5.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-73	Monitoring	M/R sd/bh		EP	2-Oct	13:08	NA	9.08	0.00	19.60										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-2A	Monitoring	M/R sd/bh	9	EP	2-Oct	13:15	NA	10.37	0.00	17.30	3-Oct	11:25	6.92	24.3	19,660	1.1	-149.9	8.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-2B	Monitoring	M/R sd/bh		EP	2-Oct	13:18	NA	11.43	0.00	52.00			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-72	Monitoring	M/R sd/bh		EP	2-Oct	13:23	NA	7.35	0.00	13.93										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-6	Monitoring	M/R sd/bh	10	EP	2-Oct	13:27	NA	10.70	0.00	26.69	3-Oct	12:10	6.84	22.0	14,090	0.7	-88.7	37.1	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7AR	Monitoring	M/R sd/bh	11	EP	2-Oct	13:31	NA	9.52	0.00	21.28	3-Oct	11:25	6.94	24.2	11,620	0.5	-160.9	17.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7B	Monitoring	M/R sd/bh		EP	2-Oct	13:33	NA	9.68	0.00	56.85										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-7C	Monitoring	M/R sd/bh		EP	2-Oct	13:36	NA	9.48	0.00	71.95			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
RW-#15C [e]	Recovery [d]	M/R sd/bh		REST	2-Oct	8:10	16.34	16.37	0.03	22.30										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-48	Monitoring	M/R sd/bh	12	REST	2-Oct	18:15	NA	18.19	0.00	32.00	3-Oct	14:55	6.97	24.8	3,660	0.7	-323.9	8.1	Clear	Yes	Yes	Issue	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-130	Monitoring	M/R sd/bh	13	REST	2-Oct	18:20	NA	19.78	0.00	45.00	3-Oct	14:40	6.82	25.5	3,301	1.4	58.1	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-4	Monitoring	M/R sd/bh	14	REST	2-Oct	18:30	23.78	24.64	0.86	41.75			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-19	Recovery [d]	M/R sd/bh		REST	2-Oct	18:35	24.13	24.43	0.30	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-76	Monitoring	SCD	15	EP	2-Oct	17:00	NA	11.52	0.00	20.33	2-Oct	17:25	6.96	23.8	6,170	1.5	-125.5	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-77	Monitoring	SCD		EP	2-Oct	17:45	NA	9.74	0.00	20.52										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-78	Monitoring	SCD		EP	2-Oct	17:40	NA	9.79	0.00	19.57										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-75	Monitoring	SCD	16	EP	2-Oct	17:50	NA	9.93	0.00	23.74	3-Oct	8:25	7.16	23.2	7,310	1.4	-84.6	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
					Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-83	Monitoring	SCD	17	EP	2-Oct	16:20	NA	9.75	0.00	19.91	2-Oct	16:45	6.95	24.0	5,340	1.3	-145.6	7.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-3	Monitoring	SCD	18	EP	2-Oct	15:25	NA	11.87	0.00	22.10	2-Oct	15:50	7.17	24.0	6,000	1.1	-31.5	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-88	Monitoring	SCD	19	EP	2-Oct	12:30	NA	9.61	0.00	20.31	2-Oct	12:55	6.92	23.9	6,650	1.2	-139.1	9.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-22A	Monitoring	SCD	20	EP	2-Oct	13:20	NA	8.83	0.00	22.65	2-Oct	13:45	6.95	23.5	7,270	1.2	-75.8	7.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-22B	Monitoring	SCD		EP	2-Oct	13:15	NA	8.66	0.00	54.66										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-10	Monitoring	SCD	21	EP	2-Oct	14:05	NA	6.45	0.00	18.45	2-Oct	14:30	6.47	24.3	5,950	1.2	-43.9	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-123	Monitoring	SCD	22	EP	2-Oct	14:50	NA	6.92	0.00	25.71	2-Oct	15:15	7.08	22.9	6,440	1.3	-60.5	8.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4A	Monitoring	SCD	23	EP	2-Oct	11:45	NA	12.05	0.00	16.55	2-Oct	12:10	7.29	23.9	6,060	2.4	-146.2	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4B	Monitoring	SCD		EP	2-Oct	11:40	NA	11.85	0.00	72.37										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5A	Monitoring	SCD	24	EP	2-Oct	10:50	NA	9.07	0.00	20.15	2-Oct	11:15	7.19	24.1	11,140	1.5	-148.2	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-5B	Monitoring	SCD		EP	2-Oct	10:40	NA	9.21	0.00	53.54										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5C	Monitoring	SCD		EP	2-Oct	10:45	NA	9.41	0.00	71.64										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-7A	Monitoring	SCD	25	EP	2-Oct	9:40	NA	9.81	0.00	18.65	2-Oct	10:05	7.17	22.1	8,540	1.3	-113.1	9.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-7B	Monitoring	SCD		EP	2-Oct	9:35	NA	9.58	0.00	52.56										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-8A	Monitoring	SCD	26	EP	2-Oct	8:45	NA	9.15	0.00	20.74	2-Oct	9:10	6.96	22.5	10,870	1.4	-144.7	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
OCD-8B	Monitoring	SCD		EP	2-Oct	9:25	NA	9.35	0.00	56.65										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
KWB-P4	Monitoring	BRH		REST			No activity in 2H18																		B	B	B	-	B	-	-	-	-	-	-
MW-25	Monitoring	BRH		TMD	2-Oct	13:50	NA	15.55	0.00	28.18										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-8	Monitoring	BRH		TMD	2-Oct	13:56	NA	13.06	0.00	>14.95	(blockage)		Not in sampling program; Navajo added PVC riser in 1H18							Yes	Issue	Yes	Yes		SA	Not in sampling program									
MW-1R	Monitoring	BRH		EP	2-Oct	14:01	NA	11.37	0.00	20.63										Yes	Issue	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-15	Monitoring	BRH		EP	2-Oct	14:05	NA	12.33	0.00	21.70										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-1R	Monitoring	BRH	27	EP	2-Oct	14:10	NA	11.75	0.00	23.74	2-Oct	14:35	7.16	22.6	7,380	0.5	-41.9	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-2A	Monitoring	BRH	28	EP	2-Oct	14:55	NA	12.13	0.00	27.56	2-Oct	15:20	7.22	21.5	6,520	0.4	-103.5	8.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-2B	Monitoring	BRH		EP	2-Oct	14:50	NA	11.85	0.00	50.38			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
OCD-3	Monitoring	BRH	29	EP	2-Oct	15:35	NA	12.60	0.00	25.20	2-Oct	16:00	7.04	22.4	5,440	0.4	-96.2	8.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-4	Monitoring	BRH	30	EP	2-Oct	16:15	NA	12.16	0.00	25.41	2-Oct	16:40	6.92	22.4	16,370	0.5	-76.4	7.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-11A	Monitoring	BRH	31	EP	2-Oct	17:35	NA	9.62	0.00	22.01	2-Oct	18:00	6.76	22.6	24,200	0.5	-78.7	18.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	SA	SA	SA
MW-11B	Monitoring	BRH		EP	2-Oct	18:10	NA	9.62	0.00	47.30										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-5	Monitoring	BRH	32	EP	2-Oct	16:55	NA	10.36	0.00	25.41	2-Oct	17:20	6.95	22.1	14,820	0.4	-121.5	41.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-87	Monitoring	BRH	33	EP	2-Oct	8:45	NA	9.15	0.00	20.39	2-Oct	9:10	7.09	20.8	14,750	0.5	-173.2	1.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-18A	Monitoring	BRH	34	EP	2-Oct	9:35	NA	10.68	0.00	22.58	2-Oct	10:00	7.05	20.8	20,200	0.4	-202.4	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-18B	Monitoring	BRH		EP	2-Oct	9:30	NA	10.64	0.00	50.59										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-18T	Monitoring	BRH		EP	2-Oct	9:25	NA	10.73	0.00	50.57			Not in sampling program; Navajo added PVC riser in 1H18							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-70	Monitoring	BRH	35	EP	2-Oct	10:20	NA	9.02	0.00	22.05	2-Oct	10:45	7.14	21.4	6,150	0.5	-143.1	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-124	Monitoring	BRH	36	EP	2-Oct	11:05	NA	9.63	0.00	22.00	2-Oct	11:30	7.04	21.4	11,530	0.5	-113.3	6.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-52	Monitoring	BRH	37	REST	2-Oct	18:30	NA	18.47	0.00	34.67	3-Oct	13:25	6.88	23.0	2,550	0.8	13.7	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-109	Monitoring	BRH	38	REST	2-Oct	18:35	NA	17.08	0.00	29.48	3-Oct	14:10	6.58	23.9	3,210	0.5	-405.1	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-110	Monitoring	BRH	39	REST	2-Oct	18:40	NA	15.30	0.00	29.74	3-Oct	15:15	7.02	21.7	1,849	1.0	-205.8	24.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-13	Monitoring	BRH		EP	3-Oct	9:15	NA	12.62	0.00	21.10			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-69	Monitoring	BRH		EP	3-Oct	9:20	NA	11.01	0.00	22.51			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-12	Monitoring	BRH		EP	3-Oct	9:25	NA	10.39	0.00	17.93			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-24	Monitoring	BRH		EP	3-Oct	8:50	NA	12.20	0.00	23.51			Not in sampling program							Yes	Yes	Issue	Yes		SA	No sampling due to location E. of river									
MW-14	Monitoring	BRH		EP	3-Oct	8:55	NA	>11.86	0.00	>11.86	(blockage)		Not in sampling program							Yes	Issue	Yes	Yes		SA	No sampling due to location N. of river									
RW-12	Recovery [d]	BTB	Field E of Refinery				Not in gauging program						Not in sampling program												-	-	-	-	-	-	-	-	-	-	-
RW-12R	Recovery [d]	BTB		REST	2-Oct	13:01	NA	20.24	0.00	NM										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-113	Monitoring	BTB	40	REST	2-Oct	13:10	NA	20.11	0.00	37.80	2-Oct	13:35	6.76	22.3	3,933	1.4	-52.5	3.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-8	Monitoring	BTB	41	REST	2-Oct	17:40	17.92	17.95	0.03	35.80			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
RW-22	Recovery [d]	BTB		REST	2-Oct	17:45	NA	18.18	0.00	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20A	Recovery [d]	BTB		REST	2-Oct	17:55	19.78	19.84	0.06	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20B	Recovery [d]	BTB		REST	2-Oct	17:50	19.63	19.70	0.07	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-13	Recovery [d]	BTB	Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-
RW-13R	Recovery [d]	BTB		REST	2-Oct	12:56	19.37	19.48	0.11	NM										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-14	Recovery [d]	BTB	Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-
RW-14R	Recovery [d]	BTB		REST	2-Oct	12:50	17.90	19.18	1.28	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-133	Monitoring	BTB	42	REST	2-Oct	12:45	18.38	18.43	0.05	37.64			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-134	Monitoring	BTB	43	REST	2-Oct	17:30	NA	17.58	0.00	32.95	3-Oct	10:55	6.89	21.3	6,405	1.4	45.3	2.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RA-4798	Irrigation	BTB	44	REST			Not in gauging program			NA	3-Oct	11:50	7.03	20.3	1,653	2.2	12.4	0.8	Clear	NA	NA	NA	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-4196	Irrigation	BTB	45	REST			Not in gauging program			NA	3-Oct	12:20	7.04	27.1	2,634	2.2	-18.6	1.9	Clear	NA	NA	Yes	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-1227	Irrigation	BTB		REST									Removed from program by Navajo, 4-13-15												NA	A [h]	-	-	A [h]	-	-	-	A [h]	A [h]	A [h]
RA-3156	Irrigation	BTB		REST			Not in gauging program			NA										NA	NA	Yes	Yes		NA	A	-	-	A	-	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RA-313	Irrigation	BTB		REST			Not in gauging program			NA										NA	NA	Yes	Yes		NA	A	-	-	A	-	-	-	A	A	A
KWB-7	Monitoring	BTB	46	REST	2-Oct	8:55	NA	18.10	0.00	34.83	2-Oct	9:20	6.98	19.8	4,935	1.0	-194.8	1.3	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-135	Monitoring	BTB	47	REST	2-Oct	11:55	NA	28.99	0.00	65.55	2-Oct	12:20	6.94	19.4	8,477	1.5	52.2	49.2	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-20	Monitoring	BTB		TMD	2-Oct	15:25	NA	15.17	0.00	26.66										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-3	Monitoring	BTB		TMD	2-Oct	15:30	NA	17.11	0.00	21.59			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-4	Monitoring	BTB		TMD	2-Oct	15:34	NA	27.88	0.00	36.98			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-2	Monitoring	BTB		TMD	2-Oct	15:21	NA	16.94	0.00	21.49			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-1	Monitoring	BTB	48	TMD	2-Oct	15:45	NA	17.24	0.00	21.88	2-Oct	16:10	6.78	21.3	6,146	1.9	-13.9	1.7	Clear	Yes	Yes	Yes	Yes		SA	SA	-	-	SA	-	-	-	A	A	A
NP-6	Monitoring	BTB		TMD	2-Oct	15:10	NA	13.87	0.00	20.35										Yes	Yes	Yes	Yes		SA	B	-	-	B	-	-	-	-	-	-
MW-8	Monitoring	BTB		TMD	2-Oct	15:17	NA	15.04	0.00	23.30										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-21	Monitoring	BTB	49	TMD	2-Oct	16:35	NA	14.39	0.00	25.12	2-Oct	17:00	6.98	21.7	7,428	2.2	4.7	2.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-9	Monitoring	BTB		TMD	2-Oct	15:02	NA	15.47	0.00	22.25			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-71	Monitoring	BTB		TMD	2-Oct	14:57	NA	15.42	0.00	21.67										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-68	Monitoring	BTB		TMD	2-Oct	14:50	NA	21.22	0.00	26.52										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-27	Monitoring	BTB		TMD	2-Oct	14:38	NA	19.20	0.00	30.28										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-89	Monitoring	BTB		TMD	2-Oct	14:20	NA	10.89	0.00	20.28										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-16	Monitoring	BTB		TMD	2-Oct	14:25	NA	8.33	0.00	21.24										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-26	Monitoring	BTB		TMD	2-Oct	14:31	NA	9.69	0.00	27.58										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-11A	Monitoring	BTB	50	REST	2-Oct	10:05	NA	17.98	0.00	42.27	2-Oct	10:30	6.79	19.7	6,365	1.2	-69.8	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-11B	Monitoring	BTB	51	REST	2-Oct	10:50	NA	18.74	0.00	72.45	2-Oct	11:15	6.97	19.6	4,524	0.6	12.1	1.5	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-3AR	Monitoring	BTB		REST			Removed from program by Navajo, 4-13-15 (farmer Jack Joy, 575-365-6042)																		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-115	Monitoring	BTB	52	REST	2-Oct	17:20	NA	5.20	0.00	27.50	3-Oct	9:10	6.98	19.4	5,094	1.4	12.1	1.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-114	Monitoring	BTB	53	REST	2-Oct	17:25	NA	7.76	0.00	38.25	3-Oct	9:50	6.81	22.1	4,185	1.2	48.8	2.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-117	Monitoring	GDS	54	REST	2-Oct	16:24	NA	9.91	0.00	27.22	3-Oct	9:35	6.64	18.5	3,580	1.9	34.6	6.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-118	Monitoring	GDS	55	REST	2-Oct	16:31	NA	10.47	0.00	28.29	3-Oct	10:20	6.69	19.0	3,930	2.5	44.1	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-9	Monitoring	GDS		TMD	2-Oct	16:39	NA	9.22	0.00	25.65			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-119	Monitoring	GDS	56	REST	2-Oct	16:46	NA	9.80	0.00	28.11	3-Oct	11:05	6.68	21.0	4,080	1.3	36.4	5.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-5	Monitoring	GDS		REST	2-Oct	8:28	NA	11.78	0.00	25.09										Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
MW-136	Monitoring	GDS	57	REST	2-Oct	10:05	NA	12.57	0.00	27.90	2-Oct	10:30	6.64	18.6	4,030	1.2	21.9	4.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-126A	Monitoring	GDS	58	REST	2-Oct	10:50	NA	17.10	0.00	37.51	2-Oct	11:15	6.74	19.2	2,770	1.6	-154.0	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
					Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-126B	Monitoring	GDS	59	REST	2-Oct	11:30	NA	16.95	0.00	51.43	2-Oct	11:55	6.63	18.7	3,640	1.3	-55.8	2.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-127	Monitoring	GDS	60	REST	2-Oct	12:10	NA	20.43	0.00	53.21	2-Oct	12:35	6.65	21.5	2,340	1.8	-242.8	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-129	Monitoring	GDS		REST	2-Oct	12:53	22.39	22.76	0.37	53.08										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-#18A [e]	Recovery [d]	GDS		REST	2-Oct	9:57	NA	13.96	0.00	17.78										Yes	Yes	Yes	Yes		SA	A	-	-	A	A	-	-	A	A	A
KWB-1A	Monitoring	GDS	61	REST	2-Oct	9:20	NA	15.73	0.00	33.50	2-Oct	9:45	6.75	17.3	4,230	1.6	-16.1	2.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
KWB-1B	Monitoring	GDS		REST	2-Oct	9:51	NA	17.40	0.00	33.92			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
KWB-1C	Monitoring	GDS		REST	2-Oct	9:54	NA	18.02	0.00	52.71										Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
KWB-10R	Monitoring	GDS	62	REST	2-Oct	8:35	17.22	17.23	0.01	29.46	2-Oct	9:00	6.67	18.6	1,550	1.9	-128.7	1.7	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-131	Monitoring	GDS	63	REST	2-Oct	12:49	23.43	23.61	0.18	53.35			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
KWB-5	Monitoring	GDS	64	REST	2-Oct	14:15	NA	23.24	0.00	37.68	2-Oct	14:45	6.63	24.1	2,510	2.9	-152.8	2.4	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-111	Monitoring	GDS	65	REST	2-Oct	13:20	NA	24.09	0.00	40.83	2-Oct	13:50	6.56	24.1	2,520	2.8	-98.8	6.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-6	Monitoring	GDS	66	REST	2-Oct	13:04	NA	21.02	0.00	36.44	3-Oct	13:55	6.63	24.8	2,580	1.4	-223.9	4.7	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-112	Monitoring	GDS	67	REST	2-Oct	12:59	20.30	22.90	2.60	37.54			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-132	Monitoring	GDS	68	REST	2-Oct	13:08	18.28	19.80	1.52	42.66			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-57	Monitoring	GDS	69	REST	2-Oct	15:51	NA	18.40	0.00	34.32	3-Oct	11:50	6.67	20.2	4,390	3.6	50.6	2.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#11-0 [e]	Recovery [d]	GDS		REST	2-Oct	15:56	NA	20.50	0.00	22.20										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-9	Monitoring	GDS		REST			(Historically-obstructed @ 15.11')						Removed from program by Navajo, 4-26-16 (farmer Jack Joy, 575-365-6042)												SA	A	A	-	A	A	A	A	A	A	A
KWB-12A	Monitoring	GDS	70	REST	2-Oct	16:05	NA	20.89	0.00	25.03	3-Oct	12:30	6.73	21.1	3,080	3.7	52.9	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-12B	Monitoring	GDS	71	REST	2-Oct	16:09	NA	20.73	0.00	39.39	3-Oct	13:10	6.78	20.4	3,230	4.0	53.6	2.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-2R	Monitoring	GDS	72	REST	2-Oct	15:19	NM	NM	NM	39.41	(Historical TD)		Unable to locate (...covered/destroyed by road construction)							Issue	Issue	Issue	Issue		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-58	Monitoring	GDS	73	REST	2-Oct	15:07	20.10	20.11	0.01	33.06	3-Oct	14:25	6.71	21.4	1,491	1.7	-215.6	5.4	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
KWB-13	Monitoring	GDS		REST	2-Oct	15:38	NA	23.90	0.00	33.10										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-103	Monitoring	RR/SU		REST	2-Oct	11:00	NA	18.50	0.00	25.20										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-104	Monitoring	RR/SU	74	REST	2-Oct	9:40	NA	17.40	0.00	21.97	2-Oct	10:05	6.63	22.7	1,882	1.4	-421.9	1.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-64	Monitoring	RR/SU	75	REST	2-Oct	9:00	NA	19.61	0.00	34.08	2-Oct	9:25	6.82	23.3	2,210	1.3	-406.8	1.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-65	Monitoring	RR/SU	76	REST	2-Oct	11:10	NA	16.14	0.00	28.78	2-Oct	11:35	6.57	25.8	1,924	1.6	-350.1	2.1	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-5	Recovery [d]	RR/SU		S Refinery			Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-
RW-5R	Recovery [d]	RR/SU		REST	2-Oct	11:50	16.75	16.99	0.24	35.30										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-102	Monitoring	RR/SU	77	REST	2-Oct	12:00	NA	15.64	0.00	26.53	2-Oct	12:25	6.57	25.0	2,100	1.4	-415.0	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-4	Recovery [d]	RR/SU		REST	2-Oct	11:55	NA	14.23	0.00	36.62										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RW-6	Recovery [d]	RR/SU		REST	2-Oct	12:40	NA	15.13	0.00	34.90										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-99	Monitoring	RR/SU	78	REST	2-Oct	14:30	NA	17.60	0.00	27.80	3-Oct	10:05	6.60	24.1	2,100	1.8	-418.9	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-66	Monitoring	RR/SU	79	REST	2-Oct	14:35	NA	16.99	0.00	29.80	3-Oct	9:25	6.60	22.5	1,732	1.0	-263.9	21.1	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-28	Monitoring	RR/SU	80	REST	2-Oct	12:50	NA	22.95	0.00	34.55	2-Oct	13:15	6.54	26.5	2,270	1.0	-421.8	1.7	Clear	Yes	Issue	Issue	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-59	Monitoring	RR/SU		REST	2-Oct	14:15	NA	10.13	0.00	32.72										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-60	Monitoring	RR/SU	81	REST	2-Oct	13:40	NA	11.18	0.00	37.78	3-Oct	10:50	6.54	25.2	3,840	3.6	-419.1	2.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-107	Monitoring	RR/SU		REST	2-Oct	13:35	NA	13.46	0.00	19.05										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-128	Monitoring	RR/SU	82	REST	2-Oct	14:10	NA	15.80	0.00	35.35	3-Oct	12:10	6.40	25.0	1,694	3.4	-209.5	5.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-125	Monitoring	RR/SU	83	REST	2-Oct	13:50	NA	11.20	0.00	28.31	3-Oct	12:55	6.54	24.3	4,120	1.8	-99.1	2.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-116	Monitoring	RR/SU	84	REST	2-Oct	13:55	NA	10.37	0.00	27.63	3-Oct	13:35	6.62	22.3	3,700	1.7	-111.4	2.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-46R	Monitoring	RR/SU	85	TMD	2-Oct	14:00	NA	4.87	0.00	19.33	3-Oct	14:15	6.51	25.5	3,670	1.5	-96.8	0.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
UG-3R	Monitoring	RR/SU		REST			No activity in 2H18																		A	A	A	A	A	A	A	A	A	A	A
UG-4	Monitoring	RR/SU		REST			No activity in 2H18																		A	A	A	A	A	A	A	A	A	A	A
UG-1	Monitoring	RR/SU		REST			No activity in 2H18																		A	A	A	A	A	A	A	A	A	A	A
UG-2	Monitoring	RR/SU		REST			No activity in 2H18																		A	A	A	A	A	A	A	A	A	A	A
MW-101	Monitoring	TAB	86	REST	2-Oct	8:40	NA	14.85	0.00	26.85	3-Oct	9:15	6.83	23.6	2,010	1.2	-192.2	0.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-105	Monitoring	TAB	87	REST	2-Oct	8:30	NA	10.28	0.00	17.20	3-Oct	8:25	6.43	25.7	2,010	0.7	-353.2	9.6	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-2	Recovery [d]	TAB		REST	2-Oct	15:40	NA	12.71	0.00	36.13										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-61	Monitoring	TAB	88	REST	2-Oct	14:10	NA	12.81	0.00	29.30	2-Oct	14:45	6.65	27.5	3,050	0.9	-372.5	3.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-62	Monitoring	TAB	89	REST	2-Oct	15:05	NA	14.05	0.00	29.50	2-Oct	15:30	6.52	26.5	3,190	1.0	-369.2	6.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-93	Monitoring	TAB		REST	2-Oct	15:50	NA	8.50	0.00	20.23										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-43	Monitoring	TAB	90	REST	2-Oct	16:40	NA	10.59	0.00	19.67	3-Oct	13:05	6.74	26.8	4,850	1.4	-398.1	4.6	Clear	Yes	Issue	No pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-137	Monitoring	TAB	91	REST	2-Oct	16:10	NA	8.76	0.00	29.60	3-Oct	14:30	6.65	25.6	4,610	3.1	-393.3	8.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-138	Monitoring	TAB	92	REST	2-Oct	16:20	NA	10.40	0.00	24.81	3-Oct	13:45	6.60	25.8	3,080	2.3	-328.1	8.2	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-23	Monitoring	TAB	93	REST	2-Oct	16:00	NA	13.83	0.00	23.10	3-Oct	13:00	7.10	32.8	3,210	1.0	-309.0	5.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-4	Monitoring	TAB	94	TEL	2-Oct	12:30	NA	9.52	0.00	27.27	2-Oct	12:55	7.43	24.7	3,410	0.6	-316.7	3.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-3	Monitoring	TAB	95	TEL	2-Oct	12:00	9.19	9.23	0.04	27.19			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-2	Monitoring	TAB	96	TEL	2-Oct	11:05	NA	10.04	0.00	27.20	2-Oct	11:30	6.57	24.2	3,830	1.3	-350.1	1.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-1	Monitoring	TAB	97	TEL	2-Oct	10:20	NA	9.19	0.00	27.00	2-Oct	10:45	6.93	23.4	3,130	0.9	-190.2	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-39	Monitoring	TAB	98	REST	2-Oct	9:50	NA	9.72	0.00	25.44	3-Oct	11:25	7.12	25.8	3,720	0.9	-342.1	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-98	Monitoring	TAB	99	REST	2-Oct	13:30	NA	9.90	0.00	25.60	2-Oct	13:55	6.60	26.3	3,380	1.0	-381.8	2.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-10	Recovery [d]	TAB		REST	2-Oct	9:55	NA	9.49	0.00	22.49										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-40	Monitoring	TAB		REST	2-Oct	9:45	NA	7.87	0.00	24.75										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-41	Monitoring	TAB		REST	2-Oct	9:35	NA	7.66	0.00	21.56										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-9	Recovery [d]	TAB		REST	2-Oct	9:40	NA	9.86	0.00	21.83										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-42	Monitoring	TAB		REST	2-Oct	9:30	NA	10.50	0.00	24.32										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-29	Monitoring	TAB	100	REST	2-Oct	9:10	NA	14.32	0.00	24.22	3-Oct	12:15	6.83	28.6	3,940	1.0	-253.9	0.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#16B [e]	Recovery [d]	TAB		REST	2-Oct	9:25	NA	12.48	0.00	17.70										Yes	Yes	Cracked pad	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-30	Monitoring	TAB		REST	2-Oct	9:15	NA	9.88	0.00	23.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-56	Monitoring	TAB		NCL	2-Oct	9:20	NA	10.93	0.00	26.50										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-49	Monitoring	TAB	101	TEL	2-Oct	8:50	NA	10.76	0.00	33.07	3-Oct	9:45	6.53	26.6	3,280	1.0	-361.5	5.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-106	Monitoring	TAB	102	REST	2-Oct	9:00	NA	8.67	0.00	22.80	3-Oct	10:35	6.45	26.5	3,590	1.1	-373.3	8.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-45	Monitoring	TAB	103	NCL	2-Oct	16:50	NA	4.84	0.00	15.05	3-Oct	14:25	6.83	24.2	5,190	1.3	-114.4	0.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-50	Monitoring	CJH	104	REST	2-Oct	10:25	NA	15.35	0.00	28.22	2-Oct	10:50	6.79	23.4	5,240	1.7	-139.5	2.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-97	Monitoring	CJH	105	REST	2-Oct	11:05	10.58	12.15	1.57	21.20			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-92	Monitoring	CJH	106	REST	2-Oct	11:15	12.47	12.55	0.08	22.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-1	Recovery [d]	CJH		REST	2-Oct	11:25	NA	11.45	0.00	35.39										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-91	Monitoring	CJH	107	REST	2-Oct	11:35	NA	11.79	0.00	25.35	2-Oct	12:00	6.43	25.7	2,914	2.1	-388.6	7.1	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-90	Monitoring	CJH	108	REST	2-Oct	12:15	NA	12.40	0.00	22.80	2-Oct	12:40	6.70	25.9	3,690	1.6	-365.1	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-96	Monitoring	CJH	109	REST	2-Oct	12:50	NA	12.19	0.00	25.57	2-Oct	13:15	6.68	26.0	2,374	1.9	-362.1	4.6	Clear	Yes	Closure	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-94	Monitoring	CJH	110	REST	2-Oct	13:30	13.24	13.43	0.19	23.45			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-8	Recovery [d]	CJH		REST	2-Oct	13:40	12.02	13.15	1.13	37.22										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-67	Monitoring	CJH	111	REST	2-Oct	13:50	NA	10.35	0.00	27.30	2-Oct	14:15	6.72	25.6	2,601	1.6	-335.5	3.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-95	Monitoring	CJH		REST	2-Oct	14:30	NA	13.27	0.00	25.37										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-7	Recovery [d]	CJH		REST	2-Oct	14:40	NA	13.05	0.00	37.00										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
NCL-34A	Monitoring	CJH	112	NCL	2-Oct	14:55	NA	11.22	0.00	19.26	2-Oct	15:20	6.54	25.1	2,230	1.7	-368.1	3.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
NCL-33	Monitoring	CJH	113	NCL	2-Oct	15:35	NA	9.58	0.00	19.60	2-Oct	16:00	6.47	25.2	3,190	1.8	-213.2	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-44	Monitoring	CJH	114	NCL	2-Oct	16:50	NA	9.59	0.00	21.34	3-Oct	11:30	6.60	25.6	2,851	1.7	-258.0	3.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-32	Monitoring	CJH	115	NCL	2-Oct	17:00	NA	10.12	0.00	20.04	3-Oct	10:45	6.83	25.1	2,963	1.3	-118.6	20.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-108	Monitoring	CJH	116	NCL	2-Oct	17:30	NA	13.70	0.00	27.74	3-Oct	9:10	6.68	21.8	2,656	1.7	-379.4	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 2H18

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
NCL-31	Monitoring	CJH	117	NCL	2-Oct	17:15	NA	10.75	0.00	20.16	3-Oct	9:55	6.87	26.3	3,370	1.2	-238.4	3.9	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-19	Monitoring	CJH		NCL	2-Oct	17:20	NA	11.06	0.00	22.08			Not in sampling program							Yes	Yes	Issue	Yes		SA	Not in sampling program									
MW-55	Monitoring	CJH	118	NCL	2-Oct	16:25	NA	11.13	0.00	26.85	3-Oct	12:15	6.67	26.7	4,210	1.5	-76.7	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
RW-#17A [e]	Recovery [d]	CJH		REST	2-Oct	16:30	NA	10.93	0.00	16.01										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-18	Monitoring	CJH		NCL	2-Oct	16:15	NA	11.36	0.00	22.20										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-54A	Monitoring	CJH	119	NCL	2-Oct	8:45	NA	12.24	0.00	31.30	2-Oct	9:10	6.54	22.2	2,467	1.9	54.0	5.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-54B	Monitoring	CJH		NCL	2-Oct	9:25	NA	12.27	0.00	46.80										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
NCL-49	Monitoring	CJH	120	NCL	2-Oct	9:30	NA	16.14	0.00	32.18	2-Oct	9:55	6.88	21.8	3,200	1.5	84.0	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-53	Monitoring	CJH		NCL	2-Oct	8:30	NA	11.31	0.00	23.60										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-P3	Monitoring			Field E of Refinery			Not in gauging program						Not in sampling program												Not included in monitoring program due to distance from impacts										

Notes:

Abbreviations:

A = Annual (Mar/Apr event)
B = Biennial (starts Mar/Apr 2011)
BR = Bolton Road
DRO = Diesel Range Organics
E = East
EP = Evaporation Ponds
ft bgs = ft below ground surface
ft btoc = ft below top of casing
ft MSL = ft Mean Sea Level
GRO = Gasoline Range Organics
HR = Haldeman Road
in = inches
N = North
NA = Not accessible
NAPI = North API Separator
NCL = North Colony Landfarm
NE = Northeast
NW = Northwest
OCD = Oil Conservation District
PSH = Phase Separated Hydrocarbon
ROW = right of way
RR = Richey Road
S = South
SA = Semi-annual (Mar/Apr and Sep/Oct events)
SE = Southeast
SW = Southwest
TMD = Three Mile Ditch
TEL = Tetra Ethyl Lead Impoundment
UG = Upgradient
US285 = U.S. Highway 285
US82 = U.S. Highway 82
VOC = Volatile Organic Compounds
W = West
Y = Yes

Footnotes:

[a] Well const. info. provided where available. TOC & ground surface elevs relative to benchmark G-416. Total depth based on 4/2010 measurements.

[b] PSH was present during March 2012 gw monitoring event or a recovery pump is in place. Note that recovery wells are gauged at least monthly.

[c] Analytical Suite to include the following:

1. Purge parameters to be measured and recorded in the field will include pH, temp, spec. cond., diss. oxy., and oxidation-reduction potential.
2. DRO by Method 8015Mod.
3. GRO by Method 8015Mod.
4. VOCs by Method 8260, to include methyl tert butyl ether (MTBE).
5. Total metals by Method 6010/6020 and/or 7470. Specific metals shown in heading, abbreviations from periodic chart (incl B, Cd, Co, U, per 3-7-16 State request).
6. Dissolved metals - same list as total metals but only analyzed during April event (field filtered by HMI)
7. Cyanide by Method SM4500.
8. Cations/anions to include Calcium, Potassium, and Sodium by Method 6010 or 6020 and Sulfate, Chloride and Fluoride by Method 300.
9. Nitrates/Nitrites as Nitrogen by Method 300.
10. Total Dissolved Solids by Method 2540C.

"-" indicates parameter not required.

Note - samples will not be collected from any well where PSH is measured to be 0.03 feet thick or greater.

[d] Samples to be collected at frequency indicated only if <0.03 feet of PSH is present.

[e] Recovery trenches 11, 15, 16, 17 and 18 have multiple vertical "wells". Gauging & sampling points are: RW #11-0, RW #15C, RW #16B, RW #17A and RW #18A.

= Well with recently gauged LNAPL (light nonaqueous phase liquid)

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

M E M O R A N D U M

Groundwater Monitoring Standard Operating Procedures
Navajo Refining LLC – Artesia, New Mexico

HMI conducts low-flow groundwater sampling in accordance with the site Sampling and Analysis Plan and EPA guidance (including Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling; REV No. 4, September 19, 2017, and Yeskis & Zavala, 2002, EPA/542:S-02/00, Groundwater Sampling Guidelines for Superfund and RCRA Project Managers).

Groundwater Sampling Methodology

HMI conducts low-flow groundwater sampling using a peristaltic pump and dedicated polyethylene tubing at wells with requisite depths-to-water. At a limited number of wells with depths-to-water greater than peristaltic range, low-flow groundwater sampling is conducted using dedicated or non-dedicated bladder pumps. In 2016, at no cost to TRC, HMI installed HMI-owned bladder pumps in a limited number of wells (approximately four). At such time that HMI no longer conducts routine groundwater monitoring at the site, it respectfully requests the opportunity to recover these dedicated bladder pumps. Sample intakes are set at midscreen, when possible (generally at least two feet from the base of the well). Sample intake depths are permanently marked, ensuring future sampling events consistently monitor the targeted water-bearing interval. During sampling with a peristaltic pump, the sample tube is attached to the pump using a one-foot section of dedicated, flexible silicone tubing (item #5703, Geotech Environmental Equipment, Inc.). A two-foot segment of polyethylene tubing connects the silicone tubing in the pump to the flow-through cell, using a disposable segment of silicone tubing. Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), while well drawdown is monitored. Groundwater field parameter readings are measured at 0.5-liter intervals (generally an equivalent of one cell-volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside the cell. Groundwater field instrumentation is calibrated and recorded daily in accordance with manufacturer specifications.

Purging continues until a requisite volume of groundwater is purged (generally a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with EPA guidance:

> *Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)*

- pH +/- 0.1 units;
- Temperature -
- Conductivity +/- 3%
- Dissolved Oxygen +/- 0.3 mg/L
- ORP +/- 10%
- Turbidity 10%

Immediately prior to sampling, the input tubing to the flow-through cell is disconnected from the disposable silicone receiving tubing on the input barb on the flow-through cell, and groundwater samples are collected directly into lab-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI's custody until shipped to ESC Lab Sciences via FedEx-overnight. Peristaltic tubes and/or dedicated bladder pumps may be dedicated in respective wells. Alternatively, dedicated tubing may be retrieved, bagged, labeled, and stored in tubs maintained at HMI. Wells with very limited water column thicknesses may be sampled with disposable bailers. Active recovery well and irrigation wells are sampled using sample ports. The purging and sampling process is documented on groundwater sampling field forms.

Cross-Contamination Prevention Program

Dedicated peristaltic tubing and dedicated bladder pumps are used as possible, to minimize any potential cross-contamination issues during the groundwater monitoring process. Remaining non-dedicated equipment (e.g., electronic gauging probes or non-dedicated bladder pumps, etc.) is properly decontaminated prior to use and between wells. The decontamination procedure may include a combination of chemical and mechanical decontamination. For example, scrubbing with ethyl alcohol (isopropanol) as warranted, followed by scrubbing using an Alconox-water solution, and distilled water rinse. The decontamination procedure for non-dedicated bladder pumps consists of cycling an Alconox-water solution through the pump bladder. Distilled water is cycled through the pump bladder, followed by decontaminating the exterior body of the pump, using the methods outlined above.

HMI Deliverables

HMI provides field documentation of groundwater monitoring activities in a deliverables package that includes a brief narrative, summary table (with gauging data, field parameters, well inspection data, and required analytical scope), groundwater sampling forms, field instrument calibration log, and chain-of-custody forms (by Refinery "Area"), and a groundwater sampling SOP memo.

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6A
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1205	NA	13.14	0.0	19.04	14.1	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-6A								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1208	NA	13.01	0.0	52.28	47.3	Yes	Issue	Yes	Yes		Weather: Sunny, 70s

↳ casing lid does not close all the way (minor)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
		MW-6B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-85
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1215	10.47	10.60	0.13	20.34	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record * Removed oil-sorbent sock & allowed well to equilibrate prior to gauging

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED DUE TO						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5		PRESENCE OF LNAPL						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5		* SOCK SATURATED						E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		MW-85										Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-86
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1220	10.24	10.28	0.04	19.21	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

*Removed oil-sorbent sock & allowed well to equilibrate prior to gauging

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		NOT SAMPLED DUE TO						(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		PRESENCE OF LNAPL						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
		MW-86								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank-EP-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-120
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH/SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1225	NA	12.82	0.0	28.00	17.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70s
10-3-18	845	NA	12.85	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	850	12.99	0.5	7.46	25.1	7750	3.1	-81.3	7.2	Clear / colorless	*Low-flow groundwater sample:*
	852	12.99	1.0	7.34	24.8	7810	2.1	-85.9	6.8		(A) peristaltic pump w/ ded tubing
	855	12.99	1.5	7.29	24.6	7860	1.4	-84.2	6.1		B) ded bladder pump
	857	12.99	2.0	7.27	24.5	7880	1.2	-89.1	5.4		C) non-ded bladder pump; or
	900	12.99	2.5	7.26	24.5	7890	1.0	-91.3	5.2		*Standard groundwater sample:*
	902	12.99	3.0	7.26	24.5	7896	1.0	-92.2	4.9		D) bailer due to limited column; or
	905	12.99	3.5	7.25	24.5	7900	0.9	-93.1	4.4		E) recovery well cycling sample
	907	12.99	4.0	7.25	24.5	7900	0.9	-94.6	4.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-3-18	910	MW-120	12.99	7.25	24.5	7900	0.9	-94.6	4.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-121
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH/SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1229	NA	12.51	0.0	27.31	17.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's
10-3-18	930	NA	12.55	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	935	12.67	0.5	7.25	25.1	6080	3.2	-29.3	21.5	Clear / colorless	*Low-flow groundwater sample:*
	937	12.75	1.0	7.20	24.7	5920	2.2	-28.1	18.1		(A) peristaltic pump w/ ded tubing
	940	12.78	1.5	7.18	24.5	5870	1.8	-26.2	15.2		B) ded bladder pump
	942	12.81	2.0	7.17	24.4	5830	1.6	-25.2	13.2		C) non-ded bladder pump; or
	945	12.82	2.5	7.17	24.4	5800	1.5	-24.6	10.2		*Standard groundwater sample:*
	947	12.83	3.0	7.16	24.4	5790	1.5	-24.1	10.1		D) bailer due to limited column; or
	950	12.84	3.5	7.16	24.4	5790	1.4	-23.9	9.8		E) recovery well cycling sample
	952	12.85	4.0	7.16	24.4	5780	1.4	-22.5	9.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	955	MW-121	12.85	7.16	24.4	5780	1.4	-22.5	9.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-84
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH/SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1233	NA	9.40	0.0	20.56	15.2	Yes	Yes	Yes	Yes		Weather: Clear 80's
10-3-18	1145	NA	9.46	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1150	9.55	0.5	7.32	25.1	9850	2.4	-82.5	7.1	Clear / colorless	*Low-flow groundwater sample:*
	1152	9.59	1.0	7.29	24.7	9760	1.8	-85.9	6.5		(A) peristaltic pump w/ ded tubing
	1155	9.63	1.5	7.25	24.6	9740	1.6	-87.2	6.0		B) ded bladder pump
	1157	9.67	2.0	7.24	24.5	9730	1.4	-89.3	5.9		C) non-ded bladder pump; or
	1200	9.69	2.5	7.24	24.5	9720	1.3	-91.2	5.4		*Standard groundwater sample:*
	1202	9.72	3.0	7.23	24.5	9720	1.3	-93.8	5.1		D) bailer due to limited column; or
	1205	9.75	3.5	7.23	24.5	9710	1.2	-94.6	5.0		E) recovery well cycling sample
	1207	9.78	4.0	7.23	24.5	9710	1.2	-95.1	4.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-3-18	1210	mw-84	9.78	7.23	24.5	9710	1.2	-95.1	4.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-122
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH/SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1238	NA	10.79	0.0	23.32	18.4	Yes	Yes	Yes	Yes		Weather: Clear 80's
10-3-18	1015	NA	10.84	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1020	10.32	0.5	7.29	24.3	5680	2.4	-95.1	29.3	clear/colorless with	*Low-flow groundwater sample:*
↓	1022	10.44	1.0	7.25	23.9	5730	1.8	-98.6	21.3	orange particles	(A) peristaltic pump w/ ded tubing
	1025	10.56	1.5	7.23	23.7	~~5780~~	1.5	-101.9	15.5	↓	B) ded bladder pump
	1027	10.67	2.0	7.21	23.6	5810	1.3	-103.5	13.2		C) non-ded bladder pump; or
	1030	10.78	2.5	7.20	23.6	5830	1.2	-105.8	11.9		*Standard groundwater sample:*
	1032	10.82	3.0	7.20	23.6	5850	1.2	-107.1	10.8		D) bailer due to limited column; or
	1035	10.85	3.5	7.19	23.6	5870	1.1	-109.3	10.1		E) recovery well cycling sample
↓	1037	10.88	4.0	7.19	23.6	5880	1.1	-110.4	9.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1040	mw-122	10.88	7.19	23.6	5880	1.1	-110.4	9.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-81
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1243	NA	11.13	0.0	18.62	13.7	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-81								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-80
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1247	NA	9.19	0.0	19.69	14.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-80								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+EB-EP-04 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-79
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH/SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1251	NA	10.25	0.0	19.24	15.0	Yes	Yes	Yes	Yes		Weather: Clear 80's
10-3-18	1325	NA	10.26	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1330	10.48	0.5	6.51	24.7	6620	2.5	-20.1	11.2	Clear / colorless	*Low-flow groundwater sample:*
	1332	10.53	1.0	6.58	24.4	6690	1.9	-22.5	10.5	↓	(A) peristaltic pump w/ ded tubing
	1335	10.57	1.5	6.62	24.3	6720	1.7	-24.6	10.0		B) ded bladder pump
	1337	10.60	2.0	6.64	24.3	6750	1.5	-26.8	9.7		C) non-ded bladder pump; or
	1340	10.63	2.5	6.65	24.2	6760	1.4	-27.1	9.4		*Standard groundwater sample:*
	1342	10.67	3.0	6.65	24.2	6760	1.3	-27.8	8.6		D) bailer due to limited column; or
	1345	10.71	3.5	6.66	24.2	6770	1.3	-28.2	8.1		E) recovery well cycling sample
↓	1347	10.75	4.0	6.66	24.2	6770	1.3	-29.4	8.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-3-18	1350	MW-79	10.75	6.66	24.2	6770	1.3	-29.4	8.3	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1410	EB-EP-04	NA	→	→	→	→	→	→	Same	same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-82
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1256	NA	9.95	0.0	20.02	15.0	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-82								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ EB-EP-01 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-74
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1303	NA	9.52	0.0	20.19	14.8	Yes	Yes	Yes	Yes		Weather: Clear 80's
10-3-18	1230	NA	9.54	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1235	9.64	0.5	7.05	24.6	10,130	2.5	10.2	8.1	Clear / colorless	*Low-flow groundwater sample:*
	1237	9.68	1.0	7.00	24.1	10,190	1.9	11.7	7.5		(A) peristaltic pump w/ ded tubing
	1240	9.69	1.5	6.98	24.0	10,210	1.6	12.5	7.0		B) ded bladder pump
	1242	9.69	2.0	6.96	24.0	10,250	1.4	13.8	6.8		C) non-ded bladder pump; or
	1245	9.69	2.5	6.95	24.0	10,270	1.3	13.9	6.3		*Standard groundwater sample:*
	1247	9.69	3.0	6.95	24.0	10,280	1.3	14.2	6.0		D) bailer due to limited column; or
	1250	9.69	3.5	6.94	24.0	10,280	1.2	14.5	5.6		E) recovery well cycling sample
	1252	9.69	4.0	6.94	24.0	10,280	1.2	14.9	5.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-3-18	1255	MW-74	9.69	6.94	24.0	10,280	1.2	14.9	5.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 747,0~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1310	EB-EP-01	NA	→	→	→	→	→	→	Same	same	same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge ONLY

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-73
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1308	NA	9.08	0.0	19.60	14.6	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-73								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	SM4500

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2A
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH/SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1315	NA	10.37	0.0	17.30	15.0	Yes	Yes	Yes	Yes		Weather: Clear 80°
10-3-18	1100	NA	10.40	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1105	10.66	0.5	6.85	24.8	19,810	2.7	-135.6	13.2	Clear/colorless	*Low-flow groundwater sample:*
	1107	10.72	1.0	6.88	24.6	19,740	2.0	-141.9	10.2		(A) peristaltic pump w/ ded tubing
	1110	10.78	1.5	6.90	24.4	19,700	1.7	-145.2	9.8		B) ded bladder pump
	1112	10.81	2.0	6.91	24.3	19,680	1.5	-147.3	9.5		C) non-ded bladder pump; or
	1115	10.85	2.5	6.92	24.3	19,670	1.3	-148.1	9.0		*Standard groundwater sample:*
	1117	10.89	3.0	6.92	24.3	19,670	1.2	-148.6	8.7		D) bailer due to limited column; or
	1120	10.92	3.5	6.92	24.3	19,660	1.2	-149.2	8.3		E) recovery well cycling sample
↓	1122	10.96	4.0	6.92	24.3	19,660	1.1	-149.9	8.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1125	MW-2A	10.96	6.92	24.3	19,660	1.1	-149.9	8.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only (Not in "sampling program")

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1318	NA	11.43	0.0	52.00	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-72
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1323	NA	7.35	0.0	13.93	11.9	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-72								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-6
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1327	NA	10.70	0.0	26.69	21.6	Yes	Yes	Yes	Yes		Weather: Sunny, 90s
10-3-18	1145	NA	10.69	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1150	10.84	0.5	7.10	24.8	14,130	1.6	-93.0	68.0	sl. cloudy w/ orange	*Low-flow groundwater sample:*
↓	1153	10.84	1.0	6.99	23.2	14,120	1.1	-90.2	52.0	algae particles, odorless	(A) peristaltic pump w/ ded tubing
	1155	10.84	1.5	6.96	22.8	14,110	0.9	-88.8	50.0		B) ded bladder pump
	1158	10.84	2.0	6.92	22.4	14,110	0.8	-88.2	42.1	↓	C) non-ded bladder pump; or
	1200	10.84	2.5	6.88	22.2	14,110	0.7	-87.9	38.6		*Standard groundwater sample:*
	1203	10.84	3.0	6.86	22.1	14,100	0.7	-88.1	36.2		D) bailer due to limited column; or
	1205	10.84	3.5	6.85	22.1	14,100	0.7	-88.2	37.8		E) recovery well cycling sample
↓	1208	10.84	4.0	6.84	22.0	14,090	0.7	-88.7	37.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-3-18	1210	OCD-6	10.84	6.84	22.0	14,090	0.7	-88.7	37.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7AR
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1331	NA	9.52	0.0	21.28	16.0	Yes	Yes	Yes	Yes		Weather: Sunny, 80s
10-3-18	1100	NA	9.50	0.0	21.28							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1105	9.70	0.5	7.27	25.8	12,810	1.3	-148.3	44.2	clear w/ orange	*Low-flow groundwater sample:*
	1108	9.74	1.0	7.12	24.9	12,260	1.0	-152.1	37.1	algae particles, colorless	(A) peristaltic pump w/ ded tubing
	1110	9.78	1.5	7.04	24.5	11,830	0.8	-155.2	26.8	↓	B) ded bladder pump
	1113	9.81	2.0	7.00	24.4	11,730	0.7	-157.8	20.7		C) non-ded bladder pump; or
	1115	9.84	2.5	6.97	24.3	11,680	0.6	-158.3	19.3		*Standard groundwater sample:*
	1118	9.87	3.0	6.95	24.2	11,650	0.6	-159.7	18.1		D) bailer due to limited column; or
	1120	9.90	3.5	6.94	24.2	11,630	0.5	-160.2	17.6		E) recovery well cycling sample
↓	1123	9.93	4.0	6.94	24.2	11,620	0.5	-160.5	17.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1125	OCD-7AR	9.93	6.94	24.2	11,620	0.5	-160.9	17.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1333	NA	9.68	0.0	56.85	51.9	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7C
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1336	NA	9.48	0.0	71.95	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Tool Co. locks gate by 5:00 PM]

Annually - Bagged tube + guidance device

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#15C
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other ✓	Other __

(Trench-related RW)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	810	16.34	16.37	0.03	22.30	20.0	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-48
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1815	NA	18.19	0.0	32.00	26.9	Yes	Yes	Issue	Yes		Weather: Clear 80's
10-3-18	1430	NA	18.21	0.0								

Well Purging Record

* Needs new at-grade pad and canister

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1435	18.47	0.5	7.16	25.3	3430	1.9	-310.6	11.2	clear; grey tint; odor	*Low-flow groundwater sample:*
↓	1437	18.51	1.0	7.09	25.0	3520	1.2	-314.6	10.5		(A) peristaltic pump w/ ded tubing
	1440	18.54	1.5	7.04	24.9	3570	1.0	-316.9	10.1		B) ded bladder pump
	1442	18.54	2.0	7.01	24.8	3610	0.9	-318.2	9.7		C) non-ded bladder pump; or
	1445	18.54	2.5	6.99	24.8	3630	0.8	-320.1	9.5		*Standard groundwater sample:*
	1447	18.54	3.0	6.98	24.8	3650	0.8	-321.5	9.0		D) bailer due to limited column; or
	1450	18.54	3.5	6.98	24.8	3660	0.7	-322.6	8.6		E) recovery well cycling sample
↓	1452	18.54	4.0	6.97	24.8	3660	0.7	-323.9	8.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1455	MW-48	18.54	6.97	24.8	3660	0.7	-323.9	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-130
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD / BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1820	NA	19.78	0.0	45.00	37.4	Yes	Yes	Yes	Yes		Weather: Sunny 80's
10/3/18	1415	NA	19.77	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
6/3/18	1420	19.80	0.5	6.98	27.6	3100	3.1	31.5	9.6	Colorless/Clear	*Low-flow groundwater sample:*
	1423	19.81	1.0	6.91	26.8	3247	2.2	39.8	8.2	" "	(A) peristaltic pump w/ ded tubing
	1425	19.82	1.5	6.88	26.2	3264	1.9	45.7	6.8	" "	B) ded bladder pump
	1428	19.82	2.0	6.86	25.9	3274	1.7	52.8	5.9	" "	C) non-ded bladder pump; or
	1430	19.82	2.5	6.84	25.7	3287	1.5	55.6	5.1	" "	*Standard groundwater sample:*
	1433	19.82	3.0	6.83	25.6	3292	1.5	56.3	4.7	" "	D) bailer due to limited column; or
	1435	19.82	3.5	6.82	25.5	3296	1.4	57.5	4.5	" "	E) recovery well cycling sample
V	1438	19.82	4.0	6.82	25.5	3301	1.4	58.1	4.4	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1440	MW-130	19.82	6.82	25.5	3301	1.4	58.1	4.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-4
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1830	23.78	24.64	0.86	41.75	31.7	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled due to						B) ded bladder pump
			2.0		presence of LNAPL						C) non-ded bladder pump; or
			2.5		≥0.03'						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		KWB-4								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only (Gauge to top of 1-in galvanized pipe)

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** RW-19
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC __
Upright __	4-in __	SS __
Above-grade Vault ✓	Other ✓	Other ✓

Recover vault w/ PVC casing; SS gauge pipe

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1835	24.13	24.43	0.30	NM	10' off	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s
						base as needed						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-19								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-76
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1700	NA	11.52	0.0	20.33	16.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1705	11.57	0.5	7.02	24.2	6010	2.5	-113.5	10.1	clear/colorless	*Low-flow groundwater sample:*
	1707	11.57	1.0	7.00	24.0	6090	1.9	-115.4	9.7		(A) peristaltic pump w/ ded tubing
	1710	11.57	1.5	6.98	23.9	6120	1.7	-117.9	9.3		B) ded bladder pump
	1712	11.57	2.0	6.97	23.9	6150	1.6	-120.3	8.6		C) non-ded bladder pump; or
	1715	11.57	2.5	6.97	23.8	6160	1.6	-121.2	8.0		*Standard groundwater sample:*
	1717	11.57	3.0	6.96	23.8	6160	1.5	-123.9	7.5		D) bailer due to limited column; or
	1720	11.57	3.5	6.96	23.8	6170	1.5	-124.2	7.4		E) recovery well cycling sample
	1722	11.57	4.0	6.96	23.8	6170	1.5	-125.5	7.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1725	MW-76	11.57	6.96	23.8	6170	1.5	-125.5	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — ***Well:*** mw-77
Artesia Refinery — ***Event:*** 2H18
Artesia, New Mexico — ***Area of Concern:*** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1745	NA	9.74	0.0	20.52	15.2	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		mw-77								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-78
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1740	NA	9.79	0.0	19.57	14.16	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-78								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-75
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1750	NA	9.93	0.0	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80s
10-3-18	800	NA	9.95	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	805	9.98	0.5	6.92	23.9	7050	2.7	-70.1	9.5	Clear w/ Gold tint	*Low-flow groundwater sample:*
	807	9.99	1.0	7.00	23.5	7190	2.0	-73.5	9.1	odor	(A) peristaltic pump w/ ded tubing
	810	9.99	1.5	7.05	23.3	7250	1.8	-75.1	8.6		B) ded bladder pump
	812	9.99	2.0	7.09	23.2	7280	1.6	-77.9	8.3		C) non-ded bladder pump; or
	815	9.99	2.5	7.11	23.2	7290	1.5	-80.2	8.2		*Standard groundwater sample:*
	817	9.99	3.0	7.13	23.2	7300	1.5	-82.3	7.9		D) bailer due to limited column; or
	820	9.99	3.5	7.15	23.2	7310	1.4	-83.9	7.5		E) recovery well cycling sample
↓	822	9.99	4.0	7.16	23.2	7310	1.4	-84.6	7.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	825	MW-75	9.99	7.16	23.2	7310	1.4	-84.6	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-83
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1620	NA	9.75	0.0	19.91	15.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1625	9.85	0.5	7.09	24.5	5450	2.8	-115.5	13.9	Clear/colorless	*Low-flow groundwater sample:*
	1627	9.90	1.0	7.02	24.2	5410	2.0	-123.5	10.9		(A) peristaltic pump w/ ded tubing
	1630	9.91	1.5	6.99	24.1	5380	1.7	-130.1	9.7		B) ded bladder pump
	1632	9.92	2.0	6.97	24.1	5360	1.5	-135.6	9.5		C) non-ded bladder pump; or
	1635	9.92	2.5	6.96	24.0	5350	1.4	-139.4	8.6		*Standard groundwater sample:*
	1637	9.92	3.0	6.96	24.0	5350	1.3	-141.8	8.3		D) bailer due to limited column; or
	1640	9.92	3.5	6.95	24.0	5340	1.3	-143.9	7.9		E) recovery well cycling sample
	1642	9.92	4.0	6.95	24.0	5340	1.3	-145.6	7.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1645	MW-83	9.92	6.95	24.0	5340	1.3	-145.6	7.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Dup-EP-03 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-3
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1525	NA	11.87	0.0	22.10	18.1	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1530	11.92	0.5	7.35	24.7	4780	2.3	-41.3	11.3	Clear	*Low-flow groundwater sample:*
	1532	11.95	1.0	7.29	24.4	5210	1.8	-38.6	9.8		(A) peristaltic pump w/ ded tubing
	1535	11.95	1.5	7.23	24.2	5580	1.5	-35.4	8.6		B) ded bladder pump
	1537	11.95	2.0	7.20	24.1	5810	1.3	-34.1	8.0		C) non-ded bladder pump; or
	1540	11.95	2.5	7.18	24.0	5960	1.2	-33.2	7.5		*Standard groundwater sample:*
	1542	11.95	3.0	7.17	24.0	5980	1.2	-32.1	7.1		D) bailer due to limited column; or
	1545	11.95	3.5	7.17	24.0	5990	1.1	-31.9	6.8		E) recovery well cycling sample
	1547	11.95	4.0	7.17	24.0	6000	1.1	-31.5	6.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-2-18	1550	MW-3	11.95	7.17	24.0	6000	1.1	-31.5	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1200	DUP-EP-03	11.95	7.17	24.0	6000	1.1	-31.5	6.3	same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-88
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1230	NA	9.61	0.0	20.31	14.8	Yes	Yes	Yes	Yes	Hole in Pad	Weather: Partly Cloudy 70's

* Issue with pad; hole in west side of pad well remains functional

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1235	9.68	0.5	7.09	24.7	6530	2.5	-119.3	15.1	clear w/ orange particles/colorless	*Low-flow groundwater sample:*
	1237	9.69	1.0	7.01	24.3	6580	1.9	-121.3	13.2		(A) peristaltic pump w/ ded tubing
	1240	9.69	1.5	6.97	24.1	6610	1.6	-125.9	11.9		B) ded bladder pump
	1242	9.69	2.0	6.94	24.0	6630	1.4	-127.2	10.5		C) non-ded bladder pump; or
	1245	9.69	2.5	6.92	23.9	6640	1.3	-130.1	10.1		*Standard groundwater sample:*
	1247	9.69	3.0	6.91	23.9	6650	1.3	-135.9	9.8		D) bailer due to limited column; or
	1250	9.69	3.5	6.91	23.9	6650	1.2	-137.2	9.3		E) recovery well cycling sample
	1252	9.69	4.0	6.92	23.9	6650	1.2	-139.1	9.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-2-18	1255	MW-88	9.69	6.92	23.9	6650	1.2	-139.1	9.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, Pace National~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Dup-EP-02
(same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22A
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1320	NA	8.83	0.0	22.65	17.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1325	8.90	0.5	7.05	24.3	7110	2.5	-63.8	13.2	Clear / colorless	*Low-flow groundwater sample:*
	1327	8.96	1.0	6.99	23.8	7180	1.8	-66.9	11.9		(A) peristaltic pump w/ ded tubing
	1330	8.99	1.5	6.97	23.6	7210	1.6	-68.2	10.5		B) ded bladder pump
	1332	9.02	2.0	6.96	23.5	7250	1.4	-70.1	9.8		C) non-ded bladder pump; or
	1335	9.03	2.5	6.96	23.5	7260	1.3	-72.5	9.2		*Standard groundwater sample:*
	1337	9.04	3.0	6.95	23.5	7260	1.2	-73.6	8.9		D) bailer due to limited column; or
	1340	9.05	3.5	6.95	23.5	7270	1.2	-74.3	8.5		E) recovery well cycling sample
	1342	9.05	4.0	6.95	23.5	7270	1.2	-75.8	7.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-2-18	1345	MW-22A	9.05	6.95	23.5	7270	1.2	-75.8	7.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										Cyanide	~~NaOH~~	~~SM4500~~
	1100	Dup-EP-02	9.05	6.95	23.5	7270	1.2	-75.8	7.8	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1315	NA	8.66	0.0	54.66	49.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18		MW-22B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-10
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1405	NA	6.45	0.0	18.45	13.3	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1410	6.46	0.5	7.29	24.7	6100	2.4	-29.3	9.3	Clear/colorless w/	*Low-flow groundwater sample:*
	1412	6.47	1.0	7.18	24.7	6010	1.8	-32.5	8.6	orange particles	(A) peristaltic pump w/ ded tubing
	1415	6.47	1.5	7.12	24.5	5990	1.5	-35.9	8.3		B) ded bladder pump
	1417	6.47	2.0	7.09	24.4	5970	1.4	-39.1	7.5		C) non-ded bladder pump; or
	1420	6.47	2.5	7.07	24.4	5960	1.3	-41.8	7.4		*Standard groundwater sample:*
	1422	6.47	3.0	7.06	24.3	5960	1.2	-42.5	6.9		D) bailer due to limited column; or
	1425	6.47	3.5	7.06	24.3	5960	1.2	-43.4	6.5		E) recovery well cycling sample
	1427	6.47	4.0	7.05	24.3	5950	1.2	-43.9	6.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1430	MW-10	6.47	7.05	24.3	5950	1.2	-43.9	6.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-123
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCO

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1450	NA	6.92	0.0	25.71	25.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1455	6.93	0.5	7.29	23.7	6410	2.7	-73.2	13.5	Clear/colorless	*Low-flow groundwater sample:*
	1457	6.93	1.0	7.18	23.4	6430	2.1	-71.5	11.2		(A) peristaltic pump w/ ded tubing
	1500	6.93	1.5	7.12	23.0	6440	1.8	-69.2	10.9		B) ded bladder pump
	1502	6.93	2.0	7.10	22.9	6450	1.6	-65.1	10.1		C) non-ded bladder pump; or
	1505	6.93	2.5	7.09	22.9	6450	1.4	-63.2	9.7		*Standard groundwater sample:*
	1507	6.93	3.0	7.09	22.9	6450	1.3	-61.0	9.3		D) bailer due to limited column; or
	1510	6.93	3.5	7.08	22.9	6440	1.3	-60.9	8.6		E) recovery well cycling sample
	1512	6.93	4.0	7.08	22.9	6440	1.3	-60.5	8.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1515	MW-123	6.93	7.08	22.9	6440	1.3	-60.5	8.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4A
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCO

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1145	NA	12.05	0.0	16.55	well base	Yes	Yes	Yes	yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1150	12.06	0.5	7.45	24.6	6480	3.3	-133.8	10.9	Clear w/ black	*Low-flow groundwater sample:*
	1152	12.06	1.0	7.40	24.0	6280	2.9	-138.1	10.1	particles/colorless	(A) peristaltic pump w/ ded tubing
	1155	12.06	1.5	7.37	23.9	6130	2.7	-140.8	9.7		B) ded bladder pump
	1157	12.06	2.0	7.34	23.8	6100	2.6	-142.9	9.4		C) non-ded bladder pump; or
	1200	12.06	2.5	7.31	23.8	6080	2.5	-143.5	8.9		*Standard groundwater sample:*
	1202	12.06	3.0	7.30	23.8	6070	2.5	-144.6	8.3		D) bailer due to limited column; or
	1205	12.06	3.5	7.29	23.8	6070	2.4	-145.8	8.0		E) recovery well cycling sample
	1207	12.06	4.0	7.29	23.9	6060	2.4	-146.2	7.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1210	MW-4A	12.06	7.29	23.9	6060	2.4	-146.2	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1140	NA	11.85	0.0	72.37	67.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-4B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+EB-EP-03 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5A
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1050	NA	9.07	0.0	20.15	14.8	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1055	9.13	0.5	7.35	24.5	10,820	2.9	-135.9	13.8	Clear/colorless w/	*Low-flow groundwater sample:*
	1057	9.13	1.0	7.29	24.3	11,030	2.1	-139.2	11.9	orange particles	(A) peristaltic pump w/ ded tubing
	1100	9.13	1.5	7.25	24.2	11,090	1.9	-141.1	10.1		B) ded bladder pump
	1102	9.13	2.0	7.23	24.2	11,120	1.7	-143.8	9.8		C) non-ded bladder pump; or
	1105	9.13	2.5	7.21	24.1	11,130	1.6	-145.9	9.5		*Standard groundwater sample:*
	1107	9.13	3.0	7.20	24.1	11,130	1.6	-146.2	8.6		D) bailer due to limited column; or
	1110	9.13	3.5	7.20	24.1	11,140	1.5	-147.5	8.3		E) recovery well cycling sample
	1112	9.13	4.0	7.19	24.1	11,140	1.5	-148.2	7.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-2-18	1115	MW-5A	9.13	7.19	24.1	11,140	1.5	-148.2	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1130	EB-EP-03	NA	→	→	→	→	→	→	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1040	NA	9.21	0.0	53.54	48.5	Yes	Yes	Yes	Yes		Weather: Cloudy 70°F

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-5B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-5c
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1045	NA	9.41	0.0	71.64	66-6	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		mw-5c								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
						Cations (Ca,K,Na), taken from total metals bottle					HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Dup-EP-01 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7A
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCP

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	940	NA	9.81	0.0	18.65	13.16	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	945	9.91	0.5	7.39	22.3	8700	2.5	-120.3	21.5	Clear w/ orange	*Low-flow groundwater sample:*
↓	947	9.92	1.0	7.31	22.2	8620	1.9	-117.4	18.1	particles/colorless	(A) peristaltic pump w/ ded tubing
	950	9.92	1.5	7.26	22.2	8590	1.6	-115.2	13.2	↓	B) ded bladder pump
	952	9.92	2.0	7.21	22.2	8570	1.5	-114.1	10.9		C) non-ded bladder pump; or
	955	9.92	2.5	7.19	22.2	8550	1.4	-113.9	10.1		*Standard groundwater sample:*
	957	9.92	3.0	7.18	22.1	8550	1.4	-113.5	9.8		D) bailer due to limited column; or
	1000	9.92	3.5	7.18	22.1	8540	1.3	-113.2	9.5		E) recovery well cycling sample
↓	1002	9.92	4.0	7.17	22.1	8540	1.3	-113.1	9.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1005	MW-7A	9.92	7.17	22.1	8540	1.3	-113.1	9.0	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1000	DUP-EP-01	9.92	7.17	22.1	8540	1.3	-113.1	9.0	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-7B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2-18	935	NA	9.58	0.0	52.56	47.6	Yes	Yes	Yes	Yes		Weather: Cloudy 70°c

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		mw-7B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - EP-02

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8A
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	845	NA	9.15	0.0	20.74	16.4	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	850	9.60	0.5	7.14	22.4	11,040	2.9	-130.5	12.5	Clear / colorless	*Low-flow groundwater sample:*
	852	9.75	1.0	7.08	22.4	10,980	2.1	-134.1	10.9		(A) peristaltic pump w/ ded tubing
	855	9.82	1.5	7.03	22.5	10,920	1.8	-137.2	10.1		B) ded bladder pump
	857	9.87	2.0	7.00	22.5	10,900	1.6	-140.2	9.7		C) non-ded bladder pump; or
	900	9.89	2.5	6.98	22.5	10,890	1.5	-142.6	9.2		*Standard groundwater sample:*
	902	9.90	3.0	6.97	22.5	10,880	1.5	-143.9	8.9		D) bailer due to limited column; or
	905	9.90	3.5	6.97	22.5	10,880	1.4	-144.5	8.5		E) recovery well cycling sample
	907	9.90	4.0	6.96	22.5	10,870	1.4	-144.7	7.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	910	OCD-8A	9.90	6.96	22.5	10,870	1.4	-144.7	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8B
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	925	NA	9.35	0.0	56.65	51.7	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18		OCD-8B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Do Not Gauge or Sample, Fall 2018] (Biennial schedule only)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-P4
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Short Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		KWB-P4								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-25
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1350	NA	15.55	0.0	28.18	23.2	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-25								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only (gauge to top of protective steel casing); Not in sampling program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-8
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1356	NA	13.06	0.0	714.95	NS	Yes	~~Yes~~ BRH	Yes	Yes		Weather: Pt. Cloudy, 80s
					↳			Issue				

↳ Blockage at 14.95' TOC ↵

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		• PVC Riser added for DTW measurements.						A) peristaltic pump w/ ded tubing
			1.5		New TOC data needed.						B) ded bladder pump
			2.0		• Blockage @ 14.95' TOC - probe will not pass.						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0		• well to possibly be P&A pending HWB						D) bailer due to limited column; or
			3.5		approval per SESI scope. If not, a						E) recovery well cycling sample
			4.0		new pad will need to be installed.						F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-1R
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1401	NA	11.37	0.0	20.63	15.6	Yes	Issue	Yes	Yes		Weather: Pt. Cloudy, 80s

→ casing & lid are bent making closure difficult. well still functional

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-1R								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-15
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BZH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1405	NA	12.33	0.0	21.70	17.7	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
		MW-15								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - EP-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** OCD-1R
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1410	NA	11.75	0.0	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1415	11.92	0.5	7.68	25.7	7760	1.8	-51.9	5.2	Colorless, clear	*Low-flow groundwater sample:*
	1418	11.95	1.0	7.53	24.0	7610	1.1	-54.6	4.8		(A) peristaltic pump w/ ded tubing
	1420	11.96	1.5	7.44	23.7	7520	0.8	-50.2	4.3		B) ded bladder pump
	1423	11.96	2.0	7.33	22.9	7470	0.7	-48.1	3.9		C) non-ded bladder pump; or
	1425	11.96	2.5	7.26	22.8	7430	0.6	-45.9	3.6		*Standard groundwater sample:*
	1428	11.96	3.0	7.20	22.7	7410	0.5	-43.7	3.5		D) bailer due to limited column; or
	1430	11.96	3.5	7.18	22.7	7390	0.5	-42.8	3.1		E) recovery well cycling sample
	1433	11.96	4.0	7.16	22.6	7380	0.5	-41.9	2.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1435	OCD-1R	11.96	7.16	22.6	7380	0.5	-41.9	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** OCD-2A
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1455	NA	12.13	0.0	27.56	22.3	Yes	Yes	Yes	Yes		Weather: PT. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1500	12.27	0.5	7.48	23.8	6420	1.6	-123.7	37.8	clear w/orange	*Low-flow groundwater sample:*
	1503	12.28	1.0	7.40	22.5	6450	0.9	-115.2	26.9	algae particles	(A) peristaltic pump w/ ded tubing
	1505	12.28	1.5	7.36	22.0	6470	0.6	-110.0	21.2	↓	B) ded bladder pump
	1508	12.28	2.0	7.31	21.8	6480	0.6	-109.8	16.4	↓	C) non-ded bladder pump; or
	1510	12.28	2.5	7.29	21.7	6480	0.5	-107.5	11.5	colorless, clear	*Standard groundwater sample:*
	1513	12.28	3.0	7.26	21.6	6490	0.5	-106.1	9.8	↓	D) bailer due to limited column; or
	1515	12.28	3.5	7.24	21.5	6510	0.4	-104.0	9.3	↓	E) recovery well cycling sample
↓	1518	12.28	4.0	7.22	21.5	6520	0.4	-103.5	8.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1520	OCD-2A	12.28	7.22	21.5	6520	0.4	-103.5	8.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								~~Anions (Chloride,Fluoride,Sulfate)~~		~~Neat~~	~~300.~~	
							~~Cations (Ca,K,Na), taken from total metals bottle~~			~~HNO3~~	~~6010/6020~~	
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, Pace National~~
										~~TDS~~	~~Neat~~	~~2540C~~
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only ; Not in "sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** OCD-2B
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1450	NA	11.85	0.0	50.38	NS	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-3
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1535	NA	12.60	0.0	25.20	20.2	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1540	12.64	0.5	7.35	24.6	5750	1.4	-63.1	30.8	clear w/ orange	*Low-flow groundwater sample:*
	1543	12.64	1.0	7.30	23.5	5670	1.0	-68.2	27.6	algae particles	(A) peristaltic pump w/ ded tubing
	1545	12.64	1.5	7.22	22.8	5580	0.7	-73.8	21.5	↓	B) ded bladder pump
	1548	12.64	2.0	7.16	22.6	5520	0.6	-84.2	16.2	colorless, clear	C) non-ded bladder pump; or
	1550	12.64	2.5	7.10	22.5	5480	0.5	-88.7	10.8	↓	*Standard groundwater sample:*
	1553	12.64	3.0	7.07	22.4	5460	0.5	-91.6	9.7	↓	D) bailer due to limited column; or
	1555	12.64	3.5	7.05	22.4	5450	0.5	-93.5	9.3	↓	E) recovery well cycling sample
↓	1558	12.64	4.0	7.04	22.4	5440	0.4	-96.2	8.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1600	OCD-3	12.64	7.04	22.4	5440	0.4	-96.2	8.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, Pace National~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-4
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1615	NA	12.16	0.0	25.41	20.1	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

*SC confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1620	12.19	0.5	7.13	24.7	15,040	1.6	-90.4	12.6	colorless, clear	*Low-flow groundwater sample:*
	1623	12.20	1.0	7.01	23.1	15,630	1.0	-88.0	10.7		(A) peristaltic pump w/ ded tubing
	1625	12.20	1.5	6.98	22.8	15,920	0.8	-84.3	9.3		B) ded bladder pump
	1628	12.20	2.0	6.96	22.6	16,220	0.7	-81.7	9.1		C) non-ded bladder pump; or
	1630	12.20	2.5	6.94	22.5	16,310	0.6	-79.6	8.6		*Standard groundwater sample:*
	1633	12.20	3.0	6.93	22.4	16,340	0.6	-78.1	8.2		D) bailer due to limited column; or
	1635	12.20	3.5	6.93	22.4	16,360	0.5	-77.0	7.9		E) recovery well cycling sample
	1638	12.20	4.0	6.92	22.4	16,370	0.5	-76.4	7.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1640	OCD-4	12.20	6.92	22.4	16,370	0.5	-76.4	7.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, Pace National~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-11A
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1735	NA	9.62	0.0	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1740	9.73	0.5	7.02	24.8	23,900	1.3	-86.6	67.0	colorless, clear w/	*Low-flow groundwater sample:*
	1743	9.73	1.0	6.92	24.0	24,000	0.8	-84.7	51.0	orange algae particles	(A) peristaltic pump w/ ded tubing
	1745	9.73	1.5	6.89	23.6	24,100	0.6	-84.2	37.2		B) ded bladder pump
	1748	9.73	2.0	6.82	23.0	24,100	0.6	-83.8	26.8		C) non-ded bladder pump; or
	1750	9.73	2.5	6.79	22.8	24,100	0.5	-82.1	21.6		*Standard groundwater sample:*
	1753	9.73	3.0	6.78	22.7	24,100	0.5	-80.4	19.5		D) bailer due to limited column; or
	1755	9.73	3.5	6.77	22.6	24,200	0.5	-79.2	19.2		E) recovery well cycling sample
↓	1758	9.73	4.0	6.76	22.6	24,200	0.5	-78.7	18.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1800	MW-11A	9.73	6.76	22.6	24,200	0.5	-78.7	18.7	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										~~VOC~~	~~HCL~~	~~8260~~
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-11B
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1810	NA	9.62	0.0	47.30	42.3	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-11B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-5
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1655	NA	10.36	0.0	25.41	20.6	Yes	Yes	Yes	Yes		Weather: Sunny, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1700	10.43	0.5	7.17	24.0	15,110	1.6	-133.0	87.0	orange tint, clear	*Low-flow groundwater sample:*
	1703	10.43	1.0	7.10	23.0	15,020	1.0	-132.8	66.0	w/orange algae particles	(A) peristaltic pump w/ ded tubing
	1705	10.43	1.5	7.07	22.7	14,960	0.8	-132.4	52.0		B) ded bladder pump
	1708	10.43	2.0	7.02	22.4	14,910	0.7	-130.7	47.8		C) non-ded bladder pump; or
	1710	10.43	2.5	6.99	22.3	14,890	0.6	-129.0	44.3		*Standard groundwater sample:*
	1713	10.43	3.0	6.98	22.2	14,850	0.5	-126.8	42.8		D) bailer due to limited column; or
	1715	10.43	3.5	6.96	22.2	14,830	0.5	-124.2	42.1		E) recovery well cycling sample
↓	1718	10.43	4.0	6.95	22.1	14,820	0.4	-121.5	41.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1720	OCD-5	10.43	6.95	22.1	14,820	0.4	-121.5	41.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-87
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	845	NA	9.15	0.0	20.39	15.1	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	850	9.27	0.5	7.48	21.7	14,510	1.9	-102.3	6.2	colorless, clear	*Low-flow groundwater sample:*
	853	9.32	1.0	7.32	21.4	14,570	1.0	-130.7	4.9		(A) peristaltic pump w/ ded tubing
	855	9.36	1.5	7.27	21.1	14,610	0.8	-142.4	4.1		B) ded bladder pump
	858	9.39	2.0	7.21	20.9	14,670	0.6	-155.8	2.2		C) non-ded bladder pump; or
	900	9.42	2.5	7.15	20.9	14,700	0.6	-163.2	1.9		*Standard groundwater sample:*
	903	9.45	3.0	7.12	20.8	14,720	0.5	-168.1	1.6		D) bailer due to limited column; or
	905	9.48	3.5	7.10	20.8	14,740	0.5	-171.0	1.7		E) recovery well cycling sample
	908	9.51	4.0	7.09	20.8	14,750	0.5	-173.2	1.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	910	MW-87	9.51	7.09	20.8	14,750	0.5	-173.2	1.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								~~Anions (Chloride,Fluoride,Sulfate)~~			~~Neat~~	~~300~~
							~~Cations (Ca,K,Na), taken from total metals bottle~~				~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, Pace National~~
										~~TDS~~	~~Neat~~	~~2540C~~
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-18A
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	935	NA	10.68	0.0	22.58	17.9	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	940	10.90	0.5	7.38	21.5	20,100	1.2	-187.4	4.3	colorless, clear	*Low-flow groundwater sample:*
	943	10.98	1.0	7.23	20.9	20,100	0.8	-194.7	3.0		(A) peristaltic pump w/ ded tubing
	945	11.05	1.5	7.19	20.8	20,100	0.7	-197.2	2.6		B) ded bladder pump
	948	11.10	2.0	7.16	20.8	20,200	0.6	-198.7	2.2		C) non-ded bladder pump; or
	950	11.13	2.5	7.12	20.8	20,200	0.5	-200.1	1.9		*Standard groundwater sample:*
	953	11.16	3.0	7.09	20.7	20,200	0.5	-201.3	1.8		D) bailer due to limited column; or
	955	11.19	3.5	7.07	20.7	20,200	0.4	-201.9	1.4		E) recovery well cycling sample
	958	11.22	4.0	7.05	20.8	20,200	0.4	-202.4	1.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1000	MW-18A	11.22	7.05	20.8	20,200	0.4	-202.4	1.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-18B
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	930	NA	10.64	0.0	50.59	45.6	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-18B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only ; Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-18T
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	925	NA	10.73	0.0	50.57	NS	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

*New TOC information needed if not surveyed after 1H18 event.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-70
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1020	NA	9.02	0.0	22.05	16.8	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1025	9.09	0.5	7.58	23.5	7540	1.4	-139.7	12.1	colorless, clear	*Low-flow groundwater sample:*
↓	1028	9.10	1.0	7.41	22.6	6710	0.9	-144.4	9.6	↓	(A) peristaltic pump w/ ded tubing
	1030	9.10	1.5	7.32	22.0	6380	0.7	-146.2	8.7		B) ded bladder pump
	1033	9.10	2.0	7.25	21.7	6250	0.7	-147.3	8.4		C) non-ded bladder pump; or
	1035	9.10	2.5	7.20	21.6	6210	0.6	-146.1	7.3		*Standard groundwater sample:*
	1038	9.10	3.0	7.17	21.5	6180	0.6	-144.9	7.1		D) bailer due to limited column; or
	1040	9.10	3.5	7.15	21.5	6170	0.6	-143.8	6.9		E) recovery well cycling sample
↓	1043	9.10	4.0	7.14	21.4	6150	0.5	-143.1	6.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1045	MW-70	9.10	7.14	21.4	6150	0.5	-143.1	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, Pace National~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-02 (same analysis)

Navajo Refining Company — **Well:** MW-124
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1105	NA	9.63	0.0	22.00	17.0	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1110	9.68	0.5	7.32	23.4	11,250	1.6	-109.2	36.2	colorless, sl. cloudy	*Low-flow groundwater sample:*
	1113	9.68	1.0	7.24	22.4	11,360	1.0	-100.4	28.7	(orange particles)	(A) peristaltic pump w/ ded tubing
	1115	9.68	1.5	7.19	22.0	11,430	0.7	-106.4	18.1	↓	B) ded bladder pump
	1118	9.68	2.0	7.11	21.7	11,480	0.6	-108.0	10.2	colorless, clear	C) non-ded bladder pump; or
	1120	9.68	2.5	7.08	21.6	11,500	0.6	-109.9	8.7		*Standard groundwater sample:*
	1123	9.68	3.0	7.06	21.5	11,510	0.6	-110.7	7.2		D) bailer due to limited column; or
	1125	9.68	3.5	7.05	21.4	11,520	0.5	-112.6	6.9		E) recovery well cycling sample
↓	1128	9.68	4.0	7.04	21.4	11,530	0.5	-113.3	6.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1130	MW-124	9.68	7.04	21.4	11,530	0.5	-113.3	6.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1145	EB-EP-02	NA	→	→	→	→	→	→	same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Driveway near bldg. A/C unit

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-52
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BEH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1830	NA	18.47	0.0	39.67	29.5	Yes	Yes	Yes	Yes		Weather: Sunny, 90s
10-3-18	1300	NA	18.44	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1305	18.49	0.5	7.29	25.6	3410	1.7	0.8	10.1	Colorless, clear	*Low-flow groundwater sample:*
	1308	18.50	1.0	7.12	24.7	3170	1.2	4.2	8.6		(A) peristaltic pump w/ ded tubing
	1310	18.50	1.5	7.02	23.9	2830	1.0	8.6	5.8		B) ded bladder pump
	1313	18.50	2.0	6.96	23.3	2680	0.9	11.3	4.9		C) non-ded bladder pump; or
	1315	18.50	2.5	6.91	23.2	2610	0.9	11.9	4.4		*Standard groundwater sample:*
	1318	18.50	3.0	6.90	23.1	2580	0.8	12.6	3.7		D) bailer due to limited column; or
	1320	18.50	3.5	6.89	23.1	2560	0.8	13.1	3.2		E) recovery well cycling sample
	1323	18.50	4.0	6.88	23.0	2550	0.8	13.7	2.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1325	MW-52	18.50	6.88	23.0	2550	0.8	13.7	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

E. side of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-109
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1835	NA	17.08	0.0	29.48	25.5	Yes	Yes	Yes	Yes		Weather: Sunny, 90s
10-3-18	1345	NA	17.09	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1350	17.25	0.5	6.88	25.7	3260	1.2	-369.5	7.1	Clear, black tint, odor	*Low-flow groundwater sample:*
↓	1353	17.31	1.0	6.79	24.8	3260	1.0	-378.2	6.4	↓	(A) peristaltic pump w/ ded tubing
	1355	17.36	1.5	6.73	24.4	3270	0.8	-382.1	5.9		B) ded bladder pump
	1358	17.39	2.0	6.65	24.1	3270	0.7	-392.5	5.2		C) non-ded bladder pump; or
	1400	17.41	2.5	6.63	24.0	3240	0.6	-397.3	4.8		*Standard groundwater sample:*
	1403	17.42	3.0	6.60	24.0	3220	0.6	-400.8	4.3		D) bailer due to limited column; or
	1405	17.43	3.5	6.59	23.9	3210	0.5	-402.7	3.9		E) recovery well cycling sample
↓	1408	17.44	4.0	6.58	23.9	3210	0.5	-405.1	3.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1410	MW-109	17.44	6.58	23.9	3210	0.5	-405.1	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

West-side driveway of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-110
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH / GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1840	NA	15.30	0.0	29.74	24.7	Yes	Yes	Yes	Yes		Weather: Sunny, 80's
10/3/18	1445	NA	15.25									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1450	15.44	0.5	7.01	24.6	1760	3.0	-194.2	24.2	colorless / clear / odor	*Low-flow groundwater sample:*
	1453	15.50	1.0	7.00	23.4	1810	1.8	-198.7	21.1		(A) peristaltic pump w/ ded tubing
	1455	15.52	1.5	7.00	22.5	1836	1.4	-201.8	18.2		B) ded bladder pump
	1457	15.54	2.0	7.01	21.9	1847	1.2	-203.6	20.2		C) non-ded bladder pump; or
	1500	15.56	2.5	7.01	21.8	1844	1.2	-204.0	22.3		*Standard groundwater sample:*
	1503	15.58	3.0	7.01	21.6	1853	1.1	-205.3	24.6		D) bailer due to limited column; or
	1505	15.59	3.5	7.02	21.6	1852	1.1	-205.6	23.9		E) recovery well cycling sample
	1507	15.60	4.0	7.02	21.7	1849	1.0	-205.8	24.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/3/18	1515	MW-110	15.60	7.02	21.7	1849	1.0	-205.8	24.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only; Not in "Sampling" Program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-18	915	NA	12.62	0.0	21.10	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only; Not in "Sampling" Program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-69
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-18	920	NA	11.01	0.0	2251	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only; Not in "Sampling" Program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-18	925	NA	10.39	0.0	17.93	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only; Not in "sampling" program due to location E. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-24
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-18	850	NA	12.20	0.0	23.51	NS	Yes	Yes	Issue	Yes		Weather: Sunny, 70s

↳ Broken hasp/hinge ... well is locked but will not close securely

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge only; Not in "sampling" program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-14
Event: 2H18
Area of Concern: EP

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BRA

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-18	855	NM	11.86	NM	11.86	NS	Yes	Issue	Yes	Yes		Weather: Sunny, 70s

*Blockage at 11.86' TOC

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Bag tube] Gauge only; Recently off, due to water rights issues (when sampled, sampled by port when RW is active)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-12R
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Above-grade Vault ✓	Other 12-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1301	NA	20.24	0.0	nm	Top of pump (if pump is not operating)	yes	yes	yes	yes		Weather: Hyc/dy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5							or	(E) recovery well cycling sample, if
			4.0								F) irrigation well grab sample active

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Dup-REST-01
+ EB-REST-01
(both for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-113
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in ✓	PVC ✓
Upright ✓	4-in	SS
Vault	Other	Other

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1310	NA	20.11	0.0	37.80	33.8	yes	yes	yes	yes		Weather: Partly cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1315	20.13	0.5	7.06	22.6	3853	2.9	-97.1	8.6	colorless/clear	*Low-flow groundwater sample:*
	1318	20.14	1.0	6.95	22.5	3887	2.5	-73.4	7.3	" "	(A) peristaltic pump w/ ded tubing
	1320	20.14	1.5	6.89	22.5	3903	2.1	-65.2	5.2	" "	B) ded bladder pump
	1323	20.14	2.0	6.83	22.4	3928	1.7	-57.3	4.7	" "	C) non-ded bladder pump; or
	1325	20.14	2.5	6.79	22.4	3930	1.5	-55.8	4.3	" "	*Standard groundwater sample:*
	1328	20.14	3.0	6.77	22.4	3932	1.4	-53.6	4.1	" "	D) bailer due to limited column; or
	1330	20.14	3.5	6.76	22.3	3933	1.4	-52.9	3.9	" "	E) recovery well cycling sample
	1333	20.14	4.0	6.76	22.3	3933	1.4	-52.5	3.8	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/2/18	1335	MW-113	20.14	6.76	22.3	3933	1.4	-52.5	3.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1000	DUP-REST-01	20.14	6.76	22.3	3933	1.4	-52.5	3.8	same analysis	Same	Same
	1345	EB-REST-01	NA	—	—	—	—	—	—	same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 8
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1740	17.92	17.95	0.03	35.80	30.8	Yes	Yes	Yes	Yes		Weather: Sunny Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	(Not Sample due to LNAPL ≥ 0.03')							(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		KWB - 8								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-22
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Above-grade Vault ✓	Other 12-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Screen 11.5-39)

Initials: BD

Date	Time	Depth to * LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1745	NP	18.18	0.0	nm	Sample port if active	Yes	Yes	Yes	Yes		Weather: Partly Cldy 80's

Well Purging Record *(Double checked with second RW probe)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
		RW-22								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

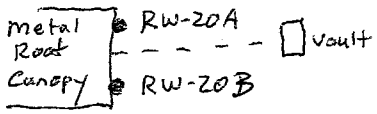
Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-20A
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other 6-in	Other __



Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1755	19.78	19.84	0.06	nm	Sample	Yes	Yes	Yes	Yes		Weather: Ptly Cldy 80's
						port						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-20A								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

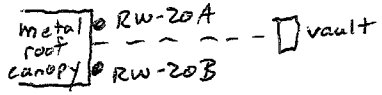
Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-20B
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other 6-in	Other __



Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BK

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1750	19.63	19.70	0.07	NM	NA - sample pport	Yes	Yes	Yes	Yes		Weather: Hot, cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-20B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged / labeled tube is stored inside above-grade vault

Gauge only (Historical LNAPL)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-13R
Event: 2H18
Area of Concern: REST

Above-grade

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other 12-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1256	19.37	19.48	0.11	NM	30.0	YES	YES	YES	YES		Weather Cloudy 70's
						(Sample part, if RW is active)						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5							or	(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-13R								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-14R
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Above-grade Vault ✓	Other 12-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1250	17.90	19.18	1.28	NM	Sample	Yes	Yes	Yes	Yes		Weather: Cloudy 70's
						Part						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-14R								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
						Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)					HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-133
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1245	18.38	18.43	0.05	37.64	27.9	Yes	Yes	Yes	Yes		Weather: Cloudy 70's
					Soft							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not sampled due to							(A) peristaltic pump w/ ded tubing
			1.5	LNAPL ≥ 0.03							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		mw-133								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
						Cations (Ca,K,Na), taken from total metals bottle					HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
						Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)					HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Trip Blank-REST-01

+ Dup-Rest-03
+ EB-Rest-03
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-134
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1730	NA	17.58	0.0	32.95	28.4	Yes	Yes	Yes	Yes		Weather: Sunny 70's
10/3/18	1030	NA	17.59	0.0	soft							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1035	17.61	0.5	7.04	22.2	5894	3.0	-60.2	7.6	Colorless/clear	*Low-flow groundwater sample:*
	1038	17.62	1.0	7.01	21.6	6234	2.1	-10.6	4.8	" "	(A) peristaltic pump w/ ded tubing
	1040	17.62	1.5	6.99	21.4	6366	1.6	+12.4	3.9	" "	B) ded bladder pump
	1043	17.62	2.0	6.95	21.4	6389	1.5	25.8	3.1	" "	C) non-ded bladder pump; or
	1045	17.62	2.5	6.93	21.3	6395	1.5	39.9	2.6	" "	*Standard groundwater sample:*
	1048	17.62	3.0	6.92	21.3	6398	1.4	44.4	2.4	" "	D) bailer due to limited column; or
	1050	17.62	3.5	6.91	21.3	6401	1.4	45.0	2.4	" "	E) recovery well cycling sample
	1053	17.62	4.0	6.89	21.3	6405	1.4	45.3	2.3	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1055	MW-134	17.62	6.89	21.3	6405	1.4	45.3	2.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1200	Dup-REST-03	17.62	6.89	21.3	6405	1.4	45.3	2.3	Same analysis	same	same
	1105	EB-REST-03	NA							same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, block bldg.
No purge
Sample port (faucet)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4798
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in	PVC
Upright	4-in	SS
Vault	Other	Other

NA

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 840-850 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/18	1150	NA	NA	NA	NA	NA	~~NA~~	NA	NA	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	No purge, active water					well	Colorless/clear	B) ded bladder pump
			2.0	with sample port							C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1150	RA-4798	NA	7.03	20.3	1653	2.2	12.4	0.8	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, block bldg.
No purge
Sample port (faucet)

Navajo Refining Company — **Well:** RA-4196
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in	PVC
Upright	4-in	SS
Vault	Other	Other

NA

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 280-292 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/18	1220	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Sunny 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Colorless/clear	*Low-flow groundwater sample:*
			1.0	No purge, active water well with							A) peristaltic pump w/ ded tubing
			1.5	sample port.							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1220	RA-4196	NA	7.04	27.1	2634	2.2	-18.6	1.9	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No Activity for 2H18 event

Do not address - Removed from program by Navajo, 4-13-15

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-1227
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in	PVC
Upright	4-in	SS
Vault	Other	Other

Irrigation well removed from program

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 194-246 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		DO NOT ADDRESS						A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No Activity for 2H18 event

Monitoring Well Purging and Sampling Record

Irrigation well
No purge
Sample part

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-3156
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade	2-in	PVC
Upright	4-in	SS
Vault	Other	Other

NA

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RA-3156								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

East of MW-101, across the street

No Activity for 2H18 event

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: RA-313
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
NA		
At-Grade	2-in	PVC
Upright	4-in	SS
Vault	Other	Other

Irrigation & water supply role, per Navajo shift foreman (Doug Collins, 1H16)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 904-1157 Ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18												Weather:
						Sample port (By tank 465)						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RA-313								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Pecan Grove)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-7
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	855	NA	18.10	0.0	34.83	30.6	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	900	18.11	0.5	7.16	20.2	4900	1.6	-203.8	3.2	Clear (strong HC)	*Low-flow groundwater sample:*
↓	903	18.12	1.0	7.06	20.1	4916	1.3	-203.9	2.4	" Colorless odor	(A) peristaltic pump w/ ded tubing
	905	18.12	1.5	7.03	20.0	4921	1.2	-199.6	1.9	" "	B) ded bladder pump
	908	18.12	2.0	7.01	19.9	4925	1.1	-197.8	1.6	" "	C) non-ded bladder pump; or
	910	18.12	2.5	7.00	19.9	4929	1.1	-196.1	1.4	" "	*Standard groundwater sample:*
	913	18.12	3.0	6.99	19.8	4931	1.1	-195.8	1.3	" "	D) bailer due to limited column; or
	915	18.12	3.5	6.98	19.8	4933	1.0	-195.1	1.3	" "	E) recovery well cycling sample
↓	918	18.12	4.0	6.98	19.8	4935	1.0	-194.8	1.3	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	920	KWB-7	18.12	6.98	19.8	4935	1.0	-194.8	1.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

*HM1 - dedicated bladder pump

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-135
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1155	NA	28.99	0.0	65.55	50.0	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity		
10/2/18	1200	29.01	0.5	7.06	21.1	7156	3.4	-30.2	101.0	tan (slightly cldy)		*Low-flow groundwater sample:*
	1203	29.01	1.0	7.43	20.2	7964	2.1	+27.4	91.6	"	"	A) peristaltic pump w/ ded tubing
	1205	29.01	1.5	7.19	19.7	8387	1.9	44.9	70.4	"	"	(B) ded bladder pump
	1208	29.01	2.0	7.01	19.6	8438	1.7	48.6	61.3	"	"	C) non-ded bladder pump; or
	1210	29.01	2.5	6.98	19.5	8456	1.6	50.2	54.8	"	"	*Standard groundwater sample:*
	1213	29.01	3.0	6.96	19.4	8469	1.6	51.3	51.5	"	"	D) bailer due to limited column; or
	1215	29.01	3.5	6.95	19.4	8474	1.5	52.0	49.7	"	"	E) recovery well cycling sample
	1218	29.01	4.0	6.94	19.4	8477	1.5	52.2	49.2	"	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1220	MW-135	29.01	6.94	19.4	8477	1.5	52.2	49.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500-~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-20
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1525	NA	15.17	0.00	26.66	21.9	Yes	Yes	Yes	Yes		Weather: Hot y cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
		MW-20								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only - Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-3
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/18	1530	NM	17.11	0.0	21.59	NS	Yes	Yes	Yes	Yes		Weather: Pthy Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only - Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-4
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1534	NA	27.88	0.0	36.98	NS	Yes	Yes	Yes	Yes		Weather: PHy Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only ; Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-2
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1521	NA	16.94	0.0	21.49	NS	Yes	Yes	Yes	Yes		Weather: Partly Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-1
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1545	NA	17.24	0.0	21.88	19.6	Yes	Yes	Yes	Yes		Weather: Hzy Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1550	17.24	0.5	6.93	22.8	6029	3.8	-19.4	4.8	Colorless clear	*Low-flow groundwater sample:*
	1553	17.24	1.0	6.89	22.1	6098	2.8	-19.0	3.6	" "	A) peristaltic pump w/ ded tubing
	1555	17.24	1.5	6.85	21.8	6121	2.5	-17.2	2.5	" "	B) ded bladder pump
	1558	17.25	2.0	6.82	21.6	6132	2.2	-16.1	2.3	" "	C) non-ded bladder pump; or
	1600	17.25	2.5	6.80	21.5	6138	2.0	-14.8	2.0	" "	*Standard groundwater sample:*
	1603	17.25	3.0	6.79	21.4	6141	1.9	-14.5	1.8	" "	D) bailer due to limited column; or
	1605	17.25	3.5	6.78	21.3	6144	1.9	-14.1	1.7	" "	E) recovery well cycling sample
	1608	17.25	4.0	6.78	21.3	6146	1.9	-13.9	1.7	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/2/18	1610	NP1	17.25	6.78	21.3	6146	1.9	-13.9	1.7	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, Pace National~~
										~~TDS~~	~~Neat~~	~~2540C~~
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-6
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1510	NA	13.87	0.0	20.35	15.4	Yes	Yes	Yes	Yes		Weather: Ptly cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-8
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1517	NA	15.04	0.0	23.30	18.3	Yes	Yes	Yes	Yes		Weather: PHy Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		mw-8										Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank -TMD-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-21
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1635	N/A	14.39	0.0	25.12	19.9	yes	Yes	Yes	yes		Weather: Sunny Cldy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity		
10/2/18	1640	14.44	0.5	7.37	23.6	7152	3.6	-44.7	5.1	Colorless/Clear		*Low-flow groundwater sample:*
	1643	14.46	1.0	7.18	22.4	7384	3.1	-17.4	4.4	"	"	(A) peristaltic pump w/ ded tubing
	1645	14.47	1.5	7.06	22.1	7402	2.9	+1.6	3.8	"	"	B) ded bladder pump
	1648	14.47	2.0	7.03	21.9	7412	2.7	3.1	3.6	"	"	C) non-ded bladder pump; or
	1650	14.47	2.5	7.01	21.8	7418	2.5	3.9	3.1	"	"	*Standard groundwater sample:*
	1653	14.47	3.0	7.00	21.8	7422	2.3	4.2	3.0	"	"	D) bailer due to limited column; or
	1655	14.47	3.5	6.99	21.7	7425	2.3	4.5	2.8	"	"	E) recovery well cycling sample
	1658	14.47	4.0	6.98	21.7	7428	2.2	4.7	2.7	"	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1700	MW-21	14.47	6.98	21.7	7428	2.2	4.7	2.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only; Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-9
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1502	NA	15.47	0.0	22.25	NS	Yes	Yes	Yes	Yes		Weather: Partly Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-71
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1457	NA	15.42	0.03	21.67	16.9	Yes	Yes	Yes	Yes		Weather: Partly Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-71								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-68
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1450	NA	27.22	0.00	26.52	~~23.5~~	Yes	Yes	Yes	Yes		Weather: Hy Cldy 90's

↳ Sample intake permanently lowered to 23.5' TOC

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-68								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-27
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1438	NA	19.20	0.0	30.28	25.0	YES	YES	YES	YES		Weather: PHy Cldy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-27								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-89
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1420	NA	10.89	0.0	20.28	15.2	Yes	Yes	Yes	YES		Weather: Hydy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-89								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-16
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1425	NA	8.33	0.0	21.24	16.2	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-16								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-26
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1431	NA	9.69	0.0	27.58	22.6	Yes	Yes	Yes	Yes		Weather: Partly Cldy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-26								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Pecan grove-access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11A
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1005	NA	17.98	0.0	42.27	37.0	YES	YES	YES	YES		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1010	18.00	0.5	7.31	20.3	5857	2.4	-102.6	4.9	Colorless Clear	*Low-flow groundwater sample:*
	1013	18.00	1.0	7.06	20.1	6275	1.9	-88.4	3.1	" "	(A) peristaltic pump w/ ded tubing
	1015	18.00	1.5	6.99	19.9	6302	1.6	-78.3	2.5	" "	B) ded bladder pump
	1018	18.00	2.0	6.88	19.8	6342	1.4	-74.2	2.2	" "	C) non-ded bladder pump; or
	1020	18.00	2.5	6.85	19.8	6351	1.3	-72.8	2.1	" "	*Standard groundwater sample:*
	1023	18.00	3.0	6.82	19.7	6358	1.2	-71.3	2.0	" "	D) bailer due to limited column; or
	1025	18.00	3.5	6.80	19.7	6362	1.2	-70.6	2.0	" "	E) recovery well cycling sample
	1028	18.00	4.0	6.79	19.7	6365	1.2	-69.8	1.9	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1030	KWB-11A	18.00	6.79	19.7	6365	1.2	-69.8	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Pecan grove access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11B
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1050	NA	18.74	0.0	72.45	62.2	Yes	Yes	Yes	Yes	X	Weather: Cloudy 70's

X (Severely cracked pad) needs new pad
same as last event

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1055	18.81	0.5	7.19	21.3	4581	1.4	-23.4	3.6	colorless, clear	*Low-flow groundwater sample:*
	1058	18.83	1.0	7.10	20.2	4561	1.3	-3.5	2.7	" "	(A) peristaltic pump w/ ded tubing
	1100	18.83	1.5	7.04	20.1	4547	1.0	+5.6	2.4	" "	B) ded bladder pump
	1103	18.83	2.0	7.01	19.9	4536	0.8	10.2	2.1	" "	C) non-ded bladder pump; or
	1105	18.83	2.5	6.99	19.8	4532	0.7	10.8	1.8	" "	*Standard groundwater sample:*
	1108	18.83	3.0	6.98	19.7	4529	0.7	11.3	1.6	" "	D) bailer due to limited column; or
	1110	18.83	3.5	6.98	19.7	4526	0.7	11.8	1.5	" "	E) recovery well cycling sample
	1113	18.83	4.0	6.97	19.6	4524	0.6	12.1	1.5	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/2/18	1115	KWB-11B	18.83	6.97	19.6	4524	0.6	12.1	1.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Removed from program per Navajo, 4-13-15 (Farmer - Jack Joy, 575-365-6042)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-3AR
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

ATV - S. Field RO-reject water field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-115
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: BD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1720	NA	5.20	0.0	27.50	19.8	Yes	Yes	Yes	Yes		Weather: Sunny 70's
10/3/18	840	NA	5.18	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	845	5.21	0.5	7.26	20.7	5082	3.9	-96.6	2.7	Colorless/clear	*Low-flow groundwater sample:*
	848	5.22	1.0	7.11	20.0	5085	2.7	-50.3	2.0	" "	(A) peristaltic pump w/ ded tubing
	850	5.22	1.5	7.05	19.7	5087	2.4	-39.8	1.6	" "	B) ded bladder pump
	853	5.22	2.0	7.03	19.5	5089	2.0	-20.4	1.5	" "	C) non-ded bladder pump; or
	855	5.22	2.5	7.01	19.5	5091	1.7	+1.4	1.3	" "	*Standard groundwater sample:*
	858	5.22	3.0	7.00	19.4	5093	1.6	8.6	1.1	" "	D) bailer due to limited column; or
	900	5.22	3.5	6.99	19.4	5093	1.5	10.3	1.1	" "	E) recovery well cycling sample
	903	5.22	4.0	6.98	19.4	5094	1.5	11.8	1.0	" "	F) irrigation well grab sample
	905	5.22	4.5	6.98	19.4	5094	1.4	12.1	1.0	" "	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	910	MW-115	5.22	6.98	19.4	5094	1.4	12.1	1.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

ATV - S. Field RO-reject water Field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-114
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1725	NA	7.76	0.0	38.25	30.5	Yes	Yes	Yes	Yes		Weather: Sunny 70's
10/3/18	925	NA	7.73	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	930	7.76	0.5	6.98	22.6	4274	3.2	56.9	8.6	Colorless / clear	*Low-flow groundwater sample:*
	933	7.76	1.0	6.91	22.4	4298	2.4	55.4	6.3	" "	(A) peristaltic pump w/ ded tubing
	935	7.76	1.5	6.84	22.3	4271	1.9	52.6	5.0	" "	B) ded bladder pump
	938	7.76	2.0	6.83	22.2	4248	1.5	50.8	4.2	" "	C) non-ded bladder pump; or
	940	7.76	2.5	6.82	22.2	4213	1.3	50.1	3.5	" "	*Standard groundwater sample:*
	943	7.76	3.0	6.82	22.2	4196	1.2	49.7	3.2	" "	D) bailer due to limited column; or
	945	7.76	3.5	6.81	22.1	4189	1.2	49.2	3.0	" "	E) recovery well cycling sample
	948	7.76	4.0	6.81	22.1	4185	1.2	48.8	2.9	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	950	MW-114	7.76	6.81	22.1	4185	1.2	48.8	2.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-117
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1624	NA	9.91	0.0	27.22	19.7	Yes	Yes	Yes	Yes		Weather: SUNNY, 70's
10/3/18	910	NA	9.94									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	915	9.94	0.5	6.79	19.0	3590	4.1	28.2	45.1	colorless / sl. Cloudy	*Low-flow groundwater sample:*
	917	9.94	1.0	6.73	18.6	3580	2.8	28.6	39.3	↓	(A) peristaltic pump w/ ded tubing
	920	9.94	1.5	6.62	19.0	3570	2.5	30.0	23.0	colorless / clear	B) ded bladder pump
	923	9.94	2.0	6.67	18.7	3580	2.4	31.6	11.9		C) non-ded bladder pump; or
	925	9.94	2.5	6.65	18.5	3580	2.1	32.9	8.7		*Standard groundwater sample:*
	927	9.94	3.0	6.65	18.5	3580	2.0	33.5	8.0		D) bailer due to limited column; or
	930	9.94	3.5	6.64	18.5	3580	2.0	33.9	7.1		E) recovery well cycling sample
↓	933	9.94	4.0	6.64	18.5	3580	1.9	34.6	6.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	935	MW-117	9.94	6.64	18.5	3580	1.9	34.6	6.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-118
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1631	NA	10.47	0.0	28.29	21.0	Yes	Yes	Yes	Yes		Weather: Sunny, 80's
10/3/18	955	NA	10.51									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1000	10.62	0.5	6.80	20.7	3950	3.9	39.9	88.7	Colorless / sl. cloudy	*Low-flow groundwater sample:*
↓	1003	10.63	1.0	6.73	19.6	3940	3.2	42.6	36.0	↓	(A) peristaltic pump w/ ded tubing
↓	1005	10.63	1.5	6.71	19.2	3950	2.9	43.2	22.1	colorless / clear	B) ded bladder pump
↓	1007	10.63	2.0	6.69	18.9	3950	2.7	43.8	15.4	↓	C) non-ded bladder pump; or
↓	1010	10.63	2.5	6.70	19.0	3930	2.6	43.8	10.2	↓	*Standard groundwater sample:*
↓	1013	10.63	3.0	6.70	19.0	3940	2.6	43.9	7.4	↓	D) bailer due to limited column; or
↓	1015	10.63	3.5	6.70	19.0	3940	2.5	44.0	6.8	↓	E) recovery well cycling sample
↓	1017	10.63	4.0	6.69	19.0	3930	2.5	44.1	6.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1020	mw-118	10.63	6.69	19.0	3930	2.5	44.1	6.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only - Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-9
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1639	NA	9.22	0.0	25.65	NS	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-119
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1646	NA	9.80	0.0	28.11	20.8	Yes	Yes	Yes	Yes		Weather: SUNNY, 70's
10/3/18	1040	NA	9.81									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1045	9.82	0.5	6.78	22.2	4010	2.6	34.4	44.4	Colorless / Clear	*Low-flow groundwater sample:*
↓	1047	9.82	1.0	6.70	21.4	4060	1.6	36.2	30.1	↓	(A) peristaltic pump w/ ded tubing
	1050	9.82	1.5	6.69	21.1	4070	1.4	36.7	15.3		B) ded bladder pump
	1052	9.82	2.0	6.68	20.9	4060	1.4	37.0	10.0		C) non-ded bladder pump; or
	1055	9.82	2.5	6.68	21.0	4070	1.4	37.0	7.3		*Standard groundwater sample:*
	1057	9.82	3.0	6.68	21.0	4070	1.4	36.5	6.5		D) bailer due to limited column; or
	1100	9.82	3.5	6.68	21.0	4070	1.3	36.5	5.9		E) recovery well cycling sample
↓	1103	9.82	4.0	6.68	21.0	4080	1.3	36.4	5.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/3/18	1105	MW-119	9.82	6.68	21.0	4080	1.3	36.4	5.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

(Cross-gradient)

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-5
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	828	NA	11.78	0.0	25.09	20.0	Yes	Yes	Yes	Yes		Weather: Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		NP-5								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

(Cross-gradient ; N. of RO-reject field)
Installed 7-28-14

Monitoring Well Purging and Sampling Record

Navajo Refining Company — Artesia Refinery — Artesia, New Mexico
Well: MW-136
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring for TRC Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1005	NA	12.57	0.0	27.90	23.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's
					by soft Base							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1010	12.61	0.5	6.77	19.7	4040	4.7	12.4	43.9	colorless / sl. cloudy	*Low-flow groundwater sample:*
↓	1013	12.61	1.0	6.67	19.1	4040	1.8	15.4	29.1	↓	(A) peristaltic pump w/ ded tubing
	1015	12.61	1.5	6.66	19.0	4030	1.5	17.3	17.3	colorless / clear	B) ded bladder pump
	1017	12.61	2.0	6.65	19.0	4030	1.4	18.8	9.3		C) non-ded bladder pump; or
	1020	12.61	2.5	6.65	18.8	4030	1.3	20.4	5.9		*Standard groundwater sample:*
	1023	12.61	3.0	6.64	18.6	4030	1.2	22.9	4.7		D) bailer due to limited column; or
	1025	12.61	3.5	6.64	18.6	4030	1.2	23.6	4.3		E) recovery well cycling sample
↓	1027	12.61	4.0	6.64	18.6	4030	1.2	21.9	4.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1030	MW-136	12.61	6.64	18.6	4030	1.2	21.9	4.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126A
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1050	NA	17.10	0.0	37.51	29.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1055	17.11	0.5	6.88	21.2	3040	3.5	-156.6	63.4	colorless / sl. cloudy	*Low-flow groundwater sample:*
↓	1057	17.11	1.0	6.80	20.2	3060	2.1	-149.0	48.8	↓	(A) peristaltic pump w/ ded tubing
↓	1100	17.11	1.5	6.77	19.8	2950	1.9	-149.6	39.4	↓	B) ded bladder pump
↓	1103	17.11	2.0	6.76	19.7	2900	1.8	-149.4	25.0	colorless / clear	C) non-ded bladder pump; or
↓	1105	17.11	2.5	6.75	19.5	2850	1.7	-150.8	12.3	↓	*Standard groundwater sample:*
↓	1107	17.11	3.0	6.75	19.5	2820	1.7	-151.8	8.4	↓	D) bailer due to limited column; or
↓	1110	17.11	3.5	6.74	19.4	2800	1.6	-152.1	5.6	↓	E) recovery well cycling sample
↓	1113	17.11	4.0	6.74	19.2	2770	1.6	-154.0	4.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1115	MW-126A	17.11	6.74	19.2	2770	1.6	-154.0	4.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126B
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AOS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1130	NA	16.95	0.0	51.43	48.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's
					↳ Soft Base							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1135	17.06	0.5	6.78	20.4	3520	3.5	-110.7	9.7	colorless/clear	*Low-flow groundwater sample:*
↓	1137	17.09	1.0	6.68	19.3	3570	1.8	-92.1	6.3	↓	(A) peristaltic pump w/ ded tubing
	1140	17.10	1.5	6.67	19.1	3580	1.5	-85.7	4.1		B) ded bladder pump
	1143	17.10	2.0	6.63	18.9	3610	1.3	-71.3	3.6		C) non-ded bladder pump; or
	1145	17.10	2.5	6.64	18.7	3630	1.3	-65.7	3.2		*Standard groundwater sample:*
	1147	17.10	3.0	6.63	18.7	3630	1.4	-61.3	3.1		D) bailer due to limited column; or
	1150	17.10	3.5	6.63	18.7	3630	1.4	-57.2	2.7		E) recovery well cycling sample
↓	1153	17.10	4.0	6.63	18.7	3640	1.3	-55.8	2.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/2/18	1155	MW-126B	17.10	6.63	18.7	3640	1.3	-55.8	2.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-127
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GOS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1210	NA	20.43	0.0	53.21	38.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1215	20.49	0.5	6.72	22.8	2400	2.7	-225.3	43.9	Colorless / Sl. Cloudy	*Low-flow groundwater sample:*
↓	1217	20.49	1.0	6.69	22.1	2390	2.0	-231.4	40.4	↓	(A) peristaltic pump w/ ded tubing
	1220	20.49	1.5	6.67	21.8	2380	1.9	-234.7	38.1		B) ded bladder pump
	1223	20.49	2.0	6.66	21.6	2370	1.9	-236.7	33.6		C) non-ded bladder pump; or
	1225	20.49	2.5	6.66	21.5	2350	1.9	-238.5	17.8	Colorless / clear	*Standard groundwater sample:*
	1227	20.49	3.0	6.65	21.5	2340	1.8	-240.1	9.4	↓	D) bailer due to limited column; or
	1230	20.49	3.5	6.65	21.4	2340	1.8	-241.4	5.3		E) recovery well cycling sample
↓	1233	20.49	4.0	6.65	21.5	2340	1.8	-242.8	4.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1235	mw-127	20.49	6.65	21.5	2340	1.8	-242.8	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-129
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GJS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1253	22.39	22.76	0.37	53.08	38.2	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		mw-129								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#18A
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	957	NA	13.96	0.0	17.78	12.7	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-#18A								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1A
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: KDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	920	NA	15.73	0.0	33.50	25.8	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	925	15.74	0.5	6.80	18.0	4120	3.7	-36.2	6.7	colorless / clear	*Low-flow groundwater sample:*
	927	15.74	1.0	6.74	17.6	4180	1.7	-30.0	5.9		(A) peristaltic pump w/ ded tubing
	930	15.74	1.5	6.74	17.5	4190	1.5	-28.5	5.0		B) ded bladder pump
	933	15.74	2.0	6.73	17.4	4210	1.5	-25.7	4.4		C) non-ded bladder pump; or
	935	15.74	2.5	6.74	17.3	4220	1.5	-22.3	3.7		*Standard groundwater sample:*
	937	15.74	3.0	6.74	17.3	4220	1.6	-19.7	3.3		D) bailer due to limited column; or
	940	15.74	3.5	6.75	17.3	4220	1.6	-17.8	3.0		E) recovery well cycling sample
↓	943	15.74	4.0	6.75	17.3	4230	1.6	-16.1	2.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	945	KWB-1A	15.74	6.75	17.3	4230	1.6	-16.1	2.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only; Not in "sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KwB-1B
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GJS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	951	NA	17.40	0.0	33.92	NS	Yes	Yes	Yes	Yes		Weather: cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		KwB-1B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1C
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	954	NM	18.02	0.0	52.71	42.7	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		KWB-1C								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Located ~25'N of original KWB-10 pad]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-10R
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	835	17.22	17.23	0.01	29.46	22.0	Yes	Yes	Yes	Yes		Weather: Cloudy, 60's

Well Purging Record

* removed LNAPL prior to purge/sample

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	840	17.30	0.5	6.76	18.6	1553	2.6	-103.7	16.6	colorless/clear/odor	*Low-flow groundwater sample:*
	843	17.32	1.0	6.71	18.5	1554	2.3	-108.8	9.0		(A) peristaltic pump w/ ded tubing
	845	17.33	1.5	6.69	18.5	1550	2.0	-114.3	4.1		B) ded bladder pump
	847	17.33	2.0	6.67	18.5	1548	1.9	-120.6	3.2		C) non-ded bladder pump; or
	850	17.33	2.5	6.67	18.5	1548	1.8	-122.3	2.6		*Standard groundwater sample:*
	853	17.33	3.0	6.67	18.5	1550	1.8	-128.4	1.9		D) bailer due to limited column; or
	855	17.33	3.5	6.67	18.6	1548	1.9	-128.2	2.2		E) recovery well cycling sample
↓	857	17.33	4.0	6.67	18.6	1550	1.9	-128.7	1.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	900	KWB-10R	17.33	6.67	18.6	1550	1.9	-128.7	1.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										ok ~~*Short List*~~ Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1249	23.43	23.61	0.18	53.35	38.1	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT SAMPLED DUE to well having						C) non-ded bladder pump; or
			2.5			LNAPL thickness ≥ 0.03'					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-13								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

* DEDICATE BLADDER PUMP IN THIS WELL IN 1H19 due to DTW. (NEED "FLAT CAP" w/ eybolt due to monument clearance)

Navajo Refinery Company — **Well:** KWB-5
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring for TRC Houston, Texas

Initials: MDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1415	NA	23.24	0.0	37.68	30.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1420	23.30	0.5	6.71	25.6	2510	3.6	-128.8	7.1	colorless / clear	*Low-flow groundwater sample:*
|	1423	23.30	1.0	6.67	25.1	2500	3.1	-132.3	5.2	|	(A) peristaltic pump w/ ded tubing
|	1425	23.30	1.5	6.65	24.8	2500	3.0	-138.2	3.7	|	B) ded bladder pump
|	1427	23.30	2.0	6.64	24.5	2500	3.1	-144.2	3.1	|	C) non-ded bladder pump; or
|	1430	23.30	2.5	6.64	24.4	2510	3.0	-149.4	2.8	|	*Standard groundwater sample:*
|	1433	23.30	3.0	6.64	24.3	2510	2.9	-150.4	3.4	|	D) bailer due to limited column; or
|	1435	23.30	3.5	6.63	24.1	2510	2.9	-151.1	2.7	|	E) recovery well cycling sample
↓	1437	23.30	4.0	6.63	24.1	2510	2.9	-152.8	2.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/2/18	1445	KWB-5	23.30	6.63	24.1	2510	2.9	-152.8	2.4	DRO	HCL	8015M
						(2510)				~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

* DEDICATED BLADDER PUMP IN THIS WELL IN 1H19 due to DTW

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-111
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AOS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1320	NA	24.09	0.0	40.83	35.8	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1325	24.16	0.5	6.73	27.0	2520	3.4	-108.0	81.3	colorless / sl. cloudy	*Low-flow groundwater sample:*
↓	1327	24.17	1.0	6.61	25.5	2530	3.1	-106.5	84.6	↓	(A) peristaltic pump w/ ded tubing
↓	1330	24.17	1.5	6.57	24.5	2530	2.8	-102.6	83.7	↓	B) ded bladder pump
↓	1333	24.17	2.0	6.55	24.1	2530	2.8	-102.5	78.3	↓	C) non-ded bladder pump; or
↓	1335	24.17	2.5	6.54	23.9	2530	2.7	-101.6	42.5	↓	*Standard groundwater sample:*
↓	1337	24.17	3.0	6.55	23.9	2530	2.7	-102.2	22.4	colorless / clear	D) bailer due to limited column; or
↓	1340	24.17	3.5	6.56	24.0	2520	2.7	-102.2	15.5	↓	E) recovery well cycling sample
↓	1343	24.17	4.0	6.57	24.0	2530	2.7	-100.8	11.4	↓	F) irrigation well grab sample
↓	1345	24.17	4.5	6.57	24.1	2520	2.8	-100.2	7.9	↓	
✓	1347	24.17	5.0	6.56	24.1	2520	2.8	-98.8	6.4		

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1350	MW-111	24.17	6.56	24.1	2520	2.8	-98.8	6.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-6
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS / BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1304	NA	21.02	0.0	36.44	27.4	Yes	Yes	YES	YES		Weather: Sunny 80's
10/3/18	1330	NA	21.01	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1335	21.03	0.5	7.01	26.6	2659	3.6	-210.8	14.8	Colorless/Clear	*Low-flow groundwater sample:*
	1338	21.04	1.0	6.88	25.5	2628	2.9	-216.7	12.9	" tiny white "	(A) peristaltic pump w/ ded tubing
	1340	21.04	1.5	6.80	25.3	2610	2.5	-218.4	11.8	" particles	B) ded bladder pump
	1343	21.04	2.0	6.72	25.1	2591	2.0	-219.9	11.2	" " "	C) non-ded bladder pump; or
	1345	21.04	2.5	6.67	24.9	2586	1.7	-221.8	7.1	" " "	*Standard groundwater sample:*
	1348	21.04	3.0	6.65	24.8	2583	1.5	-222.6	5.6	" " "	D) bailer due to limited column; or
	1350	21.04	3.5	6.64	24.8	2581	1.4	-223.1	4.9	" " "	E) recovery well cycling sample
↓	1353	21.04	4.0	6.63	24.8	2580	1.4	-223.9	4.7	" " "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1355	KWB-6	21.04	6.63	24.8	2580	1.4	-223.9	4.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-112
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CBR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/19	1259	20.30	22.90	2.60	37.54	32.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		NOT SAMPLED DUE to well having						C) non-ded bladder pump; or
			2.5			LNAPL Thickness ≥ 0.03'					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-112								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-132
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: LDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1308	18.28	19.80	1.52	42.66	NA	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED Due to well having LNAPL thickness ≥ 0.03'						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-132								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Located inside yellow vault; furthest south

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-57
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GMS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1551	NA	18.40	0.0	34.32	32.8	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
10/3/18	1125	NA	18.49									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1130	18.59	0.5	6.82	24.0	4440	4.2	39.6	6.6	Colorless/clear	*Low-flow groundwater sample:*
↓	1133	18.63	1.0	6.74	21.9	4450	3.8	43.6	5.0	↓	(A) peristaltic pump w/ ded tubing
	1135	18.66	1.5	6.72	21.2	4450	3.7	45.4	3.3		B) ded bladder pump
	1137	18.71	2.0	6.69	20.5	4440	3.7	48.3	4.1		C) non-ded bladder pump; or
	1140	18.75	2.5	6.68	20.3	4430	3.6	49.8	3.4		*Standard groundwater sample:*
	1143	18.78	3.0	6.67	20.3	4410	3.6	50.2	3.0		D) bailer due to limited column; or
	1145	18.80	3.5	6.67	20.2	4410	3.6	50.4	2.7		E) recovery well cycling sample
↓	1147	18.82	4.0	6.67	20.2	4390	3.6	50.6	2.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1150	MW-57	18.82	6.67	20.2	4390	3.6	50.6	2.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

~32" corrugated stickup Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#11-O
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC __
Upright ✓	4-in __	SS __
Vault __	Other ✓ (32")	Other ✓ (corrugated pipe)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1556	NA	20.50	0.0	22.20	NA	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-#11-O								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

until further notice, do not address in any way, per Navajo, 4-26-16 (Farmer, Jack Joy, 575-365-6042)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-9
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1559	NM	NM	NM	NM	NA	NM	NM	NM	NM		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12A
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: GNS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1605	NA	20.89	0.0	25.03	24.9	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's
10/3/18	1205	NA	20.92									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1210	21.00	0.5	6.82	24.5	3140	4.1	42.4	6.2	Colorless / Clear	*Low-flow groundwater sample:*
	1213	21.01	1.0	6.76	22.8	3150	3.7	45.8	4.0		(A) peristaltic pump w/ ded tubing
	1215	21.01	1.5	6.74	22.1	3140	3.5	48.0	2.5		B) ded bladder pump
	1217	21.01	2.0	6.73	21.3	3090	3.6	50.4	2.1		C) non-ded bladder pump; or
	1220	21.01	2.5	6.73	21.2	3090	3.6	51.1	1.8		*Standard groundwater sample:*
	1223	21.01	3.0	6.73	21.1	3080	3.7	51.8	1.8		D) bailer due to limited column; or
	1225	21.01	3.5	6.73	21.1	3080	3.7	52.1	1.6		E) recovery well cycling sample
	1228	21.01	4.0	6.73	21.1	3080	3.7	52.9	1.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1230	KWB-12A	21.01	6.73	21.1	3080	3.7	52.9	1.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[* HMI - dedicated bladder pump]

+ Trip Blank - REST-02

+ Dup - REST-05
+ EB - REST-05
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12B
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GWS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1609	NA	20.73	0.0	39.39	35.2	Yes	Yes	Yes	Yes		Weather: Sunny, 80's
10/3/18	1245	NA	20.79									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1250	20.80	0.5	6.86	22.9	3260	4.4	45.6	2.7	10 or less / clear	*Low-flow groundwater sample:*
	1253	20.80	1.0	6.79	21.9	3270	4.1	49.2	3.3		A) peristaltic pump w/ ded tubing
	1255	20.80	1.5	6.79	21.3	3260	4.0	50.9	3.4		(B) ded bladder pump
	1257	20.80	2.0	6.78	20.8	3260	4.0	52.0	2.4		C) non-ded bladder pump; or
	1300	20.80	2.5	6.78	20.7	3250	4.1	52.6	2.1		*Standard groundwater sample:*
	1303	20.80	3.0	6.78	20.6	3240	4.1	53.2	1.8		D) bailer due to limited column; or
	1305	20.80	3.5	6.78	20.4	3240	4.0	53.7	1.9		E) recovery well cycling sample
	1307	20.80	4.0	6.78	20.4	3230	4.0	53.6	2.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/3/18	1310	KWB-12B	20.80	6.78	20.4	3230	4.0	53.6	2.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
	1200	DUP-REST-05	20.80	6.78	20.4	3230	4.0	53.6	2.2	same analysis	same	same
	1330	EB-REST-05	NA							same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-2R
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

(As I remember from previous events)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1519	NM	NM	NM	NM	32.4	#	#	#	#	#	Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED; UNABLE TO LOCATE.						B) ded bladder pump
			2.0		SAME CONDITION AS REPORTED IN						C) non-ded bladder pump; or
			2.5		1H18. Well appears to be covered/						*Standard groundwater sample:*
			3.0		destroyed by road construction/						D) bailer due to limited column; or
			3.5		dirt pile.						E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		KWB-2R								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-58
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1507	20.10	20.11	0.01	33.06	25.6	Yes	*Yes	Yes	Yes		Weather: Sunny, 80's
10/3/18	1355	20.11	20.12	0.01								

Well Purging Record

* REMOVED LNAPL PRIOR TO PURGE/SAMPLE

*ROAD CONSTRUCTION RECENTLY COMPLETED ADJACENT TO MW-58. WELL PAD SITS ~6" BELOW SURFACE. COVE PLACED ON WELL PAD.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1400	20.18	0.5	6.74	29.5	1549	3.6	-194.0	14.0	colorless/clear/odor	*Low-flow groundwater sample:*
	1403	20.18	1.0	6.72	25.0	1538	2.5	-200.3	10.1		(A) peristaltic pump w/ ded tubing
	1405	20.18	1.5	6.72	22.9	1510	2.0	-204.7	7.5		B) ded bladder pump
	1407	20.18	2.0	6.71	22.1	1505	1.8	-207.3	6.9		C) non-ded bladder pump; or
	1410	20.18	2.5	6.72	21.6	1494	1.8	-210.9	6.3		*Standard groundwater sample:*
	1413	20.18	3.0	6.71	21.4	1494	1.8	-214.0	5.9		D) bailer due to limited column; or
	1415	20.18	3.5	6.71	21.4	1492	1.7	-214.9	5.9		E) recovery well cycling sample
	1417	20.18	4.0	6.71	21.4	1491	1.7	-215.6	5.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1425	MW-58	20.18	6.71	21.4	1491	1.7	-215.6	5.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* HMI - dedicated bladder pump Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-13
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GOS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1538	NA	23.90	0.0	33.10	30.1	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								(B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		KWB-13								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Sign in @ S. Crude Control Room [Gauge only]
Permit per Darla Vernon, if present (for sampling events in Spring Event)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-103
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1100	NP	18.50	0.0	25.20	22.2	yes	yes	yes	yes		Weather: Overcast; 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-103								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Sign-in @ S. Crude Control Room
Permit per Darla Vernon, if needed

+ Dup - REST - 02
+ EB - REST - 02
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-104
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	940	NP	17.40	0.0	21.97	19.0	yes	yes	yes	yes		Weather: Overcast; 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	945	17.53	0.5	6.76	23.2	1899	2.1	-406.1	6.2	Clear/colorless	*Low-flow groundwater sample:*
|	948	17.58	1.0	6.71	23.1	1880	1.8	-412.3	5.5	|	(A) peristaltic pump w/ ded tubing
|	950	17.64	1.5	6.67	23.0	1861	1.5	-416.7	4.1	|	B) ded bladder pump
|	953	17.68	2.0	6.65	22.9	1864	1.4	-417.9	3.2	|	C) non-ded bladder pump; or
|	955	17.71	2.5	6.65	22.8	1868	1.4	-419.2	2.8	|	*Standard groundwater sample:*
|	958	17.74	3.0	6.64	22.7	1875	1.4	-420.1	2.2	|	D) bailer due to limited column; or
|	1000	17.77	3.5	6.64	22.7	1879	1.4	-421.5	1.8	|	E) recovery well cycling sample
↓	1003	17.80	4.0	6.63	22.7	1882	1.4	-421.9	1.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1005	MW-104	17.80	6.63	22.7	1882	1.4	-421.9	1.5	DRO	HCL	8015M
|										GRO	HCL	8015M
|										VOC	HCL	8260
|								Anions (Chloride,Fluoride,Sulfate)			Neat	300
|							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
|										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
|										TDS	Neat	2540C
|							***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
|							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
|										~~Cyanide~~	~~NaOH~~	~~SM4500~~
|	1200	Dup-REST-02	17.80	6.63	22.7	1882	1.4	-421.9	1.5	Same analysis	same	same
↓	1025	EB-REST-02	NA	→	→	→	→	→	→	Same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tube; stretch to outside of berm
Removed & replaced absorbent sock

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-64
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLA

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	900	NP	19.61	0.0	34.08	26.6	yes	yes	yes	yes		Weather: Overcast; 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	905	19.83	0.5	6.85	23.3	2,250	1.9	-376.6	7.9	Clear/colorless	*Low-flow groundwater sample:*
	908	19.91	1.0	6.85	23.4	2,240	1.7	-385.8	6.1		(A) peristaltic pump w/ ded tubing
	910	19.95	1.5	6.84	23.5	2,230	1.6	-399.2	5.2		B) ded bladder pump
	913	19.97	2.0	6.83	23.5	2,220	1.5	-401.8	4.5		C) non-ded bladder pump; or
	915	19.98	2.5	6.83	23.4	2,210	1.4	-403.1	3.2		*Standard groundwater sample:*
	918	19.99	3.0	6.83	23.4	2,210	1.3	-405.6	2.7		D) bailer due to limited column; or
	920	20.00	3.5	6.82	23.3	2,210	1.3	-406.1	2.1		E) recovery well cycling sample
	923	20.01	4.0	6.82	23.3	2,210	1.3	-406.8	1.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	925	MW-64	20.01	6.82	23.3	2,210	1.3	-406.8	1.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tube; Located in front of Navajo storage shed area

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-65
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1110	NP	16.14	0.0	28.78	23.8	yes	yes	yes	yes		Weather: Overcast; 70s

Well Purging Record

* Trace LNAPL on probe and tubing

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1115	16.16	0.5	6.73	26.8	1958	2.4	-316.4	9.9	clear w/ blue	*Low-flow groundwater sample:*
	1118	16.17	1.0	6.69	26.4	1949	2.1	-329.1	8.5	particles; slight	(A) peristaltic pump w/ ded tubing
	1120	16.18	1.5	6.63	26.1	1941	1.9	-338.4	5.9	odor	B) ded bladder pump
	1123	16.18	2.0	6.60	25.9	1933	1.8	-341.7	4.4		C) non-ded bladder pump; or
	1125	16.19	2.5	6.58	25.8	1929	1.7	-345.1	3.9		*Standard groundwater sample:*
	1128	16.19	3.0	6.57	25.7	1927	1.7	-348.3	3.2		D) bailer due to limited column; or
	1130	16.19	3.5	6.57	25.7	1925	1.7	-349.8	2.7		E) recovery well cycling sample
↓	1133	16.19	4.0	6.57	25.8	1924	1.6	-350.1	2.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/2/18	1135	MW-65	16.19	6.57	25.8	1924	1.6	-350.1	2.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-5R
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Above-grade Vault ✓	Other ✓	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Active RW; Sampled by port, when sampled

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1150	16.75	16.99	0.24	NM	24.0	yes	yes	yes	yes		Weather: Overcast; 70s
					(pumps in well)							

Well Purging Record * Gauge to top of guide-pipe (Formerly-reported TD = 35.30 ft-toc)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-5R								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Bagged tube; do not dedicate, per historical observations]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-102
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1200	NP	15.64	0.0	26.53	21.3	yes	yes	yes	yes		Weather: Pt. Cloudy; 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1205	15.67	0.5	6.79	26.8	2,110	1.6	-396.6	6.7	clear/colorless	*Low-flow groundwater sample:*
|	1208	15.67	1.0	6.71	26.1	2,100	1.5	-401.7	6.0	|	(A) peristaltic pump w/ ded tubing
|	1210	15.67	1.5	6.67	25.6	2,100	1.4	-410.8	5.1	|	B) ded bladder pump
|	1213	15.67	2.0	6.63	25.4	2,100	1.4	-411.5	4.5	|	C) non-ded bladder pump; or
|	1215	15.67	2.5	6.60	25.1	2,100	1.4	-413.1	3.8	|	*Standard groundwater sample:*
|	1218	15.67	3.0	6.58	25.0	2,100	1.4	-414.2	3.2	|	D) bailer due to limited column; or
|	1220	15.67	3.5	6.57	25.0	2,100	1.4	-414.8	2.7	|	E) recovery well cycling sample
↓	1223	15.67	4.0	6.57	25.0	2,100	1.4	-415.0	1.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1225	MW-102	15.67	6.57	25.0	2,100	1.4	-415.0	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Bagged Tubing] Gauge only [Gauge/Samp through labeled 1-inch guide-pipe]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-4
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other ✓	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Active RW in covered doghouse (Brace doghouse cover for access...as needed) Initials: RCL

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1155	NP	14.23	0.0	36.62	31.6	yes	yes	yes	yes		Weather: Pt. Cloudy; 70s

Well Purging Record * Drawdown not monitored during sampling; due to narrow-diam guide tube (PVC)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-4								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Bagged Tubing] Gauge Only [Gauge/samp through labeled 1-inch guide-pipe]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-6
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other ✓	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Active RW in covered doghouse

Initials: RCR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1240	NP	15.13	0.0	34.90	30.0	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy; 80s

Well Purging Record * Drawdown not monitored during sampling; due to narrow-diam guide tube (PVC)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-6								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride, Fluoride, Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Position is marked on adjacent fence; ~4' N. of fence; may get covered by silt/gravel]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-99
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: KLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1430	NP	17.60	0.0	27.80	22.8	yes	yes	yes	yes		Weather: Clear; 80s
10/3/18	940	NP	17.60	0.0								Clear; 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	945	17.66	0.5	6.69	25.2	1982	2.5	-388.2	13.2	clear	*Low-flow groundwater sample:*
|	948	17.68	1.0	6.64	24.7	1998	2.2	-398.7	11.8	|	(A) peristaltic pump w/ ded tubing
|	950	17.70	1.5	6.61	24.4	2,050	1.9	-413.6	9.7	|	B) ded bladder pump
|	953	17.71	2.0	6.60	24.2	2,070	1.7	-417.2	7.5	|	C) non-ded bladder pump; or
|	955	17.71	2.5	6.60	24.2	2,080	1.8	-418.6	6.9	|	*Standard groundwater sample:*
|	958	17.71	3.0	6.61	24.2	2,090	1.8	-418.9	6.1	|	D) bailer due to limited column; or
|	1000	17.71	3.5	6.60	24.1	2,100	1.8	-419.0	5.0	|	E) recovery well cycling sample
↓	1003	17.71	4.0	6.60	24.1	2,100	1.8	-418.9	3.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1005	MW-99	17.71	6.60	24.1	2,100	1.8	-418.9	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-66
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1435	NP	16.99	0.0	29.80	24.6	yes	yes	yes	yes	Cracked	Weather: Clear; 80s
10/3/18	900	NP	16.99	0.0							pad	Clear; 70s

* One corner cracked; pad is fully functional

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU) *	Water Color / Clarity	
10/3/18	905	17.13	0.5	6.61	22.9	1768	2.2	-234.4	30.9	clear w/ black	*Low-flow groundwater sample:*
	908	17.18	1.0	6.62	22.7	1757	1.9	-247.6	27.6	particles	(A) peristaltic pump w/ ded tubing
	910	17.20	1.5	6.62	22.6	1749	1.5	-253.4	24.8		B) ded bladder pump
	913	17.22	2.0	6.61	22.6	1738	1.3	-259.7	20.1		C) non-ded bladder pump; or
	915	17.23	2.5	6.60	22.6	1734	1.1	-261.3	19.8		*Standard groundwater sample:*
	918	17.24	3.0	6.60	22.5	1733	1.1	-262.5	20.1		D) bailer due to limited column; or
	920	17.24	3.5	6.60	22.5	1733	1.1	-263.1	20.8		E) recovery well cycling sample
↓	923	17.24	4.0	6.60	22.5	1732	1.0	-263.9	21.1	↓	F) irrigation well grab sample

* Turbidity Confirmed outside of cell

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU) *	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	925	MW-66	17.24	6.60	22.5	1732	1.0	-263.9	21.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tubc; in prep for possible Navajo well completion upgrade -scw 4-4-18

Monitoring Well Purging and Sampling Record

Navajo Refining Company | **Well:** MW-28
Artesia Refinery | **Event:** 2H18
Artesia, New Mexico | **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Extends through gravel berm; No pad or lock possible

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1250	NP	22.95	0.0	34.55	30.2	Yes	Issue	Issue	Yes		Weather: PT. Cloudy; 80s

(6-in PVC (shortened at top) w/ 0.65 ft slip collar over it)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm) *	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/2/18	1255	23.00	0.5	6.72	27.8	2,330	1.6	-409.1	9.7	Clear/colorless	*Low-flow groundwater sample:*
	1258	23.04	1.0	6.68	27.3	2,310	1.3	-412.3	8.0		(A) peristaltic pump w/ ded tubing
	1300	23.07	1.5	6.64	26.9	2,300	1.1	-416.8	6.5		B) ded bladder pump
	1303	23.10	2.0	6.60	26.7	2,290	1.0	-418.2	4.9		C) non-ded bladder pump; or
	1305	23.12	2.5	6.57	26.6	2,280	1.0	-419.8	3.2		*Standard groundwater sample:*
	1308	23.14	3.0	6.55	26.6	2,280	1.0	-420.0	2.5		D) bailer due to limited column; or
	1310	23.16	3.5	6.54	26.5	2,270	1.0	-421.6	2.0		E) recovery well cycling sample
↓	1313	23.17	4.0	6.54	26.5	2,270	1.0	-421.8	1.7	↓	F) irrigation well grab sample

* SC confirmed

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm) *	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/2/18	1315	MW-28	23.17	6.54	26.5	2,270	1.0	-421.8	1.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-59
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1415	NP	10.13	0.0	32.72	25.3	yes	yes	yes	yes		Weather: Clear; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-59								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Dup-REST-04
+ EB-REST-04
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-60
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1340	NP	11.18	0.0	37.78	26.7	yes	yes	yes	yes		Weather: Clear; 80s
10/3/18	1025	NP	11.20	0.0								Clear; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1030	11.36	0.5	6.67	26.8	3,620	4.0	-395.0	10.1	Clear	*Low-flow groundwater sample:*
	1033	11.42	1.0	6.62	26.3	3,700	3.8	-404.8	8.9		(A) peristaltic pump w/ ded tubing
	1035	11.47	1.5	6.60	26.1	3,750	3.6	-409.6	7.4		B) ded bladder pump
	1038	11.48	2.0	6.58	25.9	3,810	3.5	-413.1	6.2		C) non-ded bladder pump; or
	1040	11.49	2.5	6.57	25.5	3,820	3.5	-415.8	4.9		*Standard groundwater sample:*
	1043	11.49	3.0	6.55	25.3	3,830	3.6	-417.6	4.0		D) bailer due to limited column; or
	1045	11.49	3.5	6.54	25.2	3,830	3.6	-418.9	3.1		E) recovery well cycling sample
↓	1048	11.49	4.0	6.54	25.2	3,840	3.6	-419.1	2.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1050	MW-60	11.49	6.54	25.2	3,840	3.6	-419.1	2.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
	1200	DUP-REST-04	11.49	6.54	25.2	3,840	3.6	-419.1	2.5	same analyses	same	same
↓	1115	EB-REST-04	NA	—					→	same analyses	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — ***Well:*** MW-107
Artesia Refinery — ***Event:*** 2H18
Artesia, New Mexico — ***Area of Concern:*** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RCR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1335	NP	13.46	0.0	19.05	17.1	yes	yes	yes	yes		Weather: Clear; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-107								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Located 15' NW of NW corner of berm, if buried during future events]

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-128
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RCL

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1410	NP	15.80	0.0	35.35	25.4	yes	yes	yes	yes		Weather: Clear; 80s
10/3/18	1145	NP	15.80	0.0								Clear; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1150	15.83	0.5	6.64	25.7	1895	4.5	-226.2	17.6	Clear	*Low-flow groundwater sample:*
|	1153	15.83	1.0	6.59	25.2	1803	4.1	-224.0	15.1	|	(A) peristaltic pump w/ ded tubing
|	1155	15.83	1.5	6.52	24.9	1748	3.8	-221.6	13.2	|	B) ded bladder pump
|	1158	15.83	2.0	6.49	24.9	1721	3.6	-219.3	11.7	|	C) non-ded bladder pump; or
|	1200	15.83	2.5	6.45	24.9	1709	3.5	-216.8	9.5	|	*Standard groundwater sample:*
|	1203	15.83	3.0	6.43	24.9	1700	3.4	-213.1	8.6	|	D) bailer due to limited column; or
|	1205	15.83	3.5	6.41	25.0	1698	3.4	-210.8	7.4	|	E) recovery well cycling sample
↓	1208	15.83	4.0	6.40	25.0	1694	3.4	-209.5	5.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1210	MW-128	15.83	6.40	25.0	1694	3.4	-209.5	5.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[careful driving w/ tires vs. small mesquite thorns; event when pasture is cut]

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-125
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1350	NP	11.20	0.0	28.31	23.5	yes	yes	yes	yes		Weather: Clear; 80s
10/3/18	1230	NP	11.16	0.0								Clear; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1235	11.20	0.5	6.79	25.9	4,040	2.8	-111.4	8.9	Clear	*Low-flow groundwater sample:*
↓	1238	11.20	1.0	6.70	25.1	4,060	2.5	-109.6	7.6	↓	(A) peristaltic pump w/ ded tubing
	1240	11.20	1.5	6.64	24.7	4,080	2.3	-105.3	6.4		B) ded bladder pump
	1243	11.20	2.0	6.60	24.3	4,100	2.0	-103.9	5.1		C) non-ded bladder pump; or
	1245	11.20	2.5	6.58	24.3	4,110	1.9	-101.9	4.8		*Standard groundwater sample:*
	1248	11.20	3.0	6.56	24.3	4,120	1.8	-100.5	3.9		D) bailer due to limited column; or
	1250	11.20	3.5	6.55	24.3	4,120	1.8	-99.8	2.5		E) recovery well cycling sample
↓	1253	11.20	4.0	6.54	24.3	4,120	1.8	-99.1	2.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1255	MW-125	11.20	6.54	24.3	4,120	1.8	-99.1	2.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tube extension (as needed if field is flooded...)

+ Trip Blank - REST-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-116
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: JCR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1355	NP	10.37	0.0	27.63	20.0	yes	yes	yes	yes		Weather: Clear; 80s
10/3/18	1310	NP	10.33	0.0								Clear; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1315	10.36	0.5	6.82	23.6	3,720	2.3	-124.4	11.7	Clear	*Low-flow groundwater sample:*
	1318	10.36	1.0	6.75	22.9	3,720	2.1	-121.2	9.8		(A) peristaltic pump w/ ded tubing
	1320	10.36	1.5	6.69	22.6	3,720	1.9	-118.0	8.2		B) ded bladder pump
	1323	10.36	2.0	6.65	22.4	3,710	1.8	-116.4	7.1		C) non-ded bladder pump; or
	1325	10.36	2.5	6.63	22.3	3,700	1.8	-113.9	6.0		*Standard groundwater sample:*
	1328	10.36	3.0	6.62	22.3	3,700	1.7	-112.1	3.5		D) bailer due to limited column; or
	1330	10.36	3.5	6.62	22.3	3,700	1.7	-111.8	3.0		E) recovery well cycling sample
↓	1333	10.36	4.0	6.62	22.3	3,700	1.7	-111.4	2.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10/3/18	1335	MW-116	10.36	6.62	22.3	3,700	1.7	-111.4	2.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

N. side of dirt road; in-line with westernmost row of pecan trees; position is labeled on fence pole (12' from fenceline)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-46R
Event: 2H18
Area of Concern: TMD

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1400	NP	4.87	0.0	19.33	14.1	yes	yes	yes	yes		Weather: Clear; 80s
10/3/18	1350	NP	4.78	0.0								Clear; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/18	1355	4.80	0.5	6.77	28.0	3,700	2.0	-92.6	6.2	Clear	*Low-flow groundwater sample:*
	1358	4.80	1.0	6.69	27.4	3,700	1.8	-85.8	4.9		(A) peristaltic pump w/ ded tubing
	1400	4.80	1.5	6.65	26.4	3,690	1.7	-80.1	4.0		B) ded bladder pump
	1403	4.80	2.0	6.60	26.0	3,680	1.6	-84.8	3.5		C) non-ded bladder pump; or
	1405	4.80	2.5	6.57	25.8	3,680	1.6	-89.1	2.6		*Standard groundwater sample:*
	1408	4.80	3.0	6.55	25.6	3,670	1.5	-92.6	1.9		D) bailer due to limited column; or
	1410	4.80	3.5	6.53	25.6	3,670	1.5	-94.3	1.1		E) recovery well cycling sample
↓	1413	4.80	4.0	6.51	25.5	3,670	1.5	-96.8	0.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10/3/18	1415	MW-46R	4.80	6.51	25.5	3,670	1.5	-96.8	0.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* 4M1 - dedicated bladder pump; furthest west "city well" NO ACTIVITY IN 2H18
(Upgradient)

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** UG-3R
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18						35.6						Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								(B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		UG-3R								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Near park)

NO ACTIVITY IN 2H18

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-4
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18						34.5						Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		UG-4								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Upgradient (N. of Elementary School) NO ACTIVITY IN 2H18

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-1
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18						19.1						Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Upgradient (E-W trending alley; immediately NW of Artesia Hotel NO ACTIVITY IN 2H18

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-2
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: RLP

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18						24.3						Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - REST-04

Monitoring Well Purging and Sampling Record

Navajo Refining Company | **Well:** MW-101 | Completion: At-Grade ___ Upright ✓ Vault ___ | Casing Diam.: 2-in ___ 4-in ✓ Other ___ | Casing Material: PVC ✓ SS ___ Other ___

Artesia Refinery | **Event:** 2H18

Artesia, New Mexico | **Area of Concern:** REST

Hydrologic Monitoring for TRC Houston, Texas

Well Inspection Information

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
10-2-18	840	NP	14.85	0.0	26.85	23.5	yes	yes	yes	yes		Weather: P/cloudy 70s
10-3-18	950	NP	14.84	0.0								PT/cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	855	14.86	0.5	7.05	24.1	2060	1.9	-190.7	5.7	Clear colorless	*Low-flow groundwater sample:*
	857	14.86	1.0	6.97	23.9	2060	1.7	-191.2	1.7		(A) peristaltic pump w/ ded tubing
	900	14.86	1.5	6.94	23.8	2060	1.5	-191.4	1.4		B) ded bladder pump
	903	14.86	2.0	6.88	23.7	2040	1.4	-192.0	1.3		C) non-ded bladder pump; or
	905	14.86	2.5	6.86	23.6	2030	1.3	-192.0	1.1		*Standard groundwater sample:*
	907	14.86	3.0	6.84	23.6	2020	1.3	-192.2	0.9		D) bailer due to limited column; or
	910	14.86	3.5	6.84	23.6	2020	1.2	-192.2	0.9		E) recovery well cycling sample
↓	913	14.86	4.0	6.83	23.6	2010	1.2	-192.2	0.8	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: Pace National, Mt. Juliet, TN
10-3-18	915	MW-101	14.86	6.83	23.6	2010	1.2	-192.2	0.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-105
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: IAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	830	NP	10.28	0.0	19.20	14.2	yes	yes	yes	yes		Weather: Cloudy 70s
10-3-18	800	NP	10.28	0.0								pt/cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	805	10.33	0.5	6.83	25.8	2070	1.2	-333.9	22.3	Clear / Color less	*Low-flow groundwater sample:*
	807	10.33	1.0	6.71	25.8	2070	1.1	-336.9	17.4		(A) peristaltic pump w/ ded tubing
	810	10.33	1.5	6.61	25.8	2050	0.9	-345.8	16.3		B) ded bladder pump
	813	10.33	2.0	6.52	25.7	2050	0.8	-348.0	15.5		C) non-ded bladder pump; or
	815	10.33	2.5	6.47	25.6	2030	0.8	-350.7	14.9		*Standard groundwater sample:*
	817	10.33	3.0	6.45	25.6	2030	0.8	-351.8	13.8		D) bailer due to limited column; or
	820	10.33	3.5	6.44	25.7	2020	0.7	-352.4	11.4		E) recovery well cycling sample
↓	823	10.33	4.0	6.43	25.7	2010	0.7	-353.2	9.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	825	MW-105	10.33	6.43	25.7	2010	0.7	-353.2	9.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Bagged Tubing) Gauge Only (Gauge/samp through labeled 1-in guide-pipe)

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** RW-2
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information — Active RW; inside doghouse — Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1540	ND	12.71	0.0	36.13	31.1	YES	YES	YES	YES		Weather: Sunny/Cloudy/80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-2								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-61
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TAG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1410	NP	12.81	0.0	29.30	24.3	yes	yes	yes	yes		Weather: pr/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1415	12.94	0.5	6.85	28.2	2890	1.4	-367.7	15.0	Clear colorless	*Low-flow groundwater sample:*
	1417	13.11	1.0	6.80	28.0	3120	1.2	-368.8	8.7		(A) peristaltic pump w/ ded tubing
	1420	13.22	1.5	6.74	27.6	3100	1.1	-370.9	6.9		B) ded bladder pump
	1423	13.30	2.0	6.71	27.6	3090	0.9	-371.7	6.2		C) non-ded bladder pump; or
	1425	13.40	2.5	6.70	27.3	3080	0.9	-372.6	5.2	Reduced purge rate 0.1 L/min	*Standard groundwater sample:*
	1430	13.50	3.0	6.68	27.3	3070	0.9	-372.8	3.6		D) bailer due to limited column; or
	1435	13.60	3.5	6.66	27.3	3060	0.9	-372.5	3.6		E) recovery well cycling sample
↓	1440	13.63	4.0	6.65	27.5	3050	0.9	-372.5	3.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1445	MW-61	13.63	6.65	27.5	3050	0.9	-372.5	3.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				HNO_3	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-62
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1505	NP	14.05	0.0	29.50	21.3	yes	yes	yes	yes		Weather: PT/cloudy 85°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1510	14.21	0.5	6.54	27.7	3280	1.7	-361.0	24.1	clear/colorless	*Low-flow groundwater sample:*
	1513	14.31	1.0	6.54	27.5	3250	1.5	-365.8	20.7	odor	(A) peristaltic pump w/ ded tubing
	1515	14.38	1.5	6.53	27.4	3220	1.2	-365.3	15.4		B) ded bladder pump
	1517	14.43	2.0	6.53	26.7	3210	1.1	-368.3	9.7		C) non-ded bladder pump; or
	1520	14.47	2.5	6.53	26.6	3200	1.1	-368.3	8.2		*Standard groundwater sample:*
	1523	14.50	3.0	6.52	26.5	3200	1.1	-369.2	7.7		D) bailer due to limited column; or
	1525	14.53	3.5	6.52	26.5	3190	1.0	-369.0	7.1		E) recovery well cycling sample
	1527	14.56	4.0	6.52	26.5	3190	1.0	-369.2	6.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1530	MW-62	14.56	6.52	26.5	3190	1.0	-369.2	6.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-93
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1550	NP	8.50	0.0	20.23	15.9	yes	yes	yes	yes		Weather: PT/Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-93								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-43
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAR / CSH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	1640	NP	10.59	0.0	19.67	16.5	Yes	Issue	Yes	Yes	No Pad	Weather: PC / Cloudy 80s
10.3.18	1240	NA	10.61	0.0			/	↳ No outer protective casing				

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.18	1245	10.66	0.5	6.74	27.9	4760	1.7	-391.5	9.6	Colorless; clear;	*Low-flow groundwater sample:*
↓	1247	10.66	1.0	6.73	27.6	4820	1.7	-398.6	8.1 ↓	odor	(A) peristaltic pump w/ ded tubing
	1250	10.66	1.5	6.73	27.4	4840	1.8	-400.0	7.5	yellow color;	B) ded bladder pump
	1252	10.66	2.0	6.73	27.1	4860	1.7	-401.0	6.5	Clear; odor	C) non-ded bladder pump; or
	1255	10.66	2.5	6.73	27.1	4870	1.6	-402.0	6.2	↓	*Standard groundwater sample:*
	1257	10.66	3.0	6.74	27.0	4860	1.5	-400.0	5.4	↓	D) bailer due to limited column; or
	1300	10.66	3.5	6.74	26.9	4850	1.4	-399.6	4.9	↓	E) recovery well cycling sample
↓	1302	10.66	4.0	6.74	26.8	4850	1.4	-398.1	4.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.3.18	1305	MW-43	10.66	6.74	26.8	4850	1.4	-398.1	4.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-137
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB / CSH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1610	NP	8.76	0.0	29.60	24.6	yes	yes	yes	yes		Weather: pt/cloudy 86°
10.3.18	1405	NA	8.74	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.18	1410	8.74	0.5	6.68	26.2	4820	1.9	-395.6	15.1	light yellow color;	*Low-flow groundwater sample:*
↓	1412	8.74	1.0	6.66	26.0	4800	2.2	-399.1	13.6	clear; odor	(A) peristaltic pump w/ ded tubing
	1415	8.74	1.5	6.65	25.8	4740	2.6	-399.0	11.4	↓	B) ded bladder pump
	1417	8.74	2.0	6.65	25.7	4690	2.8	-397.6	10.6		C) non-ded bladder pump; or
	1420	8.74	2.5	6.65	25.7	4660	2.9	-396.1	9.4		*Standard groundwater sample:*
	1422	8.74	3.0	6.65	25.6	4640	3.0	-395.4	9.1		D) bailer due to limited column; or
	1425	8.74	3.5	6.65	25.6	4620	3.1	-394.2	8.6		E) recovery well cycling sample
↓	1427	8.74	4.0	6.65	25.6	4610	3.1	-393.3	8.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.3.18	1430	MW-137	8.74	6.65	25.6	4610	3.1	-393.3	8.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-138
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB/CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1620	NP	10.40	0.0	24.81	19.8	yes	yes	yes	yes		Weather: pt/cloudy 80°
10-3-18	1320	NA	10.42	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1325	10.45	0.5	6.66	26.7	3210	2.3	-345.1	19.6	yellow color;	*Low-flow groundwater sample:*
↓	1327	10.45	1.0	6.63	26.4	3120	2.2	-339.0	14.1	Clear; odor;	Ⓐ peristaltic pump w/ ded tubing
	1330	10.45	1.5	6.62	26.1	3110	2.1	-336.2	10.9	sheen	B) ded bladder pump
	1332	10.45	2.0	6.61	26.1	3100	2.1	-333.4	9.4	↓	C) non-ded bladder pump; or
	1335	10.45	2.5	6.61	26.0	3090	2.2	-331.6	9.0		*Standard groundwater sample:*
	1337	10.45	3.0	6.60	25.9	3090	2.2	-330.2	8.8		D) bailer due to limited column; or
	1340	10.45	3.5	6.60	25.8	3080	2.3	-329.6	8.4		E) recovery well cycling sample
↓	1342	10.45	4.0	6.60	25.8	3080	2.3	-328.1	8.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1345	MW-138	10.45	6.60	25.8	3080	2.3	-328.1	8.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-23
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in ✓	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1600	NP	13.83	0.0	23.10	17.9	yes	yes	yes	yes		Weather: PT/Cloudy 78°
10-3-18	1335	NP	13.82	0.0								PT/Cloudy 70s

Well Purging Record

*T confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1240	13.86	0.5	7.14	33.6	3460	1.2	-279.8	8.4	Clear / Colorless	*Low-flow groundwater sample:*
	1243	13.89	1.0	7.13	33.1	3360	1.0	-295.8	8.0	Odor	(A) peristaltic pump w/ ded tubing
	1245	13.92	1.5	7.12	33.1	3330	0.9	-298.9	7.2		B) ded bladder pump
	1247	13.94	2.0	7.12	33.0	3270	0.9	-303.2	6.7		C) non-ded bladder pump; or
	1250	13.96	2.5	7.11	32.9	3240	0.9	-305.7	6.2		*Standard groundwater sample:*
	1253	13.98	3.0	7.10	32.9	3230	0.9	-308.9	6.0		D) bailer due to limited column; or
	1255	14.01	3.5	7.10	32.8	3220	1.0	-309.0	5.8		E) recovery well cycling sample
↓	1257	14.03	4.0	7.10	32.8	3210	1.0	-309.0	5.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-3-18	1300	MW-23	14.03	7.10	32.8	3210	1.0	-309.0	5.8	DRO	HCl	8015M
										GRO	HCl	8015M
										VOC	HCl	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Dup-TEL-01 (for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-4
Event: 2H18
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: JAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1230	NP	9.52	0-0	27.27	22.2	yes	yes	yes	yes		Weather: pt/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1235	9.68	0.5	7.67	25.6	3510	1.1	-293.2	7.0	Clear Colorless	*Low-flow groundwater sample:*
	1237	9.68	1.0	7.63	25.3	3480	1.0	-297.7	5.8		(A) peristaltic pump w/ ded tubing
	1240	9.68	1.5	7.58	25.1	3480	0.8	-302.9	5.6		B) ded bladder pump
	1243	9.68	2.0	7.49	24.8	3440	0.7	-309.9	5.1		C) non-ded bladder pump; or
	1245	9.68	2.5	7.46	24.7	3430	0.6	-312.8	4.2		*Standard groundwater sample:*
	1247	9.68	3.0	7.44	24.7	3420	0.6	-313.8	4.0		D) bailer due to limited column; or
	1250	9.68	3.5	7.44	24.7	3410	0.6	-315.9	3.9		E) recovery well cycling sample
	1253	9.68	4.0	7.43	24.7	3410	0.6	-316.7	3.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-2-18	1255	TEL-4	9.68	7.43	24.7	3410	0.6	-316.7	3.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1200	DUP-TEL-01	9.68	7.43	24.7	3410	0.6	-316.7	3.8	Same analysis	Same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-3
Event: 2H18
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1200	9.19	9.23	0.04	27.19	22.2	YES	YES	YES	YES		Weather: pt/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5	NOT	SAmple	DUE TO			LNAPL		B) ded bladder pump
			2.0		>0.03 feet						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		TEL-3								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ EB-TEL-01 (for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-2
Event: 2H18
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: ~~TAT~~

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1105	NP	10.04	0.0	27.20	22.1	yes	yes	yes	yes		Weather: PT/Cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1110	10.11	0.5	6.81	25.7	3720	1.0	-317.7	2.5	Clear/odor	*Low-flow groundwater sample:*
	1113	10.11	1.0	6.70	25.0	3770	1.2	-332.3	2.3	colorless	(A) peristaltic pump w/ ded tubing
	1115	10.11	1.5	6.63	24.5	3810	1.2	-336.2	2.2		B) ded bladder pump
	1117	10.11	2.0	6.60	24.3	3890	1.3	-343.7	2.2		C) non-ded bladder pump; or
	1120	10.11	2.5	6.59	24.4	3830	1.3	-346.4	2.1		*Standard groundwater sample:*
	1123	10.11	3.0	6.58	24.3	3830	1.3	-347.7	2.0		D) bailer due to limited column; or
	1125	10.11	3.5	6.57	24.2	3830	1.3	-348.1	1.8		E) recovery well cycling sample
	1127	10.11	4.0	6.57	24.2	3830	1.3	-350.1	1.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-2-18	1130	TEL-2	10.11	6.57	24.2	3830	1.3	-350.1	1.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1145	EB-TEL-01	NA							Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+Trip Blank-TEL-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-1
Event: 2H18
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TAS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1020	n/p	9.19	0.0	17.00	22.9	yes	yes	yes	yes		Weather: ft/cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1025	9.43	0.5	7.00	24.2	3190	1.2	-161.0	3.9	clear/colorless	*Low-flow groundwater sample:*
	1027	9.43	1.0	6.95	23.8	3190	0.9	-170.3	2.2		(A) peristaltic pump w/ ded tubing
	1030	9.43	1.5	6.94	23.6	3170	0.8	-178.7	2.0		B) ded bladder pump
	1033	9.43	2.0	6.93	23.5	3160	0.8	-183.6	1.6		C) non-ded bladder pump; or
	1035	9.43	2.5	6.93	23.5	3140	0.9	-187.7	1.5		*Standard groundwater sample:*
	1037	9.43	3.0	6.93	23.4	3140	0.9	-188.2	1.5		D) bailer due to limited column; or
	1040	9.43	3.5	6.93	23.4	3130	0.9	-190.0	1.4		E) recovery well cycling sample
↓	1043	9.43	4.0	6.93	23.4	3130	0.9	-190.2	1.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10-2-18	1045	TEL-1	9.43	6.93	23.4	3130	0.9	-190.2	1.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-39
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TA BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	950	NP	9.72	0.0	25.44	20.4	yes	yes	yes	yes		Weather: PC/Cloudy 70°
10-3-18	1100	NP	9.65	0.0								PC/Cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1105	9.75	0.5	7.20	27.4	3740	1.5	-335.7	6.6	Clear / colorless	*Low-flow groundwater sample:*
	1107	9.77	1.0	7.16	26.5	3730	1.3	-339.6	3.1	odor	(A) peristaltic pump w/ ded tubing
	1110	9.77	1.5	7.15	26.1	3730	1.1	-341.1	2.1		B) ded bladder pump
	1113	9.77	2.0	7.13	25.9	3730	0.9	-341.8	1.8		C) non-ded bladder pump; or
	1115	9.77	2.5	7.13	25.9	3730	0.9	-342.1	1.7		*Standard groundwater sample:*
	1117	9.77	3.0	7.12	25.8	3730	0.9	-342.8	2.0		D) bailer due to limited column; or
	1120	9.77	3.5	7.12	25.8	3720	0.9	-342.3	2.0		E) recovery well cycling sample
	1123	9.77	4.0	7.12	25.8	3720	0.9	-342.1	1.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1125	mw-39	9.77	7.12	25.8	3720	0.9	-342.1	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~*Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Prior to 2H16, this well was a stickup completion; Area has been backfilled with a couple feet of soil.

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-98
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1330	NP	9.90	0.0	25.60	21.5	yes	yes	yes	yes		Weather: pt/c/cody 85°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-2-18	1335	9.96	0.5	6.76	27.0	3410	0.8	-376.7	7.9	clear/cdy/less	*Low-flow groundwater sample:*
	1337	9.96	1.0	6.70	26.6	3390	0.9	-378.2	3.7	0.061	(A) peristaltic pump w/ ded tubing
	1340	9.96	1.5	6.64	26.4	3390	1.0	-380.7	2.3		B) ded bladder pump
	1343	9.96	2.0	6.63	26.2	3390	1.0	-381.1	2.2		C) non-ded bladder pump; or
	1345	9.96	2.5	6.62	26.2	3390	1.0	-381.7	2.4		*Standard groundwater sample:*
	1347	9.96	3.0	6.61	26.3	3380	1.0	-381.8	2.3		D) bailer due to limited column; or
	1350	9.96	3.5	6.61	26.3	3380	1.0	-381.9	2.0		E) recovery well cycling sample
↓	1351	9.96	4.0	6.60	26.3	3380	1.0	-381.8	2.1	↓ ↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-2-18	1355	MW-98	9.96	6.60	26.3	3380	1.0	-381.8	2.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(The old RW-10 permanently covered by heavy steel box. Current RW-10 is the stand-pipe ~50' S. of former RW-10, per Navajo.)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-10
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 8"	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	955	NP	9.49	0.0	22.49	17.5	YES	YES	YES	YES		Weather: pt/cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-10								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-40
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	945	NP	7.87	0.0	24.75	21.8	yes	yes	yes	yes		Weather: PC/cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-40								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-41
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	935	NP	7.66	0.0	21.56	18.6	YES	YES	YES	YES		Weather: pt/cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-41								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Gauge Only (Old RW-9 permanently covered by heavy steel box; Current RW-9 located ~50' E of former RW-9, per Navajo)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-9
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 8"	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TA DB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	940	NP	9.86	0.0	21.83	16.8	yes	yes	yes	yes		Weather: pt/cloudy/70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-9								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-42
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	930	ND	10.50	0.0	24.32	21.3	Yes	Yes	Yes	Yes		Weather: PT/Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-42								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-29
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	910	ND	14.32	0.0	24.22	19.2	yes	yes	yes	yes		Weather: Cloudy 78°
10-3-18	1150	ND	14.25	0.0								Cloudy 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1155	14.26	0.5	6.98	29.3	3990	1.9	-228.8	1.6	clear/colorless	*Low-flow groundwater sample:*
	1157	14.27	1.0	6.94	28.9	3980	1.7	-233.1	1.4		(A) peristaltic pump w/ ded tubing
	1200	14.27	1.5	6.90	28.7	3970	1.5	-243.2	1.2		B) ded bladder pump
	1203	14.27	2.0	6.87	28.7	3950	1.4	-250.2	1.0		C) non-ded bladder pump; or
	1205	14.27	2.5	6.85	28.8	3940	1.3	-251.6	0.7		*Standard groundwater sample:*
	1207	14.27	3.0	6.84	28.8	3940	1.2	-252.8	0.6		D) bailer due to limited column; or
	1210	14.27	3.5	6.84	28.7	3940	1.1	-253.1	0.4		E) recovery well cycling sample
↓	1213	14.27	4.0	6.83	28.6	3940	1.0	-253.9	0.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1215	MW-29	14.27	6.83	28.6	3940	1.0	-253.9	0.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	NaOH	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** RW-#16B
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Broken PAD Need Replaced

Hydrologic Monitoring for TRC Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	925	NM	12.48	0.0	17.70	14.7	yes	yes	yes	yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-#16B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge Only ; Not in "sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-30
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	915	NP	9.88	0.0	23.50	NS	yes	yes	yes	yes		Weather: Cloudy 78°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-56
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/2/18	920	NP	10.93	0.0	26.50	21.4	yes	yes	yes	yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-56								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Located under yellow barricade

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-49
Event: 2H18
Area of Concern: TEL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	850	NP	10.76	0.0	33.07	27.8	yes	yes	yes	yes		Weather: Cloudy 78°
10-3-18	920	NP	10.76	0.0								PT/Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	925	10.90	0.5	6.56	27.1	3220	1.5	-353.3	14.2	clear/colorless	*Low-flow groundwater sample:*
	927	10.90	1.0	6.54	26.8	3250	1.3	-360.2	12.2		(A) peristaltic pump w/ ded tubing
	930	10.90	1.5	6.53	26.7	3270	1.2	-363.3	11.8		B) ded bladder pump
	933	10.90	2.0	6.53	26.5	3270	1.0	-364.3	11.6		C) non-ded bladder pump; or
	935	10.90	2.5	6.52	26.4	3280	0.9	-363.5	8.9		*Standard groundwater sample:*
	937	10.90	3.0	6.52	26.4	3280	1.0	-363.1	7.7		D) bailer due to limited column; or
	940	10.90	3.5	6.53	26.5	3290	1.0	-362.8	6.0		E) recovery well cycling sample
↓	943	10.90	4.0	6.53	26.6	3280	1.0	-361.5	5.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	945	MW-49	10.90	6.53	26.6	3280	1.0	-361.5	5.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[If Covered by gravel; difficulty locating historically...]

Monitoring Well Purging and Sampling Record

Navajo Refining Company | **Well:** MW-106 | Completion: At-Grade ✓, Upright __, Vault __ | Casing Diam.: 2-in __, 4-in ✓, Other __ | Casing Material: PVC ✓, SS __, Other __

Artesia Refinery | **Event:** 2H18

Artesia, New Mexico | **Area of Concern:** REST

Hydrologic Monitoring for TRC Houston, Texas

Well Inspection Information

Initials: TJA BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	900	NP	8.67	0.0	22.80	17.5	yes	yes	yes	yes		Weather: cloudy 70°
10-3-18	1010	NP	8.63	0.0								pt/cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1015	8.67	0.5	6.49	26.7	3620	1.0	-375.8	20.3	clear/colorless	*Low-flow groundwater sample:*
	1017	8.68	1.0	6.47	27.6	3610	1.0	-373.2	18.1	odor	(A) peristaltic pump w/ ded tubing
	1020	8.69	1.5	6.47	26.9	3620	1.0	-373.7	16.2		B) ded bladder pump
	1023	8.71	2.0	6.46	26.6	3610	1.1	-373.6	19.9		C) non-ded bladder pump; or
	1025	8.73	2.5	6.46	26.5	3600	1.1	-373.4	12.8		*Standard groundwater sample:*
	1027	8.75	3.0	6.45	26.5	3600	1.1	-373.5	10.3		D) bailer due to limited column; or
	1030	8.77	3.5	6.45	26.5	3590	1.1	-373.3	9.7		E) recovery well cycling sample
↓	1033	8.79	4.0	6.45	26.5	3590	1.1	-373.3	8.5	↓ ↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1035	MW-106	8.79	6.45	26.5	3590	1.1	-373.3	8.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-45
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** NCL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-2-18	1650	NP	4.84	0.0	15.05	12.3	yes	yes	yes	yes		Weather: PT / Cloudy 80°
10-3-18	1400	NP	4.90	0.0								PT / Cloudy 76°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-18	1405	5.10	0.5	7.09	25.0	5000	1.9	-98.3	5.1	clear / colorless	*Low-flow groundwater sample:*
	1407	5.11	1.0	7.00	24.4	5080	1.7	-104.1	2.6		(A) peristaltic pump w/ ded tubing
	1410	5.11	1.5	6.91	24.3	5150	1.6	-109.4	1.9		B) ded bladder pump
	1413	5.11	2.0	6.88	24.1	5170	1.5	-111.4	1.4		C) non-ded bladder pump; or
	1415	5.11	2.5	6.86	24.2	5180	1.4	-112.7	1.3		*Standard groundwater sample:*
	1417	5.11	3.0	6.85	24.2	5180	1.4	-113.2	1.1		D) bailer due to limited column; or
	1420	5.11	3.5	6.84	24.2	5190	1.3	-114.2	1.0		E) recovery well cycling sample
↓	1423	5.11	4.0	6.83	24.2	5190	1.3	-114.4	0.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10-3-18	1425	MW-45	5.11	6.83	24.2	5190	1.3	-114.4	0.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Located in Artesia Wool laydown yard, N. of the main warehouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-50
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1025	NA	15.35	0.0	28.22 (soft)	24.1	yes	yes	yes	yes		Weather: Cloudy, 70's

Well Purging Record

* ORP Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	1030	15.36	0.5	6.89	25.2	5360	2.4	85.1	4.6	Colorless; clear	*Low-flow groundwater sample:*
|	1032	15.36	1.0	6.77	24.2	5500	1.6	-10.1	4.1	|	(A) peristaltic pump w/ ded tubing
|	1035	15.36	1.5	6.75	23.8	5680	1.6	-64.0	3.6	|	B) ded bladder pump
|	1037	15.36	2.0	6.74	23.7	5410	1.7	-91.2	3.2	|	C) non-ded bladder pump; or
|	1040	15.36	2.5	6.76	23.6	5360	1.8	-124.7	3.4	|	*Standard groundwater sample:*
|	1042	15.36	3.0	6.77	23.4	5290	1.8	-130.4	3.0	|	D) bailer due to limited column; or
|	1045	15.36	3.5	6.78	23.4	5260	1.7	-135.1	2.9	|	E) recovery well cycling sample
↓	1047	15.36	4.0	6.79	23.4	5240	1.7	-139.5	2.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	1050	MW-50	15.36	6.79	23.4	5240	1.7	-139.5	2.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-97
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ___	PVC ✓
Upright ___	4-in ✓	SS ___
Vault ___	Other ___	Other ___

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1105	10.58	12.15	1.57	21.20	(NS)	yes *	yes	yes	yes		Weather: Partly Cloudy, 70's
						5' off base as needed						

* HMI replaced 4in. J-plug due to deterioration.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not Sampled due to presence						(A) peristaltic pump w/ ded tubing
			1.5		of LNAPL ≥ 0.03'						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-97								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-92
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1115	12.47	12.55	0.08	22.60	17.6	yes	yes	yes	yes		Weather: Partly cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not Sampled due to Presence						(A) peristaltic pump w/ ded tubing
			1.5		of LNAPL ≥ 0.03'.						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-92								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Bagged Tubing)

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** RW-1
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other ✓	Other __

(4-in well w/ one inch guide pipe)

(Dog House)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: C JH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1125	NA	11.45	0.0	35.39	30.4	yes	yes	yes	yes		Weather: Partly Cloudy, 70's

Well Purging Record

* Gauge/samp through labeled 1-in guide-pipe

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-91
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1135	NA	11.79	0.0	25.35	17.9	yes	yes	yes	yes		Weather: partly cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	1140	11.92	0.5	6.39	26.7	2985	1.9	-368.3	16.1	Black Color; Clear;	*Low-flow groundwater sample:*
	1142	11.96	1.0	6.45	26.2	2914	1.7	-380.2	12.7	odor	(A) peristaltic pump w/ ded tubing
	1145	11.99	1.5	6.45	26.0	2901	1.9	-383.1	10.6		B) ded bladder pump
	1147	12.01	2.0	6.46	25.9	2896	2.0	-384.6	9.0		C) non-ded bladder pump; or
	1150	12.02	2.5	6.45	25.7	2900	2.0	-385.4	8.1		*Standard groundwater sample:*
	1152	12.03	3.0	6.44	25.6	2904	2.1	-386.9	7.7		D) bailer due to limited column; or
	1155	12.04	3.5	6.43	25.7	2910	2.1	-387.5	7.4		E) recovery well cycling sample
	1157	12.05	4.0	6.43	25.7	2914	2.1	-388.6	7.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	1200	MW-91	12.05	6.43	25.7	2914	2.1	-388.6	7.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-90
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1215	NA	12.40	0.0	22.80	21.5	yes	yes	yes	yes		Weather: Clear, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	1220	12.51	0.5	6.72	26.4	3650	2.0	-357.1	11.2	Colorless; clear;	*Low-flow groundwater sample:*
|	1222	12.53	1.0	6.71	26.2	3680	1.7	-356.7	9.6	odor |	(A) peristaltic pump w/ ded tubing
|	1225	12.55	1.5	6.70	26.1	3680	1.6	-358.7	9.1	|	B) ded bladder pump
|	1227	12.56	2.0	6.69	26.0	3680	1.6	-361.2	8.8	|	C) non-ded bladder pump; or
|	1230	12.57	2.5	6.69	26.0	3690	1.6	-362.3	7.5	|	*Standard groundwater sample:*
|	1232	12.58	3.0	6.70	25.9	3690	1.6	-363.6	7.2	|	D) bailer due to limited column; or
|	1235	12.58	3.5	6.70	25.9	3690	1.6	-364.5	6.5	|	E) recovery well cycling sample
↓	1237	12.59	4.0	6.70	25.9	3690	1.6	-365.1	6.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	1240	MW-90	12.59	6.70	25.9	3690	1.6	-365.1	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-96
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1250	NA	12.19	0.0	25.57	21.2	yes	*Issue	Needs lock	yes		Weather: Clear, 80's

*Well was struck prior to 2H17 event. Hinge is broken and well is not secure.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	1255	12.20	0.5	6.69	27.1	2461	2.1	-351.5	10.9	Colorless; Clear	*Low-flow groundwater sample:*
	1257	12.20	1.0	6.67	26.7	2446	1.8	-357.1	9.6	Odor	(A) peristaltic pump w/ ded tubing
	1300	12.20	1.5	6.66	26.5	2428	1.7	-359.0	9.2		B) ded bladder pump
	1302	12.20	2.0	6.66	26.4	2408	1.7	-358.0	7.1		C) non-ded bladder pump; or
	1305	12.20	2.5	6.67	26.2	2394	1.8	-359.1	6.0		*Standard groundwater sample:*
	1307	12.20	3.0	6.67	26.1	2385	1.8	-360.2	5.8		D) bailer due to limited column; or
	1310	12.20	3.5	6.68	26.0	2380	1.9	-361.1	5.1		E) recovery well cycling sample
	1312	12.20	4.0	6.68	26.0	2374	1.9	-362.1	4.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	1315	MW-96	12.20	6.68	26.0	2374	1.9	-362.1	4.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-94
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1330	13.24	13.43	0.19	23.45	16.0	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		Not sampled due to presence						(A) peristaltic pump w/ ded tubing
			1.5		of LNAPL ≥ 0.03'						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
		MW-94								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** RW-8
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other ✓	Other __

(4in well w/ 1" guide pipe)

Hydrologic Monitoring for TRC Houston, Texas

Well Inspection Information (Inside Doghouse) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1340	12.02	13.15	1.13	37.22	35.2	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record * Gauge / sample through labeled 1-in PVC guide-pipe

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-67
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in __	PVC ✓
Upright __	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1350	NA	10.35	0.0	27.30	19.9	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record

*pH confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	1355	10.49	0.5	6.87	27.0	2626	1.7	-312.1	7.1	light yellow;	*Low-flow groundwater sample:*
↓	1357	10.52	1.0	6.77	26.4	2624	1.4	-330.7	6.2	Clear; oder	(A) peristaltic pump w/ ded tubing
↓	1400	10.54	1.5	6.74	26.1	2614	1.5	-338.1	5.4	↓	B) ded bladder pump
↓	1402	10.56	2.0	6.74	25.9	2611	1.5	-338.9	4.9	↓	C) non-ded bladder pump; or
↓	1405	10.57	2.5	6.73	25.7	2609	1.6	-338.0	4.6	↓	*Standard groundwater sample:*
↓	1407	10.58	3.0	6.73	25.7	2604	1.6	-337.1	4.2	↓	D) bailer due to limited column; or
↓	1410	10.59	3.5	6.72	25.6	2602	1.6	-336.4	4.0	↓	E) recovery well cycling sample
↓	1412	10.59	4.0	6.72	25.6	2601	1.6	-335.5	3.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	1415	MW-67	10.59	6.72	25.6	2601	1.6	-335.5	3.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-95
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1430	NA	13.27	0.0	25.37	20.4	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Bagged Tubing)

Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-7
Event: 2H18
Area of Concern: REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright __	4-in __	SS __
Vault ✓	Other ✓	Other __

(Dog house)

(4in well w/ 1" guide pipe)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1440	NA	13.05	0.0	37.00	32.0	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

* Gauge/Samp through labeled 1-in PVC guide-pipe

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-7								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-34A
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1455	NA	11.22	0.0	19.26	16.8	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	1500	11.35	0.5	6.60	26.0	2266	1.9	-346.1	6.2	Colorless; Clear;	*Low-flow groundwater sample:*
	1502	11.37	1.0	6.55	25.6	2268	1.5	-362.4	5.6	Sheen; odor	(A) peristaltic pump w/ ded tubing
	1505	11.37	1.5	6.54	25.3	2260	1.4	-365.1	5.0		B) ded bladder pump
	1507	11.37	2.0	6.55	25.1	2254	1.5	-364.0	4.7		C) non-ded bladder pump; or
	1510	11.37	2.5	6.54	25.0	2245	1.6	-366.2	4.3		*Standard groundwater sample:*
	1512	11.37	3.0	6.54	25.0	2239	1.7	-366.9	4.1		D) bailer due to limited column; or
	1515	11.37	3.5	6.54	25.1	2234	1.7	-367.4	3.9		E) recovery well cycling sample
	1517	11.37	4.0	6.54	25.1	2230	1.7	-368.1	3.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	1520	NCL-34A	11.37	6.54	25.1	2230	1.7	-368.1	3.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** NCL-33
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1535	NA	9.58	0.0	19.60	17.7	yes	yes	yes	yes		Weather: partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	1540	9.68	0.5	6.70	26.0	3120	2.0	-210.7	6.4	Colorless; Clear	*Low-flow groundwater sample:*
↓	1542	9.73	1.0	6.55	25.7	3210	1.6	-208.6	6.0	↓	(A) peristaltic pump w/ ded tubing
↓	1545	9.77	1.5	6.51	25.2	3210	1.6	-209.0	5.2	↓	B) ded bladder pump
↓	1547	9.80	2.0	6.50	25.1	3220	1.7	-209.7	4.9	↓	C) non-ded bladder pump; or
↓	1550	9.83	2.5	6.49	25.0	3210	1.7	-210.7	4.6	↓	*Standard groundwater sample:*
↓	1552	9.85	3.0	6.48	25.1	3200	1.8	-211.6	4.1	↓	D) bailer due to limited column; or
↓	1555	9.87	3.5	6.47	25.1	3190	1.8	-212.5	4.2	↓	E) recovery well cycling sample
↓	1557	9.89	4.0	6.47	25.2	3190	1.8	-213.2	4.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	1600	NCL-33	9.89	6.47	25.2	3190	1.8	-213.2	4.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-44
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1650	NA	9.59	0.0	21.34	16.3	yes	yes	yes	yes		Weather: Clear, 80's
10.3.18	1105	NA	9.61	0.0	(soft)							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.18	1110	9.64	0.5	6.68	26.4	2886	2.3	-210.1	11.1	Colorless; clear	*Low-flow groundwater sample:*
	1112	9.64	1.0	6.62	26.2	2880	1.7	-226.3	9.2	sl. odor	(A) peristaltic pump w/ ded tubing
	1115	9.64	1.5	6.61	26.0	2874	1.6	-239.7	8.4		B) ded bladder pump
	1117	9.64	2.0	6.61	25.9	2869	1.5	-246.0	7.5		C) non-ded bladder pump; or
	1120	9.64	2.5	6.61	25.8	2863	1.6	-249.2	6.0		*Standard groundwater sample:*
	1122	9.64	3.0	6.60	25.7	2859	1.6	-253.1	4.9		D) bailer due to limited column; or
	1125	9.64	3.5	6.60	25.7	2854	1.7	-256.7	4.4		E) recovery well cycling sample
	1127	9.64	4.0	6.60	25.6	2851	1.7	-258.0	3.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.3.18	1130	NCL-44	9.64	6.60	25.6	2851	1.7	-258.0	3.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+EB-NCL-01 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-32
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1700	NA	10.12	0.0	20.04	18.1	yes	yes	yes	yes		Weather: Clear, 70's
10.3.18	1020	NA	10.10	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.18	1025	10.20	0.5	7.00	26.0	2886	1.7	-129.1	28.6	Colorless; Clear	*Low-flow groundwater sample:*
↓	1027	10.21	1.0	6.86	25.6	2915	1.4	-128.4	23.1	↓	(A) peristaltic pump w/ ded tubing
	1030	10.21	1.5	6.80	25.4	2932	1.3	-128.5	21.6		B) ded bladder pump
	1032	10.21	2.0	6.74	25.2	2943	1.2	-128.3	20.7		C) non-ded bladder pump; or
	1035	10.21	2.5	6.79	25.1	2950	1.3	-124.6	20.4		*Standard groundwater sample:*
	1037	10.21	3.0	6.81	25.0	2956	1.3	-122.1	20.6		D) bailer due to limited column; or
	1040	10.21	3.5	6.82	25.0	2960	1.3	-120.4	20.2		E) recovery well cycling sample
↓	1042	10.21	4.0	6.83	25.1	2963	1.3	-118.6	20.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.3.18	1045	NCL-32	10.21	6.83	25.1	2963	1.3	-118.6	20.1	DRO	HCL	8015M
↓										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1055	EB-NCL-01	NA	→	→	→	→	→	→	same analyses	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* Access by foot

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-108
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in ✓	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1730	NA	13.70	0.0	27.74	22.5	yes	yes	yes	yes		Weather: Clear, 60's
10.3.18	845	NA	13.71	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.18	850	13.81	0.5	6.65	22.5	2784	2.0	-357.1	12.0	yellow color; clear;	*Low-flow groundwater sample:*
	852	13.88	1.0	6.66	22.1	2734	1.6	-368.4	10.1	odor	(A) peristaltic pump w/ ded tubing
	855	13.93	1.5	6.66	22.0	2701	1.5	-372.4	9.2		B) ded bladder pump
	857	13.96	2.0	6.67	21.9	2686	1.6	-374.7	8.3		C) non-ded bladder pump; or
	900	13.98	2.5	6.67	21.9	2676	1.6	-376.0	6.9		*Standard groundwater sample:*
	902	14.01	3.0	6.67	21.8	2669	1.7	+377.9	5.0		D) bailer due to limited column; or
	905	14.03	3.5	6.68	21.8	2661	1.7	+378.5	4.4		E) recovery well cycling sample
↓	907	14.05	4.0	6.68	21.8	2656	1.7	+379.4	4.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.3.18	910	MW-108	14.05	6.68	21.8	2656	1.7	-379.4	4.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(SW of NCL field)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-31
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1715	NA	10.75	0.0	20.16	17.4	*Issue	yes	yes	yes		Weather: Clear, 70's
10.3.18	930	NA	10.75									

Well Purging Record

*Cannot fit cap and close prot. casing.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.18	935	10.92	0.5	7.16	27.6	3400	1.9	-239.6	7.0	Colorless; Clear	*Low-flow groundwater sample:*
	937	10.95	1.0	7.02	27.1	3420	1.3	-235.4	6.2		(A) peristaltic pump w/ ded tubing
	940	10.95	1.5	6.96	26.8	3410	1.3	-233.1	5.6		B) ded bladder pump
	942	10.95	2.0	6.91	26.6	3390	1.3	-234.3	5.2		C) non-ded bladder pump; or
	945	10.95	2.5	6.89	26.5	3380	1.2	-235.1	4.8		*Standard groundwater sample:*
	947	10.95	3.0	6.88	26.4	3370	1.2	-236.7	4.4		D) bailer due to limited column; or
	950	10.95	3.5	6.88	26.4	3370	1.2	-237.3	4.2		E) recovery well cycling sample
	952	10.95	4.0	6.87	26.3	3370	1.2	-238.4	3.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10.3.18	955	NCL-31	10.95	6.87	26.3	3370	1.2	-238.4	3.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										Cyanide	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only; Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-19
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other ✓ (6-in)	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1720	NA	11.06	0.0	22.08	NS	yes	yes	*Issue	yes		Weather: Clear, 70's

Well Purging Record

* No prot. casing, well not secured.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-55
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1625	NA	11.13	0.0	26.85	21.7	yes	yes	yes	yes		Weather: Partly Cloudy, 80's
10.3.18	1150	NA	11.14	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.18	1155	11.17	0.5	6.81	27.6	4160	2.2	-60.3	9.0	Colorless; Clear	*Low-flow groundwater sample:*
↓	1157	11.17	1.0	6.72	27.3	4210	1.6	-64.1	8.1	↓	(A) peristaltic pump w/ ded tubing
	1200	11.17	1.5	6.70	27.1	4230	1.4	-68.6	7.3		B) ded bladder pump
	1202	11.17	2.0	6.69	27.0	4240	1.3	-70.3	6.2		C) non-ded bladder pump; or
	1205	11.17	2.5	6.68	26.9	4230	1.4	-72.1	5.0		*Standard groundwater sample:*
	1207	11.17	3.0	6.68	26.8	4220	1.5	-74.0	4.6		D) bailer due to limited column; or
	1210	11.17	3.5	6.67	26.8	4210	1.5	-75.6	4.7		E) recovery well cycling sample
↓	1212	11.17	4.0	6.67	26.7	4210	1.5	-76.7	4.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.3.18	1215	MW-55	11.17	6.67	26.7	4210	1.5	-76.7	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** RW-#17A
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** REST

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other ✓ 6-in	Other __

Bell-shaped PVC stickup w/ PVC slip cap

Hydrologic Monitoring for TRC Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1630	NA	10.93	0.0	16.01 (soft)	14.0	yes	yes	yes	yes		Weather: partly cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		RW-#17A								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in __	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other ✓ 6-in	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	1615	NA	11.36	0.0	22.20	20.2	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-18								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-54A
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	845	NA	12.24	0.0	31.30	23.6	yes	yes	yes	yes		Weather: Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	850	12.27	0.5	6.24	22.4	2438	2.6	52.7	8.2	Colorless; Clear	*Low-flow groundwater sample:*
	852	12.27	1.0	6.30	22.3	2441	1.8	49.7	7.5		(A) peristaltic pump w/ ded tubing
	855	12.27	1.5	6.31	22.3	2449	1.7	49.4	7.1		B) ded bladder pump
	857	12.27	2.0	6.40	22.3	2458	1.8	49.8	6.4		C) non-ded bladder pump; or
	900	12.27	2.5	6.48	22.3	2462	1.9	51.2	6.6		*Standard groundwater sample:*
	902	12.27	3.0	6.51	22.2	2464	1.9	52.6	6.2		D) bailer due to limited column; or
	905	12.27	3.5	6.53	22.2	2466	1.9	53.4	6.0		E) recovery well cycling sample
↓	907	12.27	4.0	6.54	22.2	2467	1.9	54.6	5.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: Pace National, Mt. Juliet, TN
10.2.18	910	mw-54A	12.27	6.54	22.2	2467	1.9	54.0	5.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Gauge only

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54B
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC ✓
Upright ✓	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	925	NA	12.27	0.0	46.80	41.8	yes	yes	yes	yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
		MW-54B								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Dup-NCL-01 (same analysis)
+ Trip Blank-NCL-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-49
Event: 2H18
Area of Concern: NCL

Completion	Casing Diam.	Casing Material
At-Grade __	2-in ✓	PVC __
Upright ✓	4-in __	SS ✓
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	930	NA	16.14	0.0	32.18	41.8	yes	yes	yes	yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.2.18	935	16.17	0.5	7.13	22.9	3160	3.1	80.5	8.1	Colorless; clear	*Low-flow groundwater sample:*
|	937	16.17	1.0	7.00	22.3	3200	2.0	81.0	7.4	|	(A) peristaltic pump w/ ded tubing
|	940	16.17	1.5	6.94	22.0	3270	1.7	81.6	7.0	|	B) ded bladder pump
|	942	16.17	2.0	6.91	21.9	3290	1.6	82.2	6.5	|	C) non-ded bladder pump; or
|	945	16.17	2.5	6.90	21.9	3240	1.5	82.4	6.3	|	*Standard groundwater sample:*
|	947	16.17	3.0	6.89	21.9	3220	1.5	82.8	5.0	|	D) bailer due to limited column; or
|	950	16.17	3.5	6.88	21.8	3210	1.5	83.2	4.8	|	E) recovery well cycling sample
↓	952	16.17	4.0	6.88	21.8	3200	1.5	84.0	4.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
10.2.18	955	NCL-49	16.17	6.88	21.8	3200	1.5	84.0	4.4	DRO	HCL	8015M
|										~~GRO~~	~~HCL~~	~~8015M~~
|										VOC	HCL	8260
|								Anions (Chloride,Fluoride,Sulfate)			Neat	300
|							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
|										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
|										TDS	Neat	2540C
|										***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
|										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
|										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1100	Dup-NCL-01	16.17	6.88	21.8	3200	1.5	84.0	4.4	same analysis	same	same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

~15' S. of 70 mile marker (285 Northbound) Gauge Only

Monitoring Well Purging and Sampling Record

Navajo Refining Company — **Well:** MW-53
Artesia Refinery — **Event:** 2H18
Artesia, New Mexico — **Area of Concern:** NCL

Completion	Casing Diam.	Casing Material
At-Grade ✓	2-in ✓	PVC ✓
Upright __	4-in __	SS __
Vault __	Other __	Other __

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.2.18	830	NA	11.31	0.0	23.60	19.6	yes	yes	yes	yes		Weather: Cloudy, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: Pace National, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, Pace National
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Instrument Calibration Log

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Hydrologic Monitoring
for TRC
Houston, Texas

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)	PID Thermo Environmental 100 ppm Isobutylene	Initials / Comments
10-2-18	803	4.01/7.00	1,000	100%	10.0	232.7	NA	BRH
10.2.18	805	4.01/7.00	1,000	100%	10.0	249.8	NA	CJH
10/2/18	807	4.01/7.00	1,000	100%	10.0	250.6	NA	BB
10/2/18	810	4.01/7.00	1,000	100%	10.0	248.7	NA	TAB
10/2/18	812	4.01/7.00	1,000	100%	10.0	239.8	NA	SCD
10/2/18	816	4.01/7.00	1,000	100%	10.0	244.9	NA	GDS
10/2/18	818	4.01/7.00	1,000	100%	10.0	241.6	NA	RLR
10-3-18	645	4.01/7.00	1,000	100%	10.0	230.8	NA	BRH
10/3/18	652	4.01/7.00	1,000	100%	10.0	241.4	NA	GDS
10/3/18	655	4.01/7.00	1,000	100%	10.0	237.5	NA	SCD
10/3/18	658	4.01/7.00	1,000	100%	10.0	248.6	NA	BR
10/3/18	700	4.01/7.00	1,000	100%	10.0	250.1	NA	TAB
10/3/18	703	4.01/7.00	1,000	100%	10.0	242.8	NA	RLR
10.3.18	705	4.01/7.00	1,000	100%	10.0	256.7	NA	CJH

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day
Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-85	Grab	GW				9	X	X	X	X	X	X	X	LNAPL				
MW-86	Grab	GW				10	X	X	X		X	X	X	X	X	LNAPL		
MW-120	Grab	GW				9	X	X	X	X	X	X	X					
MW-121	Grab	GW				9	X	X	X	X	X	X	X					
MW-84	Grab	GW				9	X	X	X	X	X	X	X					
MW-122	Grab	GW				9	X	X	X	X	X	X	X					
MW-79	Grab	GW				9	X	X	X	X	X	X	X					
MW-74	Grab	GW				9	X	X	X	X	X	X	X					
MW-2A	Grab	GW				9	X	X	X	X	X	X	X					
OCD-6	Grab	GW				9	X	X	X	X	X	X	X					

Chain of Custody Page 1 of 5

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 5

Pace Analytical® National Center for Testing & Innovation

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template: T140422
Prelogin: P671812
TSR: 526
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~OCD-7AR~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
MW-76	Grab	GW		10-2-18	1725	9	X	X	X	X	X	X	X					
~~MW-75~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
MW-83	Grab	GW		10-2-18	1645	9	X	X	X	X	X	X	X					
MW-3	Grab	GW			1550	9	X	X	X	X	X	X	X					
MW-88	Grab	GW			1255	7	X	X	X	X								
MW-22A	Grab	GW			1345	9	X	X	X	X	X	X	X					
MW-10	Grab	GW			1430	9	X	X	X	X	X	X	X					
MW-123	Grab	GW			1515	9	X	X	X	X	X	X	X					
MW-4A	Grab	GW		↓	1210	9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-3-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: / If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time: / Hold: / Condition: NCF / OK

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 3 of 5

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO -40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-5A	Grab	GW		10-2-18	1115	9	X	X	X	X	X	X	X					
MW-7A	Grab	GW			1005	9	X	X	X	X	X	X	X					
OCD-8A	Grab	GW			910	10	X	X	X		X	X	X	X	X			
OCD-1R	Grab	GW			1435	9	X	X	X	X	X	X	X					
OCD-2A	Grab	GW			1520	7	X	X	X	X								
OCD-3	Grab	GW			1600	7	X	X	X	X								
OCD-4	Grab	GW			1640	7	X	X	X	X								
MW-11A	Grab	GW			1800	3					X	X	X					
OCD-5	Grab	GW			1720	9	X	X	X	X	X	X	X					
MW-87	Grab	GW		↓	910	7	X	X	X	X								

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

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Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day
Date Results Needed

Quote #

Analysis / Container / Preservative

Chain of Custody Page 4 of 5

Pace Analytical® National Center for Testing & Innovation

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Mount Juliet, TN 37122
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L #
Table #
Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-18A	Grab	GW		10-2-18	1000	8	X	X			X	X	X	X	X			
MW-70	Grab	GW			1045	7	X	X	X	X								
MW-124	Grab	GW			1130	9	X	X	X	X	X	X	X					
DUP-EP-01	Grab	GW			1000	9	X	X	X	X	X	X	X					
DUP-EP-02	Grab	GW			1100	9	X	X	X	X	X	X	X					
DUP-EP-03	Grab	GW		↓	1200	9	X	X	X	X	X	X	X					
~~EB-EP-01~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
EB-EP-02	Grab	GW		10-2-18	1145	9	X	X	X	X	X	X	X					
EB-EP-03	Grab	GW		↓	1130	9	X	X	X	X	X	X	X					
~~EB-EP-04~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
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Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

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City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately
Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~Trip Blank-EP-01~~	~~Grab~~	~~GW~~				1										X		
Trip Blank-EP-02	Grab	GW		10-2-18	—	1										X		
Trip Blank-EP-03	Grab	GW		10-2-18	—	1										X		

Analysis / Container / Preservative

Chain of Custody Page 5 of 5

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Mount Juliet, TN 37122
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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: REST Fall 2018
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project # 294318.0000.0000.
Lab Project # TRCATX-REST

Collected by (print): Scott Ude/HMI Team
Site/Facility ID # REST (Navajo - Artesia)
P.O. # 119503

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Date Results Needed

Quote #

Analysis / Container / Preservative

Chain of Custody Page 1 of 9

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template: T140424
Prelogin: P671814
TSR: 526
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~MW-48~~	~~Grab~~	~~GW~~				9	x	x	x	x	x	x	x					
~~MW-130~~	~~Grab~~	~~GW~~				9	x	x	x	x	x	x	x					
~~KWB-4~~	~~Grab~~	~~GW~~				7	x	x		x	x	x	x					
~~MW-52~~	~~Grab~~	~~GW~~				10	x	x	x		x	x	x	x	x			
~~MW-109~~	~~Grab~~	~~GW~~				9	x	x	x	x	x	x	x					
~~MW-110~~	~~Grab~~	~~GW~~				9	x	x	x	x	x	x	x					
MW-113	Grab	GW		10-2-18	1335	9	x	x	x	x	x	x	x					
~~KWB-8~~	~~Grab~~	~~GW~~				8	x	x			x	x	x	x	x			
~~MW-133~~	~~Grab~~	~~GW~~				9	x	x	x	x	x	x	x	LNAPL				
~~MW-134~~	~~Grab~~	~~GW~~				9	x	x	x	x	x	x	x					

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk
~~RA-4798~~	~~Grab~~	~~GW~~				5	X				X	X	X			
~~RA-4196~~	~~Grab~~	~~GW~~				5	X				X	X	X			
KWB-7	Grab	GW		10-2-18	920	8	X	X			X	X	X	X	X	
MW-135	Grab	GW			1220	9	X	X	X	X	X	X	X			
KWB-11A	Grab	GW			1030	10	X	X	X		X	X	X	X	X	
KWB-11B	Grab	GW		↓	1115	10	X	X	X		X	X	X	X	X	
~~MW-115~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~MW-114~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~MW-117~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~MW-118~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature) — Date: 10-3-18 — Time: 700

Received by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Relinquished by : (Signature) — Date: — Time:

Received by: (Signature)

Temp: °C Bottles Received:

If preservation required by Login: Date/Time

Relinquished by : (Signature) — Date: — Time:

Received for lab by: (Signature)

Date: Time:

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Chain of Custody Page 2 of 9

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Remarks | Sample # (lab only)

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~MW-119~~	Grab	GW				9	X				X	X	X					
MW-136	Grab	GW		10-2-18	1030	10	X	X	X		X	X	X	X	X			
MW-126A	Grab	GW			1115	9	X	X	X	X	X	X	X					
MW-126B	Grab	GW			1155	9	X	X	X	X	X	X	X					
MW-127	Grab	GW			1235	9	X	X	X	X	X	X	X					
KWB-1A	Grab	GW			945	8	X	X			X	X	X	X	X			
KWB-10R	Grab	GW		↓	900	7	X	X		X	X	X	X					
~~MW-131~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X	LNAPL				
KWB-5	Grab	GW		10-2-18	1445	7	X	X		X	X	X	X					
MW-111	Grab	GW		↓	1350	9	X	X	X	X	X	X	X					

Chain of Custody Page 3 of 9

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day
Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~KWB-6~~	~~Grab~~	~~GW~~				~~7~~	X	X		X	X	X	X					
~~MW-112~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X	LNAPL				
~~MW-132~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X	LNAPL				
~~MW-57~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X					
~~KWB-12A~~	~~Grab~~	~~GW~~				~~10~~	X	X	X		X	X	X	X	X			
~~KWB-12B~~	~~Grab~~	~~GW~~				~~10~~	X	X	X		X	X	X	X	X			
~~KWB-2R~~	~~Grab~~	~~GW~~				~~7~~	X	X		X	X	X	X	Not Sampled				
~~MW-58~~	~~Grab~~	~~GW~~				~~8~~	X	X			X	X	X	X	X			
MW-104	Grab	GW		10-2-18	1005	9	X	X	X	X	X	X	X					
MW-64	Grab	GW		↓	925	9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature) — Date: 10-3-18 — Time: 700 — Received by: (Signature)

Relinquished by : (Signature) — Date: — Time: — Received by: (Signature)

Relinquished by : (Signature) — Date: — Time: — Received for lab by: (Signature) — Date: — Time:

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Chain of Custody Page 4 of 9

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Phone: 800-767-5859
Fax: 615-758-5859

L#

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately
Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 5 of 9

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-65	Grab	GW		10-2-18	1135	9	X	X	X	X	X	X	X					
MW-102	Grab	GW		↓	1225	9	X	X	X	X	X	X	X					
~~MW-99~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-66~~	~~Grab~~	~~GW~~				~~10~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
MW-28	Grab	GW		10-2-18	1315	10	X	X	X		X	X	X	X	X			
~~MW-60~~	~~Grab~~	~~GW~~				~~10~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~MW-128~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-125~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-116~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-101~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
[signature]	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day
Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~MW-105~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X					
MW-61	Grab	GW		10-2-18	1445	9	X	X	X	X	X	X	X					
MW-62	Grab	GW		↓	1530	9	X	X	X	X	X	X	X					
~~MW-137~~	~~Grab~~	~~GW~~				~~10~~	X	X	X		X	X	X	X	X			
~~MW-138~~	~~Grab~~	~~GW~~				~~10~~	X	X	X		X	X	X	X	X			
~~MW-23~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X					
~~MW-39~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X					
MW-98	Grab	GW		10-2-18	1355	9	X	X	X	X	X	X	X					
~~MW-29~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X					
~~MW-106~~	~~Grab~~	~~GW~~				~~9~~	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-3-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Chain of Custody Page 6 of 9

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-50	Grab	GW		10-2-18	1050	7	X	X		X	X	X	X					
~~MW-97~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL				
~~MW-92~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL				
MW-91	Grab	GW		10-2-18	1200	9	X	X	X	X	X	X	X					
MW-90	Grab	GW		↓	1240	9	X	X	X	X	X	X	X					
MW-96	Grab	GW		↓	1315	9	X	X	X	X	X	X	X					
~~MW-94~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL				
MW-67	Grab	GW		10-2-18	1415	10	X	X	X		X	X	X	X	X			
DUP-REST-01	Grab	GW		↓	1000	9	X	X	X	X	X	X	X					
DUP-REST-02	Grab	GW		↓	1200	9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

Chain of Custody Page 7 of 9

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 8 of 9

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~DUP-REST-03~~	Grab	GW				9	X	X	X	X	X	X	X					
~~DUP-REST-04~~	Grab	GW				10	X	X	X		X	X	X	X	X			
~~DUP-REST-05~~	Grab	GW				10	X	X	X		X	X	X	X	X			
EB-REST-01	Grab	GW		10-2-18	1345	9	X	X	X	X	X	X	X					
EB-REST-02	Grab	GW		↓	1025	9	X	X	X	X	X	X	X					
~~EB-REST-03~~	Grab	GW				9	X	X	X	X	X	X	X					
EB-REST-04	Grab	GW				10	X	X	X		X	X	X	X	X			
~~EB-REST-05~~	Grab	GW				10	X	X	X		X	X	X	X	X			
~~TRIP BLANK-REST-01~~	Grab	GW				1										X		
~~TRIP BLANK-REST-02~~	Grab	GW				1										X		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-3-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately
Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day
Date Results Needed

Quote #

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~TRIP BLANK-REST-03~~	Grab	GW				1										X		
TRIP BLANK-REST-04	Grab	GW				1										X		
MW-43	Grab	GW				10	X	X	X		X	X	X	X	X			

Chain of Custody Page 9 of 9

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L #

Table #

Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK

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505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **NCL Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):
Immediately
Packed on Ice N____ Y✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day
Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~MW-45~~	~~Grab~~	~~GW~~				~~8~~	X	X			X	X	X	X	X			
NCL-34A	Grab	GW		10-2-18	1520	7	X	X		X	X	X	X					
NCL-33	Grab	GW		↓	1600	7	X	X		X	X	X	X					
~~NCL-44~~	~~Grab~~	~~GW~~				~~7~~	X	X		X	X	X	X					
~~NCL-32~~	~~Grab~~	~~GW~~				~~7~~	X	X		X	X	X	X					
~~MW-108~~	~~Grab~~	~~GW~~				~~7~~	X	X		X	X	X	X					
~~NCL-31~~	~~Grab~~	~~GW~~				~~7~~	X	X		X	X	X	X					
~~MW-55~~	~~Grab~~	~~GW~~				~~10~~	X	X	X		X	X	X	X	X			
MW-54A	Grab	GW		10-2-18	910	7	X	X		X	X	X	X					
NCL-49	Grab	GW		↓	955	7	X	X		X	X	X	X					

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Chain of Custody Page 1 of 2

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Fax: 615-758-5859

L #
Table #
Acctnum: **TRCATX**
Template: **T140423**
Prelogin: **P671813**
TSR: **526**
PB:
Shipped Via:

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
✓	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **NCL Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Date Results Needed

Quote #

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
DUP-NCL-01	Grab	GW		10-2-18	1100	7	X	X		X	X	X	X					
~~EB-NCL-01~~	~~Grab~~	~~GW~~				~~7~~	X	X		X	X	X	X					
TRIP BLANK-NCL-01	Grab	GW		10-2-18	—	1										X		

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

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L #

Table #

Acctnum: **TRCATX**
Template: **T140423**
Prelogin: **P671813**
TSR: **526**
PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
___ UPS ✓ FedEx ___ Courier _____
Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP ___ Y ___ N
COC Signed/Accurate: ___ Y ___ N
Bottles arrive intact: ___ Y ___ N
Correct bottles used: ___ Y ___ N
Sufficient volume sent: ___ Y ___ N
If Applicable
VOA Zero Headspace: ___ Y ___ N
Preservation Correct/Checked: ___ Y ___ N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-3-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: / If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time: / Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **TEL Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-TEL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TEL (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day
Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
TEL-4	Grab	GW		10-2-18	1255	9	X	X	X	X	X	X	X					
~~TEL-3~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL				
TEL-2	Grab	GW		10-2-18	1130	9	X	X	X	X	X	X	X					
TEL-1	Grab	GW		↓	1045	9	X	X	X	X	X	X	X					
~~MW-49~~	~~Grab~~	~~GW~~				~~10~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
DUP-TEL-01	Grab	GW		10-2-18	1200	9	X	X	X	X	X	X	X					
EB-TEL-01	Grab	GW		↓	1145	9	X	X	X	X	X	X	X					
Trip Blank-TEL-01	Grab	GW		↓	—	1										X		

Chain of Custody Page 1 of 1

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T115528**
Prelogin: **P671987**
TSR: **526**
PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-3-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: / If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time: / Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **TMD Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-TMD**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TMD (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk
NP-1	Grab	GW		10-2-18	1610	2	X									
MW-21	Grab	GW		↓	1700	9	X	X	X	X	X	X	X			
~~MW-46R~~	~~Grab~~	~~GW~~				~~7~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~			
TRIP BLANK-TMD-01	Grab	GW		10-2-18	—	1										X

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T115542**
Prelogin: **P671990**
TSR: **526**
PB:

Shipped Via:

Remarks | Sample # (lab only)

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
	10-3-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 5

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~MW-85~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL				
~~MW-86~~	~~Grab~~	~~GW~~				~~10~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL		
MW-120	Grab	GW		10-3-18	910	9	X	X	X	X	X	X	X					
MW-121	Grab	GW			955	9	X	X	X	X	X	X	X					
MW-84	Grab	GW			1210	9	X	X	X	X	X	X	X					
MW-122	Grab	GW			1040	9	X	X	X	X	X	X	X					
MW-79	Grab	GW			1350	9	X	X	X	X	X	X	X					
MW-74	Grab	GW			1255	9	X	X	X	X	X	X	X					
MW-2A	Grab	GW			1125	9	X	X	X	X	X	X	X					
OCD-6	Grab	GW		↓	1210	9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
___ UPS ✓ FedEx ___ Courier ___

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
OCD-7AR	Grab	GW		10-3-18	1125	9	X	X	X	X	X	X	X					
~~MW-76~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
MW-75	Grab	GW		10-3-18	825	9	X	X	X	X	X	X	X					
~~MW-83~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
~~MW-3~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
~~MW-88~~	~~Grab~~	~~GW~~				7	X	X	X	X								
~~MW-22A~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
~~MW-10~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
~~MW-123~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
~~MW-4A~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-4-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Chain of Custody Page 2 of 5

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Mount Juliet, TN 37122
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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk
~~MW-5A~~	Grab	GW				9	X	X	X	X	X	X	X			
~~MW-7A~~	Grab	GW				9	X	X	X	X	X	X	X			
~~OCD-8A~~	Grab	GW				10	X	X	X		X	X	X	X	X	
~~OCD-1R~~	Grab	GW				9	X	X	X	X	X	X	X			
~~OCD-2A~~	Grab	GW				7	X	X	X	X						
~~OCD-3~~	Grab	GW				7	X	X	X	X						
~~OCD-4~~	Grab	GW				7	X	X	X	X						
~~MW-11A~~	Grab	GW				3					X	X	X			
~~OCD-5~~	Grab	GW				9	X	X	X	X	X	X	X			
~~MW-87~~	Grab	GW				7	X	X	X	X						

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-4-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Chain of Custody Page 3 of 5

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Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template: T140422
Prelogin: P671812
TSR: 526
PB:

Shipped Via:

Remarks | Sample # (lab only)

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk
~~MW-18A~~	~~Grab~~	~~GW~~				8	X	X			X	X	X	X	X	
~~MW-70~~	~~Grab~~	~~GW~~				7	X	X	X	X						
~~MW-124~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~DUP-EP-01~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~DUP-EP-02~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~DUP-EP-03~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
EB-EP-01	Grab	GW		10-3-18	1310	9	X	X	X	X	X	X	X			
~~EB-EP-02~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~EB-EP-03~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
EB-EP-04	Grab	GW		10-3-18	1410	9	X	X	X	X	X	X	X			

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	10-4-18	700	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received:

Date: Time:

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Chain of Custody Page 4 of 5

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L #

Table #

Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:

Shipped Via:

Remarks	Sample # (lab only)

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **EP Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-EP**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **EP (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
Trip Blank-EP-01	Grab	GW		10-3-18	—	1										X		
~~Trip Blank-EP-02~~	~~Grab~~	~~GW~~				1										X		
~~Trip Blank-EP-03~~	~~Grab~~	~~GW~~				1										X		

Chain of Custody Page 5 of 5

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140422**
Prelogin: **P671812**
TSR: **526**
PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__UPS ✓FedEx __Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Pres Chk

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: REST Fall 2018

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project # 294318.0000.0000.

Lab Project # TRCATX-REST

Collected by (print): Scott Ude/HMI Team

Site/Facility ID # REST (Navajo - Artesia)

P.O. # 119503

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Chain of Custody Page 1 of 9

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Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template: T140424
Prelogin: P671814
TSR: 526
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-48	Grab	GW		10-3-18	1455	9	x	x	x	x	x	x	x					
MW-130	Grab	GW		↓	1440	9	x	x	x	x	x	x	x					
~~KWB-4~~	~~Grab~~	~~GW~~				~~7~~	~~x~~	~~x~~		~~x~~	~~x~~	~~x~~	~~x~~	LNAPL				
MW-52	Grab	GW		10-3-18	1325	10	x	x	x		x	x	x	x	x			
MW-109	Grab	GW			1410	9	x	x	x	x	x	x	x					
MW-110	Grab	GW		↓	1515	9	x	x	x	x	x	x	x					
~~MW-113~~	~~Grab~~	~~GW~~				~~9~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~					
~~KWB-8~~	~~Grab~~	~~GW~~				~~8~~	~~x~~	~~x~~			~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	LNAPL		
~~MW-133~~	~~Grab~~	~~GW~~				~~9~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	LNAPL				
MW-134	Grab	GW		10-3-18	1055	9	x	x	x	x	x	x	x					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions, TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
RA-4798	Grab	GW		10-3-18	1150	5	X				X	X	X					
RA-4196	Grab	GW		↓	1220	5	X				X	X	X					
~~KWB-7~~	~~Grab~~	~~GW~~				~~8~~	~~X~~	~~X~~			~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~MW-135~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~KWB-11A~~	~~Grab~~	~~GW~~				~~10~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~KWB-11B~~	~~Grab~~	~~GW~~				~~10~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
MW-115	Grab	GW		10-3-18	910	9	X	X	X	X	X	X	X					
MW-114	Grab	GW			950	9	X	X	X	X	X	X	X					
MW-117	Grab	GW			935	9	X	X	X	X	X	X	X					
MW-118	Grab	GW		↓	1020	9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature) — Date: 10-4-18 — Time: 700 — Received by: (Signature)

Relinquished by : (Signature) — Date: — Time: — Received by: (Signature)

Relinquished by : (Signature) — Date: — Time: — Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received:

Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Chain of Custody Page 2 of 9

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National Center for Testing & Innovation

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Mount Juliet, TN 37122
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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template: T140424
Prelogin: P671814
TSR: 526
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Chain of Custody Page 3 of 9

Pace Analytical® National Center for Testing & Innovation

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L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-119	Grab	GW		10-3-18	1105	9		X				X	X	X					
~~MW-136~~	~~Grab~~	~~GW~~				10		X	X	X		X	X	X	X	X			
~~MW-126A~~	~~Grab~~	~~GW~~				9		X	X	X	X	X	X	X					
~~MW-126B~~	~~Grab~~	~~GW~~				9		X	X	X	X	X	X	X					
~~MW-127~~	~~Grab~~	~~GW~~				9		X	X	X	X	X	X	X					
~~KWB-1A~~	~~Grab~~	~~GW~~				8		X	X			X	X	X	X	X			
~~KWB-10R~~	~~Grab~~	~~GW~~				7		X	X		X	X	X	X					
~~MW-131~~	~~Grab~~	~~GW~~				9		X	X	X	X	X	X	X	LNAPL				
~~KWB-5~~	~~Grab~~	~~GW~~				7		X	X		X	X	X	X					
~~MW-111~~	~~Grab~~	~~GW~~				9		X	X	X	X	X	X	X					

Analysis / Container / Preservative

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 4 of 9

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L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
KWB-6	Grab	GW		10-3-18	1355	7	X	X		X	X	X	X					
~~MW-112~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL				
~~MW-132~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	LNAPL				
MW-57	Grab	GW		10-3-18	1150	9	X	X	X	X	X	X	X					
KWB-12A	Grab	GW		↓	1230	10	X	X	X		X	X	X	X	X			
KWB-12B	Grab	GW		↓	1310	10	X	X	X		X	X	X	X	X			
~~KWB-2R~~	~~Grab~~	~~GW~~				~~7~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	NOT SAMPLED				
MW-58	Grab	GW		10-3-18	1425	8	X	X			X	X	X	X	X			
~~MW-104~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-64~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Pres Chk

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~MW-65~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-102~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
MW-99	Grab	GW		10-3-18	1005	9	X	X	X	X	X	X	X					
MW-66	Grab	GW		↓	925	10	X	X	X		X	X	X	X	X			
~~MW-28~~	~~Grab~~	~~GW~~				~~10~~	~~X~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
MW-60	Grab	GW		10-3-18	1050	10	X	X	X		X	X	X	X	X			
MW-128	Grab	GW			1210	9	X	X	X	X	X	X	X					
MW-125	Grab	GW			1255	9	X	X	X	X	X	X	X					
MW-116	Grab	GW			1335	9	X	X	X	X	X	X	X					
MW-101	Grab	GW		↓	915	9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__UPS ✓FedEx __Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK

Chain of Custody Page 5 of 9

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template: T140424
Prelogin: P671814
TSR: 526
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 6 of 9

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-105	Grab	GW		10-3-18	825	9	X	X	X	X	X	X	X					
~~MW-61~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~MW-62~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
MW-137	Grab	GW		10-3-18	1430	10	X	X	X		X	X	X	X	X			
MW-138	Grab	GW			1345	10	X	X	X		X	X	X	X	X			
MW-23	Grab	GW			1300	9	X	X	X	X	X	X	X					
MW-39	Grab	GW		↓	1125	9	X	X	X	X	X	X	X					
~~MW-98~~	~~Grab~~	~~GW~~				~~9~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
MW-29	Grab	GW		10-3-18	1215	9	X	X	X	X	X	X	X					
MW-106	Grab	GW		↓	1035	9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
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21 Griffin Road North
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Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-50	Grab	GW				7	X	X		X	X	X	X					
MW-97	Grab	GW				9	X	X	X	X	X	X	X	LNAPL				
MW-92	Grab	GW				9	X	X	X	X	X	X	X	LNAPL				
MW-91	Grab	GW				9	X	X	X	X	X	X	X					
MW-90	Grab	GW				9	X	X	X	X	X	X	X					
MW-96	Grab	GW				9	X	X	X	X	X	X	X					
MW-94	Grab	GW				9	X	X	X	X	X	X	X	LNAPL				
MW-67	Grab	GW				10	X	X	X		X	X	X	X	X			
DUP-REST-01	Grab	GW				9	X	X	X	X	X	X	X					
DUP-REST-02	Grab	GW				9	X	X	X	X	X	X	X					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Chain of Custody Page 7 of 9

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Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

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Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ✓

Chain of Custody Page 8 of 9

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L #

Table #

Acctnum: **TRCATX**
Template: **T140424**
Prelogin: **P671814**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
DUP-REST-03	Grab	GW		10-3-18	1200	9		X	X	X	X	X	X	X					
DUP-REST-04	Grab	GW		↓	1200	10		X	X	X		X	X	X	X	X			
DUP-REST-05	Grab	GW		↓	1200	10		X	X	X		X	X	X	X	X			
~~EB-REST-01~~	~~Grab~~	~~GW~~				~~9~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
~~EB-REST-02~~	~~Grab~~	~~GW~~				~~9~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~					
EB-REST-03	Grab	GW		10-3-18	1105	9		X	X	X	X	X	X	X					
EB-REST-04	Grab	GW		↓	1115	10		X	X	X		X	X	X	X	X			
EB-REST-05	Grab	GW		↓	1330	10		X	X	X		X	X	X	X	X			
TRIP BLANK-REST-01	Grab	GW		↓	—	1											X		
TRIP BLANK-REST-02	Grab	GW		↓	—	1											X		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__UPS ✓FedEx __Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	10-4-18	700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-REST**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **REST (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk
TRIP BLANK-REST-03	Grab	GW		10-3-18	—	1										X
TRIP BLANK-REST-04	Grab	GW		↓	—	1										X
MW-43	Grab	GW		↓	1305	10	X	X	X		X	X	X	X	X	

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Relinquished by : (Signature) — Date: 10-4-18 — Time: 700
Relinquished by : (Signature) — Date: — Time:
Relinquished by : (Signature) — Date: — Time:

Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received:

Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Chain of Custody Page 9 of 9

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template: T140422
Prelogin: P671814
TSR: 526
PB:

Shipped Via:

Remarks	Sample # (lab only)

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **NCL Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
MW-45	Grab	GW		10-3-18	1425	8	X	X			X	X	X	X	X			
~~NCL-34A~~	~~Grab~~	~~GW~~				~~7~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~					
~~NCL-33~~	~~Grab~~	~~GW~~				~~7~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~					
NCL-44	Grab	GW		10-3-18	1130	7	X	X		X	X	X	X					
NCL-32	Grab	GW			1045	7	X	X		X	X	X	X					
MW-108	Grab	GW			910	7	X	X		X	X	X	X					
NCL-31	Grab	GW			955	7	X	X		X	X	X	X					
MW-55	Grab	GW			1215	10	X	X	X		X	X	X	X	X			
~~MW-54A~~	~~Grab~~	~~GW~~				~~7~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~					
~~NCL-49~~	~~Grab~~	~~GW~~				~~7~~	~~X~~	~~X~~		~~X~~	~~X~~	~~X~~	~~X~~					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature) — Date: 10-4-18 — Time: 700
Relinquished by : (Signature) — Date: — Time:
Relinquished by : (Signature) — Date: — Time:

Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received:
Date: Time:

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Chain of Custody Page 1 of 2

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template: T140423
Prelogin: P671813
TSR: 526
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **NCL Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-NCL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **NCL (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~DUP-NCL-01~~	~~Grab~~	~~GW~~				7	X	X		X	X	X	X					
EB-NCL-01	Grab	GW		10-3-18	1055	7	X	X		X	X	X	X					
~~TRIP BLANK-NCL-01~~	~~Grab~~	~~GW~~				1										X		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	10-4-18	700	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received:

Date: Time:

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Chain of Custody Page 2 of 2

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Fax: 615-758-5859

L #

Table #

Acctnum: TRCATX
Template: T140423
Prelogin: P671813
TSR: 526
PB:

Shipped Via:

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **TEL Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-TEL**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TEL (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk
~~TEL-4~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~TEL-3~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~TEL-2~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~TEL-1~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
MW-49	Grab	GW		10-3-18	945	10	X	X	X		X	X	X	X	X	
~~DUP-TEL-01~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~EB-TEL-01~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X			
~~Trip Blank-TEL-01~~	~~Grab~~	~~GW~~				1										X

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Relinquished by : (Signature) — Date: 10-4-18 — Time: 700
Relinquished by : (Signature) — Date: — Time:
Relinquished by : (Signature) — Date: — Time:

Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR
Temp: °C Bottles Received:
Date: Time:

If preservation required by Login: Date/Time
Hold:
Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Chain of Custody Page 1 of 1

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Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **TRCATX**
Template: **T115528**
Prelogin: **P671987**
TSR: **526**
PB:

Shipped Via:

Remarks | Sample # (lab only)

TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095
apinvoiceapproval@trcsolutions.com

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **TMD Fall 2018**

City/State Collected: **Artesia, NM**

Phone: **512-684-3170**
Fax:

Client Project # **294318.0000.0000.**

Lab Project # **TRCATX-TMD**

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID # **TMD (Navajo - Artesia)**

P.O. # **119503**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote #

Date Results Needed

Chain of Custody Page 1 of 1

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L #

Table #

Acctnum: **TRCATX**
Template: **T115542**
Prelogin: **P671990**
TSR: **526**
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC - 40mlAmb HCl	DRO - 40mlAmb-HCl-BT	GRO - 40mlAmb HCl	Total Short List Metals 250mlHDPE-HNO3	Cations (from "total metals" bottle)	Anions. TDS - 250mlHDPE-NoPres	NO2NO3 - 250mlHDPE-H2SO4	Total Long List Metals 250mlHDPE-HNO3	Cyanide - 250mlHDPEAmb-NaOH	VOC - 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~NP-1~~	~~Grab~~	~~GW~~				2	X											
~~MW-21~~	~~Grab~~	~~GW~~				9	X	X	X	X	X	X	X					
MW-46R	Grab	GW		10-3-18	1415	7	X	X		X	X	X	X					
~~TRIP BLANK-TMD-01~~	~~Grab~~	~~GW~~				1										X		

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	10-4-18	700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
Cross-Gradient	KWB-13	Apr-15				**0.0630 J**	
	KWB-13	Apr-16				**0.0505 J**	
	KWB-13	Apr-17				0.0370 J	
	KWB-13	Apr-18				**0.0567 J**	
	MW-17	Apr-14				0.0380 J	
	NP-5	Apr-13				**<0.0530**	
	NP-5	Apr-15				0.0387 J	
	NP-5	Apr-17				<0.0247	
	RA-3156	Apr-14					
	RA-3156	Apr-16					
	RA-3156	Apr-17					
	RA-3156	Apr-18					
	MW-136	Apr-16		<0.0314		**0.162**	
	MW-136	Oct-16		<0.0314		**0.118**	
	MW-136	Apr-17		<0.0314		**0.0731 J**	
	MW-136	Oct-17		<0.0314		**0.0937 J**	
	MW-136	Apr-18		<0.0314		**0.0596 J**	
	MW-136	Oct-18		<0.0314		**0.0676 J**	
Evaporation Ponds	MW-1R	Apr-15					**0.124**
	MW-1R	Apr-16					**0.163**
	MW-1R	Apr-17					**0.0583 J**
	MW-1R	Apr-18					**0.0624 J**
	MW-2A	Apr-16		<0.0314			**0.212**
	MW-2A	Oct-16		0.0435 JB			**0.195**
	MW-2A	Apr-17		<0.0314			**0.164**
	MW-2A	Oct-17		0.0354 J			**0.265**
	MW-2A	Apr-18		<0.0314			**0.132**
	MW-2A	Oct-18		<0.0314			**0.175**
	MW-3	Apr-16		0.499			**10.2**
	MW-3	Apr-16	FD	0.490			**9.97**
	MW-3	Oct-16		0.611			**11.0**
	MW-3	Oct-16	FD	0.571			**10.5**
	MW-3	Apr-17		0.205			**8.09**
	MW-3	Apr-17	FD	0.263			**7.74**
	MW-3	Oct-17		0.602			**13.1**
	MW-3	Oct-17	FD	0.834			**4.17**
	MW-3	Apr-18		0.245			**5.43**
	MW-3	Apr-18	FD	0.237			**6.52**
	MW-3	Oct-18		0.289			**6.25**
	MW-3	Oct-18	FD	0.381			**5.62**
	MW-4A	Apr-16		0.402			**8.76**
	MW-4A	Oct-16		0.396			**5.84**
	MW-4A	Apr-17		0.607			**8.15**
	MW-4A	Oct-17		0.730			**7.49**
	MW-4A	Apr-18		0.448			**5.10**
	MW-4A	Oct-18		0.803			**5.23**
	MW-4B	Apr-13		0.102			**0.360**
	MW-4B	Apr-15		0.119			**1.31**
	MW-4B	Apr-17		0.318			**1.21**
	MW-5A	Apr-16		2.09			**8.92**
	MW-5A	Oct-16		1.17			**3.08**
	MW-5A	Apr-17		3.00			**7.60**
	MW-5A	Oct-17		2.75			**7.16**
	MW-5A	Apr-18		1.95			**6.89**
	MW-5A	Oct-18		3.29			**7.51**
	MW-5B	Apr-13		1.78			**7.10**
	MW-5B	Apr-15		1.14			**11.0**
	MW-5B	Apr-17		2.08			**11.2**
	MW-5C	Apr-13		0.0652			**0.220**
	MW-5C	Apr-15		<0.0310			**0.580**
	MW-5C	Apr-17		<0.0314			**0.500**
	MW-6A	Apr-15		<0.0310			**4.50**
	MW-6A	Apr-16		<0.0314			**4.81**
	MW-6A	Apr-17		0.335			**14.2**
	MW-6A	Apr-18		0.406			**9.27**
	MW-6B	Mar-13		<0.0500			**<0.0530**
	MW-6B	Mar-13	FD	<0.0500			**<0.0540**
	MW-6B	Apr-15		<0.0310			**0.386**
	MW-6B	Apr-17		<0.0314			**0.276**
	MW-7A	Apr-16		0.251			**1.22**
	MW-7A	Apr-16	FD	0.269			**1.32**
	MW-7A	Oct-16		0.235			**1.21**
	MW-7A	Oct-16	FD	0.212			**1.25**
	MW-7A	Apr-17		0.501			**1.12**
	MW-7A	Apr-17	FD	0.402			**1.24**
	MW-7A	Oct-17		0.473			**1.30**
	MW-7A	Oct-17	FD	0.523			**1.39**
	MW-7A	Apr-18		0.378			**1.26**
	MW-7A	Apr-18	FD	0.379			**1.28**
	MW-7A	Oct-18		0.755			**1.29**
	MW-7A	Oct-18	FD	0.649			**1.13**
	MW-7B	Apr-13		<0.0500			**<0.0530**
	MW-7B	Apr-15		<0.0310			**0.120**
	MW-7B	Apr-17		<0.0314			**0.0845 J**
	MW-10	Apr-16		1.06			**3.19**
	MW-10	Oct-16		1.05			**2.65**
	MW-10	Apr-17		0.877			**2.75**
	MW-10	Oct-17		1.11			**2.51**
	MW-10	Apr-18		0.734			**2.28**
	MW-10	Oct-18		0.915			**2.03**
	MW-11A	Apr-16		<0.0314			<0.0247
	MW-11A	Oct-16					
	MW-11A	Apr-17		<0.0314			<0.0247
	MW-11A	Oct-17					
	MW-11A	Apr-18		<0.0314			<0.0247
	MW-11A	Oct-18					
	MW-11B	Mar-13		<0.0500			**<0.0520**
	MW-11B	Apr-15		<0.0310			<0.0250
	MW-11B	Apr-17		<0.0314			<0.0247
	MW-12	Apr-14					<0.0200
	MW-13	Apr-14					<0.0200
	MW-15	Apr-15		<0.160			**1.01**
	MW-15	Apr-16		0.203			**0.549**
	MW-15	Apr-17		0.0940 J			**0.251**
	MW-15	Apr-18		0.328			**0.479**

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
Evaporation Ponds	MW-18A	**Apr-16**					**0.460**
	MW-18A	**Oct-16**					**0.424**
	MW-18A	**Apr-17**					**0.516**
	MW-18A	**Oct-17**					**0.520**
	MW-18A	**Apr-18**					**0.349**
	MW-18A	**Oct-18**					**0.329**
	MW-18B	**Apr-13**		0.0995			**<0.0520**
	MW-18B	**Apr-15**		<0.0310			**0.280**
	MW-18B	**Apr-17**		0.0932 J			**0.287**
	MW-22A	**Apr-16**		3.53			**7.43**
	MW-22A	**Apr-16**	FD	4.02			**7.66**
	MW-22A	**Oct-16**		3.48			**5.73**
	MW-22A	**Oct-16**	FD	3.25			**6.18**
	MW-22A	**Apr-17**		3.63			**6.65**
	MW-22A	**Apr-17**	FD	4.22			**6.63**
	MW-22A	**Oct-17**		4.51			**6.03**
	MW-22A	**Oct-17**	FD	4.42			**6.50**
	MW-22A	**Apr-18**		2.50			**4.86**
	MW-22A	**Apr-18**	FD	3.30			**5.22**
	MW-22A	**Oct-18**		3.61			**5.13**
	MW-22A	**Oct-18**	FD	4.46			**4.89**
	MW-22B	**Apr-13**		1.99			**3.00**
	MW-22B	**Apr-15**		2.34			**5.60**
	MW-22B	**Apr-17**		1.76			**5.25**
	MW-70	**Apr-16**		1.46			**0.896**
	MW-70	**Oct-16**		1.32			**0.772**
	MW-70	**Apr-17**		2.35			**0.899**
	MW-70	**Oct-17**		1.78			**0.865**
	MW-70	**Apr-18**		1.97			**0.749**
	MW-70	**Oct-18**		2.34			**0.666**
	MW-72	**Apr-15**		<0.0310			**1.30**
	MW-72	**Apr-16**		<0.0314			**0.950**
	MW-72	**Apr-17**		0.118			**1.03**
	MW-72	**Apr-18**		0.0713 J			**0.555**
	MW-73	**Apr-15**		0.378			**4.00**
	MW-73	**Apr-16**		0.925			**5.17**
	MW-73	**Apr-17**		0.367			**3.68**
	MW-73	**Apr-18**		0.575			**2.85**
	MW-74	**Apr-16**		1.20			**18.4**
	MW-74	**Oct-16**		0.135			**64.3**
	MW-74	**Apr-17**		1.01			**31.5**
	MW-74	**Oct-17**		1.18			**36.5**
	MW-74	**Apr-18**		1.18			**14.1**
	MW-74	**Oct-18**		0.889			**35.3**
	MW-75	**Apr-16**		1.39			**18.2**
	MW-75	**Oct-16**		2.46			**16.6**
	MW-75	**Apr-17**		1.46			**16.7**
	MW-75	**Oct-17**		2.52			**20.6**
	MW-75	**Apr-18**		1.41			**9.88**
	MW-75	**Oct-18**		3.31			**14.4**
	MW-76	**Apr-16**		0.759			**24.1**
	MW-76	**Oct-16**		2.19			**43.7**
	MW-76	**Apr-17**		1.02			**31.1**
	MW-76	**Oct-17**		1.92			**45.5**
	MW-76	**Apr-18**		1.52			**15.1**
	MW-76	**Oct-18**		1.69			**29.2**
	MW-77	**Apr-16**		0.968			**101**
	MW-77	**Oct-16**		1.53 J			**86.1**
	MW-77	**Apr-17**		1.11			**57.5**
	MW-77	**Apr-18**		1.15			**54.4**
	MW-78	**Apr-15**		0.279			**67.0**
	MW-78	**Apr-16**		0.269			**63.2**
	MW-78	**Apr-17**		<0.314			**59.1**
	MW-78	**Apr-18**		<0.314			**26.4**
	MW-79	**Apr-16**		<0.0314			**0.516**
	MW-79	**Oct-16**		0.0513 J			**0.413**
	MW-79	**Apr-17**		<0.0314			**0.498**
	MW-79	**Oct-17**		0.0568 J			**0.454**
	MW-79	**Apr-18**		0.0414 J			**0.389**
	MW-79	**Oct-18**		0.0571 J			**0.533**
	MW-80	**Apr-15**		<0.0310			**0.750**
	MW-80	**Apr-16**		<0.0314			**0.317**
	MW-80	**Apr-17**		<0.0314			**0.680**
	MW-80	**Apr-18**		<0.0314			**0.150**
	MW-81	**Apr-15**		<0.0310			**8.00**
	MW-81	**Apr-16**		0.0339 J			**8.64**
	MW-81	**Apr-17**		<0.0314			**4.84**
	MW-81	**Apr-18**		<0.0314			**0.922**
	MW-82	**Apr-15**		0.361			**14.0**
	MW-82	**Apr-16**		0.334			**8.41**
	MW-82	**Apr-17**		0.660			**6.40**
	MW-82	**Apr-18**		0.432			**3.03**
	MW-83	**Apr-16**		0.310			**26.0**
	MW-83	**Oct-16**		0.234			**28.9**
	MW-83	**Apr-17**		0.305			**29.8**
	MW-83	**Oct-17**		0.805			**36.2**
	MW-83	**Apr-18**		1.18			**7.92**
	MW-83	**Oct-18**		0.597			**19.5**
	MW-84	**Apr-16**		0.519			**83.8**
	MW-84	**Oct-16**		1.58 J			**95.3**
	MW-84	**Apr-17**		<0.314			**4.92**
	MW-84	**Oct-17**		1.16			**67.0**
	MW-84	**Apr-18**		0.765			**22.3**
	MW-84	**Oct-18**		1.21			**41.0**
	MW-87	**Apr-16**		0.0421 J			**0.449**
	MW-87	**Oct-16**		<0.0314			**0.405**
	MW-87	**Apr-17**		<0.0314			**0.356**
	MW-87	**Oct-17**		0.0463 J			**0.399**
	MW-87	**Apr-18**		<0.0314			**0.288**
	MW-87	**Oct-18**		0.0326 J			**0.222**

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
Evaporation Ponds	MW-88	Apr-16		<0.0314		**0.636**	
	MW-88	Oct-16		0.0848 J		**0.635**	
	MW-88	Apr-17		<0.0314		**0.516**	
	MW-88	Oct-17		0.0514 J		**0.627**	
	MW-88	Apr-18		0.0540 J		**0.508**	
	MW-88	Oct-18		0.0479 J		**0.415**	
	MW-120	Apr-16		0.0845 J		**1.82**	
	MW-120	Oct-16		<0.0314		**0.920**	
	MW-120	Apr-17		0.0584 J		**0.813**	
	MW-120	Oct-17		0.150		**0.737**	
	MW-120	Apr-18		0.124		**0.540**	
	MW-120	Oct-18		0.133		**0.664**	
	MW-121	Apr-16		<0.0314		**0.456**	
	MW-121	Oct-16		0.0514 JB		**0.593**	
	MW-121	Apr-17		<0.0314		**0.428**	
	MW-121	Oct-17		<0.0314		**0.567**	
	MW-121	Apr-18		<0.0314		**0.395**	
	MW-121	Oct-18		<0.0314		**0.473**	
	MW-122	Apr-16		<0.0314		**0.824**	
	MW-122	Oct-16		0.0443 JB		**0.412**	
	MW-122	Apr-17		<0.0314		**0.850**	
	MW-122	Oct-17		0.0385 J		**0.429**	
	MW-122	Apr-18		<0.0314		**0.211**	
	MW-122	Oct-18		<0.0314		**0.188**	
	MW-123	Apr-16		1.83		**3.82**	
	MW-123	Oct-16		1.50		**3.53**	
	MW-123	Apr-17		1.96		**3.36**	
	MW-123	Oct-17		1.96		**3.08**	
	MW-123	Apr-18		1.35		**3.09**	
	MW-123	Oct-18		2.04		**2.51**	
	MW-124	Apr-16		<0.0314		<0.0247	
	MW-124	Oct-16		<0.0314		<0.0247	
	MW-124	Apr-17		<0.0314		0.0365 J	
	MW-124	Oct-17		<0.0314		**0.0643 J**	
	MW-124	Apr-18		<0.0314		0.0328 J	
	MW-124	Oct-18		<0.0314		<0.0247	
	OCD-1R	Apr-16		<0.0314		**0.241**	
	OCD-1R	Oct-16		0.0450 J		**0.267**	
	OCD-1R	Apr-17		<0.0314		**0.255**	
	OCD-1R	Oct-17		0.0377 J		**0.268**	
	OCD-1R	Apr-18		<0.0314		**0.187**	
	OCD-1R	Oct-18		<0.0314		**0.141**	
	OCD-2A	Apr-16		<0.0314		**0.0682 J**	
	OCD-2A	Oct-16		0.0333 J		**0.0722 J**	
	OCD-2A	Apr-17		<0.0314		**0.0497 J**	
	OCD-2A	Oct-17		<0.0314		**0.123**	
	OCD-2A	Apr-18		<0.0314		**0.0703 J**	
	OCD-2A	Oct-18		<0.0314		0.0442 J	
	OCD-3	Apr-16		<0.0314		<0.0247	
	OCD-3	Oct-16		<0.0314		<0.0247	
	OCD-3	Apr-17		<0.0314		<0.0247	
	OCD-3	Oct-17		<0.0314		**0.173**	
	OCD-3	Apr-18		<0.0314		**0.0510 J**	
	OCD-3	Oct-18		<0.0314		0.0262 J	
	OCD-4	Apr-16		<0.0314		<0.0247	
	OCD-4	Oct-16		<0.0314		<0.0247	
	OCD-4	Apr-17		<0.0314		<0.0247	
	OCD-4	Oct-17		<0.0314		**0.0981 J**	
	OCD-4	Apr-18		<0.0314		0.0255 J	
	OCD-4	Oct-18		<0.0314		<0.0247	
	OCD-5	Apr-16		<0.0314		**0.0576 J**	
	OCD-5	Oct-16		0.0391 J		0.0423 J	
	OCD-5	Apr-17		0.0353 J		**0.102**	
	OCD-5	Oct-17		0.255		**0.331**	
	OCD-5	Apr-18		0.194		**0.249**	
	OCD-5	Oct-18		0.312		**0.259**	
	OCD-6	Apr-16		0.0939		**1.11**	
	OCD-6	Oct-16		0.242		**1.11**	
	OCD-6	Apr-17		0.199		**0.858**	
	OCD-6	Oct-17		0.294		**1.04**	
	OCD-6	Apr-18		0.218		**0.585**	
	OCD-6	Oct-18		0.293		**0.651**	
	OCD-7AR	Apr-16		0.443		**5.24**	
	OCD-7AR	Oct-16		1.08		**5.28**	
	OCD-7AR	Apr-17		0.710		**4.43**	
	OCD-7AR	Oct-17		1.29		**4.52**	
	OCD-7AR	Apr-18		0.808		**3.30**	
	OCD-7AR	Oct-18		1.32		**3.89**	
	OCD-7B	Mar-13		<0.0500		**<0.0520**	
	OCD-7B	Apr-15		<0.0310		**0.120**	
	OCD-7B	Apr-17		<0.0314		**0.0746 J**	
	OCD-8A	Apr-16		0.726		**3.26**	
	OCD-8A	Oct-16		0.714		**3.23**	
	OCD-8A	Apr-17		1.23		**3.46**	
	OCD-8A	Oct-17		1.34		**3.49**	
	OCD-8A	Apr-18		0.861		**3.15**	
	OCD-8A	Oct-18		1.39		**2.95**	
	OCD-8B	Apr-13		0.298		**0.890**	
	OCD-8B	Apr-15		<0.0310		**0.840**	
	OCD-8B	Apr-17		<0.0314		**0.585**	
Field East of Refinery	KWB-1A	Apr-16			**0.127**		
	KWB-1A	Oct-16			**0.166**		
	KWB-1A	Apr-17			**0.102**		
	KWB-1A	Oct-17			**0.158**		
	KWB-1A	Apr-18			**0.0900 J**		
	KWB-1A	Oct-18			**0.0970 J**		
	KWB-1C	Apr-13			**<0.0440**		
	KWB-1C	Apr-15			**0.113**		
	KWB-1C	Apr-17			**0.140**		

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
Field East of Refinery	KWB-7	**Apr-15**			**1.43**		
	KWB-7	**Oct-15**			**0.721**		
	KWB-7	**Apr-16**			**1.22**		
	KWB-7	**Oct-16**			**1.06**		
	KWB-7	**Apr-17**			**1.40**		
	KWB-7	**Oct-17**			**1.69**		
	KWB-7	**Oct-18**			**0.444**		
	KWB-8	**Oct-16**			**3.02**		
	KWB-8	**Apr-17**			**3.41**		
	KWB-8	**Oct-17**			**3.30**		
	KWB-10R	**Apr-16**			**5.24**		
	KWB-10R	**Oct-16**			**7.50**		
	KWB-10R	**Apr-17**			**4.01**		
	KWB-10R	**Oct-17**			**5.18**		
	KWB-10R	**Apr-18**			**3.23**		
	KWB-10R	**Oct-18**			**3.35**		
	KWB-11A	**Apr-16**		0.267	**3.74**		
	KWB-11A	**Oct-16**		0.223 B	**1.36**		
	KWB-11A	**Apr-17**		0.155	**0.511**		
	KWB-11A	**Oct-17**		0.371	**12.2**		
	KWB-11A	**Apr-18**		0.287	**0.398**		
	KWB-11A	**Oct-18**		0.369	**1.20**		
	KWB-11B	**Apr-16**		<0.0314	<0.0247		
	KWB-11B	**Oct-16**		0.0565 JB	0.0388 J		
	KWB-11B	**Apr-17**		<0.0314	0.0339 J		
	KWB-11B	**Oct-17**		<0.0314	**0.203**		
	KWB-11B	**Apr-18**		<0.0314	**0.0406 J**		
	KWB-11B	**Oct-18**		<0.0314	0.0382 J		
	KWB-12A	**Apr-15**		<0.0310	0.0310 J		
	KWB-12A	**Apr-15**	FD	<0.0310	**0.305**		
	KWB-12A	**Oct-15**		<0.0314	<0.0247		
	KWB-12A	**Apr-16**		<0.0314	0.0377 J		
	KWB-12A	**Oct-16**		0.0348 JB	0.0329 J		
	KWB-12A	**Apr-17**		<0.0314	0.0359 J		
	KWB-12A	**Oct-17**		0.0318 J	**0.0474 J**		
	KWB-12A	**Oct-18**		<0.0314	**0.132**		
	KWB-12B	**Apr-16**		<0.0314	<0.0247		
	KWB-12B	**Apr-16**	FD	<0.0314	<0.0247		
	KWB-12B	**Oct-16**		0.0581 JB	0.0351 J		
	KWB-12B	**Oct-16**	FD	0.0416 JB	**0.0806 J**		
	KWB-12B	**Apr-17**		<0.0314	<0.0247		
	KWB-12B	**Apr-17**	FD	<0.0314	<0.0247		
	KWB-12B	**Oct-17**		<0.0314	**0.0424 J**		
	KWB-12B	**Oct-17**	FD	<0.0314	**0.0765 J**		
	KWB-12B	**Apr-18**		<0.0314	0.0354 JB		
	KWB-12B	**Apr-18**	FD	<0.0314	<0.0247		
	KWB-12B	**Oct-18**		<0.0314	**0.0425 J**		
	KWB-12B	**Oct-18**	FD	<0.0314	**0.0643 J**		
	KWB-P4	**Apr-13**			**<0.0520**		
	KWB-P4	**Apr-15**			**0.0820 J**		
	KWB-P4	**Apr-17**			**0.0526 J**		
	MW-57	**Apr-16**		<0.0314	**0.198**		
	MW-57	**Oct-16**		0.0467 JB	**0.103**		
	MW-57	**Apr-17**		<0.0314	**0.195**		
	MW-57	**Oct-17**		<0.0314	**0.0940 J**		
	MW-57	**Apr-18**		<0.0314	**0.103 B**		
	MW-57	**Oct-18**		<0.0314	**0.0417 J**		
	MW-58	**Apr-16**			**6.27**		
	MW-58	**Oct-16**			**7.78**		
	MW-58	**Apr-17**			**7.23**		
	MW-58	**Oct-17**			**9.77**		
	MW-58	**Apr-18**			**5.73**		
	MW-58	**Oct-18**			**4.86**		
	MW-111	**Apr-16**		1.31	**2.04**		
	MW-111	**Oct-16**		1.13	**2.04**		
	MW-111	**Apr-17**		1.27	**2.08**		
	MW-111	**Oct-17**		1.28	**2.39**		
	MW-111	**Apr-18**		1.69	**1.52**		
	MW-111	**Oct-18**		1.36	**2.63**		
	MW-113	**Apr-16**		0.581	**0.156**		
	MW-113	**Apr-16**	FD	0.627	**0.180**		
	MW-113	**Oct-16**		0.215 B	**0.236**		
	MW-113	**Oct-16**	FD	0.218 B	**0.188**		
	MW-113	**Apr-17**		0.984	**0.169**		
	MW-113	**Apr-17**	FD	1.03	**0.214**		
	MW-113	**Oct-17**		0.444	**0.335**		
	MW-113	**Oct-17**	FD	0.368	**0.355**		
	MW-113	**Apr-18**		0.683	**0.142 B**		
	MW-113	**Apr-18**	FD	0.756	**0.174**		
	MW-113	**Oct-18**		0.285	**0.100 J**		
	MW-113	**Oct-18**	FD	0.259	**0.215**		
	MW-125	**Apr-16**		<0.0314	**0.0578 J**		
	MW-125	**Oct-16**		<0.0314	**0.0756 J**		
	MW-125	**Apr-17**		<0.0314	**0.0964 J**		
	MW-125	**Oct-17**		<0.0314	**0.0631 J**		
	MW-125	**Apr-18**		<0.0314	**0.0475 J**		
	MW-125	**Oct-18**		<0.0314	**0.211**		
	MW-126A	**Apr-16**		0.202	**0.751**		
	MW-126A	**Oct-16**		0.702	**0.924**		
	MW-126A	**Apr-17**		0.209	**0.665**		
	MW-126A	**Oct-17**		0.223	**0.793**		
	MW-126A	**Apr-18**		0.0634 J	**0.390**		
	MW-126A	**Oct-18**		0.182	**0.723**		
	MW-126B	**Apr-16**		<0.0314	**0.361**		
	MW-126B	**Oct-16**		0.0546 JB	**0.346**		
	MW-126B	**Apr-17**		<0.0314	**0.245**		
	MW-126B	**Oct-17**		<0.0314	**0.329**		
	MW-126B	**Apr-18**		<0.0314	**0.244**		
	MW-126B	**Oct-18**		<0.0314	**0.298**		
	MW-127	**Apr-16**		6.40	**1.43**		
	MW-127	**Oct-16**		3.81 B	**1.22**		
	MW-127	**Apr-17**		4.45	**1.38**		
	MW-127	**Oct-17**		1.68	**1.41**		
	MW-127	**Apr-18**		5.15	**1.06**		
	MW-127	**Oct-18**		3.13	**1.30**		

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
Field East of Refinery	MW-128	Apr-16		0.62	**2.45**		
	MW-128	Oct-16		0.907	**2.75**		
	MW-128	Apr-17		1.09	**2.42**		
	MW-128	Oct-17		1.14	**2.37**		
	MW-128	Apr-18		0.932	**1.58**		
	MW-128	Oct-18		2.76	**2.04**		
	MW-129	Apr-16		2.7	**1.68**		
	MW-129	Oct-16		2.17	**1.68**		
	MW-129	Apr-17		1.79	**2.13**		
	MW-129	Apr-18		4.33	**1.40**		
	MW-130	Apr-16		<0.0314	**1.08**		
	MW-130	Oct-16		0.200	**1.09**		
	MW-130	Apr-17		<0.0314	**1.08**		
	MW-130	Oct-17		<0.0314	**1.22**		
	MW-130	Apr-18		0.0327 J	**0.756 B**		
	MW-130	Oct-18		<0.0314	**0.945**		
	MW-131	Apr-15		7.68	**2.80**		
	MW-131	Oct-15		6.76	**4.00**		
	MW-131	Apr-16		9.16	**2.12**		
	MW-131	Oct-16		6.31	**1.86**		
	MW-131	Apr-17		6.81	**1.77**		
	MW-131	Oct-17		4.95	**1.58**		
	MW-133	Nov-14		9.40	**2.80**		
	MW-133	Apr-15		11.3	**3.10**		
	MW-134	Apr-16		0.0420 J	**0.0971 J**		
	MW-134	Apr-16	FD	<0.0314	**0.0774 J**		
	MW-134	Oct-16		<0.0314	**0.184**		
	MW-134	Oct-16	FD	<0.0314	**0.135**		
	MW-134	Apr-17		<0.0314	**0.0894 J**		
	MW-134	Apr-17	FD	<0.0314	**0.0738 J**		
	MW-134	Oct-17		<0.0314	**0.109**		
	MW-134	Oct-17	FD	<0.0314	**0.250**		
	MW-134	Apr-18		<0.0314	**0.0533 J**		
	MW-134	Apr-18	FD	<0.0314	**0.0427 J**		
	MW-134	Oct-18		<0.0314	**0.0547 J**		
	MW-134	Oct-18	FD	<0.0314	**0.0883 J**		
	MW-135	Apr-16		<0.0314	**0.162**		
	MW-135	Oct-16		0.0638 JB	**0.147**		
	MW-135	Apr-17		<0.0314	**0.0767 J**		
	MW-135	Oct-17		<0.0314	**0.102**		
	MW-135	Apr-18		<0.0314	**0.0408 J**		
	MW-135	Oct-18		<0.0314	0.0342 J		
	RA-4196	Apr-16					
	RA-4196	Oct-16					
	RA-4196	Apr-17					
	RA-4196	Oct-17					
	RA-4196	Apr-18					
	RA-4196	Oct-18					
	RA-4798	Apr-16					
	RA-4798	Oct-16					
	RA-4798	Apr-17					
	RA-4798	Oct-17					
	RA-4798	Apr-18					
	RA-4798	Oct-18					
	RW-12R	Apr-16			**1.38**		
	RW-12R	Apr-17			**1.61**		
	RW-12R	Apr-18			**0.514 B**		
	RW-13R	Apr-16			**0.808**		
	RW-13R	Apr-18			**0.526 B**		
	RW-18	Apr-15					
	RW-18	Apr-16					
	RW-18A	Apr-17					
	RW-18A	Apr-18					
	RW-20	Apr-15			**2.10**		
	RW-22	Apr-15			**5.40**		
North Refinery	MW-23	Apr-16		34.7	**28.7**		
	MW-23	Oct-16		37.1	**21.2**		
	MW-23	Apr-17		29.1	**2.78**		
	MW-23	Oct-17		17.6	**32.0**		
	MW-23	Apr-18		19.3	**13.6**		
	MW-23	Oct-18		13.4	**13.7**		
	MW-29	Apr-16		<0.0314	**1.27**		
	MW-29	Oct-16		<0.0314	**1.04**		
	MW-29	Apr-17		<0.0314	**0.857**		
	MW-29	Oct-17		<0.0314	**4.44**		
	MW-29	Apr-18		<0.0314	**1.03**		
	MW-29	Oct-18		0.126	**1.10**		
	MW-39	Apr-16		5.16	**12.5**		
	MW-39	Oct-16		7.24	**9.26**		
	MW-39	Apr-17		5.20	**9.81**		
	MW-39	Oct-17		2.66	**9.16**		
	MW-39	Apr-18		1.36	**6.39**		
	MW-39	Oct-18		0.758	**4.99**		
	MW-40	Apr-15		0.735	**4.50**		
	MW-40	Apr-16		1.03	**4.92**		
	MW-40	Apr-17		1.29	**4.15**		
	MW-40	Apr-18		1.18	**2.45**		
	MW-41	Apr-15		0.103	**1.60**		
	MW-41	Apr-16		0.171	**2.26**		
	MW-41	Apr-17		0.249	**1.58**		
	MW-41	Apr-18		0.111	**3.30**		
	MW-42	Apr-15		1.37	**7.00**		
	MW-42	Apr-16		0.737	**5.88**		
	MW-42	Apr-17		0.262	**3.41**		
	MW-42	Apr-18		0.626	**2.98**		
	MW-43	Apr-16		31.6	**6.24**		
	MW-43	Oct-16		38.0	**6.51**		
	MW-43	Apr-17		29.6	**6.53**		
	MW-43	Oct-17		28.0	**6.03**		
	MW-43	Apr-18		73.8	**5.89**		
	MW-43	Oct-18		35.8	**6.37**		
	MW-59	Apr-15		<0.0310	**0.860**		
	MW-59	Apr-16		<0.0314	**0.919**		
	MW-59	Apr-17		0.163	**0.835**		
	MW-59	Apr-18		0.232	**0.576**		

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
North Refinery	MW-60	**Apr-16**		0.575	**1.21**		
	MW-60	**Apr-16**	FD	0.396	**1.19**		
	MW-60	**Oct-16**		0.331	**0.628**		
	MW-60	**Oct-16**	FD	0.251	**0.573**		
	MW-60	**Apr-17**		0.309	**0.923**		
	MW-60	**Apr-17**	FD	0.343	**0.947**		
	MW-60	**Oct-17**		0.479	**1.07**		
	MW-60	**Oct-17**	FD	0.469	**1.54**		
	MW-60	**Apr-18**		0.319	**0.633**		
	MW-60	**Apr-18**	FD	0.347	**0.688**		
	MW-60	**Oct-18**		0.593	**1.23**		
	MW-60	**Oct-18**	FD	0.502	**1.09**		
	MW-61	**Apr-16**		2.60	**3.59**		
	MW-61	**Oct-16**		4.21	**3.55**		
	MW-61	**Apr-17**		6.48	**2.70**		
	MW-61	**Oct-17**		7.01	**4.21**		
	MW-61	**Apr-18**		7.59	**2.55**		
	MW-61	**Oct-18**		13.4	**4.40**		
	MW-62	**Apr-16**		7.81	**7.54**		
	MW-62	**Oct-16**		11.3	**4.72**		
	MW-62	**Apr-17**		8.61	**5.93**		
	MW-62	**Oct-17**		9.55	**8.69**		
	MW-62	**Apr-18**		9.38	**4.28**		
	MW-62	**Oct-18**		11.6	**7.19**		
	MW-67	**Apr-16**		1.29	**11.1**		
	MW-67	**Oct-16**		1.03	**9.36**		
	MW-67	**Apr-17**		1.77	**9.40**		
	MW-67	**Oct-17**		0.649	**8.48**		
	MW-67	**Apr-18**		1.53	**4.25**		
	MW-67	**Oct-18**		0.562	**7.73**		
	MW-90	**Apr-16**		0.119	**4.03**		
	MW-90	**Oct-16**		<0.0314	**1.11**		
	MW-90	**Apr-17**		0.217	**4.20**		
	MW-90	**Oct-17**		0.160	**4.63**		
	MW-90	**Apr-18**		0.354	**3.29**		
	MW-90	**Oct-18**		0.397 B	**5.54**		
	MW-91	**Apr-16**		22.1	**22.2**		
	MW-91	**Oct-16**		20.6	**16.3**		
	MW-91	**Apr-17**		17.0	**19.8**		
	MW-91	**Oct-17**		13.6	**17.9**		
	MW-91	**Apr-18**		17.2	**8.33**		
	MW-91	**Oct-18**		16.7	**11.8**		
	MW-92	**Apr-16**		5.50	**20.4**		
	MW-92	**Oct-16**		6.05	**22.8**		
	MW-93	**Apr-16**		1.06	**7.83**		
	MW-93	**Oct-16**		2.57	**8.66**		
	MW-93	**Apr-17**		3.73	**7.89**		
	MW-93	**Apr-18**		3.59	**5.05**		
	MW-94	**Oct-15**		6.12	**25.6**		
	MW-94	**Apr-16**		7.91	**8.69**		
	MW-94	**Oct-16**		6.83	**9.76**		
	MW-94	**Apr-17**		10.2	**9.96**		
	MW-95	**Apr-15**		<0.0310	**7.58**		
	MW-95	**Apr-16**		0.129	**8.06**		
	MW-95	**Apr-17**		0.0826 J	**6.96**		
	MW-95	**Apr-18**		<0.0314	**3.68**		
	MW-96	**Apr-16**		25.3	**10.8**		
	MW-96	**Oct-16**		20.0	**7.74**		
	MW-96	**Apr-17**		25.1	**9.02**		
	MW-96	**Oct-17**		13.9	**7.85**		
	MW-96	**Apr-18**		36.5	**4.65**		
	MW-96	**Oct-18**		31.3	**8.07**		
	MW-98	**Apr-16**		14.7	**6.88**		
	MW-98	**Oct-16**		20.0	**4.97**		
	MW-98	**Apr-17**		15.9	**5.94**		
	MW-98	**Oct-17**		20.1	**5.92**		
	MW-98	**Apr-18**		25.4	**4.78**		
	MW-98	**Oct-18**		20.9	**5.69**		
	MW-137	**Apr-16**		33.8	**11.8**		
	MW-137	**Oct-16**		30.9	**9.65**		
	MW-137	**Apr-17**		14.1 J	**12.6**		
	MW-137	**Oct-17**		33.1	**11.3**		
	MW-137	**Apr-18**		26.6	**9.60**		
	MW-137	**Oct-18**		32.6	**8.76**		
	MW-138	**Apr-16**		4.86	**15.5**		
	MW-138	**Oct-16**		2.28	**10.3**		
	MW-138	**Apr-17**		1.00	**14.6**		
	MW-138	**Oct-17**		2.20	**15.0**		
	MW-138	**Apr-18**		2.44	**6.05**		
	MW-138	**Oct-18**		4.06	**6.00**		
	RW-1	**Apr-15**		2.95 J	**12.0**		
	RW-1R	**Apr-16**		2.13	**8.54**		
	RW-1	**Apr-17**		2.20	**21.5**		
	RW-1	**Apr-18**		6.05	**8.92**		
	RW-2	**Apr-15**		18.3	**19.7**		
	RW-2R	**Apr-16**		20.8	**17.3**		
	RW-2	**Apr-17**		17.2	**11.6**		
	RW-2	**Apr-18**		20.5	**8.31**		
	RW-7	**Apr-15**		1.05	**9.70**		
	RW-7R	**Apr-16**		0.0588 J	**1.97**		
	RW-7	**Apr-17**		<0.0314	**1.15**		
	RW-7	**Apr-18**		0.177	**11.3**		
	RW-8	**Apr-15**			**7.30**		
	RW-8	**Apr-17**			**11.6**		
	RW-9	**Apr-15**		2.55	**3.20**		
	RW-9	**Apr-16**		0.492 J	**3.44**		
	RW-9	**Apr-17**		2.36	**3.21**		
	RW-9	**Apr-18**		2.20	**2.31**		
	RW-10	**Apr-15**		<0.0310	**4.80**		
	RW-10	**Apr-16**		<0.157	**3.66**		
	RW-10	**Apr-17**		0.207	**2.90**		
	RW-10	**Apr-18**		0.380	**2.81**		

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
North Refinery	RW-16	Apr-15				**1.90**	
	RW-16	Apr-16				**2.29**	
	RW-16	Apr-17				**1.08**	
	RW-16	Apr-18				**0.350**	
	RW-17	Apr-15		<0.0310		**1.20**	
	RW-17	Apr-16		<0.0314		**1.75**	
	RW-17	Apr-17		0.0622	J	**2.57**	
	RW-17	Apr-18		0.0927	J	**1.57**	
North RO Reject Field	MW-117	Apr-16		<0.0314		<0.0247	
	MW-117	Oct-16		<0.0314		0.0265	J
	MW-117	Apr-17		<0.0314		<0.0247	
	MW-117	Oct-17		<0.0314		**0.385**	
	MW-117	Apr-18		<0.0314		<0.0247	
	MW-117	Oct-18		<0.0314		<0.0247	
	MW-118	Apr-16		<0.0314		0.0248	J
	MW-118	Oct-16		<0.0314		<0.0247	
	MW-118	Apr-17		<0.0314		<0.0247	
	MW-118	Oct-17		<0.0314		**0.0524**	**J**
	MW-118	Apr-18		<0.0314		<0.0282	
	MW-118	Oct-18		<0.0314		0.0325	J
	MW-119	Apr-16		<0.0314		<0.0247	
	MW-119	Oct-16		0.0557	JB	**0.0570**	**J**
	MW-119	Apr-17		<0.0314		**0.0622**	**J**
	MW-119	Oct-17		<0.0314		**0.0805**	**J**
	MW-119	Apr-18		<0.0314		<0.0247	
	MW-119	Oct-18		<0.0314		**0.0470**	**J**
NCL	MW-18	Apr-15				**2.41**	
	MW-18	Apr-16				**2.02**	
	MW-18	Apr-17				**0.960**	
	MW-18	Apr-18				**0.672**	
	MW-45	Apr-16				**1.11**	
	MW-45	Oct-16				**1.15**	
	MW-45	Apr-17				**0.857**	
	MW-45	Oct-17				**0.864**	
	MW-45	Apr-18				**0.502**	
	MW-45	Oct-18				**1.30**	
	MW-53	Apr-15				**0.296**	
	MW-53	Apr-16				**0.316**	
	MW-53	Apr-17				**0.258**	
	MW-53	Apr-18				**0.158**	
	MW-54A	Apr-16				**3.34**	
	MW-54A	Oct-16				**3.24**	
	MW-54A	Apr-17				**2.55**	
	MW-54A	Oct-17				**2.38**	
	MW-54A	Apr-18				**2.51**	
	MW-54A	Oct-18				**2.18**	
	MW-54B	Apr-13		<0.0500		**0.630**	
	MW-54B	Apr-15		<0.0310		**2.47**	
	MW-54B	Apr-17		<0.0314		**0.881**	
	MW-55	Apr-16		<0.0314		**0.691**	
	MW-55	Oct-16		<0.0314		**0.354**	
	MW-55	Apr-17		<0.0314		**1.08**	
	MW-55	Oct-17		0.0634	J	**0.697**	
	MW-55	Apr-18		0.0479	J	**0.518**	
	MW-55	Oct-18		0.0888	J	**1.09**	
	MW-56	Apr-16				**1.07**	
	MW-56	Oct-16				**1.18**	
	MW-56	Apr-17				**1.15**	
	MW-56	Apr-18				**0.287**	
	MW-108	Apr-16				**9.20**	
	MW-108	Oct-16				**15.2**	
	MW-108	Apr-17				**6.80**	
	MW-108	Oct-17				**7.93**	
	MW-108	Apr-18				**8.78**	
	MW-108	Oct-18				**4.41**	
	NCL-31	Apr-16				**1.87**	
	NCL-31	Oct-16				**24.2**	
	NCL-31	Apr-17				**1.37**	
	NCL-31	Oct-17				**1.16**	
	NCL-31	Apr-18				**0.927**	
	NCL-31	Oct-18				**1.45**	
	NCL-32	Apr-16				**4.05**	
	NCL-32	Oct-16				**2.70**	
	NCL-32	Apr-17				**1.88**	
	NCL-32	Oct-17				**1.27**	
	NCL-32	Apr-18				**0.971**	
	NCL-32	Oct-18				**2.11**	
	NCL-33	Apr-16				**4.53**	
	NCL-33	Oct-16				**6.55**	
	NCL-33	Apr-17				**4.80**	
	NCL-33	Oct-17				**4.78**	
	NCL-33	Apr-18				**2.44**	
	NCL-33	Oct-18				**4.50**	
	NCL-34A	Apr-16				**19.2**	
	NCL-34A	Oct-16				**10.8**	
	NCL-34A	Apr-17				**11.4**	
	NCL-34A	Oct-17				**6.04**	
	NCL-34A	Apr-18				**5.16**	
	NCL-34A	Oct-18				**7.41**	
	NCL-44	Apr-16				**7.59**	
	NCL-44	Oct-16				**8.88**	
	NCL-44	Apr-17				**7.97**	
	NCL-44	Oct-17				**6.69**	
	NCL-44	Apr-18				**3.65**	
	NCL-44	Oct-18				**8.38**	
	NCL-49	Apr-16				**0.0890**	**J**
	NCL-49	Apr-16	FD			**0.0664**	**J**
	NCL-49	Oct-16				**0.0712**	**J**
	NCL-49	Oct-16	FD			**0.0626**	**J**
	NCL-49	Apr-17				**0.0515**	**J**
	NCL-49	Apr-17	FD			**0.0582**	**J**
	NCL-49	Oct-17				0.0373	J
	NCL-49	Oct-17	FD			0.0355	J
	NCL-49	Apr-18				**0.0568**	**J**
	NCL-49	Apr-18	FD			**0.0559**	**J**
	NCL-49	Oct-18				**0.0922**	**J**
	NCL-49	Oct-18	FD			**0.0672**	**J**

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
South Refinery	KWB-2R	**Apr-16**				**1.49**	
	KWB-2R	**Oct-16**				**1.84**	
	KWB-2R	**Apr-17**				**1.35**	
	KWB-2R	**Oct-17**				**4.84**	
	KWB-5	**Apr-16**				**2.36**	
	KWB-5	**Oct-16**				**1.89**	
	KWB-5	**Apr-17**				**1.98**	
	KWB-5	**Oct-17**				**1.55**	
	KWB-5	**Apr-18**				**1.70**	
	KWB-5	**Oct-18**				**1.62**	
	KWB-6	**Apr-16**				**3.75**	
	KWB-6	**Oct-16**				**1.78**	
	KWB-6	**Apr-17**				**2.04**	
	KWB-6	**Oct-17**				**2.16**	
	KWB-6	**Apr-18**				**1.77**	
	KWB-6	**Oct-18**				**1.52**	
	MW-28	**Apr-16**		4.83		**17.0**	
	MW-28	**Oct-16**		6.13		**22.2**	
	MW-28	**Apr-17**		9.38		**14.4**	
	MW-28	**Oct-17**		7.24		**7.51**	
	MW-28	**Apr-18**		5.55		**3.62**	
	MW-28	**Oct-18**		1.30		**4.68**	
	MW-48	**Apr-16**		23.3		**15.3**	
	MW-48	**Oct-16**		15.8		**7.81**	
	MW-48	**Apr-17**		31.5		**10.6**	
	MW-48	**Oct-17**		28.7		**18.5**	
	MW-48	**Apr-18**		45.6		**6.50**	
	MW-48	**Oct-18**		21.8		**5.56**	
	MW-50	**Apr-16**				**1.10**	
	MW-50	**Oct-16**				**1.02**	
	MW-50	**Apr-17**				**0.835**	
	MW-50	**Oct-17**				**1.12**	
	MW-50	**Apr-18**				**0.489**	
	MW-50	**Oct-18**				**0.677**	
	MW-52	**Apr-16**		<0.0314		**0.324**	
	MW-52	**Oct-16**		0.0386	J	**0.367**	
	MW-52	**Apr-17**		<0.0314		**0.271**	
	MW-52	**Oct-17**		<0.0314		**0.380**	
	MW-52	**Apr-18**		<0.0314		**0.231**	**B**
	MW-52	**Oct-18**		<0.0314		**0.269**	
	MW-64	**Apr-16**		136		**12.3**	
	MW-64	**Oct-16**		90.7		**12.0**	
	MW-64	**Apr-17**		109		**9.88**	
	MW-64	**Oct-17**		88.3		**12.6**	
	MW-64	**Apr-18**		102		**8.37**	
	MW-64	**Oct-18**		141		**7.23**	
	MW-65	**Apr-16**		19.6		**10.6**	
	MW-65	**Oct-16**		19.2		**7.99**	
	MW-65	**Apr-17**		18.5		**8.30**	
	MW-65	**Oct-17**		17.1		**7.44**	
	MW-65	**Apr-18**		15.5		**5.05**	
	MW-65	**Oct-18**		10.4		**4.57**	
	MW-66	**Apr-16**		6.09		**4.19**	
	MW-66	**Oct-16**		7.32		**4.24**	
	MW-66	**Apr-17**		6.04		**4.18**	
	MW-66	**Oct-17**		9.46		**3.58**	
	MW-66	**Apr-18**		9.68		**2.97**	
	MW-66	**Oct-18**		6.51		**4.31**	
	MW-99	**Apr-16**		18.1		**4.29**	
	MW-99	**Oct-16**		17.8	B	**2.26**	
	MW-99	**Apr-17**		14.4		**2.06**	
	MW-99	**Oct-17**		10.4		**2.23**	
	MW-99	**Apr-18**		11.9		**1.52**	
	MW-99	**Oct-18**		11.9		**2.23**	
	MW-101	**Apr-16**		0.614		**5.84**	
	MW-101	**Oct-16**		0.208		**2.95**	
	MW-101	**Apr-17**		0.311		**3.72**	
	MW-101	**Oct-17**		0.377		**5.50**	
	MW-101	**Apr-18**		0.485	J	**3.21**	
	MW-101	**Oct-18**		0.452		**5.05**	
	MW-102	**Apr-16**		26.2		**9.69**	
	MW-102	**Oct-16**		31.5		**14.8**	
	MW-102	**Apr-17**		26.4		**11.9**	
	MW-102	**Oct-17**		335		**18.1**	
	MW-102	**Apr-18**		32.7		**34.6**	
	MW-102	**Oct-18**		41.8		**10.4**	
	MW-103	**Apr-15**		4.15		**8.66**	
	MW-103	**Apr-16**		3.55		**7.35**	
	MW-103	**Apr-17**		3.46		**6.94**	
	MW-103	**Apr-18**		6.45		**6.23**	
	MW-104	**Apr-16**		0.797		**2.23**	
	MW-104	**Apr-16**	FD	0.775		**2.19**	
	MW-104	**Oct-16**		1.35		**2.55**	
	MW-104	**Oct-16**	FD	1.26		**2.68**	
	MW-104	**Apr-17**		1.66		**5.36**	
	MW-104	**Apr-17**	FD	2.41		**4.91**	
	MW-104	**Oct-17**		1.52		**5.42**	
	MW-104	**Oct-17**	FD	1.36		**4.95**	
	MW-104	**Apr-18**		1.40		**1.85**	
	MW-104	**Apr-18**	FD	1.53		**1.80**	
	MW-104	**Oct-18**		1.44		**3.05**	
	MW-104	**Oct-18**	FD	1.38		**2.87**	
	MW-105	**Apr-16**		33.6		**21.2**	
	MW-105	**Oct-16**		43.7		**8.66**	
	MW-105	**Apr-17**		33.9		**13.8**	
	MW-105	**Oct-17**		24.0		**19.0**	
	MW-105	**Apr-18**		21.4		**11.4**	
	MW-105	**Oct-18**		17.7		**13.4**	
	MW-106	**Apr-16**		23.9		**19.5**	
	MW-106	**Oct-16**		27.1		**21.8**	
	MW-106	**Apr-17**		21.4		**17.9**	
	MW-106	**Oct-17**		21.9		**22.2**	
	MW-106	**Apr-18**		25.9		**9.31**	
	MW-106	**Oct-18**		33.9		**11.2**	

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Analyte Group: TPH — GRO	DRO	DRO - EP
				Analyte: GRO	DRO	DRO - EP
				Units: mg/L	mg/L	mg/L
				CGWSL: ---	0.0398	0.0473
				CGWSL Source:	NMED TPH	NMED TPH
South Refinery	MW-107	Apr-16		4.89	**6.80**	
	MW-107	Oct-16		17.7	**7.24**	
	MW-107	Apr-17		6.67	**7.91**	
	MW-107	Apr-18		21.6	**4.50**	
	MW-109	Apr-16		1.93	**5.92**	
	MW-109	Oct-16		2.12	**3.19**	
	MW-109	Apr-17		5.26	**5.78**	
	MW-109	Oct-17		4.62	**6.74**	
	MW-109	Apr-18		5.96	**2.84**	
	MW-109	Oct-18		6.56	**3.76**	
	MW-110	Apr-16		0.735	**1.55**	
	MW-110	Oct-16		0.503	**1.00**	
	MW-110	Apr-17		2.69	**2.53**	
	MW-110	Oct-17		0.379	**1.01**	
	MW-110	Apr-18		2.04	**1.27**	
	MW-110	Oct-18		0.377	**0.774**	
	RA-313	Apr-15				
	RA-313	Apr-16				
	RA-313	Apr-17				
	RA-313	Apr-18				
	RW-4	Apr-15			**3.72**	
	RW-4R	Apr-16			**5.03**	
	RW-4	Apr-17			**2.35**	
	RW-4	Apr-18			**1.02**	
	RW-5R	Apr-15			**6.42**	
	RW-5R	Apr-16			**7.39**	
	RW-6	Apr-15			**11.4**	
	RW-6R	Apr-16			**4.20**	
	RW-6	Apr-18			**3.04**	
	RW-15C	Apr-17			**9.74**	
	RW-15C	Apr-18			**9.27**	
South RO Reject Field	MW-114	Apr-16		<0.0314	0.0317 J	
	MW-114	Oct-16		<0.0314	**0.0410 J**	
	MW-114	Apr-17		<0.0314	<0.0247	
	MW-114	Oct-17		<0.0314	**0.0650 J**	
	MW-114	Apr-18		<0.0314	<0.0247	
	MW-114	Oct-18		<0.0314	<0.0247	
	MW-115	Apr-16		<0.0314	**0.0616 J**	
	MW-115	Oct-16		<0.0314	**0.0582 J**	
	MW-115	Apr-17		<0.0314	**0.0657 J**	
	MW-115	Oct-17		<0.0314	**0.109**	
	MW-115	Apr-18		<0.0314	0.0341 JB	
	MW-115	Oct-18		<0.0314	<0.0247	
	MW-116	Apr-16		<0.0314	**0.112**	
	MW-116	Oct-16		<0.0314	**0.0868 J**	
	MW-116	Apr-17		<0.0314	**0.0549 J**	
	MW-116	Oct-17		<0.0314	<0.0247	
	MW-116	Apr-18		<0.0314	0.0353 J	
	MW-116	Oct-18		<0.0314	**0.0468 J**	
TEL	MW-49	Apr-16		1.75	**8.63**	
	MW-49	Oct-16		2.82	**9.26**	
	MW-49	Apr-17		2.65	**7.62**	
	MW-49	Oct-17		3.45	**8.36**	
	MW-49	Apr-18		4.42	**4.48**	
	MW-49	Oct-18		2.99	**4.24**	
	TEL-1	Apr-16		0.153	**8.51**	
	TEL-1	Oct-16		0.193	**3.58**	
	TEL-1	Apr-17		0.285	**9.45**	
	TEL-1	Oct-17		0.467	**12.7**	
	TEL-1	Apr-18		0.415	**8.29**	
	TEL-1	Oct-18		0.381	**8.36**	
	TEL-2	Apr-16		3.12	**18.1**	
	TEL-2	Oct-16		3.08	**17.0**	
	TEL-2	Apr-17		3.02	**14.8**	
	TEL-2	Oct-17		2.51	**22.8**	
	TEL-2	Apr-18		3.84	**16.7**	
	TEL-2	Oct-18		5.19	**14.8**	
	TEL-3	Apr-16		1.05	**14.1**	
	TEL-3	Oct-16		0.589	**4.22**	
	TEL-3	Apr-17		0.716	**5.32**	
	TEL-3	Apr-18		2.05	**7.42**	
	TEL-4	Apr-16		2.36	**9.13**	
	TEL-4	Apr-16	FD	2.65	**8.65**	
	TEL-4	Oct-16		2.52	**6.36**	
	TEL-4	Oct-16	FD	2.72	**6.66**	
	TEL-4	Apr-17		1.25	**8.44**	
	TEL-4	Apr-17	FD	1.29	**8.00**	
	TEL-4	Oct-17		1.53	**10.0**	
	TEL-4	Oct-17	FD	1.77	**9.67**	
	TEL-4	Apr-18		1.32	**3.99**	
	TEL-4	Apr-18	FD	1.16	**4.24**	
	TEL-4	Oct-18		0.815	**1.15**	
	TEL-4	Oct-18	FD	0.737	**1.18**	
TMD	MW-8	Apr-15		<0.0310	**0.380**	
	MW-8	Apr-16		<0.0314	**0.230**	
	MW-8	Apr-17		0.585	**0.238**	
	MW-8	Apr-18		0.0561 J	**0.112**	
	MW-16	Apr-14			**0.0580**	
	MW-16	Apr-15			**0.340**	
	MW-16	Apr-17			**0.275**	
	MW-16	Apr-18			**0.189**	
	MW-20	Apr-15			**0.150**	
	MW-20	Apr-16			**0.149**	
	MW-20	Apr-17			**0.280**	
	MW-20	Apr-18			**0.0810 J**	

Area	Well ID	Date	Dup	Analyte Group: TPH — GRO	DRO	DRO - EP
				Analyte: GRO	DRO	DRO - EP
				Units: mg/L	mg/L	mg/L
				CGWSL: ---	0.0398	0.0473
				CGWSL Source:	NMED TPH	NMED TPH
TMD	MW-21	**Apr-16**		<0.0314	**0.190**	
	MW-21	**Oct-16**		<0.0314	**0.132**	
	MW-21	**Apr-17**		0.0721 J	**0.169**	
	MW-21	**Oct-17**		0.0416 J	**0.106**	
	MW-21	**Apr-18**		0.0452 J	**0.0542 J**	
	MW-21	**Oct-18**		0.0645 J	**0.0958 J**	
	MW-25	**Apr-15**			**0.690**	
	MW-25	**Apr-16**			**0.348**	
	MW-25	**Apr-17**			**0.107**	
	MW-25	**Apr-18**			0.0327 J	
	MW-26	**Apr-15**			**0.0530 J**	
	MW-26	**Apr-16**			**0.103**	
	MW-26	**Apr-17**			**0.0773 J**	
	MW-26	**Apr-18**			**0.0492 J**	
	MW-27	**Apr-15**			**0.110**	
	MW-27	**Apr-16**			**0.134**	
	MW-27	**Apr-17**			**0.0992 J**	
	MW-27	**Apr-18**			**0.0537 J**	
	MW-46R	**Apr-16**			**0.0622 J**	
	MW-46R	**Oct-16**			**0.0459 J**	
	MW-46R	**Apr-17**			**0.0889 J**	
	MW-46R	**Oct-17**			0.0327 J	
	MW-46R	**Apr-18**			<0.0247	
	MW-46R	**Oct-18**			<0.0247	
	MW-68	**Apr-15**			**0.130**	
	MW-68	**Apr-16**			**0.162**	
	MW-68	**Apr-17**			**0.138**	
	MW-68	**Apr-18**			**0.0508 J**	
	MW-71	**Apr-15**			**0.0930 J**	
	MW-71	**Apr-16**			0.0252 J	
	MW-71	**Apr-17**			**0.0947 J**	
	MW-71	**Apr-18**			<0.0247	
	MW-89	**Apr-15**			**2.40**	
	MW-89	**Apr-16**			**3.38**	
	MW-89	**Apr-17**			**2.15**	
	MW-89	**Apr-18**			**0.403**	
	NP-1	**Apr-16**				
	NP-1	**Oct-16**				
	NP-1	**Apr-17**				
	NP-1	**Oct-17**				
	NP-1	**Apr-18**				
	NP-1	**Oct-18**				
	NP-2	**Apr-13**		<0.0500	**<0.0520**	
	NP-6	**Apr-13**				
	NP-6	**Apr-15**				
	NP-6	**Apr-17**				
Up-Gradient	UG-1	**Apr-15**		<0.0310	<0.0250 B	
	UG-1	**Apr-16**		<0.0314	0.0302 J	
	UG-1	**Apr-17**		<0.0314	**0.0484 J**	
	UG-1	**Apr-18**		<0.0314	**0.0723 J**	
	UG-2	**Apr-15**		<0.0310	<0.0250 B	
	UG-2	**Apr-16**		<0.0314	**0.0692 J**	
	UG-2	**Apr-17**		<0.0314	**0.0818 J**	
	UG-2	**Apr-18**		<0.0314	<0.0247	
	UG-3R	**Apr-15**		<0.0310	<0.0250 B	
	UG-3R	**Apr-16**		<0.0314	<0.0247	
	UG-3R	**Apr-17**		<0.0314	**0.0517 J**	
	UG-3R	**Apr-18**		<0.0314	<0.0247	
	UG-4	**Apr-16**		<0.0314	0.0349 J	
	UG-4	**Apr-17**		<0.0314	**0.0463 J**	
	UG-4	**Apr-18**		<0.0314	<0.0247	

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
---	No applicable CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
DRO	Diesel Range Organics
DRO-EP	Diesel Range Organics data from wells located in the Evaporation Ponds area
Dup	Duplicate sample
FD	Field duplicate sample
GRO	Gasoline Range Organics
mg/L	Milligrams per Liter
TPH	Total Petroleum Hydrocarbons
NMED TPH	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table 6-4 TPH Groundwater Screening Levels

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Cross-Gradient	KWB-13	Apr-15		**0.0118**	0.122				0.0182	**12.3**	**0.0190**	**0.399**	<0.0000490	0.0144	0.0110		0.0426
	KWB-13	Apr-16		0.00484 J	0.0459	0.384	<0.00500	0.00161 J	0.00621 J	**4.00**	0.00403 J	0.0747	<0.0000490	<0.00175	0.0188	0.0261 J	0.0304
	KWB-13	Apr-17		0.00286	0.0229	0.294	<0.000160	0.000487 J	0.00148 J	**1.02**	0.00107 J	0.0234	<0.0000490	0.00119 J	0.0130	0.0227	0.0213
	KWB-13	Apr-18		0.00395	0.0325	0.343	<0.000160	0.000953 J	0.00437 B	**3.01**	0.00292	0.0490	0.0000726 JB	0.00296	0.0131	0.0249	0.0261
	MW-17	Apr-14		<0.00200	0.0152				<0.00200	<0.100	0.00724 J	<0.00500			0.0104		
	NP-5	Apr-13		<0.0100	<0.0100				<0.0100	<0.400	<0.0100	<0.0100			0.0135		
	NP-5	Apr-15		0.00288	0.0159				0.00109 J	0.437	0.000415 J	0.00318 J			0.0125		
	NP-5	Apr-17		0.00305	0.00938				<0.000540	0.0632 J	<0.000240	0.000586 J			0.0124		
	RA-3156	Apr-14												<0.00500			
	RA-3156	Apr-16															
	RA-3156	Apr-17															
	RA-3156	Apr-18															
	MW-136	Apr-16		0.00280 J	0.0270	0.695	<0.00500	0.00132 J	<0.00270	0.599	<0.00120	0.0591	<0.0000490	<0.00350	0.0112	**0.0702**	0.0197 J
	MW-136	Oct-16		0.00284	0.0134	0.512	<0.000160	0.000279 J	0.00118 JB	0.0892 JB	0.000940 JB	0.0112 B	<0.0000490	0.00184 JB	0.00562	**0.0720**	0.0176
	MW-136	Apr-17		0.00237	0.0117	0.588	<0.000160	<0.000260	<0.000540	0.0262 J	<0.000240	0.00602	<0.0000490	0.00102 J	0.00563	**0.0664**	0.0171
	MW-136	Oct-17		0.00239	0.0144	0.724	<0.000160	0.000362 J	0.000794 J	0.193	0.000313 J	0.0209	<0.0000490	0.00157 J	0.00608	**0.0729**	0.0181
	MW-136	Apr-18		0.00245	0.0104	0.657	<0.000160	<0.000260	0.00403 B	0.0368 JB	<0.000240	0.00375 J	0.0000593 JB	0.00193 J	0.00759	**0.0675**	0.0163
	MW-136	Oct-18		0.00258 J	0.0115	0.697	<0.000160	<0.000520	<0.00108	0.0379 J	<0.000480	0.00900 JB	0.000168 J	0.00180 J	0.00759	**0.0688**	0.0176
Evaporation Ponds	MW-1R	Apr-15		0.00366 J	0.0240 J				<0.00270	**3.49**	<0.00120	**2.14 J**			<0.00190		
	MW-1R	Apr-16		0.00917 J	0.0301				0.0188	**9.67**	<0.00120	**2.94**			<0.00190		
	MW-1R	Apr-17		0.00221	0.0258				<0.000540	**4.50**	<0.000240	**2.38**			<0.000380		
	MW-1R	Apr-18		0.00180 J	0.0224				<0.000540	**3.42**	0.000344 J	**1.71**			0.000380 J		
	MW-2A	Apr-16		**0.0154**	0.0228 J				<0.00270	**3.37**	<0.00120	**2.50**			0.00432 J		
	MW-2A	Oct-16		0.00798	0.0208				0.00105 J	0.146	<0.000240	**1.43**			0.000560 J		
	MW-2A	Apr-17		0.00923	0.0188				0.000757 J	**3.02**	<0.000240	**1.43**			0.00105 J		
	MW-2A	Oct-17		0.00731	0.0164				<0.000540	0.578	<0.000240	**0.788**			0.00128 J		
	MW-2A	Apr-18		0.00931	0.0225				0.000609 JB	**2.94**	<0.000240	**1.28**			0.00199 J		
	MW-2A	Oct-18		0.00892	0.0314				0.000784 J	0.617	<0.000240	**1.24**			0.000828 J		
	MW-3	Apr-16		**0.0388**	0.0175 J				<0.00270	0.677	<0.00120	**2.61**			0.00580 J		
	MW-3	Apr-16	FD	**0.0348**	0.0168 J				<0.00270	0.612	<0.00120	**2.62**			0.00575 J		
	MW-3	Oct-16		**0.0550**	0.0152				0.000868 J	**1.82**	0.000241 JB	**1.60**			0.00258		
	MW-3	Oct-16	FD	**0.0553**	0.0152				0.000869 J	**1.75**	0.000692 JB	**1.60**			0.00263		
	MW-3	Apr-17		**0.0213**	0.0140				<0.000540	0.532	0.000306 J	**0.945**			0.00303		
	MW-3	Apr-17	FD	**0.0228**	0.0148				0.000571 J	0.718	0.000272 J	**1.10**			0.00386		
	MW-3	Oct-17		**0.0520**	0.0153				0.000568 J	**2.00**	0.000425 J	**1.15**			0.00335		
	MW-3	Oct-17	FD	**0.0519**	0.0148				0.00107 J	**1.99**	0.000243 J	**1.20**			0.00399		
	MW-3	Apr-18		**0.0291**	0.0143				0.00246	0.472 B	0.000534 J	**0.694**			0.00605		
	MW-3	Apr-18	FD	**0.0281**	0.0159				0.00326	0.418	0.000369 JB	**0.686**			0.00725		
	MW-3	Oct-18		**0.0254**	0.0151				<0.000540	0.0441 J	0.000448 JB	**0.869**			0.00889		
	MW-3	Oct-18	FD	**0.0279**	0.0169				<0.000540	0.0176 J	0.000706 JB	**0.983**			0.00932		
	MW-4A	Apr-16		**0.188**	0.0125 J				<0.00270	**3.21**	<0.00120	**2.39**			<0.00190		
	MW-4A	Oct-16		**0.172**	0.0121				0.000815 J	**1.08**	0.000566 JB	**1.69**			0.000608 J		
	MW-4A	Apr-17		**0.172**	0.0123				<0.000540	**2.34**	0.000274 J	**1.91**			0.000665 J		
	MW-4A	Oct-17		**0.100**	0.0143				<0.000540	**2.22**	<0.000240	**1.95**			0.000494 J		
	MW-4A	Apr-18		**0.105**	0.0125				0.00444	**9.18**	0.00119 J	**1.93**			0.000515 J		
	MW-4A	Oct-18		**0.183**	0.0122 J				<0.000540	**1.34**	<0.00120	**1.77**			0.000579 J		
	MW-4B	Apr-13		**0.0371**	<0.0250				<0.0250	<1.00	**<0.0250**	**1.30**			<0.0250		
	MW-4B	Apr-15		**0.101**	0.0349				<0.00110	**3.60**	0.00189 J	**8.68**			<0.000760		
	MW-4B	Apr-17		**0.0371**	0.0182				<0.000540	**3.42**	<0.000240	**7.35**			<0.000380		
	MW-5A	Apr-16		**0.213**	0.0149 J				<0.00270	**8.10**	<0.00120	**1.34**			<0.00190		
	MW-5A	Oct-16		**0.0638**	0.0117				<0.000540	**4.19**	0.000445 JB	**1.73**			0.000606 J		
	MW-5A	Apr-17		**0.149**	0.0135				<0.000540	**6.69**	<0.000240	**1.15**			0.000824 J		
	MW-5A	Oct-17		**0.216**	0.0153				<0.000540	**8.41**	<0.000240	**0.811**			0.00119 J		
	MW-5A	Apr-18		**0.187**	0.0124				<0.000540	**8.07**	0.000629 J	**1.15**			0.00121 J		
	MW-5A	Oct-18		**0.196**	0.0137 J				<0.000540	**6.17**	<0.00120	**0.946**			0.00100 J		
	MW-5B	Apr-13		**0.122**	<0.0250				<0.0250	<1.00	**<0.0250**	**2.44**			<0.0250		
	MW-5B	Apr-15		**0.201**	0.0112 J				0.00277 J	**6.11**	<0.00120	**3.87**			0.00197 J		
	MW-5B	Apr-17		**0.154**	0.0115				<0.000540	**4.61**	<0.000240	**3.32**			0.00139 J		
	MW-5C	Apr-13		**0.0139**	0.0166				<0.0100	**1.04**	<0.0100	**0.943**			<0.0100		
	MW-5C	Apr-15		**0.0145**	0.0200 J				<0.00270	**1.15**	<0.00120	**0.975**			<0.00190		
	MW-5C	Apr-17		**0.0113**	0.0237				<0.000540	**1.09**	0.000287 J	**0.918**			<0.000380		
	MW-6A	Apr-15		**0.0129**	0.0308				<0.00270	0.155 J	<0.00120	**1.40**			0.0308		
	MW-6A	Apr-16		0.00953 J	0.0158 J				<0.00270	0.0787 J	<0.00120	**0.505**			<0.00190		
	MW-6A	Apr-17		**0.0105**	0.0135				<0.000540	0.193	0.000366 J	**0.385**			0.000910 J		
	MW-6A	Apr-18		0.00960	0.0132				0.00136 JB	0.275 B	0.000553 J	**0.301**			0.000614 J		
	MW-6B	Mar-13		**0.0493**	0.0139				<0.00500	**1.54**	<0.00500	**2.39**			<0.00500		
	MW-6B	Mar-13	FD	**0.0537**	0.0163				<0.00500	**1.69**	<0.00500	**2.43**			<0.00500		
	MW-6B	Apr-15		**0.0333**	0.0164				<0.00110	**1.37**	<0.000480	**3.45**			<0.000760		
	MW-6B	Apr-17		**0.0115**	0.0134				<0.000540	0.149	<0.000240	**0.889**			<0.000380		
	MW-7A	Apr-16		**0.0382**	0.0170 J				0.00370 J	**6.35**	<0.00120	**0.682**			<0.00190		
	MW-7A	Apr-16	FD	**0.0305**	0.0158 J				<0.00270	**4.43**	<0.00120	**0.588**			<0.00190		
	MW-7A	Oct-16		**0.0181**	0.0173				0.00184 J	**1.66**	0.000527 JB	**0.563**			0.000402 J		
	MW-7A	Oct-16	FD	**0.0186**	0.0159				0.00184 J	**1.66**	0.000618 JB	**0.563**			0.000507 J		
	MW-7A	Apr-17		**0.0182**	0.0148				0.000819 J	**3.20**	<0.000240	**0.530**			0.000425 J		
	MW-7A	Apr-17	FD	**0.0195**	0.0154				0.000720 J	**3.07**	<0.000240	**0.521 V**			<0.000380		
	MW-7A	Oct-17		**0.0278**	0.0211				0.00136 J	**4.76**	0.000335 J	**0.509**			<0.000380		
	MW-7A	Oct-17	FD	**0.0286**	0.0168				0.00128 J	**4.82**	<0.000240	**0.522**			<0.000380		
	MW-7A	Apr-18		**0.0348**	0.0162				0.00319	**5.95**	0.000534 J	**0.483**			0.000393 J		
	MW-7A	Apr-18	FD	**0.0298**	0.0164				0.00109 J	**5.05**	0.000599 J	**0.481**			<0.000380		
	MW-7A	Oct-18		**0.0311**	0.0163 J				0.00129 J	**4.69**	<0.00120	**0.449**			<0.000380		
	MW-7A	Oct-18	FD	**0.0316**	0.0179				0.000814 J	**4.52**	0.000623 JB	**0.480**			0.000485 J		
	MW-7B	Apr-13		**<0.0250**	<0.0250				<0.0250	<1.00	**<0.0250**	**0.397**			<0.0250		
	MW-7B	Apr-15		0.00588	0.0111				0.000702 J	0.188	<0.000240	**0.580**			<0.000380		
	MW-7B	Apr-17		0.00397	0.0111				<0.000540	0.146	<0.000240	**0.472**			<0.000380		
	MW-10	Apr-16		**0.0196**	0.0123 J				<0.00270	<0.0750	<0.00120	**2.83**			<0.00190		
	MW-10	Oct-16		**0.0191**	0.0184				<0.000540	0.589	0.000399 JB	**2.21**			<0.000380		
	MW-10	Apr-17		**0.0156**	0.0118				<0.000540	0.0992 J	0.000290 J	**2.24**			0.000483 J		
	MW-10	Oct-17		**0.0156**	0.0110				<0.000540	0.147	<0.000240	**2.74**			<0.000380		
	MW-10	Apr-18		**0.0161**	0.0188				0.000870 J	0.632	0.00180 J	**2.62**			0.000478 J		
	MW-10	Oct-18		**0.0153**	0.0109 J				<0.000540	0.114	<0.00120	**2.70**			0.000472 J		
	MW-11A	Apr-16		<0.00125	0.0301				0.00353 J	0.416 J	<0.00120	**0.876 V**			<0.00190		
	MW-11A	Oct-16															
	MW-11A	Apr-17		0.00056 J	0.0306				0.00121 J	0.804	<0.000240	**0.758**			<0.000380		
	MW-11A	Oct-17															
	MW-11A	Apr-18		0.00046 J	0.0321				0.00104 J	**1.02**	0.00146 JB	**0.294**			<0.000380		
	MW-11A	Oct-18															
	MW-11B	Mar-13		**<0.0250**	<0.0250				<0.0250	**3.25**	**<0.0250**	**0.316**			<0.0250		
	MW-11B	Apr-15		0.00453 J	0.0189 J				<0.00540	**4.38**	<0.00240	**0.427**			<0.00380		
	MW-11B	Apr-17		0.00420	0.0189				<0.000540	**4.59**	<0.000240	**0.374**			<0.000380		
	MW-12	Apr-14		<0.00500	0.0194				<0.00500	0.441 J	<0.00140	0.200			0.0172 J		
	MW-13	Apr-14		0.00205 J	0.0310				<0.00200	<0.100	<0.00140	0.192			<0.00200		
	MW-15	Apr-15		**0.0279**	0.0236 J				<0.00270	<0.0750	<0.00120	**0.861**			0.0195		
	MW-15	Apr-16		**0.0216**	0.0203 J				<0.00270	<0.0750	<0.00120	**0.887**			0.00201 J		
	MW-15	Apr-17		**0.0130**	0.0180				<0.000540	0.0239 B	<0.000240	0.173			0.000518 J		
	MW-15	Apr-18		**0.0165**	0.0225				0.00926	0.0730 J	0.000357 JB	**0.394**			0.00128 J		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	MW-18A	Apr-16			0.00644 J	0.0155 J	**3.14**	<0.00500	<0.00130	<0.00270	0.358 J	<0.00120	**0.366**	<0.0000490	0.0121 J	<0.00190	**0.0417 J**	0.00258 J
	MW-18A	Oct-16			0.00411	0.0166	**2.73**	<0.000160	<0.000260	<0.000540	0.722	<0.000240	**0.576**	<0.0000490	0.00618	0.000448 J	**0.0375**	0.00128 J
	MW-18A	Apr-17			0.00466	0.0152	**2.04**	<0.000160	<0.000260	<0.000540	0.637	<0.000240	**0.723**	<0.0000490	0.00762	0.000491 J	**0.0305**	0.000435 J
	MW-18A	Oct-17			0.00600 J	0.0173 J	**2.53**	<0.000800	0.00282 J	<0.000540	**1.47**	<0.00120	**2.05**	<0.0000490	0.00793 J	<0.00190	**0.0302 J**	<0.000900
	MW-18A	Apr-18			0.00489	0.0173	**2.31**	<0.000160	0.00108 J	0.00488	0.148	<0.000240	**0.533**	<0.0000490	0.00947	0.00120 J	**0.0314**	0.000459 J
	MW-18A	Oct-18			0.00475	0.0160 J	**2.34**	<0.000800	0.000525 J	<0.000540	0.436	<0.00120	**1.73**	0.000145 J	0.00828	<0.000380	0.0243 J	0.000400 J
	MW-18B	Apr-13			<0.0100	0.0126				<0.0100	<0.400	<0.0100	**0.572**			<0.0100		
	MW-18B	Apr-15			**0.0120**	0.0125				0.000942 J	0.139	0.000814 J	**0.789**			<0.000380		
	MW-18B	Apr-17			0.00883	0.0137				<0.000540	0.0793 J	0.00104 J	**0.803**			<0.000380		
	MW-22A	Apr-16			**0.0449**	0.0174 J				<0.00270	**4.42**	<0.00120	**6.06**			<0.00190		
	MW-22A	Apr-16	FD		**0.0455**	0.0167				<0.00270	**4.46**	<0.00120	**6.20**			<0.00190		
	MW-22A	Oct-16			**0.0452**	0.0179				0.000678 J	**5.41**	<0.000240	**7.28**			0.000938 J		
	MW-22A	Oct-16	FD		**0.0447**	0.0183				0.000633 J	**5.26**	<0.000240	**7.15**			0.000874 J		
	MW-22A	Apr-17			**0.0411**	0.0161				<0.000540	**6.07**	0.000354 J	**5.82**			0.000886 J		
	MW-22A	Apr-17	FD		**0.0412**	0.0155				0.000813 J	**6.33**	<0.000240	**6.41**			0.000774 J		
	MW-22A	Oct-17			**0.0427**	0.0167				0.0233	**4.91**	0.000434 J	**6.34**			0.000800 J		
	MW-22A	Oct-17	FD		**0.0432**	0.0158				0.000695 J	**4.94**	<0.000240	**6.52**			0.000858 J		
	MW-22A	Apr-18			**0.0386**	0.0170				0.00141 J	**4.16**	0.00101 J	**6.12**			0.000962 J		
	MW-22A	Apr-18	FD		**0.0371**	0.0165				<0.000540	**3.68**	<0.000240	**6.18**			0.000839 J		
	MW-22A	Oct-18			**0.0463**	0.0156 J				<0.000540	**5.81**	<0.00120	**5.71**			0.000677 J		
	MW-22A	Oct-18	FD		**0.0496**	0.0173				<0.000540	**5.73**	0.000489 JB	**6.14**			0.000707 J		
	MW-22B	Apr-13			**0.0343**	<0.0250				<0.0250	**1.78**	**<0.0250**	**3.37**			<0.0250		
	MW-22B	Apr-15			**0.0389**	0.0160 J				<0.00270	**2.32**	0.00134 J	**4.32**			<0.00190		
	MW-22B	Apr-17			**0.0255**	0.0116				<0.000540	**1.03**	0.000313 J	**3.35**			0.000603 J		
	MW-70	Apr-16			**0.0238**	0.0147 J				<0.00270	**6.19**	<0.00120	**0.543**			<0.00190		
	MW-70	Oct-16			**0.0189**	0.0162				<0.000540	**4.69**	<0.000240	**0.381**			<0.000380		
	MW-70	Apr-17			**0.0156**	0.0149				<0.000540	**2.19**	<0.000240	**0.440**			<0.000380		
	MW-70	Oct-17			**0.0180**	0.0159 J				<0.000540	**4.58**	<0.00120	**0.272**			<0.00190		
	MW-70	Apr-18			**0.0508**	0.0212				<0.000540	**46.3**	0.000270 JB	**0.425**			0.000479 J		
	MW-70	Oct-18			**0.0186**	0.0161				<0.000540	**4.49**	0.000490 JB	**0.270**			<0.000380		
	MW-72	Apr-15			**0.149**	0.0321				<0.00270	**32.3**	<0.00120	**3.05**			0.0155		
	MW-72	Apr-16			**0.0318**	0.0195 J				<0.00270	**7.20**	<0.00120	**4.86**			<0.00190		
	MW-72	Apr-17			**0.0164**	0.0213				<0.000540	**1.62**	<0.000240	**3.88**			0.00210		
	MW-72	Apr-18			**0.0175**	0.0155				0.000688 JB	**2.04**	<0.000240	**3.04**			0.00173 J		
	MW-73	Apr-15			**0.0757**	0.00999 J				<0.00270	**2.40**	<0.00120	**2.61**			0.00233 J		
	MW-73	Apr-16			**0.0990**	0.0114 J				<0.00270	**8.28**	<0.00120	**3.17**			0.00201 J		
	MW-73	Apr-17			**0.0650**	0.00734				<0.000540	**1.92**	<0.000240	0.187			0.00184 J		
	MW-73	Apr-18			**0.0614**	0.00806				0.00109 JB	0.932	<0.000240	**1.84**			0.00147 J		
	MW-74	Apr-16			**0.136**	0.0151 J				<0.00270	0.756	<0.00120	**2.19**			0.0150		
	MW-74	Oct-16			**0.0699**	0.0147				0.00120 J	0.203 B	<0.000240	0.0907			**0.585**		
	MW-74	Apr-17			**0.0672**	0.0132				<0.000540	0.0369 J	<0.000240	**1.04**			**0.156**		
	MW-74	Oct-17			**0.0696**	0.0146				<0.000540	0.0463 J	<0.000240	**1.05**			**0.144**		
	MW-74	Apr-18			**0.0956**	0.0129				0.00199 JB	0.0666 JB	<0.000240	**1.22**			0.0335		
	MW-74	Oct-18			**0.0567**	0.0133				<0.000540	0.0233 J	0.000376 J	**0.926**			**0.227**		
	MW-75	Apr-16			**0.183**	0.0218 J				<0.00270	**2.52**	<0.00120	**1.01**			0.00310 J		
	MW-75	Oct-16			**0.275**	0.0150				0.00156 J	**3.29**	<0.000240	**0.916**			0.00245		
	MW-75	Apr-17			**0.220**	0.0174				<0.000540	**3.39**	<0.000240	**0.828**			0.00229		
	MW-75	Oct-17			**0.296**	0.0159				0.00133 J	**3.58**	0.000323 J	**0.834**			0.00196 J		
	MW-75	Apr-18			**0.104**	0.0167				0.00325	0.523	0.000500 J	**0.877**			0.00178 J		
	MW-75	Oct-18			**0.312**	0.0149				0.000998 J	**5.50**	0.000372 J	**0.884**			0.00187 J		
	MW-76	Apr-16			**0.0610**	0.0140 J				<0.00270	**4.68**	<0.00120	**1.07**			0.00298 J		
	MW-76	Oct-16			**0.0818**	0.0163				0.00266	**6.79**	<0.000240	**1.25**			0.00582		
	MW-76	Apr-17			**0.0561**	0.0120				<0.000540	**4.06**	<0.000240	**0.780**			0.00327		
	MW-76	Oct-17			**0.0594**	0.0134				0.00185 J	**3.93**	<0.000240	**0.741**			0.00399		
	MW-76	Apr-18			**0.0549**	0.0166				0.00166 JB	**3.51**	<0.000240	**0.688**			0.00321		
	MW-76	Oct-18			**0.0718**	0.0714				0.00888	**7.39**	0.00261 JB	**0.737**			0.00404		
	MW-77	Apr-16			**0.0749**	0.0136 J				0.0132	**12.2**	<0.00120	**0.687**			0.0137		
	MW-77	Oct-16			**0.0505**	0.0120 JB				0.00899 J	**7.87**	<0.00120	**0.706**			0.00996 J		
	MW-77	Apr-17			**0.0466**	0.0100				0.00752	**7.88**	<0.000240	**0.521**			0.0106		
	MW-77	Apr-18			**0.0431**	0.00992				0.00946	**5.64**	0.000745 J	**0.540**			0.00983		
	MW-78	Apr-15			**0.0211**	0.0318				**0.133**	**12.3**	<0.00120	**1.29**			0.0156		
	MW-78	Apr-16			**0.0210**	0.0445				**0.0761**	**14.8**	<0.00120	**0.946**			0.0141		
	MW-78	Apr-17			0.00820	0.0388				0.0422	0.469	<0.000240	**0.435**			0.00957		
	MW-78	Apr-18			0.0100	0.0459				**0.142**	0.185 B	0.000249 J	0.198			0.0119		
	MW-79	Apr-16			**0.0113**	0.0181 J				<0.00270	0.882	<0.00120	**3.00**			<0.00190		
	MW-79	Oct-16			**0.0208**	0.0184				<0.000540	**5.37**	<0.000240	**3.68 V**			<0.000380		
	MW-79	Apr-17			0.00521	0.0166				<0.000540	0.150	<0.000240	**1.11 V**			0.000569 J		
	MW-79	Oct-17			0.00441	0.0178				<0.000540	0.751	<0.000240	**3.82**			<0.000380		
	MW-79	Apr-18			0.00536	0.0160				0.000558 JB	0.0528 JB	<0.000240	**0.227**			0.000902 J		
	MW-79	Oct-18			0.00332	0.0179				<0.000540	0.114	<0.000240	**2.69**			0.000411 J		
	MW-80	Apr-15			**0.0187**	0.0151 J				<0.00270	**1.73**	<0.00120	**0.555**			<0.00190		
	MW-80	Apr-16			0.00788 J	0.0185 J				0.0465	**1.34**	<0.00120	**0.234**			<0.00190		
	MW-80	Apr-17			0.00643	0.0173				0.00138 J	0.160	<0.000240	**0.598**			0.00218		
	MW-80	Apr-18			0.00302	0.0110				0.00109 JB	0.139 B	<0.000240	0.129			0.00111 J		
	MW-81	Apr-15			**0.0220**	0.0131 J				<0.00270	0.183 J	<0.00120	0.132			0.0235		
	MW-81	Apr-16			**0.0300**	0.0212 J				<0.00270	0.136 J	<0.00120	0.106			0.0467		
	MW-81	Apr-17			**0.0157**	0.0144				<0.000540	<0.0150	0.000248 J	0.0117			0.0182		
	MW-81	Apr-18			0.00875	0.0154				0.000676 JB	<0.0150	0.000245 J	0.0200			0.00666		
	MW-82	Apr-15			**0.0929**	0.0302				0.00570 J	**1.68**	<0.00120	**1.38**			0.00302 J		
	MW-82	Apr-16			**0.0510**	0.0387				<0.00270	0.414 J	<0.00120	**1.76**			0.00199 J		
	MW-82	Apr-17			**0.0468**	0.0273				0.00182 J	0.792	0.000744 J	**2.02**			0.00137 J		
	MW-82	Apr-18			**0.0297**	0.0260				0.00125 J	0.0904 JB	0.000271 J	**2.00**			0.00146 J		
	MW-83	Apr-16			**0.0313**	0.0248 J				0.0153	**5.63**	<0.00120	**0.573**			0.00364 J		
	MW-83	Oct-16			**0.0131**	0.121				0.00973	**1.85**	0.00141 JB	**0.434**			0.00925		
	MW-83	Apr-17			**0.0236**	0.0387				0.0224	**8.80**	0.00153 J	**0.570**			0.00556		
	MW-83	Oct-17			**0.0237**	0.0457				0.0338	**5.69**	0.00154 J	**0.460**			0.00446		
	MW-83	Apr-18			**0.0562**	0.0316				0.0137	**4.08**	0.00133 J	**0.342**			0.00218		
	MW-83	Oct-18			**0.0343**	0.0365				0.0477	**7.25**	0.00814	**0.472**			0.0124		
	MW-84	Apr-16			**0.115**	0.0173 J				0.00771 J	**1.27**	<0.00120	**3.30**			0.00714 J		
	MW-84	Oct-16			**0.0981**	0.0189				0.00917	0.868	<0.000240	**2.71**			0.0110		
	MW-84	Apr-17			**0.0798**	0.0132				0.000849 J	0.439	0.000346 J	**2.28**			0.00527		
	MW-84	Oct-17			**0.151**	0.0133				0.00353	**6.03**	<0.000240	**2.90**			0.00432		
	MW-84	Apr-18			**0.0904**	0.0126				0.00224	**1.30**	<0.000240	**2.66**			0.00438		
	MW-84	Oct-18			**0.150**	0.0135				0.00213	**8.01**	0.000288 J	**2.83**			0.00367		
	MW-87	Apr-16			**0.0106**	0.0200 JO1				<0.00270	**4.56**	<0.00120	**2.70 V**			<0.00190		
	MW-87	Oct-16			0.00673	0.0179				<0.000540	**1.53**	<0.000240	**0.731**			<0.000380		
	MW-87	Apr-17			0.00551	0.0155				<0.000540	**1.52**	<0.000240	**1.62**			<0.000380		
	MW-87	Oct-17			0.00776 J	0.0174 J				<0.000540	**1.71**	0.00473 J	**1.48**			<0.00190		
	MW-87	Apr-18			0.00609	0.0145				<0.000540	0.924	0.000262 JB	**0.686**			0.000502 J		
	MW-87	Oct-18			0.00723	0.0168 J				<0.000540	**1.27**	<0.00120	**1.18**			<0.000380		
	MW-88	Apr-16			0.00976 J	0.0107 J				<0.00270	<0.0750	<0.00120	**0.844**			<0.00190		
	MW-88	Oct-16			0.00911	0.0104				0.000551 J	<0.0150	<0.000240	**0.976**			<0.000380		
	MW-88	Apr-17			0.00709	0.0101				<0.000540	<0.0150	<0.000240	**0.819**			<0.000380		
	MW-88	Oct-17			0.00742	0.0113				<0.000540	0.0458 J	0.000315 J	**0.823**			<0.000380		
	MW-88	Apr-18			0.00806	0.0112				0.00119 J	0.0352 J	0.000649 J	**0.927 V**			<0.000380		
	MW-88	Oct-18			0.00660	0.0109				<0.000540	0.0233 J	0.000531 JB	**0.881**			<0.000380		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	MW-120	Apr-16		**0.0138**	0.0176 J				<0.00270	**7.32**	<0.00120	**2.14**			0.00511 J		
	MW-120	Oct-16		**0.0135**	0.0194				<0.000540	**5.90**	<0.000240	**1.96**			<0.000380		
	MW-120	Apr-17		**0.0106**	0.0144				<0.000540	**4.54**	0.000345 J	**1.48**			0.00251		
	MW-120	Oct-17		**0.0112**	0.0160				0.000571 J	**4.59**	<0.000240	**1.49**			0.000531 J		
	MW-120	Apr-18		**0.0117**	0.0104				<0.000540	**3.78**	<0.000240	**1.24**			0.000466 J		
	MW-120	Oct-18		**0.0118**	0.0126				<0.000540	**4.55** O1	0.000327 J	**1.35** O1V			<0.000380		
	MW-121	Apr-16		**0.0443**	0.0179 J				<0.00270	0.530	<0.00120	**3.56**			0.00777 J		
	MW-121	Oct-16		**0.0377**	0.0130				<0.000540	0.262	<0.000240	**2.33**			0.00746		
	MW-121	Apr-17		**0.0322**	0.0128				<0.000540	0.304	<0.000240	**2.66**			0.00468		
	MW-121	Oct-17		**0.0345**	0.0136				<0.000540	0.221	<0.000240	**2.40**			0.00788		
	MW-121	Apr-18		**0.0373**	0.0122				<0.000540	0.519	0.000325 J	**2.57**			0.00485		
	MW-121	Oct-18		**0.0350**	0.0123				<0.000540	0.118	0.000425 J	**2.03**			0.00619		
	MW-122	Apr-16		0.00444 J	0.0291				<0.00270	0.610	<0.00120	**1.50**			<0.00190		
	MW-122	Oct-16		0.00559	0.0272				<0.000540	**5.20**	<0.000240	**1.61**			<0.000380		
	MW-122	Apr-17		0.00519	0.0300				<0.000540	**2.02**	<0.000240	**2.03**			0.000551 J		
	MW-122	Oct-17		0.00559	0.0231				<0.000540	**5.01**	<0.000240	**1.28**			<0.000380		
	MW-122	Apr-18		0.00252	0.0198				0.00136 JB	0.860	<0.000240	**0.763**			<0.000380		
	MW-122	Oct-18		0.00349	0.0197				<0.000540	**3.58**	<0.000240	**1.08**			<0.000380		
	MW-123	Apr-16		**0.0275**	0.0242 J				<0.00270	<0.0750	<0.00120	**2.92**			<0.00190		
	MW-123	Oct-16		**0.0226**	0.0236				<0.000540	0.0599 J	0.000364 JB	**2.59**			<0.000380		
	MW-123	Apr-17		**0.0231**	0.0213 O1				<0.000540	0.0684 B	<0.000240	**2.59**			0.000395 J		
	MW-123	Oct-17		**0.0221**	0.0239				<0.000540	<0.0150	<0.000240	**2.88**			<0.000380		
	MW-123	Apr-18		**0.0226**	0.0229				<0.000540	0.0493 J	0.000256 J	**2.77**			<0.000380		
	MW-123	Oct-18		**0.0211**	0.0249 J				<0.000540	0.0298 J	<0.00120	**3.06**			<0.000380		
	MW-124	Apr-16		0.00477 J	0.0288				<0.00270	**4.08**	<0.00120	**0.749**			<0.00190		
	MW-124	Oct-16		0.00303	0.0323				0.00124 J	**4.99**	0.000546 JB	**0.469**			<0.000380		
	MW-124	Apr-17		0.00565	0.0205				<0.000540	**10.6**	<0.000240	**0.448**			<0.000380		
	MW-124	Oct-17		0.00354 J	0.0219 J				<0.000540	**5.08**	<0.00120	**0.521**			<0.00190		
	MW-124	Apr-18		0.00179 J	0.0203				<0.000540	**3.58**	<0.000240	**0.506**			<0.000380		
	MW-124	Oct-18		0.00214	0.0216 O1				<0.000540	**4.05**	0.000355 JB	**0.527**			<0.000380		
	OCD-1R	Apr-16		0.00729 J	0.0141 J				**0.105**	**1.54**	<0.00120	**0.462**			0.00420 J		
	OCD-1R	Oct-16		0.00524	0.0286				0.00312	**3.04**	<0.000240	**3.92**			0.000543 J		
	OCD-1R	Apr-17		0.00319	0.0150				0.00119 J	0.275 B	<0.000240	**1.27**			0.000988 J		
	OCD-1R	Oct-17		0.00433	0.0192				0.000885 J	0.830	0.000662 J	**1.56**			0.000822 J		
	OCD-1R	Apr-18		0.00396	0.0155				0.00148 J	0.246	<0.000240	**0.306**			0.00143 J		
	OCD-1R	Oct-18		0.00423	0.0198 J				0.00104 J	0.679	<0.00120	**1.47**			0.000628 J		
	OCD-2A	Apr-16		0.00640 J	0.0209 J				0.00304 J	**5.47**	<0.00120	**1.66**			<0.00190		
	OCD-2A	Oct-16		0.00234	0.0264				0.000783 J	**1.50**	0.000260 J	**0.535**			<0.000380		
	OCD-2A	Apr-17		0.00591	0.0213				<0.000540	**6.76**	<0.000240	**1.22**			<0.000380		
	OCD-2A	Oct-17		0.00323	0.0197				<0.000540	**3.74**	<0.000240	**0.966**			<0.000380		
	OCD-2A	Apr-18		**0.0112**	0.0201				<0.000540	**8.58**	<0.000240	**1.02**			0.000730 J		
	OCD-2A	Oct-18		0.00227	0.0266				<0.000540	**1.60**	0.000247 JB	**0.688**			<0.000380		
	OCD-3	Apr-16		0.00389 J	0.0214 J				<0.00270	**1.23**	<0.00120	0.0524			<0.00190		
	OCD-3	Oct-16		0.00422	0.0228				<0.000540	**2.31**	<0.000240	**0.527**			<0.000380		
	OCD-3	Apr-17		0.00141 J	0.0207				<0.000540	0.681	<0.000240	0.0337			<0.000380		
	OCD-3	Oct-17		**0.0104**	0.0255				0.000587 J	**5.44**	<0.000240	**0.770**			<0.000380		
	OCD-3	Apr-18		0.00258	0.0219				<0.000540	**1.82**	0.000364 JB	**0.412**			<0.000380		
	OCD-3	Oct-18		0.00175 J	0.0184				<0.000540	**1.36**	0.000312 JB	**0.248**			<0.000380		
	OCD-4	Apr-16		0.00209 J	0.0226 J				<0.00270	0.855	<0.00120	0.119			<0.00190		
	OCD-4	Oct-16		0.00374	0.0255				<0.000540	**3.46**	<0.000240	**0.285**			<0.000380		
	OCD-4	Apr-17		0.00227	0.0219				<0.000540	**2.00**	<0.000240	0.0669			<0.000380		
	OCD-4	Oct-17		**0.0105**	0.0248				<0.000540	**10.0**	<0.000240	**0.270**			<0.000380		
	OCD-4	Apr-18		0.00167 J	0.0223				0.00361	**1.15**	<0.000240	0.0438			0.000780 J		
	OCD-4	Oct-18		0.00318	0.0278				0.00118 J	**2.31**	0.000457 JB	**0.323**			<0.000380		
	OCD-5	Apr-16		**0.0126**	0.0279				<0.00270	**15.4**	0.00177 J	**0.267**			<0.00190		
	OCD-5	Oct-16		0.00863	0.0288				0.000559 J	**9.09**	<0.000240	**0.295**			<0.000380		
	OCD-5	Apr-17		**0.0108**	0.0269				<0.000540	**17.0**	<0.000240	**0.343**			<0.000380		
	OCD-5	Oct-17		**0.0124**	0.0261				0.000602 J	**12.6**	<0.000240	**0.271**			<0.000380		
	OCD-5	Apr-18		0.00513	0.0257				<0.000540	**4.65**	<0.000240	0.182			<0.000380		
	OCD-5	Oct-18		0.00753	0.0255				<0.000540	**6.56**	<0.00120	**0.262**			0.000417 J		
	OCD-6	Apr-16		**0.0139**	0.0214 J				<0.00270	**2.39**	<0.00120	**2.22**			<0.00190		
	OCD-6	Oct-16		**0.0120**	0.0253				0.000759 JB	**1.82**	0.000501 JB	**2.61**			0.00090 J		
	OCD-6	Apr-17		0.00911	0.0222				<0.000540	**2.28**	<0.000240	**2.09**			0.000598 J		
	OCD-6	Oct-17		**0.0200**	0.0256				<0.000540	**11.4**	<0.000240	**2.29**			<0.000380		
	OCD-6	Apr-18		0.00951	0.0203				<0.000540	**2.17**	<0.000240	**2.26**			0.000743 J		
	OCD-6	Oct-18		**0.0125**	0.0262				<0.000540	**6.45**	0.000466 J	**2.35**			<0.000380		
	OCD-7AR	Apr-16		**0.150**	0.0145 J				<0.00270	**2.89**	<0.00120	**2.25**			0.00195 J		
	OCD-7AR	Oct-16		**0.169**	0.0151				0.000837 J	**10.3**	<0.000240	**2.92**			0.00178 J		
	OCD-7AR	Apr-17		**0.113**	0.0134				<0.000540	**1.77**	<0.000240	**2.14**			0.00141 J		
	OCD-7AR	Oct-17		**0.181**	0.0150				<0.000540	**10.9**	<0.000240	**2.69**			0.00160 J		
	OCD-7AR	Apr-18		**0.110**	0.0133				0.00180 JB	**1.42**	0.000318 J	**2.49**			0.00181 J		
	OCD-7AR	Oct-18		**0.124**	0.0156				<0.000540	**9.57**	0.000362 J	**2.98**			0.00153 J		
	OCD-7B	Mar-13		<0.00500	0.0160				<0.00500	<0.200	<0.00500	0.0246			<0.00500		
	OCD-7B	Apr-15		0.00294 J	0.0196 J				<0.00270	**3.52**	<0.00120	**0.710**			<0.00190		
	OCD-7B	Apr-17		0.00194 J	0.0179				<0.000540	**2.73**	<0.000240	**0.621**			<0.000380		
	OCD-8A	Apr-16		**0.0618**	0.0199 J	**0.813**	<0.00500	<0.00130	<0.00270	**8.89**	<0.00120	**3.80**	<0.0000490	0.0306	<0.00190	<0.00165	0.00190 J	
	OCD-8A	Oct-16		**0.0616**	0.0213	**0.776**	<0.000160	0.00124 J	0.000710 J	**6.60**	0.000478 JB	**3.08**	<0.0000490	0.0260	0.000984 J	0.00108 J	0.000745 J	
	OCD-8A	Apr-17		**0.0632**	0.0177	**0.837**	<0.000160	0.00103 J	<0.000540	**6.72**	<0.000240	**2.91**	<0.0000490	0.0246	0.000793 J	0.00102 J	0.000626 J	
	OCD-8A	Oct-17		**0.0857**	0.0196	**0.888**	<0.000160	0.00180 J	0.000994 J	**7.29**	<0.000240	**3.25**	<0.0000490	0.0230	0.000961 J	0.000983 J	0.00103 J	
	OCD-8A	Apr-18		**0.0847**	0.0174	**0.770**	<0.000160	0.000833 J	<0.000540	**6.63**	0.000279 J	**3.85**	0.000103 J	0.0234	0.00112 J	0.000801 J	0.000500 J	
	OCD-8A	Oct-18		**0.101**	0.0358	**0.853**	<0.000800	0.00489	0.00233	**11.2**	0.00152 JB	**3.52**	0.000139 J	0.0279	0.00141 J	<0.00165	0.00359 J	
	OCD-8B	Apr-13		**<0.0250**	<0.0250				<0.0250	<1.00	**<0.0250**	**0.417**			<0.0250			
	OCD-8B	Apr-15		**0.0126**	0.0141				0.000872 J	0.239	0.000392 J	**5.98**			0.000525 J			
	OCD-8B	Apr-17		0.00912	0.0124				<0.000540	0.266	0.000256 J	**6.36**			<0.000380			
Field East of Refinery	KWB-1A	Apr-16		0.00401 J	0.0131 J	0.741	<0.00500	0.0122	<0.00270	<0.0750	<0.00120	**0.552**	<0.0000490	0.0100	0.00528 J	0.0247 J	0.0258	
	KWB-1A	Oct-16		0.00296	0.00944	0.608 O1V	<0.000160	0.0143	0.00127 JB	0.0845 JB	0.000408 J	**0.500**	<0.0000490	0.00846	0.00106 J	0.0188	0.0204	
	KWB-1A	Apr-17		0.00319	0.00857	0.706	<0.000160	0.00583	<0.000540	<0.0150	<0.000240	**0.447**	<0.0000490	0.00881	0.00164 J	0.0232	0.0221	
	KWB-1A	Oct-17		0.00342	0.00856	0.745	<0.000160	0.00612	<0.000540	<0.0150	<0.000240	**0.413**	<0.0000490	0.00841	0.000912 J	0.0174	0.0237	
	KWB-1A	Apr-18		0.00344	0.00777	**0.759**	<0.000160	0.00513	<0.000540	<0.0150	0.000342 J	**0.379**	<0.0000490	0.00815	0.000859 J	0.0197	0.0209	
	KWB-1A	Oct-18		0.00263 J	0.00840	0.734	<0.000160	0.00583 J	<0.00270	<0.0750	<0.00120	**0.394**	0.000132 J	0.00823 J	<0.00190	0.0153 J	0.0210 J	
	KWB-1C	Apr-13		<0.0100	0.0146				<0.0100	<0.400	<0.0100	<0.0100			<0.0100			
	KWB-1C	Apr-15		0.00338	0.00918				<0.000540	0.0537 J	0.000320 J	**0.462**			0.000549 J			
	KWB-1C	Apr-17		0.00303	0.00955				<0.000540	<0.0150	<0.000240	**0.501**			<0.000380			
	KWB-2R	Apr-16		0.00401 J	0.0326				<0.00270	0.883	<0.00120	**0.898**			0.00551 J			
	KWB-2R	Oct-16		0.00325	0.0343				0.00113 JB	0.465	0.000548 J	**0.609**			<0.000380			
	KWB-2R	Apr-17		0.00152 J	0.0271				<0.000540	0.0346 J	0.000273 J	**0.564**			<0.000380			
	KWB-2R	Oct-17		0.00258	0.324				<0.000540	0.0522 J	0.00130 J	0.0596			<0.000380			
	KWB-7	Apr-15		**0.0200**	0.0645				0.000832 J	**1.44**	0.000625 J	**5.65**	<0.0000490	0.00901	<0.000380		0.00133 J	
	KWB-7	Oct-15		0.00939	0.0647				<0.000540	**1.04**	<0.000240	**4.09**	<0.0000490	0.00442	<0.000380		0.00182 J	
	KWB-7	Apr-16		**0.0104**	0.0550	0.503	<0.00500	0.00739 J	<0.00270	**1.42**	<0.00120	**3.48**	<0.0000490	0.0121	<0.00190	0.00299 J	0.00196 J	
	KWB-7	Oct-16		0.00597	0.0560	0.455	<0.000160	0.00298	<0.000540	0.677	0.000441 J	**3.04**	<0.0000490	0.0107	<0.000380	0.00286 J	0.000901 J	
	KWB-7	Apr-17		0.00307	0.0650	0.436	<0.000160	0.00206	<0.000540	**1.47**	0.000707 J	**3.44**	<0.0000490	0.00746	<0.000380	0.00159 J	0.00102 J	
	KWB-7	Oct-17		0.00415	0.0915	0.460	<0.000160	0.00247	0.000670 J	**1.37**	0.000698 J	**3.22**	<0.0000490	0.00875	0.00100 J	0.00142 J	0.00129 J	
	KWB-7	Oct-18		0.00037 J	0.0513	0.491	<0.000160	0.000457 J	0.000570 J	0.432	0.000317 J	**2.55**	0.000134 J	0.00144 J	<0.000380	0.00120 J	0.00118 JB	
	KWB-8	Oct-16		0.00109 J	0.139	0.665	<0.000160	<0.000260	0.000710 JB	0.672	0.00387	**0.997**	<0.0000490 J6	0.00102 JB	0.000475 J	0.000746 J	0.00122 J	
	KWB-8	Apr-17		0.00129 J	0.106	0.632	<0.000160	0.000264 J	0.000851 J	**1.07**	0.00495	**1.83**	<0.0000490	0.00120 J	<0.000380	<0.000330	0.00157 J	
	KWB-8	Oct-17		0.00135 J	0.130	**0.769**	<0.000160	<0.000260	0.00153 J	0.0804 J	0.00296	**0.510**	<0.0000490	0.000997 J	0.0463	<0.000330	0.00112 J	

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
	Analyte Group:			Total Metals													
	Analyte:			Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
	Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL:			0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
	CGWSL Source:			WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Field East of Refinery	KWB-10R	Apr-16		**0.0226**	**4.31**				<0.00270	**7.43**	0.00131 J	0.199			<0.00190		
	KWB-10R	Oct-16		**0.0301**	0.816				0.000798 JB	**6.11**	0.00102 J	0.161			<0.000380		
	KWB-10R	Apr-17		**0.0157**	**3.82**				<0.000540	**5.21**	0.000971 J	0.157			<0.000380		
	KWB-10R	Oct-17		**0.0170**	**3.85**				<0.000540	**5.24**	0.000996 J	0.163			<0.000380		
	KWB-10R	Apr-18		**0.0169**	**3.91**				<0.000540	**4.57**	0.00320	0.170			<0.000380		
	KWB-10R	Oct-18		**0.0164**	**3.93**				<0.00270	**4.24**	0.00124 J	0.168			<0.00190		
	KWB-11A	Apr-16		0.00231 J	0.00508	0.502	<0.00500	0.00175 J	<0.00270	<0.0750	0.00851 J	**0.222**	<0.0000490	0.00476 J	0.00852 J	**0.0326 J**	0.0118 J
	KWB-11A	Oct-16		0.00220	0.0227	0.449	<0.000160	0.00194 J	<0.000540	<0.0150	0.00525	**0.212**	<0.0000490 J3J6O1	0.00476 B	0.00529	0.0217	0.0102
	KWB-11A	Apr-17		0.00183 J	0.0214	0.412	<0.000160	0.00126 J	<0.000540	<0.0150	0.00281	**0.243**	<0.0000490	0.00431	0.00536	0.0187	0.0113
	KWB-11A	Oct-17		0.00890	0.0190	0.502	<0.000160	0.00470	<0.000540	0.100	0.00271	**0.325**	<0.0000490	0.00598	0.00200 J	0.0127	0.00608
	KWB-11A	Apr-18		**0.0112**	0.0210	0.460	<0.000160	0.00532	<0.000540	0.595	0.00131 J	**0.413**	<0.0000490	0.00463	0.00246	0.0140	0.00760
	KWB-11A	Oct-18		**0.0487**	0.0379	0.423	<0.000160	0.0143	<0.000540	**12.6**	0.00226	**1.98**	0.000140 J	0.00485	0.00182 J	0.0119	0.00855
	KWB-11B	Apr-16		<0.00125	0.0135 J	0.173 JJ6O1	<0.00500	<0.00130	<0.00270	0.121 J	<0.00120	0.00188 J	<0.0000490	<0.00175	0.00949 J	0.00987 J	0.00814 J
	KWB-11B	Oct-16		0.00109 J	0.0116	0.105	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000800 J	<0.0000490 J3	0.000559 JB	0.00701	0.0101	0.00727
	KWB-11B	Apr-17		0.00126 J	0.0138	0.121	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000954 J	<0.0000490	<0.000350	0.00959	0.0113	0.00846
	KWB-11B	Oct-17		0.00133 J	0.0127	0.133 J	<0.000160	<0.000260	0.000977 J	0.0153 J	<0.000240	0.00153 J	<0.0000490	0.00144 J	0.00907	0.0112	0.00864
	KWB-11B	Apr-18		0.00154 J	0.0130	0.131 J	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000543 J	0.0000648 JB	<0.000350	0.0107	0.0111	0.00826
	KWB-11B	Oct-18		0.00122 J	0.0130	0.128 J	<0.000160	<0.000520	<0.00108	<0.0300	<0.000480	0.00248 JB	0.000180 J	0.00108 J	0.00911	0.0111 J	0.00776 J
	KWB-12A	Apr-15		0.00160 J	0.0168				0.00164 J	0.269	0.000780 J	0.00353 J	<0.0000490	0.000930 J	0.00435		0.0108
	KWB-12A	Apr-15	FD	0.00145 J	0.0138				<0.000540	<0.0150	<0.000240	0.000251 J	<0.0000490	0.000503 J	0.00375		0.0100
	KWB-12A	Oct-15		0.00242	0.0170				0.000659 J	0.0285 J	<0.000240	0.000862 J	<0.0000490	0.000959 J	0.00368		0.0139
	KWB-12A	Apr-16		0.00162 J	0.0164 J	0.695	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.0000490	<0.00175	0.00370 J	**0.0331 J**	0.0132 J
	KWB-12A	Oct-16		0.00159 J	0.0156	0.481	<0.000160	<0.000260	0.00159 JB	<0.0150	0.000256 J	<0.000250	<0.0000490 J3	0.000739 J	0.00360	0.0288	0.0110
	KWB-12A	Apr-17		0.00149 J	0.0157	0.492	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.00213 J	<0.0000490	<0.000350	0.00372 B	0.0260	0.0112
	KWB-12A	Oct-17		0.00142 J	0.0144	0.593	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000334 J	<0.0000490	0.000495 J	0.00334	0.0252	0.0127
	KWB-12A	Oct-18		0.00135 J	0.0138	0.592	<0.000160	<0.000260	0.000549 J	<0.0150	<0.000240	0.000829 J	<0.0000490	0.000350 J	0.00302	0.0234	0.0120
	KWB-12B	Apr-16		0.00178 J	0.0130 J	0.712	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00441 J	<0.0000490	<0.00175	0.00307 J	**0.0302 J**	0.0125 J
	KWB-12B	Apr-16	FD	0.00165 J	0.0116 J	0.651	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00434 J	<0.0000490	<0.00175	0.00301 J	0.0282 J	0.0117 J
	KWB-12B	Oct-16		0.00159 J	0.0101	0.464	<0.000160	<0.000260	0.00136 JB	0.0358 J	<0.000240	0.00955	<0.0000490 J3	0.000824 J	0.00248	0.0263	0.0112
	KWB-12B	Oct-16	FD	0.00161 J	0.0108	0.533	<0.000160	<0.000260	0.00147 JB	0.0369 J	0.000299 J	0.0104	<0.0000490 J3	0.000703 J	0.00295	0.0265	0.0114
	KWB-12B	Apr-17		0.00157 J	0.00901	0.525	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.00232 J	<0.0000490	<0.000350	0.00382 B	0.0273	0.0122
	KWB-12B	Apr-17	FD	0.00167 J	0.00968	0.558	<0.000160	<0.000260	<0.000540	0.0486 J	<0.000240	0.00129 J	<0.0000490	0.000513 JB	0.00356	**0.0307**	0.0127
	KWB-12B	Oct-17		0.00159 J	0.00870	0.616	<0.000160	<0.000260	0.000543 J	0.0534 J	<0.000240	0.00158 J	<0.0000490	0.000457 J	0.00346	0.0264 J	0.0127
	KWB-12B	Oct-17	FD	0.00169 J	0.00878	0.629	<0.000160	<0.000260	<0.000540	0.0374 J	<0.000240	0.00122 J	<0.0000490	0.000453 J	0.00298	0.0273	0.0122
	KWB-12B	Apr-18		0.00155 J	0.00991	0.609	<0.000160	<0.000260	0.00116 J	0.0689 JB	0.000700 JB	0.00277 JB	0.0000606 J	0.000382 J	0.00311 B	**0.0301**	0.0125
	KWB-12B	Apr-18	FD	0.00174 J	0.0102	0.607	<0.000160	<0.000260	<0.000540	0.0363 J	<0.000240	0.00120 J	<0.0000490	0.000364 J	0.00329	**0.0304**	0.0125
	KWB-12B	Oct-18		0.00155 J	0.00876	0.602	<0.000160	<0.000260	<0.000540	0.0949 J	<0.000240	0.000451 J	<0.0000490	<0.000350	0.00277	0.0248	0.0112
	KWB-12B	Oct-18	FD	0.00157 J	0.00884	0.585	<0.000160	<0.000260	0.000608 J	<0.0150	<0.000240	0.000456 J	<0.0000490	0.000531 J	0.00294	0.0269	0.0117
	KWB-P4	Apr-13															
	KWB-P4	Apr-15															
	KWB-P4	Apr-17															
	MW-57	Apr-16		0.00654 J	0.0344				0.00322 J	0.881	0.00266 J	**0.378**			0.0131		
	MW-57	Oct-16		0.00564	0.0253				0.000798 JB	0.559	0.000516 J	0.104			0.0169		
	MW-57	Apr-17		0.00502	0.0202				<0.000540	0.353	0.000515 J	**0.278**			0.0231		
	MW-57	Oct-17		0.00391	0.0176				0.000652 J	0.0996 J	<0.000240	0.0323			0.0171		
	MW-57	Apr-18		0.00550	0.0169				<0.000540	0.120 B	0.000325 JB	**0.481**			0.0140 B		
	MW-57	Oct-18		0.00512	0.0170				0.000612 J	0.209	<0.000240	0.0900			0.0120		
	MW-58	Apr-16		**0.0135**	0.744	0.518	<0.00500	<0.00130	<0.00270	**1.06**	0.00297 J	**0.391**	<0.0000490	<0.00175	0.00524 J	<0.00165	0.00259 J
	MW-58	Oct-16		0.00683	0.915	0.455	<0.000160	0.000318 J	0.00108 JB	**1.01**	0.00234	0.114	<0.0000490 J3	0.00133 J	<0.000380	<0.000330	0.00451 J
	MW-58	Apr-17		**0.0115**	0.716	0.453	<0.000160	<0.000260	<0.000540	0.521	0.00218	**0.333**	<0.0000490	0.000637 J	<0.000380	<0.000330	0.00233 J
	MW-58	Oct-17		0.00648	1.15	0.471	<0.000160	<0.000260	<0.000540	0.385	0.00204	**0.319**	<0.0000490	0.00129 J	<0.000380	<0.00165	0.00422 J
	MW-58	Apr-18		0.00453	1.35	0.511	<0.000160	<0.000260	<0.000540	**1.54**	0.00185 J	**0.210**	<0.0000490	0.00105 J	<0.000380	<0.000330	0.00270 J
	MW-58	Oct-18		0.00336	1.29	0.348	<0.000160	<0.000260	0.000567 J	0.721	0.00167 J	**0.335**	<0.0000490	0.000975 J	<0.000380	0.000458 J	0.00305 J
	MW-111	Apr-16		**0.0131**	0.0926				<0.00270	**6.67**	<0.00120	**1.66**			<0.00190		
	MW-111	Oct-16		**0.0108**	0.0757				0.000976 JB	**6.14**	0.000310 J	**1.41**			<0.000380		
	MW-111	Apr-17		**0.0127**	0.0697				<0.000540	**6.15**	<0.000240	**1.57**			<0.000380		
	MW-111	Oct-17		0.00926	0.0714				<0.000540	**7.15**	<0.000240	**1.45**			<0.000380		
	MW-111	Apr-18		**0.0137**	0.0620				<0.000540	**6.30**	<0.000240	**1.68**			0.000847 J		
	MW-111	Oct-18		0.00849 J	0.0674				<0.00270	**6.39**	<0.00120	**1.42**			<0.00190		
	MW-113	Apr-16		0.00282 J	0.0251				<0.00270	0.270 J	<0.00120	**0.734**			<0.00190		
	MW-113	Apr-16	FD	0.00306 J	0.0289				<0.00270	0.347 J	<0.00120	**0.823**			<0.00190		
	MW-113	Oct-16		0.00138 J	0.0249				<0.000540	**1.17 O1**	<0.000240	**1.36 O1V**			<0.000380		
	MW-113	Oct-16	FD	0.00125 J	0.0245				<0.000540	**1.13**	<0.000240	**1.37**			<0.000380		
	MW-113	Apr-17		0.00284	0.0257				<0.000540	0.512	<0.000240	**1.08**			<0.000380		
	MW-113	Apr-17	FD	0.00285	0.0244				<0.000540	0.480	<0.000240	**1.05**			<0.000380		
	MW-113	Oct-17		0.00138 J	0.0253				<0.000540	0.764	<0.000240	**1.14**			0.000401 J		
	MW-113	Oct-17	FD	0.00140 J	0.0235				<0.000540	0.774	0.000324 J	**1.19**			<0.000380		
	MW-113	Apr-18		0.00199 J	0.0212				0.00154 J	0.454	<0.000240	**0.856**			<0.000380		
	MW-113	Apr-18	FD	0.00257	0.0245				0.00532 B	0.550	<0.000240	**0.892**			<0.000380		
	MW-113	Oct-18		0.00240	0.0200				<0.000540	0.487	<0.000240	**1.06 V**			<0.000380		
	MW-113	Oct-18	FD	0.00265	0.0228				<0.000540	0.522	0.000639 JB	**1.15**			<0.000380		
	MW-125	Apr-16		0.00408 J	0.00922 J				<0.00270	<0.0750	<0.00120	**0.438**			0.00410 J		
	MW-125	Oct-16		0.00383	0.00806				0.000898 JB	<0.0150	<0.000240	**0.370**			0.00253		
	MW-125	Apr-17		0.00336	0.00822				<0.000540	<0.0150	<0.000240	**0.374**			0.00962		
	MW-125	Oct-17		0.00386	0.0153				0.00253	0.0228 J	<0.000240	**0.329**			0.00635		
	MW-125	Apr-18		0.00440	0.00924				<0.000540	0.0793 J	<0.000240	**0.393**			0.00275		
	MW-125	Oct-18		0.00334	0.00858				<0.000540	<0.0150	<0.000240	**0.390**			0.00238		
	MW-126A	Apr-16		0.00222	0.0174				<0.00270	0.803	<0.00120	**0.797**			<0.00190		
	MW-126A	Oct-16		0.00257	0.0109				<0.000540	0.299	<0.000240	**0.371**			<0.000380		
	MW-126A	Apr-17		0.00171 J	0.0157				<0.000540	0.602	<0.000240	**0.821**			<0.000380		
	MW-126A	Oct-17		0.00118 J	0.0133				<0.000540	0.485	<0.000240	**0.651**			<0.000380		
	MW-126A	Apr-18		0.00200 J	0.0170				<0.000540	0.653	0.000242 J	**0.851**			<0.000380		
	MW-126A	Oct-18		0.00135 J	0.0153				0.00132 J	0.537	<0.000480	**0.642**			<0.000760		
	MW-126B	Apr-16		0.00430 J	0.0133 J				<0.00270	0.170 J	<0.00120	0.0744			0.00285 J		
	MW-126B	Oct-16		0.00404	0.00919				<0.000540	0.0351 J	<0.000240	0.0539			0.00133 J		
	MW-126B	Apr-17		0.00367	0.0101				<0.000540	0.0356 J	<0.000240	0.0612			0.00207		
	MW-126B	Oct-17		0.00360	0.0100				0.000749 J	0.0330 J	0.000777 J	0.0547			0.00256		
	MW-126B	Apr-18		0.00339	0.00918				<0.000540	<0.0150	<0.000240	0.0516			0.00364		
	MW-126B	Oct-18		0.00387 J	0.00911				0.00139 J	<0.0300	<0.00120	0.0593			0.00383 J		
	MW-127	Apr-16		0.00535 J	0.137				<0.00270	0.357 J	<0.00120	0.103			<0.00190		
	MW-127	Oct-16		0.00453	0.0797				<0.000540	0.296	<0.000240	0.101			<0.000380		
	MW-127	Apr-17		0.00383	0.0718				<0.000540	0.187	<0.000240	0.0940			<0.000380		
	MW-127	Oct-17		**0.0114**	0.212				0.00109 J	**1.39**	0.000965 J	0.135			<0.000380		
	MW-127	Apr-18		0.00381	0.0682				0.00370 B	0.144 B	<0.000240	0.106			<0.000380		
	MW-127	Oct-18		0.00439	0.0589				<0.00108	0.0981 J	<0.000480	0.121			<0.000760		
	MW-128	Apr-16		**0.341**	0.372				0.00347 J	**15.4**	0.00336 J	**12.9**			<0.00190		
	MW-128	Oct-16		**0.0643**	0.0676				0.00182 JB	**3.12**	0.00222	**2.11**			<0.000380		
	MW-128	Apr-17		**0.0583**	0.0621				0.000580 J	**2.98**	0.00114 J	**2.09**			0.00973		
	MW-128	Oct-17		**0.0554**	0.0610				0.000618 J	**3.07**	0.000404 J	**2.09**			0.00122 J		
	MW-128	Apr-18		**0.0566**	0.0728				0.00278	**4.19**	0.00257 B	**2.04**			0.000436 JB		
	MW-128	Oct-18		**0.0447**	0.0604				<0.000540	**2.40**	0.000261 J	**1.78 O1V**			<0.000380		
	MW-129	Apr-16		**0.0272**	0.593				<0.00270	**5.49**	<0.00120	**1.10**			<0.00190		
	MW-129	Oct-16		**0.0236**	0.607				0.000625 JB	**4.79**	0.000529 J	**1.00**			<0.000380		
	MW-129	Apr-17		**0.0226**	0.627				<0.000540	**5.10**	<0.000240	**0.987**			<0.000380		
	MW-129	Apr-18		**0.0252**	0.516				<0.000540	**5.42**	<0.000240	**1.01**			<0.000380		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup																
Field East of Refinery	MW-130	Apr-16		0.00449 J	0.0228 J				<0.00270	0.451 J	<0.00120	0.105			0.00575 J		
	MW-130	Oct-16		0.00403	0.0188				0.000869 JB	0.104	<0.000240	0.0891			0.00675		
	MW-130	Apr-17		0.00391	0.0198				<0.000540	0.0756 J	<0.000240	0.0972			0.0101		
	MW-130	Oct-17		0.00374	0.0179				<0.000540	0.0360 J	<0.000240	0.0918			0.00852		
	MW-130	Apr-18		0.00400	0.0179				<0.000540	0.0297 J	<0.000240	0.0937			0.0162		
	MW-130	Oct-18		0.00341	0.0159				<0.000540	0.0289 J	<0.000240	0.0888			0.00722		
	MW-131	Apr-15		**0.0220**	**2.67**				0.000747 J	**2.34**	0.000919 J	**0.316**			<0.000380		
	MW-131	Oct-15		**0.0261**	**2.88**				0.00371	**4.71**	0.00294	**0.337**			<0.000380		
	MW-131	Apr-16		**0.0222**	**2.67**				<0.00270	**1.46**	<0.00120	**0.305**			<0.00190		
	MW-131	Oct-16		**0.0207**	**2.69**				<0.000540	**1.34**	<0.000240	**0.285**			<0.000380		
	MW-131	Apr-17		**0.0214**	**2.75**				<0.000540	**1.29**	<0.000240	**0.294**			<0.000380		
	MW-131	Oct-17		**0.0223**	1.98				<0.000540	**1.56**	<0.000240	**0.283**			<0.000380		
	MW-133	Nov-14		**0.0190**	0.130				0.000600 J	**3.50**	0.000800 J	**0.380**			<0.000380		
	MW-133	Apr-15		0.00897	0.157				<0.000540	**5.53**	0.00145 J	**0.312**			0.00124 J		
	MW-134	Apr-16		0.00566 J	0.0112 J				<0.00270	<0.0750	0.00131 J	0.0102 J			0.00812 J		
	MW-134	Apr-16	FD	0.00555 J	0.00895 J				<0.00270	0.0767 J	<0.00120	0.0110 J			0.00711 J		
	MW-134	Oct-16		0.00511	0.00827				0.00158 JB	0.0181 JB	<0.000240	0.00886			0.00647		
	MW-134	Oct-16	FD	0.00475	0.00833				0.00148 JB	0.0293 JB	0.000513 J	0.00817			0.00416		
	MW-134	Apr-17		0.00453	0.00963				<0.000540	<0.0150	<0.000240	0.00801			0.00537		
	MW-134	Apr-17	FD	0.00464	0.00877				0.000611 J	<0.0150	<0.000240	0.00808			0.00572		
	MW-134	Oct-17		0.00432	0.00942				0.000691 J	<0.0150	<0.000240	0.00999			0.00743		
	MW-134	Oct-17	FD	0.00445	0.0100				0.000840 J	0.0489 J	<0.000240	0.0109			0.00554		
	MW-134	Apr-18		0.00410	0.00963				<0.000540	<0.0150	<0.000240	0.0144			0.00560		
	MW-134	Apr-18	FD	0.00465	0.0100				0.00883 J3J5	0.0683 J	0.000274 J	0.0135			0.00665		
	MW-134	Oct-18		0.00394	0.00921				<0.000540	<0.0150	<0.000240	0.0119			0.00564		
	MW-134	Oct-18	FD	0.00388	0.00989				<0.000540	<0.0150	<0.000240	0.0134			0.00539		
	MW-135	Apr-16		**0.0216**	0.303				0.0130	**5.54**	0.00566 J	**0.225**			**0.128**		
	MW-135	Oct-16		0.00394	0.0397				0.00149 JB	0.598	0.000686 J	0.0324			0.0368		
	MW-135	Apr-17		0.00324	0.0221				<0.000540	0.339	0.000499 J	0.0187			0.0361		
	MW-135	Oct-17		0.00339	0.0249				0.00166 J	0.526	0.000498 J	0.0229			0.0341		
	MW-135	Apr-18		0.00348	0.0186				0.00386 B	0.205 B	0.000510 J	0.0114			0.0254		
	MW-135	Oct-18		0.00335 J	0.0422				0.00276 J	0.649	0.000966 J	0.0380			0.0298		
	RA-4196	Apr-16															
	RA-4196	Oct-16															
	RA-4196	Apr-17															
	RA-4196	Oct-17															
	RA-4196	Apr-18															
	RA-4196	Oct-18															
	RA-4798	Apr-16															
	RA-4798	Oct-16															
	RA-4798	Apr-17															
	RA-4798	Oct-17															
	RA-4798	Apr-18															
	RA-4798	Oct-18															
	RW-12R	Apr-16		<0.00125	0.0512				0.0453	0.213 J	0.00204 J	**0.547**			<0.00740		
	RW-12R	Apr-17		0.0005 J	0.0409				0.0359	0.241	0.00193 J	**0.398**			<0.000380		
	RW-12R	Apr-18		0.00029 J	0.0387				0.00973	0.0459 J	0.00104 J	**0.718**			0.000554 J		
	RW-13R	Apr-16		0.00922 J	0.0165				<0.00270	0.572	<0.00120	**1.26**					
	RW-13R	Apr-18		0.00084 J	0.0475				0.00357	0.349	0.000602 J	**0.985**			0.00161 J		
	RW-18	Apr-15		0.00379	0.0105				0.000703 J	<0.0150	<0.000240	<0.000250			0.00988		
	RW-18	Apr-16		0.00400 J	0.0124 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00436 J		
	RW-18A	Apr-17		0.00331	0.0107				<0.000540	<0.0150	<0.000240	0.000927 J			0.00406		
	RW-18A	Apr-18		0.00278	0.0105				<0.000540	<0.0150	<0.000240	0.00299 J			0.00321		
	RW-20	Apr-15		0.00375 J	0.527				<0.00270	**1.75**	0.00354 J	**0.872**			<0.00190		
	RW-22	Apr-15		0.00248	0.816				0.00320	0.140	0.00397	**0.845**			0.00234		
North Refinery	MW-23	Apr-16		**0.0113**	**12.8**				<0.00270	0.456 J	**0.0186**	0.105			<0.00190		
	MW-23	Oct-16		0.00776	**12.0**				0.00711	**1.89**	**0.0334**	0.184			0.00190 J		
	MW-23	Apr-17		0.00608	**9.82**				0.000789 J	0.0552 J	0.00296	0.0653			0.00287		
	MW-23	Oct-17		0.00636	**10.5**				0.00108 J	0.0413 J	**0.0172**	0.0662			0.00939		
	MW-23	Apr-18		0.00511	**9.72**				0.000601 JB	0.0297 J	0.00227	0.0750			0.000496 J		
	MW-23	Oct-18		0.00455	**8.55**				<0.000540	0.0527 J	0.00657	0.0630			**0.0661**		
	MW-29	Apr-16		<0.00125	0.0182 J				<0.00270	<0.0750	<0.00120	**0.485**			0.0141		
	MW-29	Oct-16		0.00165 J	0.0156				0.000619 JB	0.0168 J	0.000465 J	**0.374**			0.000713 J		
	MW-29	Apr-17		0.00052 J	0.0156				<0.000540	0.0276 J	<0.000240	**0.436 V**			<0.000380		
	MW-29	Oct-17		0.00193 J	0.0161				<0.000540	0.0193 J	<0.000240	**0.382**			0.000672 J		
	MW-29	Apr-18		0.00154 J	0.0192				<0.000540	0.0804 J	0.000379 J	**0.483**			<0.000380		
	MW-29	Oct-18		0.00209	0.0289				<0.000540	<0.0150	<0.000240	**0.341**			0.0275		
	MW-39	Apr-16		**0.0195**	0.0209 J				0.00407 J	0.0932 J	0.00124 J	0.0161 J			0.0192		
	MW-39	Oct-16		**0.0274**	0.0145				0.00128 JB	0.0160 J	0.000867 J	0.0211			0.00146 J		
	MW-39	Apr-17		**0.0135**	0.0192				0.00275	0.101	0.00157 J	0.0113			0.00268		
	MW-39	Oct-17		**0.0148**	0.0158				0.00186 J	0.0837 J	0.000906 J	0.0169			0.00410		
	MW-39	Apr-18		**0.0110**	0.0159				0.00126 JB	0.0868 J	0.00139 J	0.0181			<0.000380		
	MW-39	Oct-18		0.00800	0.0687				<0.000540	<0.0150	0.000324 J	0.0200			0.0389		
	MW-40	Apr-15		0.00122 J	0.0336				<0.00270	0.345 J	0.00213 J	0.0398			<0.00190		
	MW-40	Apr-16		0.00154 J	0.0392				<0.00270	0.512	0.00311 J	0.0321			<0.00190		
	MW-40	Apr-17		0.00079 J	0.0249				<0.000540	0.0151 J	0.000660 J	0.0241			**0.0704**		
	MW-40	Apr-18		0.00066 J	0.0227				0.000593 JB	0.0289 J	0.000415 J	0.0161			<0.000380		
	MW-41	Apr-15		0.00591 J	0.0203 J				<0.00270	0.136 J	<0.00120	**1.01**			<0.00190		
	MW-41	Apr-16		0.00578 J	0.0210 J				<0.00270	<0.0750	<0.00120	**0.888**			<0.00190		
	MW-41	Apr-17		0.00391	0.0154				<0.000540	0.0429 J	0.000578 J	**0.737**			0.00229		
	MW-41	Apr-18		0.00729	0.0206				<0.000540	0.0230 J	0.000304 J	**1.03**			0.000470 J		
	MW-42	Apr-15		0.00935 J	0.0242 J				<0.00270	0.136 J	<0.00120	0.171			0.00393 J		
	MW-42	Apr-16		0.00814 J	0.0274				<0.00270	0.182 J	<0.00120	0.197			<0.00190		
	MW-42	Apr-17		0.00486	0.0182				<0.000540	<0.0150	0.000252 J	0.177			0.00222		
	MW-42	Apr-18		0.00477	0.0206				<0.000540	0.0216 J	0.000406 J	0.123			<0.000380		
	MW-43	Apr-16		**0.0106**	0.251	**1.78**	<0.000800	<0.00130	<0.00270	0.163 J	0.00151 J	**0.274**	<0.0000490	0.00625 J	**0.205**	<0.00165	0.00455 J
	MW-43	Oct-16		0.00946	0.0772	**1.36**	<0.000160	<0.000260	0.00121 JB	0.0890 J	0.000510 J	0.196	<0.0000490 J3	0.00666	0.0211	0.000344 J	0.00328 J
	MW-43	Apr-17		0.00987	0.100	**1.21**	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.175	<0.0000490	0.00534	0.00413 B	<0.000330	0.00200 J
	MW-43	Oct-17		0.00616	0.130	**1.43**	<0.000160	<0.000260	0.000981 J	0.0345 J	0.000387 J	0.142	<0.0000490	0.00700	0.0447	<0.000330	0.00261 J
	MW-43	Apr-18		**0.0124**	0.186	**1.32**	<0.000160	<0.000260	0.00246	0.0572 JB	0.000412 JB	0.154	<0.0000490	0.00839	0.00143 JB	<0.000330	0.00181 J
	MW-43	Oct-18		0.00997	0.137	**1.22**	<0.000160	<0.000260	<0.000540	0.0287 J	0.000253 J	0.151	<0.0000490	0.00608	0.000723 J	<0.000330	0.00207 J
	MW-59	Apr-15		**0.0172**	0.0163				<0.000540	0.163	0.000394 J	**0.465**			0.00573 J		
	MW-59	Apr-16		**0.0763**	0.113				<0.00270	0.976	<0.00120	**2.34**			<0.00190		
	MW-59	Apr-17		**0.0234**	0.0202				<0.000540	0.123	<0.000240	**0.440**			<0.000380		
	MW-59	Apr-18		**0.0240**	0.0236				<0.000540	0.102 B	<0.000240	**0.448**			<0.000380		
	MW-60	Apr-16		**0.0111**	0.0203 J	0.438	<0.00500	<0.00130	<0.00270	0.105 J	<0.00120	**0.364**	<0.0000490	<0.00175	<0.00190	0.00235 J	0.000910 J
	MW-60	Apr-16	FD	**0.0121**	0.0193 J	0.449	<0.00500	<0.00130	<0.00270	0.165 J	<0.00120	**0.377**	<0.0000490	<0.00175	<0.00190	0.00254 J	0.00110 J
	MW-60	Oct-16		0.00457	0.0154	0.347	<0.000160	0.000490 J	0.00133 JB	0.151 B	0.000403 J	**0.336**	<0.0000490	0.00178 JB	<0.000380	0.00252 J	0.000358 J
	MW-60	Oct-16	FD	0.00478	0.0147	0.332	<0.000160	0.000589 J	0.00129 JB	0.148 B	0.000342 J	**0.339**	<0.0000490	0.00135 JB	<0.000380	0.00251 J	0.000307 J
	MW-60	Apr-17		0.00595	0.0167	0.376	<0.000160	<0.000260	<0.000540	0.0568 J	<0.000240	**0.294**	<0.0000490	0.000791 J	<0.000380	0.00223 J	0.000578 JB
	MW-60	Apr-17	FD	0.00605	0.0167	0.376	<0.000160	<0.000260	<0.000540	0.0692 J	<0.000240	**0.290**	<0.0000490	0.000704 J	<0.000380	0.00222 J	0.000605 JB
	MW-60	Oct-17		0.00682	0.0185	0.567	<0.000160	0.000302 J	<0.000540	0.0449 J	0.000355 J	**0.258**	<0.0000490	0.00205	0.00188 J	0.00149 J	0.000363 J
	MW-60	Oct-17	FD	0.00299	0.0186	0.613	<0.000160	<0.000260	<0.000540	0.0330 J	0.000245 J	**0.259**	<0.0000490	0.00420	<0.000380	0.00144 J	0.000347 J
	MW-60	Apr-18		0.00895	0.0188	0.537	<0.000160	0.000365 J	<0.000540	0.0975 JB	0.000342 JB	**0.291**	<0.0000490	0.000820 J	<0.000380	0.00208 J	0.000298 J
	MW-60	Apr-18	FD	0.00863	0.0188	0.531	<0.000160	<0.000260	<0.000540	0.0606 J	0.000350 J	**0.279**	<0.0000490	0.00260	<0.000380	0.00211 J	0.000362 J
	MW-60	Oct-18		0.00751	0.0193	0.690	<0.000160	0.000515 J	<0.000540	0.204	0.000520 J	**0.270**	<0.0000490	0.000952 J	<0.000380	0.00140 J	0.000370 J
	MW-60	Oct-18	FD	0.00684	0.0172	0.677	<0.000160	0.000409 J	<0.000540	0.190	0.000289 J	**0.268**	<0.0000490	0.000846 J	<0.000380	0.00143 J	0.000313 J

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Total Metals													
		Analyte:		Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
		CGWSL Source:		WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup														
North Refinery	MW-61	Apr-16		<0.00125	0.0192 J				<0.00270	<0.0750	<0.00120	0.0664			0.0101		
	MW-61	Oct-16		0.00083 J	0.0223				0.00145 JB	0.0204 J	0.000914 J	0.0746			<0.000380		
	MW-61	Apr-17		0.00098 J	0.0218				0.000618 J	0.0299 J	0.000959 J	0.0352			0.00551		
	MW-61	Oct-17		0.00125 J	0.0330				0.00316	0.0342 J	0.00128 J	0.0320			**0.0519**		
	MW-61	Apr-18		0.00249	0.0288				0.000703 J	0.0382 JB	0.00174 JB	0.0184			0.000498 JB		
	MW-61	Oct-18		0.00157 J	0.0316				<0.00270	<0.0750	0.00145 J	0.0190 JB			<0.00190		
	MW-62	Apr-16		0.00321 J	0.0390				<0.00270	<0.0750	<0.00120	<0.00125			0.00935 J		
	MW-62	Oct-16		**0.0115**	0.0252				0.000596 JB	0.0385 J	0.000715 J	0.00213 J			<0.000380		
	MW-62	Apr-17		0.00450	0.0285				<0.000540	<0.0150	0.000317 J	0.00311 J			0.00328		
	MW-62	Oct-17		0.00366	0.0312				<0.000540	0.0375 J	0.000415 J	0.000930 J			**0.0554**		
	MW-62	Apr-18		0.00849	0.0467				0.000842 J	<0.0150	0.000380 JB	0.00452 J			<0.000380		
	MW-62	Oct-18		0.00419 J	0.0529				<0.00270	0.0752 J	<0.00120	0.00287 JB			<0.00190		
	MW-67	Apr-16		**0.0101**	0.229	0.471	<0.00500	<0.00130	<0.00270	<0.0750	0.00135 J	0.117	<0.0000490	<0.00175	<0.00190	<0.00165	0.00139 J
	MW-67	Oct-16		**0.0103**	0.161	0.451	<0.000160	<0.000260	0.000671 JB	0.0242 J	0.00127 J	0.104	<0.0000490	0.000689 J	0.000479 J	<0.000330	0.000595 J
	MW-67	Apr-17		**0.0147**	0.137	0.435	<0.000160	<0.000260	0.000612 J	0.0312 J	0.00155 J	0.0878	<0.0000490	0.000780 J	0.00230	<0.000330	0.00124 JB
	MW-67	Oct-17		**0.0103**	0.0906	0.464	<0.000160	<0.000260	0.000639 J	0.0172 J	0.00112 J	0.0986	<0.0000490	0.000648 J	<0.000380	<0.000330	0.000547 J
	MW-67	Apr-18		**0.0107**	0.120	0.456	<0.000160	<0.000260	0.000927 JJ3J4	0.0743 J	0.00171 J	0.0943	<0.0000490	0.000828 J	0.000518 J	<0.000330	0.000584 J
	MW-67	Oct-18		0.00516	0.0745	0.401	0.000220 JB	<0.000260	0.000568 J	0.0289 J	0.00192 JB	0.126	0.000120 J	0.000595 J	<0.000380	<0.000330	0.000634 J
	MW-90	Apr-16		**0.0111**	0.0140 J				<0.00270	**1.34**	<0.00120	0.166			0.00262 J		
	MW-90	Oct-16		**0.0103**	0.00945				<0.000540	0.201	0.000244 J	0.0186			**0.0663**		
	MW-90	Apr-17		0.00894	0.0159				<0.000540	**1.53**	<0.000240	0.144			0.00359 B		
	MW-90	Oct-17		0.00392	0.0152				0.000863 J	0.223	<0.000240	0.0711			0.00150 J		
	MW-90	Apr-18		0.00307	0.0170				<0.000540 J3J4	0.0329 J	<0.000240	0.0329			0.000532 J		
	MW-90	Oct-18		0.00274	0.0189				<0.000540	0.0894 J	0.000534 JB	0.0916			0.000461 J		
	MW-91	Apr-16		0.00660 J	0.0716				<0.00270	<0.0750	0.00376 J	0.00267 J			<0.00740		
	MW-91	Oct-16		0.00880	0.0554				<0.000540	<0.0150	0.00340	0.00304 JB			0.000630 J		
	MW-91	Apr-17		0.00780	0.0532				<0.000540	0.0336 J	0.00352	0.00138 J			0.00138 JB		
	MW-91	Oct-17		0.00586	0.0512				0.000787 J	0.0900 J	0.00312	0.00640			0.00111 J		
	MW-91	Apr-18		0.00800	0.0454				<0.000540 J3J4	0.0370 J	0.00365	0.00264 J			<0.000380		
	MW-91	Oct-18		0.00772	0.0484				0.000738 J	0.0472 J	0.00440 B	0.00539			0.000542 J		
	MW-92	Apr-16		0.00316 J	**3.44** O1V				<0.00270	0.328 J	<0.00120	0.0363			0.00207 J		
	MW-92	Oct-16		0.00732	**2.81**				0.00101 JB	0.0744 J	0.00183 J	0.0274			0.00172 J		
	MW-93	Apr-16		**0.0137**	0.0231 J				0.00907 J	0.858	<0.00120	0.0663			0.0242		
	MW-93	Oct-16		0.00195 JJ3J6	0.0263				0.00337 B	**1.19**	0.00112 J	**0.335**			0.0119 J3J6		
	MW-93	Apr-17		0.00456	0.0228				0.00367	0.278	0.00116 J	0.0258			0.00683		
	MW-93	Apr-18		0.00706	0.0304				0.00945	0.145 B	0.00152 JB	0.0325			0.00377 B		
	MW-94	Oct-15		**0.0215**	1.57				0.00144 J	<0.0150	<0.000240	0.00194 J			0.000935 J		
	MW-94	Apr-16		**0.0286**	0.353				<0.00270	<0.0750	<0.00120	0.00666 J			<0.00190		
	MW-94	Oct-16		**0.0115**	0.635				0.00119 JB	0.0159 J	0.000255 J	0.00631			0.000962 J		
	MW-94	Apr-17		**0.0170**	0.873				0.00141 J	0.134	0.000298 J	0.00382 J			0.00304		
	MW-95	Apr-15		0.00133 J	0.0762				<0.000540	0.0357 J	0.000477 J	0.0247			0.000381 J		
	MW-95	Apr-16		0.00175 J	0.0736				<0.00270	<0.0750	<0.00120	0.0214 J			<0.00190		
	MW-95	Apr-17		0.00173 J	0.0612				<0.000540	<0.0150	<0.000240	0.0330			0.000407 J		
	MW-95	Apr-18		0.00154 J	0.0691				<0.000540	0.0155 J	<0.000240	0.0556			<0.000380		
	MW-96	Apr-16		0.00463 J	0.155				<0.00270	<0.0750	<0.00120	0.00174 J			0.00330 J		
	MW-96	Oct-16		0.00238	0.106				<0.000540	0.0573 J	<0.000240	0.00700			0.000695 J		
	MW-96	Apr-17		0.00314	0.124				<0.000540	<0.0150	<0.000240	0.000699 J			0.00148 JB		
	MW-96	Oct-17		0.00241	0.0709				<0.000540	0.117	<0.000240	0.00173 J			0.000629 J		
	MW-96	Apr-18		0.00321	0.124				0.000908 JJ3J4	0.0251 J	0.000257 J	0.00146 J			<0.000380		
	MW-96	Oct-18		0.00251	0.111				<0.000540	0.0658 J	0.000673 JB	0.00158 J			<0.000380		
	MW-98	Apr-16		0.00199 J	0.0204 J				<0.00270	<0.0750	0.00934 J	0.0312			<0.00190		
	MW-98	Oct-16		0.00110 J	0.0150				0.000797 JB	0.0160 J	0.00734	0.0233			0.000906 J		
	MW-98	Apr-17		0.00109 J	0.0163				<0.000540	<0.0150	0.00875	0.0261			0.00227 B		
	MW-98	Oct-17		0.00082 J	0.0159				0.000791 J	0.126	0.00929	0.0280			0.000620 J		
	MW-98	Apr-18		0.00120 J	0.0156				0.000670 JJ3J4	<0.0150	0.00964	0.0246			0.000402 J		
	MW-98	Oct-18		0.000968 J	0.0182				0.000615 J	0.0174 J	0.00903 JB	0.0210			<0.000380		
	MW-137	Apr-16		**0.0893**	0.0567	**0.982**	<0.00500	<0.00130	<0.00270	0.0953 J	0.00601 J	0.144	<0.0000490	0.0101	0.00327 J	<0.00165	0.00840 J
	MW-137	Oct-16		**0.0345**	0.0453	**0.799**	<0.000160	<0.000260	0.000628 JB	0.0169 J	0.00436	0.120	<0.0000490	0.00652	0.00368	<0.000330	0.00529
	MW-137	Apr-17		**0.0496**	0.0564	**0.752**	<0.000160	<0.000260	<0.000540	<0.0150	0.00408	0.113	<0.0000490	0.00689	0.00397 B	<0.000330	0.00580
	MW-137	Oct-17		**0.0156**	0.0756	**1.03**	<0.000160	<0.000260	0.00109 J	0.260	0.00338	**0.209**	<0.0000490	0.0198	0.0393	<0.000330	0.00771
	MW-137	Apr-18		**0.0512**	0.0711	**0.997**	<0.000160	<0.000260	0.00132 J	0.0740 JB	0.00433	0.154	<0.0000490	0.0134	0.00240 B	<0.000330	0.00718
	MW-137	Oct-18		**0.0129**	0.0942	**0.989**	<0.000160	<0.000260	0.000586 J	0.0553 J	0.00318	0.183	<0.0000490	0.0126	**0.341**	<0.000330	0.00844
	MW-138	Apr-16		0.00777 J	0.220	**1.56**	<0.00500	<0.00130	<0.00270	0.221 J	<0.00120	0.164	<0.0000490	0.00598 J	<0.00190	<0.00165	0.00531 J
	MW-138	Oct-16		0.00609	0.0947	**1.01**	<0.000160	<0.000260	0.000775 JB	0.0178 J	0.000407 J	0.143	<0.0000490	0.00523	0.00284	<0.000330	0.00306 J
	MW-138	Apr-17		0.00569	0.130	**1.01**	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.111	<0.0000490	0.00546	0.00267 B	<0.000330	0.00269 J
	MW-138	Oct-17		0.00507	0.103	**1.11**	<0.000160	<0.000260	0.000747 J	0.0334 J	0.000271 J	0.0931	<0.0000490	0.00619	0.00945	<0.000330	0.00195 J
	MW-138	Apr-18		0.00514	0.124	**0.984**	<0.000160	<0.000260	0.000785 J	0.160 B	<0.000240	0.103	<0.0000490	0.00977	0.000667 JB	<0.000330	0.00169 J
	MW-138	Oct-18		0.00464	0.108	**0.927**	<0.000160	<0.000260	<0.000540	0.0235 J	0.000249 J	0.111	<0.0000490	0.00490	**0.0973**	<0.000330	0.00120 J
	RW-1	Apr-15		0.00607	0.0305				0.00290	0.216	0.000495 J	0.126			0.00302 J		
	RW-1R	Apr-16		0.00695 J	0.0414				<0.00270	**17.1**	0.00149 J	**0.317**			0.00246 J		
	RW-1	Apr-17		**0.0359**	0.0243				0.00254	**4.88**	0.00492	**0.240**			0.00573 B		
	RW-1	Apr-18		**0.0204**	0.0328				0.000826 JJ3J4	**1.50**	0.00156 J	0.0237			0.00213		
	RW-2	Apr-15		**0.0264**	0.0245 J				0.00553 J	0.381 J	0.00233 J	**0.313**			**0.0705**		
	RW-2R	Apr-16		0.00552 J	0.171				0.00750 J	**2.25**	**0.0153**	0.0705			**0.422**		
	RW-2	Apr-17		0.00504	0.0566				0.00173 J	0.264	0.000960 J	0.0161			0.0100		
	RW-2	Apr-18		0.00374	0.139				0.00362	0.123 B	0.00163 JB	0.0215			0.00128 JB		
	RW-7	Apr-15		0.00239 J	0.508				<0.00270	0.0976 J	<0.00120	0.0280			<0.00190		
	RW-7R	Apr-16		**0.0154**	0.0293				<0.00270	**1.09**	<0.00120	**1.22**			<0.00190		
	RW-7	Apr-17		0.00332	0.0198				<0.000540	0.183	<0.000240	**1.13**			<0.000380		
	RW-7	Apr-18		**0.0174**	0.144				0.00434 B	**2.92**	0.000599 J	0.106			<0.000380		
	RW-8	Apr-15		0.00556 J	0.0889				<0.00270	0.427 J	<0.00120	0.0556			0.00200 J		
	RW-8	Apr-17		**0.0343**	0.0593				0.00135 J	**9.50**	0.00169 J	**1.12**			<0.000380		
	RW-9	Apr-15		0.00392	0.0397				0.00102 J	0.257	0.000449 J	**0.460**			0.0144		
	RW-9	Apr-16		0.00476 J	0.0550				<0.00270	0.169 J	<0.00120	**0.441**			0.00735 J		
	RW-9	Apr-17		0.00338	0.0378				<0.000540	<0.0150	<0.00120	**0.784**			0.0217		
	RW-9	Apr-18		0.00404	0.0462				<0.000540	0.0199 J	0.00111 J	**0.545**			0.000498 J		
	RW-10	Apr-15		0.00171 J	0.0258				0.000561 J	0.454	<0.000240	**0.237**			0.00517		
	RW-10	Apr-16		0.00175 J	0.0372				<0.00270	**1.27**	<0.00120	**0.266**			0.0404		
	RW-10	Apr-17		0.00167 J	0.0184				<0.000540	0.0250 J	0.000433 J	0.173			<0.000380		
	RW-10	Apr-18		0.00234	0.0224				<0.000540	<0.0150	0.000469 J	0.189			<0.000380		
	RW-16	Apr-15		**0.0171**	0.0138 J				<0.00270	<0.0750	<0.00120	**0.421**			<0.00190		
	RW-16	Apr-16		**0.0115**	0.0138 J				<0.00270	<0.0750	<0.00120	**0.406**			0.0223		
	RW-16	Apr-17		**0.0129**	0.0126				0.00108 J	0.0227 J	0.00125 J	**0.263**			0.00658		
	RW-16	Apr-18		0.00922	0.0130				0.000754 JB	0.0239 J	0.000343 J	**0.201**			0.00643		
	RW-17	Apr-15		**0.0111**	0.0274				<0.00270	0.0850 J	0.00425 J	0.121			0.0361		
	RW-17	Apr-16		**0.0522**	0.119				<0.00270	0.197 J	**0.0385**	**3.55**			**0.0714**		
	RW-17	Apr-17		**0.0113**	0.0223				0.000584 J	0.0569 J	0.0106	**0.719**			0.0106		
	RW-17	Apr-18		**0.0106**	0.0232				<0.000540 J3J4	0.0346 J	0.00975	**0.767**			0.00322		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
North RO Reject Field	MW-117	Apr-16		0.00266 J	0.0186 J				<0.00270	0.684	<0.00120	0.0103 J			0.00857 J		
	MW-117	Oct-16		0.00312	0.0249				0.00417 B	**1.57**	0.00137 J	0.0171			0.00403		
	MW-117	Apr-17		0.00255	0.0197				0.00209	**1.11**	0.000901 J	0.0147			0.00349 B		
	MW-117	Oct-17		0.00238	0.0177				0.00279	**1.15**	0.000777 J	0.0110			0.00982		
	MW-117	Apr-18		0.00236	0.0110				0.000952 J	0.200	0.000293 J	0.00405 J			0.0126		
	MW-117	Oct-18		0.00224	0.00996				<0.000540	0.0302 J	<0.000240	0.000557 J			0.0121		
	MW-118	Apr-16		**0.0108**	0.0139 J				<0.00270	0.426 J	<0.00120	0.00480 J			0.00645 J		
	MW-118	Oct-16		**0.0117**	0.0111				0.000649 JB	0.0658 J	<0.000240	0.000302 J			0.0156		
	MW-118	Apr-17		**0.0105**	0.00910				<0.000540	0.0337 J	<0.000240	0.000670 J			0.0222		
	MW-118	Oct-17		**0.0109**	0.00884				0.000983 J	<0.0150	<0.000240	<0.000250			0.0196		
	MW-118	Apr-18		0.00991	0.00943				<0.000540	0.0223 J	0.000430 J	0.000501 J			0.00851		
	MW-118	Oct-18		**0.0103**	0.00867				0.000593 J	0.0156 J	<0.000240	0.000403 J			0.00774		
	MW-119	Apr-16		0.00315 J	0.00645 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00259 J		
	MW-119	Oct-16		0.00404	0.00979				<0.000540	0.0660 J	<0.000240	0.00190 J			0.00334		
	MW-119	Apr-17		0.00376	0.00966				<0.000540	0.0438 J	<0.000240	0.00331 J			0.00442		
	MW-119	Oct-17		0.00513	0.0108				0.000757 J	0.0324 J	<0.000240	0.00324 J			0.00145 J		
	MW-119	Apr-18		0.00392	0.00951				<0.000540	0.0347 J	0.000502 J	0.00250 J			0.00324		
	MW-119	Oct-18		0.00462	0.0110				<0.000540	<0.0150	<0.000240	0.00375 J			0.00112 J		
NCL	MW-18	Apr-15		0.00321	0.0167				0.00108 J	<0.0150	<0.000240	0.00671	<0.0000490	0.00120 J	0.00947		0.0147
	MW-18	Apr-16		0.00395 J	0.0207 J	**1.36**	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.0157 J	<0.0000490	<0.00350	0.0153	**0.0480 J**	0.0200 J
	MW-18	Apr-17		0.00365	0.0183	**1.71**		0.000321 J	0.00222	<0.0150	<0.000240	0.00474 JB	<0.0000490	0.00120 J	0.0151	0.0250	0.0195
	MW-18	Apr-18		0.00413	0.0130	**1.40**	<0.000160	<0.000260	0.000973 J	<0.0150	0.000243 J	0.0125	<0.0000490	0.00198 J	0.0148	**0.0378**	0.0178
	MW-45	Apr-16		0.00752 J	0.0191 J	0.671	<0.00500	<0.00130	<0.00270	**4.14**	0.00443 J	**0.633**	<0.0000490	0.00631 J	<0.00190	<0.00165	0.00188 J
	MW-45	Oct-16		0.00346	0.0182	0.636	<0.000160	<0.000260	<0.000540	0.942	0.000647 J	**0.576**	<0.0000490	0.00513 B	<0.000380	0.000909 J	0.000251 J
	MW-45	Apr-17		0.00404	0.0162	0.514	<0.000160	<0.000260	<0.000540	**1.29**	<0.000240	**0.582**	<0.0000490	0.00558	<0.000380	0.00109 J	0.000466 J
	MW-45	Oct-17		0.00460	0.0154	0.675	<0.000160	<0.000260	<0.000540	**2.27**	0.00143 J	**0.583**	<0.0000490	0.00569	<0.000380	0.000671 J	0.000377 J
	MW-45	Apr-18		0.00591	0.0141	0.611	<0.000160	<0.000260	<0.000540	**1.33**	0.00179 J	**0.457**	<0.0000490	0.00452	<0.000380	0.000779 J	0.000586 J
	MW-45	Oct-18		0.00327	0.0156 B	0.670	0.000394 JB	<0.000260	<0.000540	**1.58**	0.00109 JB	**0.599**	<0.0000490	0.00378	<0.000380	0.000654 J	0.000278 J
	MW-53	Apr-15		0.00179 J	0.0256				<0.000540	0.0338 J	0.000252 J	**1.20**			0.00566		
	MW-53	Apr-16		0.00193 J	0.0308				<0.00270	<0.0750	<0.00120	**1.07**			0.00617 J		
	MW-53	Apr-17		0.00166 J	0.0201				<0.000540	<0.0150	<0.000240	**1.60**			0.00281		
	MW-53	Apr-18		0.00259	0.0423				0.000742 JJ3J4	0.0922 J	0.000794 J	**2.34**			0.000729 J		
	MW-54A	Apr-16		0.00343 J	0.0189 J				<0.00270	<0.0750	<0.00120	**0.512**			<0.00190		
	MW-54A	Oct-16		0.00236	0.0158				<0.000540	<0.0150	<0.000240	**0.437**			0.000709 J		
	MW-54A	Apr-17		0.00464	0.0147				<0.000540	0.227	<0.000240	**0.456**			<0.000380		
	MW-54A	Oct-17		0.00375	0.0184				<0.000540	0.0535 J	<0.000240	**0.506**			0.000562 J		
	MW-54A	Apr-18		0.00456	0.0161				<0.000540 J3J4	0.0500 J	0.000449 J	**0.531**			0.000467 J		
	MW-54A	Oct-18		0.00410	0.0165				<0.000540	0.0601 J	<0.000240	**0.541**			<0.000380		
	MW-54B	Apr-13		<0.00500	0.0183				<0.00500	<0.200	<0.00500	0.145			<0.00500		
	MW-54B	Apr-15		0.00220	0.0165				<0.000540	0.0520 J	<0.000240	0.165			0.000400 J		
	MW-54B	Apr-17		0.00181 J	0.0158				<0.000540	<0.0150	<0.000240	**0.253**			0.000720 J		
	MW-55	Apr-16		0.00933 J	0.0157 J	**1.31**	0.000891 J	0.00141 J	<0.00270	0.128 J	0.00168 J	0.151	0.0000514 J	<0.00350	0.00896 J	**0.0460 J**	0.0244 J
	MW-55	Oct-16		0.00543	0.0140	**1.21**	<0.000160	0.000680 J	0.00168 J	0.0587 JB	0.000582 J	0.113	0.0000531 J	0.00314 B	0.00746	**0.0335**	0.0170
	MW-55	Apr-17		0.00565	0.0128	**0.829**	<0.000160	0.000407 J	<0.000540	0.0222 J	<0.000240	0.0682	<0.0000490	0.00552	0.00436	**0.0406**	0.0192
	MW-55	Oct-17		0.00566	0.0123	**1.52**	<0.000160	0.000827 J	0.00121 J	0.0843 J	<0.000240	0.167	<0.0000490	0.00562	0.00703	**0.0466**	0.0204
	MW-55	Apr-18		0.00661	0.0128	**1.50**	<0.000160	0.000359 J	0.000955 J	0.0331 J	0.000370 J	0.139	0.000151 J	0.00581	0.00444	**0.0503**	0.0190
	MW-55	Oct-18		0.00584	0.0109 B	**1.45**	0.000388 JB	<0.000260	0.000540 J	0.0292 J	0.000240 JB	0.114	<0.0000490	0.00678	0.00570	**0.0504**	0.0186
	MW-56	Apr-16		0.00777 J	0.0203 J				<0.00270	<0.0750	<0.00120	**0.373**			0.00381 J		
	MW-56	Oct-16		0.00721	0.0138				<0.000540	<0.0150	0.000540 J	**0.282**			0.00125 J		
	MW-56	Apr-17		0.00642	0.0157				<0.000540	<0.0150	0.000467 J	**0.320**			0.00325		
	MW-56	Apr-18		0.00731	0.0119				0.0102	0.0355 J	0.000487 J	**0.307**			0.000796 J		
	MW-108	Apr-16		0.00454 J	0.481				<0.00270	0.206 J	0.00209 J	0.0501			<0.00190		
	MW-108	Oct-16		**0.0102**	0.0462				0.00732	**3.13**	0.0101	0.182			0.00126 J		
	MW-108	Apr-17		0.00252	0.0366				0.00124 J	0.0538 J	0.00145 J	0.0412			<0.000380		
	MW-108	Oct-17		0.00251	0.0495				0.00210	0.441	0.00199 J	0.0395			0.00201		
	MW-108	Apr-18		0.00398	0.0468				0.00323	0.174	0.00243	0.0342			0.000702 J		
	MW-108	Oct-18		0.00274	0.0384				0.00310	**4.57**	0.00279 B	0.0540			<0.000380		
	NCL-31	Apr-16		0.00495 J	0.0241 J				<0.00270	0.838	<0.00120	**1.85**			<0.00190		
	NCL-31	Oct-16		**0.0428**	0.0220				0.000711 JB	**1.04**	0.000493 J	**2.48**			<0.000380		
	NCL-31	Apr-17		0.00975	0.0152				<0.000540	0.446	0.000330 J	**2.19**			0.000525 J		
	NCL-31	Oct-17		**0.0122**	0.0140				<0.000540	0.978	<0.000240	**2.26**			<0.000380		
	NCL-31	Apr-18		**0.0129**	0.0150				0.00375	0.998	0.000361 J	**2.05**			<0.000380		
	NCL-31	Oct-18		**0.0241**	0.0172 B				<0.000540	**1.03**	0.000447 JB	**2.02**			<0.000380		
	NCL-32	Apr-16		**0.0108**	0.227				**0.0660**	**9.75**	**0.0681**	**1.77**			<0.00190		
	NCL-32	Oct-16		0.00428	0.0254				0.00312	0.407 B	0.00296	**1.06**			0.00138 J		
	NCL-32	Apr-17		0.00358	0.0195				0.00114 J	0.116	0.00127 J	**0.988**			0.00124 J		
	NCL-32	Oct-17		0.00304	0.0166				<0.000540	0.0488 J	0.000454 J	**1.11**			0.00207		
	NCL-32	Apr-18		0.00443	0.0199				0.000813 J	0.0806 J	0.000723 J	**0.926**			0.00138 J		
	NCL-32	Oct-18		0.00306	0.0198 B				0.00201	0.339	0.00224 B	**1.34**			0.00134 J		
	NCL-33	Apr-16		0.00444 J	0.0246 J				<0.00270	0.770	<0.00120	0.188			<0.00190		
	NCL-33	Oct-16		0.00593	0.0224				0.00187 J	**1.93**	0.000459 J	0.128			0.00217		
	NCL-33	Apr-17		0.00302	0.0194				<0.000540	**1.12**	0.000288 J	0.135			0.000546 J		
	NCL-33	Oct-17		0.00325	0.0201				0.000552 J	**1.67**	<0.000240	0.138			0.000672 J		
	NCL-33	Apr-18		0.00382	0.0223				<0.000540	**1.64**	<0.000240	0.117			0.000746 J		
	NCL-33	Oct-18		0.00303	0.0244				<0.000540	**2.02**	<0.000240	0.119			0.000474 J		
	NCL-34A	Apr-16		0.00184 J	0.854				<0.00270	<0.0750	<0.00120	0.0185 J			<0.00190		
	NCL-34A	Oct-16		0.00075 J	0.370				<0.000540	<0.0150	<0.000240	0.0279			0.0142		
	NCL-34A	Apr-17		0.00083 J	0.458				<0.000540	<0.0150	<0.000240	0.0146			<0.000380		
	NCL-34A	Oct-17		0.00056 J	0.338				0.00104 J	0.0445 J	0.00105 J	0.0224			<0.000380		
	NCL-34A	Apr-18		0.00175 J	0.452				<0.000540	0.0183 J	0.000440 J	0.0204			0.000485 J		
	NCL-34A	Oct-18		0.00069 J	0.376				<0.000540	<0.0150	<0.000240	0.0191			0.000423 J		
	NCL-44	Apr-16		**0.0459**	0.0371				<0.00270	**1.82**	<0.00120	**1.11**			<0.00190		
	NCL-44	Oct-16		**0.0490**	0.0276				0.00165 JB	**1.78**	0.000521 J	**0.896**			0.000394 J		
	NCL-44	Apr-17		**0.0348**	0.0269				0.00235	0.953	0.00102 J	**0.860**			<0.000380		
	NCL-44	Oct-17		**0.0479**	0.0252				0.00122 J	**1.61**	0.000413 J	**0.896**			0.000416 J		
	NCL-44	Apr-18		**0.0387**	0.0230				0.00120 J	**1.03**	0.000489 J	**0.884**			<0.000380		
	NCL-44	Oct-18		**0.0301**	0.0201 B				<0.000540	**1.13**	0.000618 JB	**0.879**			<0.000380		
	NCL-49	Apr-16		0.00188 J	0.0150 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00518 J		
	NCL-49	Apr-16	FD	0.00178 J	0.0134 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00483 J		
	NCL-49	Oct-16		0.00156 J	0.0116				<0.000540	<0.0150	<0.000240	0.000460 JB			0.00551		
	NCL-49	Oct-16	FD	0.00137 J	0.0117				<0.000540	<0.0150	<0.000240	0.000493 JB			0.00549		
	NCL-49	Apr-17		0.00151 J	0.0118				<0.000540	<0.0150	<0.000240	0.000320 J			0.00871		
	NCL-49	Apr-17	FD	0.00149 J	0.0115				<0.000540	<0.0150	<0.000240	0.000263 J			0.00924		
	NCL-49	Oct-17		0.00142 J	0.0113				0.000635 J	0.0590 J	<0.000240	<0.000250			0.0111		
	NCL-49	Oct-17	FD	0.00163 J	0.0121				0.000649 J	0.0255 J	<0.000240	<0.000250			0.0110		
	NCL-49	Apr-18		0.00283	0.0138				0.000688 JJ3J4	<0.0150	0.000258 J	0.00310 J			0.0111		
	NCL-49	Apr-18	FD	0.00254	0.0136				<0.000540 J3J4	<0.0150	<0.000240	0.00462 J			0.0125		
	NCL-49	Oct-18		0.00156 J	0.0127				<0.000540	<0.0150	<0.000240	0.000358 J			0.00739		
	NCL-49	Oct-18	FD	0.00154 J	0.0115				<0.000540	<0.0150	<0.000240	<0.000250			0.00624		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
South Refinery	KWB-5	Apr-16		**0.0252**	**3.63**				<0.00270	**4.28**	<0.00120	**1.82**			<0.00190		
	KWB-5	Oct-16		**0.0212**	**3.82**				<0.000540	**3.13**	<0.000240	**1.60**			<0.000380		
	KWB-5	Apr-17		**0.0219**	**3.49**				<0.000540	**4.43**	<0.000240	**1.81**			0.000511 JB		
	KWB-5	Oct-17		**0.0202**	**5.06**				<0.000540	**2.11**	0.000287 J	**1.64**			<0.000380		
	KWB-5	Apr-18		**0.0201**	**5.09**				<0.000540	**1.21**	0.000758 JB	**1.29**			<0.000380		
	KWB-5	Oct-18		**0.0166**	**3.75**				<0.00270	**2.13**	<0.00120	**1.55**			<0.00190		
	KWB-6	Apr-16		0.00703 J	0.327				<0.00270	0.546	0.00143 J	**2.55**			<0.00190		
	KWB-6	Oct-16		0.00915	0.0891				0.000950 JB	0.303	0.00103 J	**1.87**			<0.000380		
	KWB-6	Apr-17		0.00406	0.152				<0.000540	0.152	0.000533 J	**1.91**			<0.000380		
	KWB-6	Oct-17		0.00898	0.0998				<0.000540	0.250	0.000661 J	**2.15**			<0.000380		
	KWB-6	Apr-18		**0.0251**	0.120				0.00170 J	**4.68**	0.00564	**2.03**			<0.000380		
	KWB-6	Oct-18		0.00813	0.0699				<0.000540	0.149	<0.000240	**1.91**			0.000421 J		
	MW-28	Apr-16		**0.0610**	0.331	**1.23**	<0.00500	<0.00130	0.00274 J	0.342 J	**0.0520**	0.164	<0.0000490	0.0226	0.00220 J	<0.00165	0.0158 J
	MW-28	Oct-16		**0.0154**	0.0424	**1.27**	<0.000160	0.000289 J	0.00213 B	0.0951 JB	**0.0168**	0.0375	<0.0000490	0.00387 B	0.000605 J	<0.000330	0.00701	
	MW-28	Apr-17		0.00674	0.0462	**1.21**	<0.000160	<0.000260	0.000618 J	0.0779 J	0.0130	0.0624	<0.0000490	0.0484	0.0491	0.000382 J	0.00329 J	
	MW-28	Oct-17		0.00777	0.0492	**1.39**	<0.000160	<0.000260	0.00947	0.0870 J	0.00855	0.0417	<0.0000490	0.00719	<0.000380	<0.000330	0.00227 J	
	MW-28	Apr-18		0.00749	0.0581	**1.29**	<0.000160	<0.000260	<0.000540	0.156 B	0.0134	0.037	<0.0000490	0.00415	0.000588 JB	<0.000330	0.00230 J	
	MW-28	Oct-18		0.00486 J	0.0652	**1.16**	<0.000160	<0.00130	<0.00270	0.0971 J	0.00453 J	0.0509	0.000108 J	0.00659 J	<0.00190	<0.00165	0.00111 JB	
	MW-48	Apr-16		**0.0125**	**2.77**				<0.00270	0.177 J	0.00371 J	**0.390**			<0.00190		
	MW-48	Oct-16		**0.0107**	1.18				0.00119 JB	0.166	0.00173 J	**0.565**			0.000520 J		
	MW-48	Apr-17		0.00786	**2.54**				<0.000540	0.0884 J	0.00150 J	**0.210**			0.000838 JB		
	MW-48	Oct-17		0.00558	1.81				0.000835 J	0.141	0.00166 J	**0.286**			**0.0669**		
	MW-48	Apr-18		0.00554	1.82				<0.000540	0.105	0.00142 J	0.136			**0.247**		
	MW-48	Oct-18		0.00561	1.13 V				0.00119 J	0.231	0.00268	**0.347**			0.00132 J		
	MW-50	Apr-16		0.00234 J	0.0141 JB				<0.00270	0.0916 J	<0.00120	**0.214**			**0.0994**		
	MW-50	Oct-16		0.00434	0.0207				<0.000540	0.160	0.000413 J	**0.295**			**0.0704**		
	MW-50	Apr-17		0.00210	0.0137				<0.000540	0.0253 J	<0.000240	**0.433**			0.0485		
	MW-50	Oct-17		0.00250	0.0142				<0.000540	0.0340 J	<0.000240	**0.494**			0.0436		
	MW-50	Apr-18		0.00391	0.0130				<0.000540 J3J4	0.323	0.000419 J	**0.968**			0.00580		
	MW-50	Oct-18		0.00610	0.0137				<0.000540	**1.59**	0.000401 JB	**0.898**			0.00178 J		
	MW-52	Apr-16		**0.0193**	0.0436	0.736	<0.00500	0.00155 J	<0.00270	0.158 J	<0.00120	**0.230**	<0.0000490	0.0263	0.00545 J	**0.0438 J**	**0.123**
	MW-52	Oct-16		0.00343	0.0104	0.718	<0.000160	0.000423 J	0.000547 JB	<0.0150	<0.000240	0.0484	<0.0000490 J3	0.00810	0.00179 J	0.0105	0.0243	
	MW-52	Apr-17		0.00368	0.0101	0.702	<0.000160	0.000503 J	<0.000540	0.0447 J	<0.000240	0.0659	<0.0000490	0.00798	0.00178 J	0.00976 J	0.0269	
	MW-52	Oct-17		0.00363	0.0113	**0.852**	<0.000160	0.000429 J	<0.000540	0.0245 J	<0.000240	0.0774	<0.0000490	0.00817	0.00607	0.0124	0.0246	
	MW-52	Apr-18		0.00363	0.0108	0.728	<0.000160	0.000378 J	<0.000540	<0.0150	<0.000240	0.0435	<0.0000490	0.00628	0.00799	0.0105	0.0259	
	MW-52	Oct-18		0.00321	0.00897	0.723	<0.000160	0.000271 J	<0.000540	<0.0150	<0.000240	0.0433	<0.0000490	0.00504	0.00221	0.00888 J	0.0232	
	MW-64	Apr-16		**0.0333**	**2.26**				<0.00270	<0.0750	0.00187 J	0.0599			<0.00190		
	MW-64	Oct-16		**0.0302**	**2.41**				0.000897 JB	0.0566 JB	0.00105 J	0.0480			0.000493 J		
	MW-64	Apr-17		**0.0346**	2.00				<0.000540	0.151	0.000997 J	0.0515			0.000642 J		
	MW-64	Oct-17		**0.0317**	**2.10**				<0.000540	0.139	0.00101 J	0.0571			0.000523 J		
	MW-64	Apr-18		**0.0394**	**2.17**				<0.000540	0.179 B	0.00122 J	0.0638			0.000584 J		
	MW-64	Oct-18		**0.0291**	**2.33**				<0.00270	0.148 J	<0.00120	0.0644			<0.00190		
	MW-65	Apr-16		**0.0142**	**3.42 V**				<0.00270	**2.09**	0.00124 J	**0.748 V**			<0.00190		
	MW-65	Oct-16		**0.0120**	**2.97**				0.00121 JB	**1.66**	0.00103 J	**0.605**			<0.000380		
	MW-65	Apr-17		**0.0108**	**3.01**				<0.000540	**1.58**	0.000874 J	**0.593**			<0.000380		
	MW-65	Oct-17		**0.0113**	**3.03**				<0.000540	**2.16**	0.00128 J	**0.568**			<0.000380		
	MW-65	Apr-18		**0.0108**	**2.60**				<0.000540	**2.18**	0.000448 J	**0.527**			<0.000380		
	MW-65	Oct-18		0.00679 J	1.71				<0.00270	0.624	<0.00120	**0.431**			<0.00190		
	MW-66	Apr-16		**0.0148**	**12.7**	0.378	<0.00500	<0.00130	0.00289 J	**4.74**	0.00659 J	**1.13**	<0.0000490	0.121	<0.00190	<0.00165	0.00670 J	
	MW-66	Oct-16		0.00269	1.88	0.283	<0.000160	<0.000260	0.000733 JB	0.717	0.000342 J	**0.216**	<0.0000490 J3	0.00497	<0.000380	<0.000330	0.000342 J	
	MW-66	Apr-17		0.00255	**2.22**	0.263	<0.000160	<0.000260	<0.000540	0.773	0.000592 J	0.193	<0.0000490	0.00829	0.0134	<0.000330	0.000535 JB	
	MW-66	Oct-17		0.00282	1.81	0.314	<0.000160	<0.000260	0.00128 J	**1.02**	0.00453	**0.288**	<0.0000490	0.00602	<0.000380	<0.000330	0.00169 J	
	MW-66	Apr-18		0.00275	**2.17**	0.309	<0.000160	<0.000260	<0.000540	0.820	0.000939 JB	**0.293**	<0.0000490	0.00678	0.000509 JB	<0.000330	0.000530 J	
	MW-66	Oct-18		0.00258	1.88	0.324	<0.000160	<0.000260	<0.000540	0.833	0.00280	**0.278**	<0.0000490	0.00661	<0.000380	<0.000330	0.000708 J	
	MW-99	Apr-16		**0.0491**	**5.05**				0.00682 J	**4.55**	**0.0193**	**1.20**			<0.00190		
	MW-99	Oct-16		0.00635	1.14				0.00128 JB	0.208	0.00150 J	**0.354**			<0.000380		
	MW-99	Apr-17		0.00772	0.297				<0.000540	0.204	0.00116 J	**0.243**			**0.0857**		
	MW-99	Oct-17		0.00865	0.221				<0.000540	0.0585 J	0.000379 J	**0.232**			<0.000380		
	MW-99	Apr-18		0.00900	0.311				0.000544 J	0.143 B	0.000673 JB	**0.244**			<0.000380		
	MW-99	Oct-18		0.00821	0.452				0.000542 J	0.163	0.000718 J	**0.224**			0.00169 J		
	MW-101	Apr-16		**0.0293**	0.0898				<0.00270	**1.38**	<0.00120	**1.34**			<0.00190		
	MW-101	Oct-16		**0.0783**	0.0366				0.00145 JB	**2.56**	0.000266 J	**1.06**			<0.000380		
	MW-101	Apr-17		**0.0659**	0.0732				<0.000540	**1.18**	<0.000240	**1.18**			<0.000380		
	MW-101	Oct-17		**0.0824**	0.0472				0.0137	**2.99**	0.000670 J	**1.21**			0.00139 J		
	MW-101	Apr-18		**0.0754**	0.0518				<0.000540	**2.27**	<0.000240	**1.21**			0.000442 JB		
	MW-101	Oct-18		**0.0819**	0.0374				<0.000540	**2.68**	<0.000240	**1.12**			<0.000380		
	MW-102	Apr-16		**0.0117**	**7.71**				<0.00270	0.222 J	0.00339 J	0.0308			<0.00190		
	MW-102	Oct-16		**0.0132**	0.427				0.00200 B	0.0940 JB	0.00223	0.0214			<0.000380		
	MW-102	Apr-17		**0.0123**	**5.06**				<0.000540	0.201	0.00242	0.0231			0.000673 JB		
	MW-102	Oct-17		**0.0135**	**5.52**				0.00110 J	**1.12**	0.00254	0.0176			0.000450 J		
	MW-102	Apr-18		**0.0181**	**7.83**				0.00358 B	**6.74**	0.0111	0.0651			0.000601 J		
	MW-102	Oct-18		**0.0130**	**7.92**				<0.00270	0.103 J	0.00376 J	0.0381			<0.00190		
	MW-103	Apr-15		0.00617 J	**9.36**				<0.0110	<0.300	<0.00480	0.0125 J			**0.0607 J**		
	MW-103	Apr-16		0.00594 J	**26.8**				<0.00270	<0.0750	0.00148 J	0.0262			<0.00190		
	MW-103	Apr-17		0.00848 J	**8.12**				<0.0108	<0.300	<0.00480	0.00689 J			<0.00760		
	MW-103	Apr-18		0.00699	**3.44**				<0.000540	0.0617 JB	<0.00240	0.00151 J			0.00106 J		
	MW-104	Apr-16		0.00165 J	0.0343 O1				<0.00270	<0.0750	<0.00120	0.0113 J			<0.00190 J3J6		
	MW-104	Apr-16	FD	0.00195 J	0.0319				<0.00270	<0.0750	<0.00120	0.00995 J			<0.00190		
	MW-104	Oct-16		**0.0164**	0.0293				0.00128 JB	0.0150 JB	<0.000240	0.00278 J			<0.000380		
	MW-104	Oct-16	FD	**0.0194**	0.0290				0.00132 JB	0.0190 JB	<0.000240	0.00277 J			<0.000380		
	MW-104	Apr-17		**0.0551**	0.0438				<0.000540	0.0283 J	<0.000240	0.00109 J			<0.000380		
	MW-104	Apr-17	FD	**0.0570**	0.0451 O1				<0.000540	<0.0150	<0.000240	0.00134 J			0.00166 JB		
	MW-104	Oct-17		**0.0584**	0.0430				<0.000540	0.0218 J	<0.000240	0.00326 J			<0.000380		
	MW-104	Oct-17	FD	**0.0602**	0.0446				0.000624 J	0.0247 J	<0.000240	0.00416 J			<0.000380		
	MW-104	Apr-18		**0.0200**	0.0371				0.00170 JB	0.241 B	<0.000240	0.00414 J			<0.000380		
	MW-104	Apr-18	FD	**0.0213**	0.0346				0.00103 JB	0.231	<0.000240	0.00567			0.000732 J		
	MW-104	Oct-18		**0.0159**	0.0306				<0.00270	<0.0750	<0.00120	0.0152 JB			<0.00190		
	MW-104	Oct-18	FD	**0.0185**	0.0353				0.000631 J	<0.0150	0.000503 JB	0.0157			<0.000380		
	MW-105	Apr-16		**0.0197**	1.31				<0.00270	0.286 J	0.00176 J	0.195			0.00947 J		
	MW-105	Oct-16		**0.0121**	1.15				0.00154 JB	0.265	0.00118 J	0.117			<0.000380		
	MW-105	Apr-17		**0.0123**	**2.63**				0.00150 J	0.151	0.00143 J	0.0622			0.0357		
	MW-105	Oct-17		**0.0237**	1.23				0.00900	0.492	0.00112 J	0.0657			0.000624 J		
	MW-105	Apr-18		**0.0220**	**4.29**				0.0165	**10.1**	**0.0326**	**0.285**			0.00123 JB		
	MW-105	Oct-18		0.00742	0.283				0.00246	0.848	0.000804 J	**0.216**			0.000508 J		
	MW-106	Apr-16		**0.0150**	0.0379				<0.00270	<0.0750	0.00274 J	0.0113 J			<0.00190		
	MW-106	Oct-16		**0.0152**	0.0232				0.00143 JB	0.0422 JB	0.00305 B	0.00515 B			0.000476 J		
	MW-106	Apr-17		**0.0114**	0.0259				<0.000540	<0.0150	0.00133 J	0.00658			0.00216 B		
	MW-106	Oct-17		**0.0105**	0.0263				0.0111	0.119	0.00271	0.00542			0.00731		
	MW-106	Apr-18		**0.0152**	0.0277				0.00136 JJ3J4	0.0688 J	0.00240	0.00677			0.000564 J		
	MW-106	Oct-18		**0.0165**	0.0397				0.00134 J	0.102	0.00291	0.00317 J			0.000436 J		
	MW-107	Apr-16		0.0100	**10.2**				0.00340 J	**1.78**	0.00200 J	**0.454**			<0.00190		
	MW-107	Oct-16		0.00388	1.30				0.000930 JB	0.158	0.000595 J	0.0896			<0.000380		
	MW-107	Apr-17		0.00143 J	1.99				<0.000540	**5.17**	0.000437 J	0.105			0.0145		
	MW-107	Apr-18		0.00157 J	**2.32**				<0.000540	**4.54**	0.000427 JB	0.146			<0.000380		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
South Refinery	MW-109	Apr-16		**0.0331**	0.299				<0.00270	0.677	0.00147 J	**0.624**			<0.00190		
	MW-109	Oct-16		0.00269	0.0617				<0.000540	0.0900 J	<0.000240	0.0821			<0.000380		
	MW-109	Apr-17		0.00176 J	0.0479				<0.000540	0.0422 J	<0.000240	0.0425			<0.000380		
	MW-109	Oct-17		0.00146 J	0.0605				0.000611 J	0.0514 J	<0.000240	0.0413			0.000784 J		
	MW-109	Apr-18		0.00144 J	0.0441				<0.000540	0.0641 J	<0.000240	0.0265			0.00300		
	MW-109	Oct-18		0.00162 J	0.0472				<0.000540	0.0416 J	<0.000240	0.0340			0.000401 J		
	MW-110	Apr-16		**0.0854**	0.300				0.00399 J	**2.77**	0.00565 J	**6.26**			<0.00190		
	MW-110	Oct-16		**0.0344**	0.0480				<0.000540	0.730	0.000412 J	**1.67**			<0.000380		
	MW-110	Apr-17		0.00529	0.0571				<0.000540	0.229	<0.000240	**0.510**			<0.000380		
	MW-110	Oct-17		**0.0384**	0.0483				<0.000540	0.913	<0.000240	**1.78**			<0.000380		
	MW-110	Apr-18		0.00965	0.0887				0.00152 J	**1.26**	0.00123 J	**0.451**			<0.000380		
	MW-110	Oct-18		**0.0231**	0.0674				0.00155 J	**1.32**	0.00118 J	**1.60**			<0.000380		
	RA-313	Apr-15															
	RA-313	Apr-16															
	RA-313	Apr-17															
	RA-313	Apr-18															
	RW-4	Apr-15		0.00183 J	0.0521				<0.000540	0.0744 J	0.000665 J	0.104			<0.000380		
	RW-4R	Apr-16		0.00440 J	0.0623				<0.00270	0.181 J	<0.00120	0.0728			<0.00190		
	RW-4	Apr-17		0.00340	0.0732				<0.000540	0.192	0.000419 J	0.0261			<0.000380		
	RW-4	Apr-18		0.00293	0.0671				0.000673 J	0.0270 JB	0.000685 JB	0.0548			0.000499 JB		
	RW-5R	Apr-15		0.00136 J	0.0259				<0.000540	0.0952 J	0.000336 J	0.0177			<0.000380		
	RW-5R	Apr-16		0.00183 J	0.0282				<0.00270	<0.0750	<0.00120	0.0191 J			<0.00190		
	RW-6	Apr-15		**0.0332**	1.66				<0.000540	**13.8**	0.000574 J	**0.280**			<0.000380		
	RW-6R	Apr-16		**0.0712**	0.480				<0.00270	**3.70**	<0.00120	**0.553**			<0.00190		
	RW-6	Apr-18		**0.0170**	1.94				0.00106 J	**1.59**	0.000764 JB	**0.298**			<0.000380		
	RW-15C	Apr-17		**0.0274**	0.885				<0.000540	0.316	0.0116	**0.358**			0.000461 JB		
	RW-15C	Apr-18		**0.0239**	1.19				0.000699 J	0.264	0.000822 J	**0.372**			0.000836 J		
South RO Reject Field	MW-114	Apr-16		0.00344 J	0.0155 J				<0.00270	<0.0750	<0.00120	**1.15**			<0.00190		
	MW-114	Oct-16		0.00327	0.0119				0.00115 JB	<0.0150	0.000617 J	**0.899**			0.00839		
	MW-114	Apr-17		0.00262	0.0138				<0.000540	<0.0150	<0.000240	**0.944**			0.00129 J		
	MW-114	Oct-17		0.00262	0.0129				<0.000540	0.0208 J	<0.000240	**0.873**			0.0179		
	MW-114	Apr-18		0.00226	0.0129				0.00708	0.0871 J	<0.000240	**0.900**			0.0105		
	MW-114	Oct-18		0.00225	0.0133				<0.000540	<0.0150	<0.000240	**0.867**			0.00985		
	MW-115	Apr-16		**0.0230**	0.0415				<0.00270	0.134 J	0.00135 J	**0.308**			0.00217 J		
	MW-115	Oct-16		0.00838	0.00908				0.000944 JB	0.116 B	0.000381 J	0.146			<0.000380		
	MW-115	Apr-17		0.00336	0.00809				<0.000540	0.0381 J	<0.000240	0.0455			<0.000380		
	MW-115	Oct-17		0.00342	0.00796				<0.000540	0.0264 J	<0.000240	0.0553			0.000723 J		
	MW-115	Apr-18		0.00333	0.00824				<0.000540	0.0246 J	<0.000240	0.0564			0.00159 J		
	MW-115	Oct-18		0.00298	0.00719				<0.000540	<0.0150	<0.000240	0.0425			0.00413		
	MW-116	Apr-16		0.00422 J	0.0231 J				<0.00270	0.800	<0.00120	0.0396			<0.00190		
	MW-116	Oct-16		0.00720	0.0118				0.000922 JB	0.119	0.000397 J	0.0506			0.000738 J		
	MW-116	Apr-17		0.00357	0.0121				0.000560 J	0.224	0.000542 J	0.0545			0.00488		
	MW-116	Oct-17		0.00521	0.0178				0.00151 J	0.598	0.000647 J	0.0402			0.00741		
	MW-116	Apr-18		0.00492	0.00839				<0.000540	0.0594 J	<0.000240	0.0226			0.00743		
	MW-116	Oct-18		0.00304	0.00833				<0.000540	<0.0150	<0.000240	0.0211			0.00475		
TEL	MW-49	Apr-16		0.00489 J	0.0439	0.695	<0.00500	<0.00130	<0.00270	0.0770 J	<0.00120	**0.269**	<0.0000490	0.00686 J	<0.00190	<0.00165	0.00245 J
	MW-49	Oct-16		0.00505	0.0449	0.642	<0.000160	<0.000260	0.000766 JB	0.127	0.000423 J	**0.223**	<0.0000490 J6	0.00867	<0.000380	<0.000330	0.000357 J
	MW-49	Apr-17		0.00426	0.0461	0.733	<0.000160	<0.000260	<0.000540	0.100	0.000499 J	**0.250**	<0.0000490	0.00809	<0.000380	<0.000330	0.000515 J
	MW-49	Oct-17		0.00467	0.0480	0.747	<0.000160	<0.000260	0.000609 J	0.128	0.000563 J	0.146	<0.0000490	0.0152	<0.000380	<0.000330	0.000321 J
	MW-49	Apr-18		0.00627	0.0565	0.740	<0.000160	<0.000260	<0.000540	0.321	0.00122 JB	0.197	<0.0000490	0.00655	0.000591 J	<0.000330	0.00110 J
	MW-49	Oct-18		0.00517	0.0506	0.693	<0.000160	<0.000260	<0.000540	0.0585 J	0.000826 J	**0.211**	<0.0000490	0.00660	0.000519 J	<0.000330	0.000439 J
	TEL-1	Apr-16		0.00407 J	0.0126 J				0.0269	0.104 J	<0.00120	0.199			<0.00190		
	TEL-1	Oct-16		0.00256	0.00987				0.00911 B	0.0829 J	0.000300 J	**0.216**			<0.000380		
	TEL-1	Apr-17		0.00520	0.0116				0.0260	0.382	<0.000240	0.117			<0.000380		
	TEL-1	Oct-17		**0.0139**	0.0121				0.0196	0.258	0.000341 J	0.070			<0.000380		
	TEL-1	Apr-18		**0.0132**	0.0140				0.0103	0.107	<0.000240	0.0532			<0.000380		
	TEL-1	Oct-18		**0.0173**	0.0171				0.00240	0.0675 J	<0.000240	0.0419			<0.000380		
	TEL-2	Apr-16		**0.0101**	0.127				0.00303 J	<0.0750	0.00131 J	0.0212 J			<0.00190		
	TEL-2	Oct-16		**0.0147**	0.0773				0.00209 B	0.0279 J	0.00145 J	0.0144			0.000618 J		
	TEL-2	Apr-17		**0.0123**	0.162				0.00307	0.0749 J	0.00143 J	0.0149			0.000558 J		
	TEL-2	Oct-17		**0.0140**	0.0942				0.00457	0.0896 J	0.00111 J	0.0166			0.000473 J		
	TEL-2	Apr-18		**0.0183**	0.221				0.00202	0.0568 J	0.00114 J	0.0154			0.000522 J		
	TEL-2	Oct-18		**0.0152**	0.101				0.00151 J	0.0287 J	0.000727 J	0.0273			0.000520 J		
	TEL-3	Apr-16		0.00876 J	0.0208 J				0.0269	0.171 J	<0.00120	0.00661 J			<0.00190		
	TEL-3	Oct-16		0.00126 J	0.0156				**0.138**	0.456	0.000368 J	0.0133			<0.000380		
	TEL-3	Apr-17		0.00204	0.0161				**0.156**	0.473	0.000250 J	0.0121			<0.000380		
	TEL-3	Apr-18		**0.0109**	0.0248				**0.334**	**1.47**	0.000726 J	0.0114			<0.000380		
	TEL-4	Apr-16		0.00710 J	0.0247 J				**0.282**	0.331 J	0.00330 J	**0.751**			<0.00190		
	TEL-4	Apr-16	FD	0.00736 J	0.0245 J				**0.306**	0.628	0.00316 J	**0.750**			<0.00190		
	TEL-4	Oct-16		0.00784	0.0190				**0.688**	**1.93**	0.00263	**0.508**			0.000883 J		
	TEL-4	Oct-16	FD	0.00700	0.0199				**0.389**	**1.07**	0.00241	**0.501**			<0.000380		
	TEL-4	Apr-17		0.00723	0.0185				**0.790**	**1.45**	0.00173 J	**0.973**			0.000535 J		
	TEL-4	Apr-17	FD	0.00707	0.0180				**0.443**	0.105	0.00110 J	**0.963**			<0.000380		
	TEL-4	Oct-17		0.00750	0.0178				**0.236**	0.952	0.00118 J	**1.05**			0.000561 J		
	TEL-4	Oct-17	FD	0.00731	0.0172				**0.273**	**1.03**	0.00125 J	**1.04**			0.000454 J		
	TEL-4	Apr-18		0.00733	0.0224				**0.593**	0.796	0.000795 J	**1.48**			<0.000380		
	TEL-4	Apr-18	FD	0.00695	0.0208				**0.741**	0.950	0.000918 J	**1.45**			0.000409 J		
	TEL-4	Oct-18		0.00130 J	0.0123				**0.274**	0.370	0.000418 J	**0.827**			<0.000380		
	TEL-4	Oct-18	FD	0.00160 J	0.0119				**0.293**	0.286	0.000413 J	**0.822**			<0.000380		
TMD	MW-8	Apr-15		**0.0108**	0.0107				**0.234**	0.779	0.000470 J	**0.507**			0.0188		
	MW-8	Apr-16		0.00885 J	0.0117 J				**0.107**	0.397 J	<0.00120	**0.538**			0.00622 J		
	MW-8	Apr-17		0.00678	0.0102				0.0259	0.111	<0.000240	**0.467**			0.00647		
	MW-8	Apr-18		0.00948	0.0110				**0.0627**	0.462	0.000387 J	**0.702**			0.0181		
	MW-16	Apr-14		0.00470 J	0.0151				<0.00200	<0.100	<0.00140	**0.244**			0.00322 J		
	MW-16	Apr-15		0.00500 J	0.0174 J				<0.00270	<0.0750	<0.00120	0.0950 J			0.00213 J		
	MW-16	Apr-17		0.00498	0.0127				<0.000540	<0.0150	<0.000240	0.00510			0.0106		
	MW-16	Apr-18		0.00612	0.0157				<0.000540 J3J4	0.0436 J	<0.000240	**0.322**			0.00394		
	MW-20	Apr-15		0.00621	0.0104				<0.000540	0.0746 J	<0.000240	0.00743			0.0289		
	MW-20	Apr-16		0.00628 J	0.0113 J				<0.00270	<0.0750	<0.00120	0.00814 J			0.0305		
	MW-20	Apr-17		0.00575	0.00980				<0.000540	<0.0150	<0.000240	0.00756			0.0188		
	MW-20	Apr-18		0.00700	0.0104				<0.000540	<0.0150	<0.000240	0.0197			0.0147		
	MW-21	Apr-16		0.00607 J	0.0100 J				<0.00270	<0.0750	<0.00120	**0.354**			0.0327		
	MW-21	Oct-16		0.00613	0.00790				<0.000540	<0.0150	<0.000240	**0.616**			0.0287		
	MW-21	Apr-17		0.00530	0.00817				<0.000540	<0.0150	<0.000240	**0.204**			0.0258		
	MW-21	Oct-17		0.00545	0.00860				0.000607 J	0.0290 J	<0.000240	**0.607**			0.0314		
	MW-21	Apr-18		0.00656	0.00782				<0.000540	<0.0150	<0.000240	**0.290**			0.0284		
	MW-21	Oct-18		0.00537	0.0101				<0.000540	<0.0150	<0.000240	**0.738** O1V			0.0331		
	MW-25	Apr-15		0.00984 J	0.0187 J				<0.00270	<0.0750	<0.00120	**0.582 J**			0.0204		
	MW-25	Apr-16		0.00582 J	0.0148 J				0.00332 J	<0.0750	<0.00120	**0.889**			<0.00190		
	MW-25	Apr-17		0.00300	0.0121				0.000842 J	0.0157 J	<0.000240	**0.507 V**			0.00254		
	MW-25	Apr-18		0.00338	0.0128				0.000687 J	0.0314 J	0.000330 J	**0.676** J3V			0.00337		
	MW-26	Apr-15		0.00351	0.00944				<0.000540	0.0811 J	<0.000240	**0.613**			0.0197		
	MW-26	Apr-16		0.00384 J	0.0101 J				<0.00270	<0.0750	<0.00120	**0.847**			0.0194		
	MW-26	Apr-17		0.00335	0.00916				<0.000540	<0.0150	<0.000240	**0.560**			0.0232		
	MW-26	Apr-18		0.00426	0.00944				<0.000540 J3J4	<0.0150	0.000351 J	**0.513**			0.0238		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	2.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC Irr	WQCC HH	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
TMD	MW-27	Apr-15		0.00239	0.0235				<0.000540	<0.0150	<0.000240	0.0318			0.0180		
	MW-27	Apr-16		0.00228 J	0.0179 J				<0.00270	<0.0750	<0.00120	0.0186 J			0.0127		
	MW-27	Apr-17		0.00216	0.0153				<0.000540	<0.0150	<0.000240	0.0158			0.00706		
	MW-27	Apr-18		0.00335	0.0150				0.000709 JB	0.183	0.000265 J	0.0539			0.0124		
	MW-46R	Apr-16		0.00317 J	0.0140 J				<0.00270	0.159 J	<0.00120	0.125			<0.00190		
	MW-46R	Oct-16		0.00314	0.0150				0.000894 JB	0.196	0.000459 J	0.137			0.00154 J		
	MW-46R	Apr-17		0.00266	0.0134				<0.000540	0.167	0.000538 J	0.162			0.00199 J		
	MW-46R	Oct-17		0.00262	0.0130				<0.000540	0.0344 J	0.000354 J	0.124			0.00135 J		
	MW-46R	Apr-18		0.00428	0.0125				<0.000540	0.0570 J	0.000480 J	0.170			0.000882 J		
	MW-46R	Oct-18		0.00264	0.0119				0.000793 J	0.0221 J	<0.000240	0.107			0.00132 J		
	MW-68	Apr-15		0.00292	0.0159				<0.000540	0.0594 J	0.000524 J	0.00131 J			0.0123		
	MW-68	Apr-16		0.00314 J	0.0133 J				<0.00270	<0.0750	<0.00120	0.0393			0.00339 J		
	MW-68	Apr-17		0.00244	0.0107				<0.000540	<0.0150	<0.000240	0.0824			0.00275		
	MW-68	Apr-18		0.00326	0.0119				0.00211 B	0.141	0.000658 J	0.0543			0.00780		
	MW-71	Apr-15		0.00411	0.00897				0.000581 J	0.0373 J	<0.000240	0.000898 J	<0.0000490	0.00134 J	0.0349		0.0229
	MW-71	Apr-16		0.00436 J	0.0103 J	0.689 V	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.0000490	<0.00175	0.0370	**0.0605**	0.0257
	MW-71	Apr-17		0.00387	0.00845	0.538	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000841 J	<0.0000490	0.000916 J	0.0324	**0.0587**	0.0248
	MW-71	Apr-18		0.00500	0.00896	0.673	<0.000160	<0.000260	0.00106 J	<0.0150	<0.000240	0.000412 J	<0.0000490	0.00115 J	0.0321	**0.0594**	0.0255
	MW-89	Apr-15		0.00900 J	0.0144 J				<0.00270	0.120 J	<0.00120	0.0710 J			0.0275		
	MW-89	Apr-16		0.00839 J	0.0155 J				<0.00270	0.228 J	<0.00120	0.0788			0.0311	<0.00100	
	MW-89	Apr-17		0.00657	0.0145				0.00102 J	<0.0150	<0.000240	0.0420			**0.0534**		
	MW-89	Apr-18		**0.0112**	0.0136				0.000638 JJ3J4	<0.0150	0.000617 J	**0.628**			0.00218		
	NP-1	Apr-16															
	NP-1	Oct-16															
	NP-1	Apr-17															
	NP-1	Oct-17															
	NP-1	Apr-18															
	NP-1	Oct-18															
	NP-2	Apr-13															
	NP-6	Apr-13															
	NP-6	Apr-15															
	NP-6	Apr-17															
Upgradient	UG-1	Apr-15		0.00113 J	0.0137				0.00242	0.0262 J	<0.000240	0.000764 J	<0.0000490	<0.000350 B	0.0103		0.0105
	UG-1	Apr-16		<0.00125	0.0136 J	0.574	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.0000490	<0.00175	0.0140	0.0252 J	0.0107 J
	UG-1	Apr-17		0.00106 J	0.0135	0.548	<0.000160	<0.000260	0.000572 J	0.0561 J	<0.000240	0.00689	<0.0000490	0.00145 J	0.0100	0.0262	0.0118
	UG-1	Apr-18		0.00177 JB	0.0122	0.668	<0.000160	0.00130 J	<0.000540	<0.0150	<0.000240	0.000486 J	0.0000552 JB	0.00188 J	0.00692	0.0263	0.0153
	UG-2	Apr-15		0.00205	0.0153				<0.000540	<0.0150	<0.000240	0.0110	<0.0000490	0.00527	<0.000380 B		0.0115
	UG-2	Apr-16		0.00202 J	0.0150 J	0.343	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.0147	<0.0000490	0.00905	0.00321 J	0.0156 J	0.0123 J
	UG-2	Apr-17		0.00197 J	0.0154	0.303	<0.000160	<0.000260	<0.000540	0.0172 J	<0.000240	0.0154	<0.0000490	0.00271	0.00572	0.0153	0.0154
	UG-2	Apr-18		0.00236 B	0.0142	0.303	<0.000160	<0.000260	<0.000540	0.0153 J	<0.000240	0.00678	0.0000684 JB	0.00188 J	0.00710	0.0131	0.0176
	UG-3R	Apr-15		0.00258	0.0595				0.00368	**2.05**	0.000626 J	0.0725	<0.0000490	<0.000350 B	<0.000380 B		0.0135
	UG-3R	Apr-16		0.00182 J	0.0198 J	0.295	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00141 J	<0.0000490	0.00188 J	0.00386 J	0.0122 J	0.0104 J
	UG-3R	Apr-17		0.00161 J	0.0185	0.256	<0.000160	0.000465 J	<0.000540	0.0316 J	<0.000240	0.00182 J	<0.0000490	0.00225	0.00325	0.0129	0.00961
	UG-3R	Apr-18		0.00202 B	0.0170	0.470	<0.000160	<0.000260	<0.000540	0.0377 J	<0.000240	0.000713 J	<0.0000490	0.00104 J	0.00418	0.0124	0.0111
	UG-4	Apr-16		<0.00125	0.0184 J	**1.19**	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00752 J	<0.0000490	0.00203 J	0.00634 J	**0.0364 J**	0.00749 J
	UG-4	Apr-17		0.00111 J	0.0164	**1.06**	<0.000160	<0.000260	<0.000540	0.0249 J	<0.000240	0.00935	<0.0000490	0.00143 J	0.0143	**0.0361**	0.00739
	UG-4	Apr-18		0.00177 JB	0.0158	**1.07**	<0.000160	<0.000260	<0.000540	0.0330 J	<0.000240	0.00117 J	0.0000571 JB	0.000467 J	0.0202	**0.0324**	0.00962 B

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
WQCC Dom	NMED Groundwater standard for domestic exposure taken from 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC
WQCC Irr	NMED Groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	WQCC Irr	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Cross-Gradient	KWB-13	Apr-15		0.00376	0.0439			0.00125 J		0.337	0.00143 J	0.0462		0.00136 J	0.0117		0.0173	
	KWB-13	Apr-16		0.0029 J	0.021 J	0.416	<0.00080	<0.00270	<0.0013	0.483 J	<0.00120	0.00842 JB	<4.9E-05	<0.00175	0.014	0.0245 J	0.0201 J	
	KWB-13	Apr-17		0.00251	0.0181	0.348	0.000738 J	0.000961 J	<0.002	<0.1	0.000617 J	0.0007 JB	<0.0002	0.00154 JB	0.0126	0.0254	0.0197	
	KWB-13	Apr-18		0.00325	0.0201	0.343	0.000440 J	**0.142**	0.00156 J	0.619	0.000566 J	0.00905	0.0000695 JB	0.0687	0.0133	0.0278	0.0206	
	MW-17	Apr-14		0.00217 J	0.0139			0.00184 J		<0.0780	<0.00070	<0.00250			0.00918			
	NP-5	Apr-13		<0.0100	<0.0100			<0.0100		<0.400	<0.0100	<0.0100			0.0148			
	NP-5	Apr-15		0.00306	0.0076			<0.00054		<0.0150	<0.00024	0.000511 J			0.0128			
	NP-5	Apr-17		0.00315	0.00738			<0.002		<0.1	<0.002	<0.005			0.0125			
	MW-136	Apr-15		0.00283	0.0107		<0.00016	<0.00054		0.0239 J	<0.00024	0.00574		0.0011 J	0.00362		0.0158	
	MW-136	Apr-16		0.00242 J	0.0113 J	0.661	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.00291 JB	<4.9E-05	0.00772 JB	0.00664 J	**0.0698**	0.0188 J	
	MW-136	Apr-17		0.00248	0.0101	0.558	<0.001	<0.002	<0.002	<0.1	<0.002	0.00136 J	<0.0002	0.00109 J	0.00472	**0.0684**	0.0176	
	MW-136	Apr-18		0.00258	0.0103	0.681	<0.000160	0.000582 J	<0.000260	<0.0150	<0.000240	0.00578	<0.0000490	0.00356	0.00755	**0.0769**	0.0176	
Evaporation Ponds	MW-1R	Apr-15		0.00264 J	0.0229 J			<0.00270		**2.58**	<0.00120	**2.14**			<0.00190			
	MW-1R	Apr-16		0.00311 J	0.0252			<0.00270		**3.72**	<0.00120	**2.64**			0.00216 J			
	MW-1R	Apr-17		0.00088 J	0.0254			0.000638 J		0.0387 J	<0.002	**2.34**			<0.002			
	MW-1R	Apr-18		0.00160 J	0.0232			<0.000540		**3.40**	0.000491 J	**1.72** V			<0.000380			
	MW-2A	Apr-15		**0.0116**	0.0216			<0.00054		0.201	<0.00024	**1.83**			0.00186 J			
	MW-2A	Apr-16		**0.014**	0.0223 J			<0.00270		**2.64**	<0.00120	**2.31**			0.00347 J			
	MW-2A	Apr-17		0.00354	0.0175			<0.002		<0.1	<0.002	**1.49**			0.000949 J			
	MW-2A	Apr-18		0.00772	0.0232			<0.000540		**2.71**	<0.000240	**1.23**			0.00148 J			
	MW-3	Apr-15	FD	**0.0253**	0.0171			<0.00054		<0.0150	<0.00024	**1.30**			**0.0955**			
	MW-3	Apr-15		**0.0269**	0.018			<0.00054		<0.0150	<0.00024	**1.37**			**0.095**			
	MW-3	Apr-16	FD	**0.0246**	0.0141 J			<0.00270		0.401 J	<0.00120	**2.13**			0.00615 J			
	MW-3	Apr-16		**0.0299**	0.0146			0.00103 J		0.388	0.0003 J	**2.49**			0.00429			
	MW-3	Apr-17	FD	**0.0172**	0.0152			<0.002		0.0247 J	<0.002	**1.12**			0.00293			
	MW-3	Apr-17		**0.0179**	0.0138			<0.002		<0.1	<0.002	**1.08**			0.00281			
	MW-3	Apr-18		**0.0228**	0.0125			<0.000540		0.213	0.000366 J	**0.668**			0.00562			
	MW-3	Apr-18	FD	**0.0239**	0.0153			<0.000540		0.239 B	0.000318 J	**0.706**			0.00414			
	MW-4A	Apr-15		**0.104**	0.0113			0.000987 J		**1.89**	<0.00024	**2.73**			0.000614 J			
	MW-4A	Apr-16		**0.174**	0.0128 J			<0.00270		**2.99**	<0.00120	**2.29**			0.00269 J			
	MW-4A	Apr-17		**0.147**	0.0123			<0.002		0.104	<0.002	**1.94**			0.000498 J			
	MW-4A	Apr-18		**0.106**	0.0120			<0.000540		**1.49**	<0.000240	**1.98**			<0.000380			
	MW-4B	Apr-17		**0.0471**	0.0188			<0.002		0.0449 J	<0.002	**9.32**			<0.002			
	MW-5A	Apr-15		**0.0848**	0.0107			0.000957 J		**4.50**	<0.00024	**1.58**			0.00086 J			
	MW-5A	Apr-16		**0.179**	0.0128 J			<0.00270		**6.87**	<0.00120	**1.33**			0.00262 J			
	MW-5A	Apr-17		**0.0861**	0.0133			<0.002		0.0208 J	<0.002	**1.23**			0.000895 J			
	MW-5A	Apr-18		**0.128**	0.0135			<0.000540		**5.93**	<0.000240	**1.14**			0.00153 J			
	MW-5B	Apr-13		**0.109**	<0.0100			<0.0100		0.618	<0.0100	**2.17**			<0.0100			
	MW-5B	Apr-15		**0.198**	0.0104			0.000978 J		**4.71**	<0.00024	**3.49**			0.00197 J			
	MW-5B	Apr-17		**0.127**	0.0111			<0.002		0.0226 J	<0.002	**3.51**			0.00155 J			
	MW-5C	Apr-13		**0.0137**	0.014			<0.00500		**1.08**	<0.00500	**0.900**			<0.00500			
	MW-5C	Apr-15		**0.0124**	0.0172			0.00115 J		0.77	0.000449 J	**0.687**			<0.00038			
	MW-5C	Apr-17		0.00981	0.014			<0.002		<0.1	<0.002	**0.906**			<0.002			
	MW-6A	Apr-15		**0.0114**	0.0331			<0.00054		0.0527 J	0.0004 J	**1.40**			0.0318			
	MW-6A	Apr-16		0.00932 J	0.0156 J			<0.00270		<0.075	<0.00120	**0.491**			<0.00190			
	MW-6A	Apr-17		0.00999	0.0137			<0.002		<0.1	<0.002	**0.416**			0.000824 J			
	MW-6A	Apr-18		0.00829	0.0127			0.000902 J		0.186	0.000497 J	**0.294**			0.000905 J			
	MW-6B	Mar-13	FD	**0.0336**	0.0173			<0.00500		**1.23**	<0.00500	**3.03**			<0.00500			
	MW-6B	Mar-13		**0.032**	0.0145			<0.00500		**1.24**	<0.00500	**2.84**			<0.00500			
	MW-6B	Apr-15		**0.0319**	0.0186			<0.00054		**1.21**	<0.00024	**3.52**			<0.00038			
	MW-6B	Apr-17		0.00863	0.0141			<0.002		<0.1	<0.002	**1.01**			<0.002			
	MW-7A	Apr-15	FD	**0.0141**	0.0149			0.000544 J		<0.0150	<0.00024	**0.997**			0.000601 J			
	MW-7A	Apr-15		**0.0172**	0.0148			0.00089 J		0.676	<0.00024	**0.994**			0.000532 J			
	MW-7A	Apr-16	FD	**0.0226**	0.0174 J			<0.00270		**2.56**	<0.00120	**0.642**			0.00207 J			
	MW-7A	Apr-16		**0.0224**	0.017 J			<0.00270		**2.63**	<0.00120	**0.634**			<0.00190			
	MW-7A	Apr-17	FD	**0.0131**	0.015			<0.002		0.0169 J	<0.002	**0.541**			<0.002			
	MW-7A	Apr-17		**0.0124**	0.015			<0.002		0.0171 J	<0.002	**0.57**			<0.002			
	MW-7A	Apr-18		**0.0254**	0.0152			<0.000540		**4.66**	<0.000240	**0.499**			<0.000380			
	MW-7A	Apr-18	FD	**0.0251**	0.0160			<0.000540		**4.57**	<0.000240	**0.516**			<0.000380			
	MW-7B	Apr-13		<0.0100	0.0114			<0.0100		<0.400	<0.0100	**0.358**			<0.0100			
	MW-7B	Apr-15		0.00529	0.011			<0.00054		0.0879 J	<0.00024	**0.541** J			<0.00038			
	MW-7B	Apr-17		0.00373	0.0118			<0.002		<0.1	<0.002	**0.493**			<0.002			
	MW-10	Apr-15		**0.0191**	0.013 J			<0.00270		<0.0750	<0.00120	**2.53**			<0.00190			
	MW-10	Apr-16		**0.0247**	0.0174 J			<0.00270		<0.075	<0.00120	**2.60**			0.00211 J			
	MW-10	Apr-17		**0.0154**	0.0115			<0.002		<0.1	<0.002	**2.46**			<0.002			
	MW-10	Apr-18		**0.0149**	0.0138			0.00545		0.113	0.000258 J	**2.73**			<0.000380			
	MW-11A	Apr-15		<0.00250	0.0338 J			<0.00540		<0.150	<0.00240	**0.846**			<0.00380			
	MW-11A	Apr-16		0.00133 J	0.0321			<0.00270		0.887	<0.00120	**0.903**			<0.00190			
	MW-11A	Apr-17		0.000295 J	0.0329			<0.002		0.0408 J	<0.002	**0.773**			<0.002			
	MW-11A	Apr-18		0.000357 J	0.0309			0.00200 JB		0.536	<0.000240	**0.306**			0.000600 J			
	MW-11B	Mar-13		**<0.0250**	<0.0250			<0.0250		**3.62**	**<0.0250**	**0.365**			<0.0250			
	MW-11B	Apr-15		0.00458 J	0.0187			<0.00270		**3.59**	<0.00120	**0.376**			<0.00190			
	MW-11B	Apr-17		0.00103 J	0.0188			<0.002		0.0826 J	<0.002	**0.370**			<0.002			
	MW-12	Apr-14		<0.00200	0.0204			<0.00200		<0.156	<0.00140	0.183			0.0208			
	MW-13	Apr-14		<0.00200	0.0334			<0.00200		<0.156	<0.00140	0.173			<0.00200			
	MW-15	Apr-15		**0.0268**	0.0219 J			<0.00270		0.0762 J	<0.00120	**0.814**			0.0211			
	MW-15	Apr-16		**0.0204**	0.0217 J			<0.00270		<0.075	<0.00120	**0.874**			<0.00190			
	MW-15	Apr-17		**0.0132**	0.0182			0.000671 J		<0.1	0.000257 J	0.18			0.000506 J			
	MW-15	Apr-18		**0.0171**	0.0210			<0.000540		<0.0150	0.000498 J	**0.388**			0.00122 J			
	MW-18A	Apr-15		0.00341	0.0116			<0.00054		<0.0150	<0.00024	0.00939		0.00194 J	0.0464		0.0042 J	
	MW-18A	Apr-16		0.00629 J	0.0157 J	**2.87**	<0.00080	<0.00270	<0.0013	0.333 JB	<0.00120	**0.335**	<4.9E-05	0.00835 J	<0.00190	**0.041** J	0.00163 J	
	MW-18A	Apr-17		0.00465	0.017	**2.38**	<0.001	<0.002	0.000305 J	0.382	<0.002	**0.776**	<0.0002	0.00693	0.000553 J	**0.0309**	0.000553	
	MW-18A	Apr-18		0.00509	0.0165	**2.23**	<0.000160	<0.000540	0.00107 J	0.0239 JB	<0.000240	**0.527**	<0.0000490	0.00883	<0.000380	**0.0362**	0.000373 J	
	MW-18B	Apr-13		0.00781	0.0119			<0.00500		<0.200	<0.00500	**0.657**			<0.00500			
	MW-18B	Apr-15		**0.0104**	0.0116			<0.00054		0.0398 J	<0.00024	**0.723**			<0.00038			
	MW-18B	Apr-17		0.00962	0.013			<0.002		<0.1	<0.002	**0.897**			<0.002			
	MW-22A	Apr-15	FD	**0.0369**	0.0171			<0.00054		0.901	<0.00024	**5.08**			0.00105 J			
	MW-22A	Apr-15		**0.0376**	0.0162 J			<0.00270		0.537	<0.00120	**5.37**			<0.00190			
	MW-22A	Apr-16	FD	**0.037**	0.0171 J			<0.00270		**2.39**	<0.00120	**5.87**			0.00218 J			
	MW-22A	Apr-16		**0.0383**	0.0157 J			<0.00270		**2.37**	<0.00120	**5.83**			0.00242 J			
	MW-22A	Apr-17	FD	**0.0314**	0.0155			0.000775 J		0.0154 J	<0.002	**6.70**			0.000846 J			
	MW-22A	Apr-17		**0.0325**	0.0145			<0.002		<0.1	<0.002	**6.25**			0.000797 J			
	MW-22A	Apr-18		**0.0298**	0.0161			<0.000540		**1.29**	<0.000240	**6.15**			0.000519 J			
	MW-22A	Apr-18	FD	**0.0308**	0.0156			<0.000540		**1.06**	<0.000240	**6.27**			0.000837 J			
	MW-22B	Apr-13		**0.0288**	<0.0250			<0.0250		**1.98**	**<0.0250**	**3.41**			<0.0250			
	MW-22B	Apr-15		**0.0383**	0.0154 J			<0.00270		**2.20**	<0.00120	**4.64**			<0.00190			
	MW-22B	Apr-17		**0.0242**	0.0109			<0.002		<0.1	<0.002	**3.53**			0.000555 J			
	MW-70	Apr-15		**0.0196**	0.0139			<0.00054		**1.57**	<0.00024	**0.213**			<0.00038			
	MW-70	Apr-16		**0.0228**	0.0147 J			<0.00270		**5.40**	<0.00120	**0.513**			<0.00190			
	MW-70	Apr-17		**0.0156**	0.0156			<0.002		0.42	<0.002	**0.244**			<0.002			
	MW-70	Apr-18		**0.0179**	0.0165			<0.000540		0.780	<0.000240	**0.420**			<0.000380			
	MW-72	Apr-15		**0.0306**	0.0226			0.000575 J		**1.19**	<0.00024	**2.89**			0.0117			
	MW-72	Apr-16		**0.0269**	0.0185 J			<0.00270		**5.04**	<0.00120	**4.98**			<0.00190			
	MW-72	Apr-17		**0.0151**	0.0217			<0.002		<0.1	<0.002	**4.2**			0.0018 J			
	MW-72	Apr-18		**0.0149**	0.0148			0.000774 J		**1.78**	<0.000240	**3.04**			0.00213			
	MW-73	Apr-15		**0.064**	0.0109			0.000772 J		0.058 J	<0.00024	**2.36**			0.00193 J			
	MW-73	Apr-16		**0.0843**	0.0109 J			<0.00270		**3.67**	<0.00120	**3.00**			0.00314 J			
	MW-73	Apr-17		**0.0642**	0.0074			<0.002		0.0403 J	<0.002	**0.22**			0.00189 J			
	MW-73	Apr-18		**0.0639**	0.00845			0.000722 J		**1.07**	<0.000240	**1.97**			0.00148 J			

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals
2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	WQCC Irr	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	MW-74	Apr-15		**0.0515**	0.0103			<0.00054		0.065 J	<0.00024	**0.392**			**0.480**		
	MW-74	Apr-16		**0.135**	0.0133 J			<0.00270		<0.075	<0.00120	**2.20**			0.0155		
	MW-74	Apr-17		**0.0689**	0.0136			<0.002		<0.1	<0.002	**1.07**			**0.165**		
	MW-74	Apr-18		**0.0944**	0.0129			0.000610 J		<0.0150	<0.000240	**1.22**			0.0323		
	MW-75	Apr-15		**0.355**	0.0186			0.003		**9.82**	<0.00024	**0.861**			0.00261		
	MW-75	Apr-16		**0.125**	0.0176 J			<0.00270		**1.08**	<0.00120	**0.907**			0.00374 J		
	MW-75	Apr-17		**0.114**	0.017			<0.002		0.0351 J	<0.002	**0.882**			0.00182 J		
	MW-75	Apr-18		**0.0891**	0.0160			0.000835 J		0.175	0.000466 JB	**0.876**			0.00218		
	MW-76	Apr-15		**0.0628**	0.012			0.00133 J		**3.53**	<0.00024	**0.977**			0.00214		
	MW-76	Apr-16		**0.0455**	0.012 J			<0.00270		**3.62**	<0.00120	**0.856**			0.00464 J		
	MW-76	Apr-17		**0.0458**	0.0116			<0.002		0.0501 J	<0.002	**0.824**			0.00325		
	MW-76	Apr-18		**0.0504**	0.0109			0.00187 J		**3.00**	<0.000240	**0.686**			0.00271		
	MW-77	Apr-15		**0.0921**	0.0144 J			0.0116		**13.6**	<0.00120	**0.644**			0.0127		
	MW-77	Apr-16		**0.0594**	0.00881 J			0.0122 J		**10.7**	<0.00240	**0.599**			0.0110		
	MW-77	Apr-17		**0.0336**	0.0101			0.00772		0.158	<0.002	**0.563**			0.0101		
	MW-77	Apr-18		**0.0423**	0.0108			0.00949		**5.47**	<0.000240	**0.547**			0.0112		
	MW-78	Apr-15		**0.0117**	0.032			0.0342		**10.7**	<0.00120	**1.26**			0.0122		
	MW-78	Apr-16		**0.0116**	0.0382			0.049		**11.2**	<0.00120	**0.773**			0.0124		
	MW-78	Apr-17		0.00661	0.0411			0.0388		0.0653 J	<0.002	**0.473**			0.00868		
	MW-78	Apr-18		0.00899	0.0443			**0.132**		0.0392 J	0.000479 J	0.196			0.0125		
	MW-79	Apr-15		0.0063	0.0161			<0.00054		<0.0150	<0.00024	**1.34**			0.0012 J		
	MW-79	Apr-16		0.00557 J	0.0166 J			<0.00270		0.13 J	<0.00120	**2.91**			<0.00190		
	MW-79	Apr-17		0.00433	0.0162			<0.002		<0.1	<0.002	**1.21**			0.000456 J		
	MW-79	Apr-18		0.00395	0.0155			0.000671 J		0.0154 J	<0.000240	**0.267**			0.000757 J		
	MW-80	Apr-15		**0.0109**	0.0153			<0.00054		0.0598 J	<0.00024	**0.381**			0.000949 J		
	MW-80	Apr-16		0.00359 J	0.0171 J			<0.00270		0.173 J	<0.00120	0.162			0.00232 J		
	MW-80	Apr-17		0.00597	0.0166			<0.002		<0.1	<0.002	**0.587**			0.00205		
	MW-80	Apr-18		0.00206	0.0123			<0.000540		0.0447 J	<0.000240	0.105			0.00106 J		
	MW-81	Apr-15		**0.0188**	0.0144			0.000736 J		0.019 J	<0.00024	0.0128			0.0229		
	MW-81	Apr-16		**0.0226**	0.0137 J			<0.00270		<0.075	<0.00120	0.00553 J			0.0426		
	MW-81	Apr-17		**0.016**	0.0144			<0.002		<0.1	<0.002	0.0025 J			0.0169		
	MW-81	Apr-18		0.00772	0.0129			0.000790 J		<0.0150	<0.000240	0.0233			0.00569		
	MW-82	Apr-15		**0.0761**	0.0303			0.0032		0.765	<0.00024	**1.25**			0.00265		
	MW-82	Apr-16		**0.04**	0.0326			<0.00270		0.121 J	<0.00120	**1.64**			0.00331 J		
	MW-82	Apr-17		**0.0326**	0.026			<0.002		0.0479 J	<0.002	**1.97** V			0.00125 J		
	MW-82	Apr-18		**0.0274**	0.0232			0.00115 J		0.0685 J	<0.000240	**1.99**			0.000871 J		
	MW-83	Apr-15		**0.0253**	0.0129			0.00766		**6.99**	<0.00024	**0.741**			0.00376		
	MW-83	Apr-16		**0.0282**	0.0207 J			0.00814 J		**3.77**	<0.00120	**0.532**			0.0052 J		
	MW-83	Apr-17		**0.0183**	0.0357			0.00753		0.0258 J	<0.002	**0.606**			0.00339		
	MW-83	Apr-18		**0.0522**	0.0314			0.00788		**3.11**	0.000452 J	**0.336**			0.00203		
	MW-84	Apr-15		**0.0885**	0.0139			0.00335		0.265	<0.00024	**2.90**			0.005		
	MW-84	Apr-16		**0.0867**	0.0146 J			0.00527 J		0.682	<0.00120	**2.98**			0.00813 J		
	MW-84	Apr-17		**0.074**	0.013			0.00227		0.0725 J	<0.002	**2.46**			0.00472		
	MW-84	Apr-18		**0.0777**	0.0129			0.00224		0.378	0.000259 J	**2.67**			0.00450		
	MW-87	Apr-15		0.00565	0.0186			0.000544 J		<0.0150	0.000455 J	0.0419			0.0011 J		
	MW-87	Apr-16		0.00841 J	0.0178 J			<0.00270		**3.82** O1	<0.00120	**2.39** V			0.00215 J		
	MW-87	Apr-17		0.00522	0.0162			<0.002		0.617	<0.002	**1.71**			<0.002		
	MW-87	Apr-18		0.00587	0.0158			0.000970 JB		0.986	<0.000240	**0.689**			<0.000380		
	MW-88	Apr-15		**0.0106**	0.0139 J			<0.00270		0.0753 J	<0.00120	**1.31**			<0.00190		
	MW-88	Apr-16		0.00969 J	0.0111 J			<0.00270		<0.075	<0.00120	**0.852**			<0.00190		
	MW-88	Apr-17		0.00761	0.0104			<0.002		<0.1	<0.002	**0.901** V			0.000412 J		
	MW-88	Apr-18		0.00679	0.0111			<0.000540		<0.0150	<0.000240	**0.922**			<0.000380		
	MW-120	Apr-15		0.00704	0.0113			<0.00054		**1.35**	<0.00024	**1.28**			0.0324		
	MW-120	Apr-16		0.00838 J	0.0155 J			<0.00270		**3.28**	<0.00120	**1.85**			0.00538 J		
	MW-120	Apr-17		0.00532	0.0129			<0.002		<0.1	<0.002	**1.52**			<0.002		
	MW-120	Apr-18		**0.0107**	0.0110			<0.000540		**3.72**	0.000518 J	**1.25**			<0.000380		
	MW-121	Apr-15		**0.0337**	0.0138			<0.00054		0.567	<0.00024	**3.86**			0.00764		
	MW-121	Apr-16		**0.0369**	0.0134 J			<0.00270		0.174 JB	<0.00120	**2.92**			0.00792 J		
	MW-121	Apr-17		**0.0244**	0.0128			<0.002		<0.1	<0.002	**2.6**			0.0056		
	MW-121	Apr-18		**0.0291**	0.0107			<0.000540		0.235	<0.000240	**2.42**			0.00498		
	MW-122	Apr-15		**0.0108**	0.025			<0.00054		0.224	<0.00024	**1.85**			0.00914		
	MW-122	Apr-16		0.00405 J	0.028			<0.00270		0.541 B	<0.00120	**1.39**			<0.00190		
	MW-122	Apr-17		0.00436	0.0292			<0.002		<0.1	<0.002	**2.16**			0.000462 J		
	MW-122	Apr-18		0.00138 J	0.0201			<0.000540		0.305	<0.000240	**0.741**			0.000579 J		
	MW-123	Apr-15		**0.0274**	0.021 J			<0.00270		<0.0750	<0.00120	**2.67**			<0.00190		
	MW-123	Apr-16		**0.0254**	0.0211 J			<0.00270		<0.075	<0.00120	**2.85**			0.0022 J		
	MW-123	Apr-17		**0.0224**	0.0206			<0.002		<0.1	<0.002	**1.73**			<0.002		
	MW-123	Apr-18		**0.0216**	0.0220			<0.000540		<0.0150	<0.000240	**2.87**			0.000629 J		
	MW-124	Apr-15		0.00199 J	0.017			<0.00054		0.961	<0.00024	**0.703**			<0.00038		
	MW-124	Apr-16		0.00255 J	0.0198 J			<0.00270		**2.70**	<0.00120	**0.601**			<0.00190		
	MW-124	Apr-17		0.00047 J	0.0192			<0.002		<0.1	<0.002	**0.463**			<0.002		
	MW-124	Apr-18		0.00155 J	0.0185			0.000834 JB		**3.49**	<0.000240	**0.530**			<0.000380		
	OCD-1R	Apr-15		0.00669 J	0.0184 J			<0.00270		<0.0750	<0.00120	**0.690**			0.0204		
	OCD-1R	Apr-16		0.00566 J	0.0159 J			**0.0508**		0.905	<0.00120	**0.599**			0.00328 J		
	OCD-1R	Apr-17		0.00284	0.0174			<0.002		<0.1	<0.002	**1.22**			0.000904 J		
	OCD-1R	Apr-18		0.00359	0.0154			<0.000540		0.0172 JB	<0.000240	**0.288**			0.00152 J		
	OCD-2A	Apr-15		0.00138 J	0.0188 J			<0.00270		<0.0750	<0.00120	**0.296**			<0.00190		
	OCD-2A	Apr-16		0.0046 J	0.0237 J			0.00345 J		**4.22**	<0.00120	**1.41**			<0.00190		
	OCD-2A	Apr-17		0.000769 J	0.0228			<0.002		<0.1	<0.002	**1.21**			<0.002		
	OCD-2A	Apr-18		0.00192 J	0.0167			<0.000540		**1.93**	<0.000240	**0.651**			0.000595 J		
	OCD-3	Apr-15		<0.00120	0.018 J			<0.00270		0.341 J	<0.00120	0.105			<0.00190		
	OCD-3	Apr-16		0.00135 J	0.0219 J			<0.00270		0.0865 JB	<0.00120	0.0382			<0.00190		
	OCD-3	Apr-17		0.000537 J	0.0222			<0.002		<0.1	<0.002	0.0565			<0.002		
	OCD-3	Apr-18		0.000894 J	0.0236			<0.000540		0.823	<0.000240	**0.392**			0.000544 J		
	OCD-4	Apr-15		0.00246 J	0.0228 J			<0.00270		**1.89**	<0.00120	**0.290**			<0.00190		
	OCD-4	Apr-16		0.00176 J	0.0263			<0.00270		0.8	0.00146 J	0.149			<0.00190		
	OCD-4	Apr-17		0.000607 J	0.0235			<0.002		0.419	<0.002	0.066			<0.002		
	OCD-4	Apr-18		0.00102 J	0.0231			<0.000540		0.519	<0.000240	0.0541			0.000539 J		
	OCD-5	Apr-15		0.00721 J	0.0265			<0.00270		**3.41**	<0.00120	**0.312**			<0.00190		
	OCD-5	Apr-16		0.00259 J	0.024 J			<0.00270		**1.16**	<0.00120	**0.216**			<0.00190		
	OCD-5	Apr-17		0.00197 J	0.0245			<0.002		0.357	<0.002	**0.29**			<0.002		
	OCD-5	Apr-18		0.00319	0.0233			<0.000540		0.830	<0.000240	0.176			<0.000380		
	OCD-6	Apr-15		**0.0124**	0.0209			0.000915 J		**2.91**	0.000267 J	**1.98**			0.000955 J		
	OCD-6	Apr-16		**0.0118**	0.0208 J			<0.00270		**2.00**	<0.00120	**2.14** V			0.00282 J		
	OCD-6	Apr-17		0.00705	0.0224			<0.002		<0.1	<0.002	**2.2**			0.000614 J		
	OCD-6	Apr-18		0.00734	0.0217			0.00324		**1.03**	<0.000240	**2.25**			<0.000380		
	OCD-7AR	Apr-15		**0.0732**	0.0122			<0.00054		0.237	0.0003 J	**2.70**			0.00179 J		
	OCD-7AR	Apr-16		**0.127**	0.0133 J			<0.00270		0.217 J	<0.00120	**2.20**			0.0036 J		
	OCD-7AR	Apr-17		**0.105**	0.0135			<0.002		0.0872 J	<0.002	**2.22**			0.00167 J		
	OCD-7AR	Apr-18		**0.103**	0.0131			0.000685 J		0.471	0.000266 J	**2.53**			0.00179 J		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	WQCC Irr	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	OCD-7B	Mar-13		<0.00500	0.0155			<0.00500		<0.200	<0.00500	<0.00500			<0.00500		
	OCD-7B	Apr-15		0.00304	0.0178			0.000838 J		**2.72**	<0.00024	**0.626**			<0.00038		
	OCD-7B	Apr-17		0.00131 J	0.0195			<0.002		<0.1	<0.002	**0.667**			<0.002		
	OCD-8A	Apr-15		**0.0543**	0.0315			0.000744 J		**11.0**	<0.00024	**6.40**		0.0562	0.000889 J		0.000737 J
	OCD-8A	Apr-16		**0.0651**	0.0222 J	**0.816**	<0.00080	<0.00270	<0.0013	**9.02**	<0.00120	**3.89**	<4.9E-05	0.0331	0.00226 J	<0.00165	0.00186 J
	OCD-8A	Apr-17		**0.0533**	0.0163	0.745	<0.001	<0.002	0.00105 J	0.0677 J	<0.002	**3.01**	<0.0002	0.0227	0.00106 J	0.00102 J	0.000283
	OCD-8A	Apr-18		**0.0830**	0.0186	**0.798**	<0.000160	<0.000540	0.000836 J	**6.88**	<0.000240	**3.87**	<0.0000490	0.0216	0.000965 J	0.000903 J	0.000582 J
	OCD-8B	Apr-13		**<0.0250**	<0.0250			<0.0250		<1.00	**<0.0250**	**0.617**			<0.0250		
	OCD-8B	Apr-15		**0.0113**	0.012			0.000653 J		0.2	<0.00024	**5.18**			0.000497 J		
	OCD-8B	Apr-17		0.0091	0.0127			<0.002		0.0155 J	<0.002	**6.46**			<0.002		
	KWB-1A	Apr-15		0.00328	0.0084			<0.00054		<0.0150	<0.00024	**0.371**		0.00773	0.00336		0.0226
	KWB-1A	Apr-16		0.00279	0.00849	0.647	<0.000160	<0.00054	0.00479	<0.0150	0.000318 J	**0.398**	<4.9E-05	0.00956	0.00669 B	0.0217	0.0217
	KWB-1A	Apr-17		0.00344	0.00795	0.681	<0.001	<0.002	0.00545	<0.1	<0.002	**0.409**	<0.0002	0.00948	0.0013 J	0.0243	0.0223
	KWB-1A	Apr-18		0.00373	0.00914	**0.783**	<0.000160	0.00238	0.00503	0.0224 JB	<0.000240	**0.399**	<0.0000490	0.00904	0.000469 J	0.0226	0.0233
	KWB-1C	Apr-13		<0.0100	0.0131			<0.0100		<0.400	<0.0100	<0.0100			<0.0100		
	KWB-1C	Apr-15		0.00297	0.0087			<0.00054		<0.0150	0.000528 J	**0.451**			0.00155 J		
	KWB-1C	Apr-17		0.00303	0.00839			<0.002		<0.1	<0.002	**0.472**			<0.002		
	KWB-7	Apr-13		<0.00500	0.0429			<0.00500		<0.200	<0.00500	**1.72**	<0.000200	0.0201	<0.00500		0.0116
	KWB-7	Apr-15		**0.0191**	0.0628			<0.00054		**1.51**	<0.00024	**5.86**		0.00784	0.000486 J		0.00111 J
	KWB-7	Apr-16		0.00997 J	0.0544	0.472	<0.00080	<0.00270	0.00568	**1.40**	<0.00120	**3.66**	<4.9E-05	0.00777 J	<0.00190	0.00299 J	0.00229 J
	KWB-7	Apr-17		0.00204	0.044	0.405	<0.001	<0.002	<0.002	<0.1	<0.002	**3.25**	<0.0002	0.00101 J	<0.002	0.00167 J	0.00093 J
	KWB-8	Apr-17		0.000904 J	0.087	0.6	<0.001	<0.002	<0.002	0.0772 J	0.000556 J	**1.77**	<0.0002	0.000663 J	<0.002	<0.01	0.00112 J
	KWB-10R	Apr-15		**0.0247**	**3.15**			<0.00054		**7.25**	0.00142 J	0.151			0.000839 J		
	KWB-10R	Apr-16		**0.0156**	**3.93**			<0.00054		**5.93**	0.000669 J	0.165			0.00194 JB		
	KWB-10R	Apr-17		**0.0115**	**3.39**			<0.002		0.281	0.000478 J	0.145			<0.002		
	KWB-10R	Apr-18		**0.0178**	**4.22**			0.00201		**4.73**	0.00295	0.182			<0.000380		
	KWB-11A	Apr-15		0.00241	0.0217			<0.00054		<0.0150	0.00817	**0.265**		0.00442	0.0026		0.0123
	KWB-11A	Apr-16		0.00234 J	0.0283	0.477	<0.00080	<0.00270	0.00202	<0.075	0.00533 J	**0.240**	<4.9E-05	0.00547 J	0.00847 J	0.0209 J	0.0134 J
	KWB-11A	Apr-17		0.00194 J	0.0205	0.386	<0.001	<0.002	0.0014 J	<0.1	0.00294	**0.240**	<0.0002	0.00478	0.00483	0.0196	0.0119
	KWB-11A	Apr-18		0.00547	0.0231	0.473	<0.000160	0.000575 J	0.00616	0.315	0.00129 J	**0.423**	<0.0000490	0.00639	0.00257	0.0159	0.00659
	KWB-11B	Apr-15		0.00139 J	0.0135			0.000786 J		<0.0150	<0.00024			0.000504 J	0.00972		0.00811
	KWB-11B	Apr-16		0.00144 J	0.0119 J	0.154	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.00845 J	0.00958 J	0.00947 J
	KWB-11B	Apr-17		0.0013 J	0.0123	0.0995	<0.001	0.000579 J	<0.002	<0.1	<0.002	0.000589 J	<0.0002	<0.002	0.00905	0.0114	0.00855
	KWB-11B	Apr-18		0.00145 J	0.0131	0.171 J	<0.000160	0.0320	0.000364 J	0.137 B	<0.000240	0.00464 J	<0.0000490	0.0157	0.0108	0.0125	0.00884
	KWB-12A	Apr-15	FD	0.0015 J	0.0128			<0.00054		<0.0150	<0.00024	0.000359 J		0.000473 J	0.00374		0.00955
	KWB-12A	Apr-15		0.00167 J	0.016			<0.00054		0.0156 J	<0.00024	<0.000250		0.000471 J	0.00445		0.0112
	KWB-12A	Apr-16		0.00191 J	0.0184 J	0.621	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.00383 J	**0.0337** J	0.0143 J
	KWB-12A	Apr-17		0.00145 J	0.0155	0.56	<0.001	<0.002	<0.002	<0.1	<0.002	0.00171 JB	<0.0002	0.000403 JB	0.00361	0.029	0.0121
	KWB-12B	Apr-15		0.00169 J	0.00905			<0.00054		<0.0150	<0.00024	0.000656		0.000442 J	0.00404		0.0112
	KWB-12B	Apr-16	FD	0.00196 J	0.0132 J	0.625	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.0047 J	<4.9E-05	<0.00175	0.00397 J	**0.0322** J	0.0141 J
	KWB-12B	Apr-16		0.00196 J	0.0159 J	0.625	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.00501 J	<4.9E-05	<0.00175	0.00398 J	**0.0325** J	0.0152 J
	KWB-12B	Apr-17	FD	0.00152 J	0.00889	0.507	<0.001	<0.002	<0.002	<0.1	<0.002	0.00235 J	<0.0002	<0.002	0.00405 B	0.029	0.0124
	KWB-12B	Apr-17		0.00158 J	0.0101	0.603	<0.001	<0.002	<0.002	<0.1	<0.002	0.000491 JB	<0.0002	0.00061 JB	0.00354	**0.0307**	0.012
	KWB-12B	Apr-18		0.00167 J	0.00890	0.594	0.000179 J	<0.000540	<0.000260	<0.0150	0.000469 JB	0.00191 J	<0.0000490	0.00122 J	0.00352	0.0294	0.0122
	KWB-12B	Apr-18	FD	0.00159 J	0.00958	0.573	<0.000160	0.000621 JB	<0.000260	<0.0150	<0.000240	0.000411 JB	<0.0000490	0.000357 J	0.00298	**0.0301**	0.0125
	MW-57	Apr-15		0.00508	0.0171			<0.00054		0.385	<0.00024	0.188			0.0331		
	MW-57	Apr-16		0.00424 J	0.0144 J			<0.00270		<0.075	<0.00120	**0.388**			0.0116		
	MW-57	Apr-17		0.00348	0.0154			<0.002		<0.1	<0.002	**0.283**			0.0231		
	MW-57	Apr-18		0.00602	0.0145			<0.000540		0.0979 JB	0.000638 JB	**0.525**			0.0108		
	MW-58	Apr-15		**0.0116**	0.89			<0.00054		**1.33**	0.00259	0.0974		0.000747 J	0.000588 J		0.00237 J
	MW-58	Apr-16		**0.0109**	0.632	0.519	<0.00080	<0.00270	<0.0013	0.429 J	0.00166 J	**0.357**	<4.9E-05	0.00864 JB	<0.00190	<0.00165	0.00201 J
	MW-58	Apr-17		**0.0118**	0.68	0.395	<0.001	<0.002	<0.002	0.123	0.00131 J	**0.319**	<0.0002	0.000589 J	<0.002	<0.01	0.00242 J
	MW-58	Apr-18		0.00405	**1.47**	0.517	<0.000160	<0.000540	<0.000260	0.160 B	0.000816 J	**0.219**	<0.0000490	0.000927 J	0.000412 J	<0.000330	0.00108 J
	MW-111	Apr-15		**0.0123**	0.239			<0.00054		**5.92**	<0.00024	**1.60**			<0.00038		
	MW-111	Apr-16		**0.0137**	0.0935			<0.00270		**6.54**	<0.00120	**1.68**			<0.00190		
	MW-111	Apr-17		0.00967	0.0596			<0.002		<0.1	<0.002	**1.59**			0.000586 J		
	MW-111	Apr-18		0.00961	0.0522			<0.000540		**4.79**	0.000253 J	**1.25**			<0.000380		
	MW-113	Apr-15	FD	0.00413	0.0254			<0.00054		0.35	<0.00024	**0.946**			0.000388 J		
	MW-113	Apr-15		0.00445	0.0248			<0.00054		0.341	<0.00024	**0.917**			0.00328		
	MW-113	Apr-16	FD	0.00251 J	0.0233 J			<0.00270		0.191 J	<0.00120	**0.675**			<0.00190		
	MW-113	Apr-16		0.00282 J	0.0218 J			<0.00270		0.178 J	<0.00120	**0.723** V			<0.00190		
	MW-113	Apr-17	FD	0.00271	0.0262			<0.002		<0.1	<0.002	**1.12**			0.000537 JB		
	MW-113	Apr-17		0.00264	0.0251			<0.002		<0.1	<0.002	**1.14**			0.000664 JB		
	MW-113	Apr-18		0.00275 J	0.0214 J			<0.00270		0.498 J	<0.00120	**0.960**			<0.00190		
	MW-113	Apr-18	FD	0.00243	0.0240			<0.000540		0.489	<0.000240	**0.935**			<0.000380		
	MW-125	Apr-15		0.00367	0.00842 J			<0.00054		<0.0150	<0.00024	**0.385**			0.00797 J		
	MW-125	Apr-16		0.00391 J	0.0101 J			<0.00270		<0.075	<0.00120	**0.412**			0.00379 J		
	MW-125	Apr-17		0.0035	0.00884			<0.002		<0.1	<0.002	**0.393**			0.00331		
	MW-125	Apr-18		0.00345	0.00760			<0.000540		<0.0150	<0.000240	**0.398**			0.00261		
	MW-126A	Apr-15		0.00257	0.0159			0.000604 J		**1.17**	<0.00024	**0.829**			<0.00038		
	MW-126A	Apr-16		0.00221 J	0.0178 J			<0.00270		0.714	<0.00120	**0.820**			0.00299 J		
	MW-126A	Apr-17		0.0016 J	0.0171			<0.002		<0.1	<0.002	**0.880**			0.000761 JB		
	MW-126A	Apr-18		0.00225	0.0177			0.00329		0.709	<0.000240	**0.930**			<0.000380		
	MW-126B	Apr-15		0.00384	0.0102			0.000682 J		0.032 J	<0.00024	0.0807			0.00222		
	MW-126B	Apr-16		0.0035 J	0.00925			0.00119 J		<0.0150	<0.00024	0.0661			0.00538 JB		
	MW-126B	Apr-17		0.00361	0.0101			<0.002		<0.1	0.000513 J	0.0652			0.00284 JB		
	MW-126B	Apr-18		0.00363	0.0107			0.00124 J		<0.0150	0.000247 J	0.0513			0.00349		
	MW-127	Apr-15		0.00374	0.204			0.000841 J		0.486	0.000441 J	0.0919			<0.00038		
	MW-127	Apr-16		0.00441 J	0.115			<0.00270		0.258 J	<0.00120	0.103			0.00298 J		
	MW-127	Apr-17		0.00321	0.0692			<0.002		0.0152 J	<0.002	0.103			0.000512 JB		
	MW-127	Apr-18		0.00350	0.0793			<0.000540		0.0507 JB	<0.000240	0.108			<0.000380		
	MW-128	Apr-15		**0.045**	0.0674 J			<0.00054		**2.23**	<0.00024	**2.20**			0.00455 J		
	MW-128	Apr-16		**0.0646**	0.0812			<0.00270		**2.77**	<0.00120	**2.52**			<0.00190		
	MW-128	Apr-17		**0.0464**	0.0573			<0.002		0.0239 J	<0.002	**2.16**			<0.002		
	MW-128	Apr-18		**0.0530**	0.0634			<0.000540		**2.60**	0.000403 JB	**1.93**			<0.000380		
	MW-129	Apr-15		**0.0279**	0.536			<0.00054		**4.93**	<0.00024	**1.11**			<0.00038		
	MW-129	Apr-16		**0.0256**	0.614			<0.00270		**5.58**	<0.00120	**1.17**			0.00253 J		
	MW-129	Apr-17		**0.0152**	0.585			<0.002		<0.1	<0.002	**1.03**			0.000611 JB		
	MW-129	Apr-18		**0.0244**	0.558			<0.000540		**5.17**	<0.000240	**1.08**			<0.000380		
	MW-130	Apr-15		0.00464	0.0233			0.00155 J		0.446 J	0.00165 J	0.119			0.00337 J		
	MW-130	Apr-16		0.0045 J	0.0198 J			<0.00270		0.116 J	<0.00120	0.103			0.0126		
	MW-130	Apr-17		0.00386	0.0173			<0.002		<0.1	<0.002	0.0967			0.0164		
	MW-130	Apr-18		0.00432	0.0195			<0.000540		0.0377 J	0.000283 J	0.103			0.00698		
	MW-131	Apr-14		**0.0205**	**2.21**			<0.00100		**1.56**	<0.00070	**0.384**			0.00118 J		
	MW-131	Apr-15		**0.0219**	**2.82**			<0.00054		**1.84**	0.000414 J	**0.323**			<0.00038		
	MW-131	Apr-16		**0.0218**	**2.76**			<0.00270		**1.46**	<0.00120	**0.322**			0.00271 J		
	MW-131	Apr-17		**0.0183**	**2.48**			<0.002		<0.1	<0.002	**0.309**			0.000632 JB		
	MW-133	Apr-15		**0.0102**	0.138			<0.00054		**2.59**	0.000513 J	**0.290**			0.00325		
	MW-134	Apr-15	FD	0.00571	0.00941			0.00147 J		0.182	<0.00024	0.00509			0.0134		
	MW-134	Apr-15		0.00634 J	0.0115 J			<0.00270		<0.0750	<0.00120	0.00504 J			0.0180		
	MW-134	Apr-16	FD	0.00504 J	0.00916 J			<0.00270		<0.075	<0.00120	0.00888 J			0.00888 J		
	MW-134	Apr-16		0.00551 J	0.0107 J			<0.00270		<0.075	<0.00120	0.00802 J			0.00963 J		
	MW-134	Apr-17	FD	0.00466	0.00895			<0.002		<0.1	<0.002	0.00835			0.00588 B		
	MW-134	Apr-17		0.00441	0.0101			<0.002		<0.1	0.000467 J	0.00881			0.0106		
	MW-134	Apr-18		0.00542 J	0.0102 J			0.00337 J		<0.0750	0.00129 J	0.0157 J			0.00603 J		
	MW-134	Apr-18	FD	0.00435	0.00947			0.000575 JB		<0.0150	<0.000240	0.0110			0.00638		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

	Analyte Group:			Dissolved Metals														
			Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
			CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	WQCC Irr	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup														
Field East of Refinery	MW-135	Apr-15		0.00291	0.0106			0.000881 J		<0.0150	<0.00024	0.00329 J			0.0345		
	MW-135	Apr-16		0.00339 J	0.0105 J			<0.00270		0.149 J	<0.00120	0.00261 J			0.0244		
	MW-135	Apr-17		0.003	0.00994			0.000633 J		<0.1	0.00027 J	0.000848 JB			0.0402		
	MW-135	Apr-18		0.00335	0.00908			0.00103 J		0.0191 JB	0.000295 J	0.00153 J			0.0275		
	RW-12R	Apr-16		<0.00250	0.0398 J			0.0149 JB		<0.150	0.0031 J	**0.489**			<0.00740		
	RW-12R	Apr-17		0.000617 J	0.041			0.023		<0.1	0.000776 J	**0.425**			0.00072 JB		
	RW-12R	Apr-18		<0.00125	0.0341			0.00339 J		<0.0750	<0.00120	**0.760**			<0.00190		
	RW-13R	Apr-16		0.0089 J	0.0888			<0.00270		0.47 J	<0.00120	**1.36**			<0.00190		
	RW-18	Apr-14		0.00353 J	0.0108			<0.00200		<0.156	<0.00140	<0.00500			0.00964 J		
	RW-18	Apr-16		0.00399	0.00975			0.000707 J		<0.0150	<0.00024	0.00112 J			0.00511 B		
	RW-18	Apr-17		0.00331	0.0105			<0.002		0.02 J	<0.002	0.00103 J			0.0034		
	RW-18A	Apr-18		0.00355	0.0118			<0.000540		<0.0150	<0.000240	0.00395 J			0.00389		
	RW-20	Apr-15		0.00171 J	0.464			<0.00054		0.27	<0.00024	**0.717**			0.00488		
	RW-22	Apr-15		<0.00250	0.802			<0.00540		0.394 J	0.00305 J	**0.886**			0.0326		
North Refinery	MW-23	Apr-15		**0.0206**	0.215			0.000653 J		0.156	0.000295 J	**0.203**			0.000997 J		
	MW-23	Apr-16		0.00911	**10.9**			0.000955 J		0.0206 J	0.000319 J	0.0697			0.00164 JB		
	MW-23	Apr-17		0.00644	**9.68**			0.000654 J		<0.1	0.000731 J	0.0673			0.0033		
	MW-23	Apr-18		0.00502	**9.89**			0.000579 JB		0.0160 J	0.000791 J	0.0741			0.000725 J		
	MW-29	Apr-15		0.000886 J	0.0185			<0.00054		<0.0150	<0.00024	**0.378**			0.00432		
	MW-29	Apr-16		<0.00125	0.021 J			<0.00270		0.185 J	<0.00120	**0.487**			<0.00190		
	MW-29	Apr-17		0.000531 J	0.0173			<0.002		<0.1	<0.002	**0.451** V			<0.002		
	MW-29	Apr-18		0.00138 J	0.0197			0.00128 JB		0.0666 J	<0.000240	**0.474**			<0.000380		
	MW-39	Apr-15		0.00174 J	0.0226			<0.00054		<0.0150	0.000389 J	0.191			0.00533		
	MW-39	Apr-16		**0.0176**	0.0192 J			<0.00270		<0.075	<0.00120	0.0166 J			0.00222 J		
	MW-39	Apr-17		**0.0134**	0.0206			0.000959 J		<0.1	0.000354 J	0.012			0.00316		
	MW-39	Apr-18		**0.0105**	0.0190			<0.000540		<0.0150	0.000243 J	0.0186			<0.000380		
	MW-40	Apr-15		0.000999 J	0.027			<0.00054		0.2	<0.00024	0.0375			0.000388 J		
	MW-40	Apr-16		0.000937 J	0.0253			<0.00054		<0.0150	<0.00024	0.0214			0.00176 JB		
	MW-40	Apr-17		0.00103 J	0.0255			<0.002		<0.1	<0.002	0.0249			<0.002		
	MW-40	Apr-18		0.00213	0.0247			0.0314		0.143	0.00213	0.0190			0.00164 J		
	MW-41	Apr-15		0.00448	0.0152			<0.00054		0.0163 J	<0.00024	**0.791**			<0.00038		
	MW-41	Apr-16		0.00459	0.0177			<0.00054		0.0198 J	<0.00024	**0.740**			0.00129 JB		
	MW-41	Apr-17		0.00393	0.0145			<0.002		<0.1	<0.002	**0.790**			0.00126 J		
	MW-41	Apr-18		0.00774	0.0206			0.00773		0.0416 J	0.000558 J	**0.996**			0.000464 J		
	MW-42	Apr-15		0.0074	0.023			0.00079 J		0.142	0.000322 J	0.152			0.000534 J		
	MW-42	Apr-16		0.00492	0.0204			<0.00054		0.0401 J	<0.00024	0.137			0.00121 JB		
	MW-42	Apr-17		0.00487	0.0179			<0.002		0.0328 J	0.000254 J	0.18			0.00156 J		
	MW-42	Apr-18		0.00531	0.0204			0.000739 JB		<0.0150	0.000575 J	0.118			0.000448 J		
	MW-43	Apr-15		**0.0114**	0.25			<0.00054		<0.0150	<0.00024	**0.374**		0.00384	0.000428 J		0.000695 J
	MW-43	Apr-16		**0.0128**	0.0745	**1.65**	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	**0.290**	<4.9E-05	0.00561 JB	0.0067 J	<0.00165	0.00283 J
	MW-43	Apr-17		**0.0107**	0.0928	**1.2**	<0.001	<0.002	<0.002	0.017 J	<0.002	0.191	<0.0002	0.00955	0.00152 J	<0.01	0.00185 JB
	MW-43	Apr-18		**0.0121**	0.195	**1.29**	<0.000160	<0.000540	<0.000260	<0.0150	0.000387 JB	0.148	<0.0000490	0.00629	0.00150 J	<0.000330	0.00143 J
	MW-59	Apr-15		**0.0177**	0.0137 J			<0.00054		0.126	<0.00120	**0.427**			0.00859 J		
	MW-59	Apr-16		**0.0145**	0.0221 J			<0.00270		0.121 J	<0.00120	**0.466**			<0.00190		
	MW-59	Apr-17		**0.026**	0.021			<0.002		0.0343 J	<0.002	**0.468**			0.000557 JB		
	MW-59	Apr-18		**0.0223**	0.0246			<0.000540		0.0876 JB	0.000405 JB	**0.427**			<0.000380		
	MW-60	Apr-15	FD	0.0016 J	0.0177			<0.00054		0.127	0.000283 J	**0.349**		0.000977 J			
	MW-60	Apr-15		**0.0171** J	0.026 J			<0.00054		0.116 J	0.000316 J	**0.321**		0.000587 J	0.047 J		0.000471 J
	MW-60	Apr-16	FD	0.00871 J	0.0169 J	0.431	<0.00080	<0.00270	<0.0013	0.17 J	<0.00120	**0.339**	<4.9E-05	<0.00175	<0.00190	0.00239 J	0.00129 J
	MW-60	Apr-16		0.00902 J	0.0184 J	0.439	<0.00080	<0.00270	<0.0013	0.139 J	<0.00120	**0.333**	<4.9E-05	<0.00175	<0.00190	0.00241 J	<0.00090
	MW-60	Apr-17	FD	0.00763	0.0183	0.352	<0.001	<0.002	<0.002	0.027 J	<0.002	**0.308**	<0.0002	<0.002	<0.002	0.00218 J	0.000755 JB
	MW-60	Apr-17		0.00888	0.0171	0.378	<0.001	<0.002	<0.002	0.0207 J	<0.002	**0.31**	<0.0002	<0.002	0.000813 JB	0.00218 J	0.000538 JB
	MW-60	Apr-18		0.00496	0.0192	0.526	<0.000160	<0.000540	<0.000260	0.0194 JB	0.000505 JB	**0.274**	<0.0000490	0.000576 J	<0.000380	0.00203 J	0.000221 J
	MW-60	Apr-18	FD	0.00472	0.0201	0.514	<0.000160	0.00120 JB	<0.000260	0.0837 J	0.000771 J	**0.292**	<0.0000490	0.00124 J	<0.000380	0.00209 J	0.000377 J
	MW-61	Apr-15		0.00381	0.0442			<0.00054		<0.0150	<0.00024	0.0047 J			0.000496 J		
	MW-61	Apr-16		<0.00125	0.0205 J			<0.00270		0.103 J	<0.00120	0.062			<0.00190		
	MW-61	Apr-17		0.000757 J	0.0204			<0.002		<0.1	0.000747 J	0.0367			0.0188		
	MW-61	Apr-18		0.00185 J	0.0307			0.00112 J		0.0155 JB	0.00192 JB	0.0183			<0.000380		
	MW-62	Apr-15		**0.0110**	**9.93**			0.000662 J		<0.0150	0.000487 J	0.0688			0.000755 J		
	MW-62	Apr-16		0.00286 J	0.0329			<0.00270		0.152 J	<0.00120	0.00388 JB			0.00392 J		
	MW-62	Apr-17		0.00302	0.0239			<0.002		<0.1	<0.002	0.00371 J			0.0172		
	MW-62	Apr-18		0.00834	0.0403			<0.000540		<0.0150	0.000347 JB	0.00427 J			0.000514 J		
	MW-67	Apr-15		0.00402	0.129			<0.00054		0.0443 J	0.00062 J	0.0816		0.00369	<0.00038		0.000753 J
	MW-67	Apr-16		**0.0110**	0.231	0.458	<0.00080	<0.00270	<0.0013	0.156 J	<0.00120	0.133	<4.9E-05	0.00267 J	0.00609 J	<0.00165	0.002830 J
	MW-67	Apr-17		**0.0163**	0.118	0.436	<0.001	0.000587 J	<0.002	<0.1	0.000542 J	0.091	<0.0002	0.00158 J	0.00205	<0.01	0.000929 JB
	MW-67	Apr-18		0.00676	0.0921	0.470	<0.000160	0.000938 J	<0.000260	<0.0150	0.000391 J	0.0930	<0.0000490	0.000912 J	<0.000380	<0.000330	0.000590 J
	MW-90	Apr-15		0.00775	0.0207			0.000646 J		0.187	<0.00024	**0.338**			0.00101 J		
	MW-90	Apr-16		0.00739 J	0.0116 J			<0.00270		<0.075	<0.00120	0.158			0.00584 J		
	MW-90	Apr-17		0.00507	0.0148			<0.002		0.0528 J	<0.002	0.144			0.000711 J		
	MW-90	Apr-18		0.00225	0.0166			<0.000540		<0.0150	<0.000240	0.0330			0.000611 J		
	MW-91	Apr-15		0.00974	0.0899			<0.00054		0.0216 J	0.00281	0.00489 J			<0.00038		
	MW-91	Apr-16		0.00741 J	0.065 O1			<0.00270		<0.075	0.00386 J	0.00359 J			<0.00740 J3J6		
	MW-91	Apr-17		0.00818	0.0523			<0.00054		<0.015	0.00238	0.00165 J			<0.0038		
	MW-91	Apr-18		0.00616	0.0432			0.00125 J		<0.0150	0.00312	0.00285 J			0.000491 J		
	MW-92	Apr-16		0.00285 J	**3.57**			<0.00270		0.217 J	<0.00120	0.0349			<0.00190		
	MW-92	Apr-17		0.00818	0.0523			<0.002		<0.1	0.00238	0.00165 J			<0.002		
	MW-93	Apr-15		**0.0124**	0.0327			0.00341		0.0375 J	0.000293 J	**0.215**			0.00468		
	MW-93	Apr-16		0.01	0.0197			0.00692		0.219	0.000301 J	0.054			0.018		
	MW-93	Apr-17		0.00375	0.021			0.00235		0.0197 J	0.000486 J	0.0255			0.0145		
	MW-93	Apr-18		0.00554	0.0288			0.00278		<0.0150	0.000746 JB	0.0282			0.00375		
	MW-94	Apr-16		**0.0163**	0.356			<0.00270		<0.075	<0.00120	0.00601 J			0.0334		
	MW-94	Apr-17		**0.0106**	0.771			0.00124 J		<0.1	0.000343 J	0.00235 J			0.00973		
	MW-95	Apr-15		0.00134 J	0.0681			<0.00054		0.0255 J	<0.00024	0.0368			<0.00038		
	MW-95	Apr-16		0.00164 J	0.0732			<0.00270		<0.075	<0.00120	0.0269			0.00486 J		
	MW-95	Apr-17		0.00162 J	0.0592			<0.002		<0.1	0.000323 J	0.0285			0.00164 J		
	MW-95	Apr-18		0.00135 J	0.0690			<0.000540		<0.0150	<0.000240	0.0559			0.000786 J		
	MW-96	Apr-15		0.00499	0.113			0.000705 J		0.0345 J	<0.00024	0.00338 J			0.000787 J		
	MW-96	Apr-16		0.00429 J	0.141			<0.00270		<0.075	<0.00120	0.00127 J			0.0033 J		
	MW-96	Apr-17		0.00326	0.119			<0.002		<0.1	<0.002	0.00148 J			0.000546 J		
	MW-96	Apr-18		0.00269	0.121			<0.000540		<0.0150	<0.000240	0.000674 J			<0.000380		
	MW-98	Apr-15		0.00139 J	0.0151			<0.00054		<0.0150	0.00908	0.0259			0.000446 J		
	MW-98	Apr-16		0.00153 J	0.0164			0.00107 J		<0.0150	0.00629	0.0222			0.00216 B		
	MW-98	Apr-17		0.00164 J	0.0157			<0.002		<0.1	0.00758	0.0242			<0.002		
	MW-98	Apr-18		0.000942 J	0.0273			0.00591		0.0464 JB	0.00903	0.0255			0.000756 J		
	MW-137	Apr-16		**0.0671**	0.0397	**0.76**	<0.000160	0.00081 J	<0.00026	<0.0150	0.00429	0.103	<4.9E-05	0.00729	0.00345 B	<0.00033	0.00646
	MW-137	Apr-17		**0.052**	0.0518	0.7	<0.001	<0.002	<0.002	<0.1	0.00355	0.124	<0.0002	0.0079	0.00196 J	<0.01	0.00537
	MW-137	Apr-18		**0.0491**	0.0727	**0.973**	<0.000160	<0.000540	<0.000260	<0.0150	0.00404	0.147	<0.000490	0.0110	0.00248	<0.000330	0.00694
	MW-138	Apr-16		0.0062	0.169	**1.08**	<0.000160	<0.00054	<0.00026	0.0158 J	<0.00024	0.128	<4.9E-05	0.00484	0.00157 JB	<0.00033	0.00403 J
	MW-138	Apr-17		0.00553	0.129	**0.945**	<0.001	<0.002	<0.002	<0.1	<0.002	0.105	<0.0002	0.00484	0.000432 J	<0.01	0.00246 J
	MW-138	Apr-18		0.00517	0.133	**0.955**	<0.000160	<0.000540	<0.000260	<0.0150	<0.000240	0.111	<0.0000490	0.00593	<0.000380	<0.000330	0.00128 J
	RW-1	Apr-15		0.00426	0.0301			0.00131 J		0.0744 J	0.000323 J	0.118			0.00136 J		
	RW-1R	Apr-16		0.00435 J	0.0367			<0.00270		**11.3**	<0.00120	**0.301**			<0.00190		
	RW-1	Apr-17		**0.0234**	0.0229			0.00338		0.184	<0.002	**0.218**			0.00286		
	RW-1	Apr-18		0.00532	0.0308			0.000552 J		0.0584 J	0.000322 J	0.0124			0.00122 J		
	RW-2	Apr-15		**0.0194**	0.0174			0.00494		0.0471 J	0.000546 J	**0.285**			0.00133 J		
	RW-2R	Apr-16		0.00883 J	0.0206 J			0.004 JB		0.770	<0.00120	0.0466			0.00516 J		
	RW-2	Apr-17		0.0023	0.053			0.00131 J		0.020 J	0.000647 J	0.0157			0.0364		
	RW-2	Apr-18		0.00314	0.131			0.000882 J		<0.0150	0.000739 JB	0.0203			0.000515 J		
	RW-7	Apr-15		0.00249	0.404			0.000879 J		<0.0150	0.000482 J	0.0266			0.0165		
	RW-7R	Apr-16		**0.0136**	0.0303			<0.00270		0.509	<0.00120	**1.25**			0.00396 J		
	RW-7	Apr-17		0.00273	0.0191			<0.002		0.0228 J	<0.002	**1.12**			0.00142 J		
	RW-7	Apr-18		0.00798	0.138			0.00243 B		0.0450 J	<0.000240	0.0650			0.000791 J		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	WQCC Irr	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
North Refinery	RW-8	Apr-15		0.00521	0.0797			<0.00054		0.163	0.000591 J	0.0744			<0.00038		
	RW-8	Apr-17		**0.0346**	0.0661			<0.002		**2.13**	<0.002	**1.14**			<0.002		
	RW-9	Apr-15		0.00358	0.0468			<0.00054		0.179	0.000454 J	**0.501**			0.000418 J		
	RW-9	Apr-16		0.00328 J	0.0453			<0.00270		<0.075	<0.00120	**0.397**			<0.00190		
	RW-9	Apr-17		0.00324	0.0415			<0.002		<0.1	0.000371 J	**0.745**			<0.002		
	RW-9	Apr-18		0.00305	0.0452			0.000544 JB		<0.0150	0.000890 J	**0.511**			0.000670 J		
	RW-10	Apr-15		0.00177 J	0.0275			<0.00054		0.0573 J	<0.00024	**0.250**			0.00598		
	RW-10	Apr-16		<0.00125	0.0324			<0.00270		0.0776 J	<0.00120	**0.237**			0.0121		
	RW-10	Apr-17		0.0018 J	0.0184			<0.002		<0.1	<0.002	0.18			0.000631 JB		
	RW-10	Apr-18		0.00191 J	0.0220			<0.000540		<0.0150	0.000521 J	0.181			<0.000380		
	RW-16	Apr-15		**0.0133**	0.0143			0.00101 J		0.0234 J	0.000255 J	**0.400**			0.00931		
	RW-16	Apr-16		**0.0122**	0.0126 J			<0.00270		<0.075	<0.00120	**0.379**			0.00842 J		
	RW-16	Apr-17		**0.0133**	0.0126			0.000989 J		<0.1	<0.002	**0.264**			0.00535		
	RW-16	Apr-18		0.00858	0.0130			0.000761 JB		<0.0150	<0.000240	0.194			0.00691		
	RW-17	Apr-15		0.00838	0.0211			0.000835 J		<0.0150	0.00228	0.0992			0.0393		
	RW-17	Apr-16		0.00847 J	0.0228 J			<0.00270		<0.075	0.0065 J	**0.652**			0.0133		
	RW-17	Apr-17		**0.0109**	0.0213			<0.002		<0.1	0.00763	**0.711**			0.00945		
	RW-17	Apr-18		**0.0102**	0.0217			0.000940 J		<0.0150	0.00688	**0.748**			0.00305		
North RO Reject Field	MW-117	Apr-14		0.00328 J	<0.000900 B			<0.00100		<0.0780	<0.00070	0.0204			0.00425 J		
	MW-117	Apr-15		0.00241	0.00887			0.000697 J		0.0963 J	<0.00024	0.0016 J			0.0166		
	MW-117	Apr-16		0.0026 J	0.00993 J			<0.00270		<0.075	<0.00120	<0.00125			0.00912 J		
	MW-117	Apr-17		0.0024	0.0095 B			<0.002		<0.1	0.00033 J	0.0026 JB			0.00439		
	MW-117	Apr-18		0.00176 J	0.00815			0.000583 J		0.0309 J	0.000252 J	0.00132 J					
	MW-118	Apr-14		0.00974	<0.000900 B			<0.00100		<0.0780	<0.00070	0.0121			0.00108 J		
	MW-118	Apr-15		0.00984	0.00952			0.00131 J		0.0698 J	<0.00024	0.00169 J			0.00799		
	MW-118	Apr-16		**0.011**	0.00885 J			<0.00270		<0.075	<0.00120	<0.00125			0.00607 J		
	MW-118	Apr-17		**0.0104**	0.0091 B			<0.002		<0.1	0.000324 J	<0.005			0.0236		
	MW-118	Apr-18		0.00818	0.00656			0.00117 J		<0.0150	<0.000240	0.000531 J			0.00696		
	MW-119	Apr-14	FD	0.00461 J	<0.000900 B			<0.00100		<0.0780	<0.00070	<0.00250			0.00402 J		
	MW-119	Apr-14		0.00468 J	<0.000900 B			<0.00100		<0.0780	<0.00070	<0.00250			0.00393 J		
	MW-119	Apr-15		0.00374	0.00758			0.000834 J		0.262	<0.00024	0.00863			<0.00038		
	MW-119	Apr-16		0.00338 J	0.00748 J			<0.00270		<0.075	<0.00120	<0.00125			0.00271 J		
	MW-119	Apr-17		0.00382	0.0103			<0.002		<0.1	<0.002	0.00177 JB			0.00434		
	MW-119	Apr-18		0.00300	0.00773			<0.000540		<0.0150	0.000254 J	0.00159 J			0.00299		
NCL	MW-18	Apr-15		0.0035	0.0171			0.00131 J		0.0182 J	<0.00024	0.00643		0.00135 J	0.0129		0.0157	
	MW-18	Apr-16		0.00307 J	0.0146 J	**1.35**	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.00725 J	<4.9E-05	<0.00175	0.02	**0.0405** J	0.0177 J	
	MW-18	Apr-17		0.00373	0.0211	**1.5**	<0.001	0.00176 JB	0.000362 J	<0.1	<0.002	0.00248 J	<0.0002	0.00198 JB	0.0155	0.0242	0.0198	
	MW-18	Apr-18		0.00297	0.0148	**1.39**	<0.000160	0.0156	<0.000260	0.113 B	<0.000240	0.00722	<0.0000490	0.00204	0.0155	**0.0403**	0.0177	
	MW-45	Apr-15		0.00359	0.0174			<0.00054		0.790	<0.00024	**0.526**		0.00635	0.000904 J		0.00028 J	
	MW-45	Apr-16		0.00368 J	0.0185 J	0.596	<0.00080	<0.00270	<0.0013	**1.25**	<0.00120	**0.561**	<4.9E-05	0.00391 J	<0.00190	<0.00165	0.0010 J	
	MW-45	Apr-17		0.00343	0.0174	0.549	<0.001	<0.002	<0.002	0.153	<0.002	**0.572**	<0.0002	0.00333	0.000382 J	0.0011 J	0.0003 J	
	MW-45	Apr-18		0.00359	0.0158	0.631	<0.000160	<0.000540	<0.000260	0.734	0.000338 J	**0.474**	<0.0000490	0.00433	0.000617 J	0.00110 J	0.000441 J	
	MW-53	Apr-15		0.00167 J	0.0212			<0.00054		<0.0150	<0.00024	**0.797**			0.00627			
	MW-53	Apr-16		0.00166 J	0.0246 J			<0.00270		<0.075	<0.00120	**0.605**			0.00498 J			
	MW-53	Apr-17		0.00162 J	0.021			<0.002		<0.1	<0.002	**1.5**			0.00293			
	MW-53	Apr-18		0.00144 J	0.0197			<0.000540		<0.0150	<0.000240	**0.437**			0.00109 J			
	MW-54A	Apr-15		0.00289	0.0178			<0.00054		<0.0150	<0.00024	**0.461**			0.0029			
	MW-54A	Apr-16		0.00314 J	0.0175 J			<0.00270		0.354 J	<0.00120	**0.477**			<0.00190			
	MW-54A	Apr-17		0.00274	0.0164			<0.002		<0.1	<0.002	**0.45**			<0.002			
	MW-54A	Apr-18		0.00347	0.0166			<0.000540		0.0258 J	0.000275 J	**0.525**			0.000398 J			
	MW-54B	Apr-13		<0.00500	0.0157			<0.00500		<0.200	<0.00500	0.138			<0.00500			
	MW-54B	Apr-15		0.00205	0.015			<0.00054		0.0456 J	<0.00024	0.164			0.00289			
	MW-54B	Apr-17		0.00173 J	0.0168			<0.002		<0.1	<0.002	**0.246**			0.000795 J			
	MW-55	Apr-15		0.00452	0.00832			0.00119 J		<0.0150	<0.00024	0.0421		0.00209	0.023		0.0141	
	MW-55	Apr-16		0.00504 J	0.011 J	**1.26**	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.0251	<4.9E-05	0.00242 J	0.0134	**0.0445** J	0.0187 J	
	MW-55	Apr-17		0.0056	0.0136	**0.756**	<0.001	<0.002	<0.002	<0.1	<0.002	0.0235	<0.0002	0.0054	0.00494	**0.0395**	0.0190	
	MW-55	Apr-18		0.00562	0.0120	**1.50**	<0.000160	<0.000540	<0.000260	<0.0150	<0.000240	0.114	<0.0000490	0.00608	0.00365	**0.0518**	0.0189	
	MW-56	Apr-15		0.00709	0.0136			<0.00054		<0.0150	0.000483 J	**0.286**			0.00334			
	MW-56	Apr-16		0.00737 J	0.0158 J			<0.00270		0.112 J	0.00132 J	**0.331**			0.00369 J			
	MW-56	Apr-17		0.00665	0.0174			<0.002		<0.1	0.000369 J	**0.339**			0.00306			
	MW-56	Apr-18		0.00638	0.0139			0.000557 JB		<0.0150	0.000333 J	**0.305**			0.000537 J			
	MW-108	Apr-15		0.00343	0.0299			0.00223		<0.0150	0.00105 J	0.0224			0.0184			
	MW-108	Apr-16		0.00281 J	0.0408			<0.00270		0.154 J	0.00173 J	0.0367			<0.00190			
	MW-108	Apr-17		0.00283	0.0428			0.000655 JB		<0.1	0.000859 J	0.0443			<0.002			
	MW-108	Apr-18		0.00287	0.0467			0.00517 B		0.0524 JB	0.00141 J	0.0347			0.000610 J			
	NCL-31	Apr-15		0.00908	0.0141			<0.00054		0.731	0.000439 J	**1.59**			0.00311			
	NCL-31	Apr-16		0.00599 J	0.0178 J			<0.00270		0.866	<0.00120	**1.90**			<0.00190			
	NCL-31	Apr-17		0.00727	0.017			<0.002		<0.1	<0.002	**2.35**			0.000414 J			
	NCL-31	Apr-18		**0.0115**	0.0141			0.00103 JB		0.899	<0.000240	**2.04**			<0.000380			
	NCL-32	Apr-15		0.00262	0.0355			0.0012 J		0.42	0.000769 J	**0.878**			<0.00038			
	NCL-32	Apr-16		0.00412 J	0.0632			0.00772 J		**1.65**	0.00736 J	**1.32**			<0.00190			
	NCL-32	Apr-17		0.00306	0.019			<0.002		<0.1	<0.002	**0.994**			0.00116 J			
	NCL-32	Apr-18		0.00327	0.0189			0.00348 B		0.0315 JB	0.000265 J	**0.954**			0.00189 J			
	NCL-33	Apr-15		0.00311	0.0223			<0.00054		**1.49**	<0.00024	0.104			0.000538 J			
	NCL-33	Apr-16		0.00228 J	0.0202 J			<0.00270		0.134 J	<0.00120	0.146			0.0156			
	NCL-33	Apr-17		0.00153 J	0.0217			<0.002		0.0173 J	<0.002	0.141			0.000812 J			
	NCL-33	Apr-18		0.00221	0.0217			<0.000540		0.695	<0.000240	0.117			0.000554 J			
	NCL-34A	Apr-15		0.000947 J	0.492			<0.00054		<0.0150	<0.00024	0.0338			<0.00038			
	NCL-34A	Apr-16		<0.00125	0.616			<0.00270		<0.075	<0.00120	0.0172 J			0.00268 J			
	NCL-34A	Apr-17		0.000865 J	0.493			<0.002		<0.1	<0.002	0.0171			0.000444 J			
	NCL-34A	Apr-18		0.000682 J	0.472			<0.000540		<0.0150	<0.000240	0.0224			<0.000380			
	NCL-44	Apr-15		**0.0536**	0.0256			<0.00054		**1.37**	<0.00024	**0.663**			<0.00038			
	NCL-44	Apr-16		**0.0362**	0.0257			<0.00270		**1.33**	<0.00120	**0.938**			<0.00190			
	NCL-44	Apr-17		**0.0279**	0.0281			<0.002		0.0169 J	<0.002	**0.895**			<0.002			
	NCL-44	Apr-18		**0.0310**	0.0234			<0.000540		0.828	<0.000240	**0.887**			<0.000380			
	NCL-49	Apr-15	FD	0.00152 J	0.0102			<0.00054		<0.0150	<0.00024	<0.000250			0.00364			
	NCL-49	Apr-15		0.00145 J	0.0104			<0.00054		0.0227 J	<0.00024	0.000312 J			0.00471			
	NCL-49	Apr-16	FD	0.00155 J	0.0143 J			<0.00270		<0.075	<0.00120	<0.00125			0.00471 J			
	NCL-49	Apr-16		0.00163 J	0.0136 J			<0.00270		0.204 J	<0.00120	0.00168 J			0.00498 J			
	NCL-49	Apr-17	FD	0.00145 J	0.0133			<0.002		<0.1	<0.002	<0.005			0.00921			
	NCL-49	Apr-17		0.00143 J	0.0123			<0.002		<0.1	<0.002	<0.005			0.00904			
	NCL-49	Apr-18		0.00167 J	0.0126			<0.000540		<0.0150	0.000260 J	0.00138 J			0.0115			
	NCL-49	Apr-18	FD	0.00149 J	0.0127			<0.000540		<0.0150	<0.000240	0.00114 J			0.0122			
South Refinery	KWB-2R	Apr-15		0.00249	0.273			<0.00054		0.216	0.000989 J	**0.419**			0.000612 J			
	KWB-2R	Apr-16		0.00506 J	0.0278			<0.00270		**1.17**	<0.00120	**0.863**			<0.00190			
	KWB-2R	Apr-17		0.00326	0.0234			<0.002		0.517	0.000733 J	**0.665**			<0.002			
	KWB-5	Apr-15		**0.0227**	**3.64**			<0.00054		**3.64**	0.000353 J	**1.74**			<0.00038			
	KWB-5	Apr-16		**0.0237**	**3.61**			<0.00270		**4.22**	<0.00120	**1.85**			<0.00190			
	KWB-5	Apr-17		**0.0214**	**3.27**			<0.002		<0.1	<0.002	**1.89**			0.000873 J			
	KWB-5	Apr-18		**0.0152**	**3.15**			0.00359		**1.89**	<0.000240	**1.14**			<0.000380			
	KWB-6	Apr-15		0.00581	0.293			<0.00054		0.629	0.00116 J	**2.18**			<0.00038			
	KWB-6	Apr-16		0.00454	0.245			<0.00054		0.332	0.000729 J	**2.13**			0.00226 B			
	KWB-6	Apr-17		0.00449	0.14			<0.002		<0.1	<0.002	**1.98**			0.00045 J			
	KWB-6	Apr-18		0.00437	0.0911			<0.000540		0.103	0.000429 J	**1.51**			<0.000380			
	MW-28	Apr-15		**0.013** J	0.0644 J			0.000923 J		0.0283 J	0.012	0.0647		0.00417	**0.0699** J		0.00527	
	MW-28	Apr-16		**0.0116**	0.0685	**1.15**	<0.00080	<0.00270	<0.0013	<0.075	0.00812 J	0.0342	<4.9E-05	0.00599 J	<0.00190	<0.00165	0.00371 J	
	MW-28	Apr-17		**0.0137**	0.0543	**1.38**	<0.001	<0.002	<0.002	<0.1	0.00539	0.0603	<0.0002	0.00259	0.000569 J	0.000332 J	0.00198 J	
	MW-28	Apr-18		0.00632	0.0625	**1.27**	<0.000160	<0.000540	<0.000260	0.0591 JB	0.00618	0.0349	<0.0000490	0.00445	<0.000380	0.000368 J	0.00160 J	

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals
2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	WQCC Irr	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
South Refinery	MW-48	Apr-15		0.00412	0.58 J			0.000777 J		0.255	0.00139 J	**0.242** J			0.00302 J		
	MW-48	Apr-16		0.00857 J	**2.64**			<0.00270		<0.075	0.00134 J	**0.402**			0.00321 J		
	MW-48	Apr-17		0.00737	**2.54**			0.000562 J		<0.1	0.000434 J	**0.214**			**0.0553**		
	MW-48	Apr-18		0.00747	**1.97**			<0.000540		<0.0150	0.000847 J	0.154			0.000669 J		
	MW-50	Apr-15		0.00146 J	0.0223			<0.00054		0.0396 J	0.00067 J	**1.62**			<0.00038		
	MW-50	Apr-16		0.00273 J	0.0143 J			<0.00270		0.104 J	<0.00120	**0.276**			**0.0837**		
	MW-50	Apr-17		0.00213	0.013			<0.002		<0.1	<0.002	**0.549**			0.0427		
	MW-50	Apr-18		0.00326	0.0128			<0.000540		0.165	<0.000240	**1.01**			0.00415		
	MW-52	Apr-15		0.00397	0.00909			<0.00054		<0.0150	<0.00024	0.0341		0.00635	0.00124 J		0.0268
	MW-52	Apr-16		0.0037 J	0.00904 J	0.749	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.035	<4.9E-05	0.00641 J	<0.00190	0.00809 J	0.026
	MW-52	Apr-17		0.00361	0.0106	0.639	<0.001	<0.002	0.000377 J	<0.1	<0.002	0.042	<0.0002	0.00519	0.00222 B	0.00963 J	0.0269
	MW-52	Apr-18		0.00390	0.0114	0.724	<0.000160	<0.000540	0.000509 J	<0.0150	0.000369 J	0.0472	<0.0000490	0.00721	0.00412	0.01120	0.0280
	MW-64	Apr-16		**0.0321**	**2.24**			<0.00270		<0.075	<0.00120	0.0624			0.00232 J		
	MW-64	Apr-17		**0.0382**	**1.88**			<0.002		<0.1	<0.002	0.0479			0.000431 J		
	MW-64	Apr-18		**0.0391**	**2.32**			<0.000540		<0.0150	0.000331 J	0.0656			0.000382 J		
	MW-65	Apr-15		**0.0202**	**3.38**			<0.00054		**2.64**	0.000681 J	**0.814**			0.000425 J		
	MW-65	Apr-16		**0.0128**	**3.3**			<0.00270		**2.03**	<0.00120	**0.750**			0.00698 J		
	MW-65	Apr-17		**0.0107**	**2.81**			<0.002		0.124	<0.002	**0.547**			<0.002		
	MW-65	Apr-18		**0.0108**	**2.75**			0.00329		**1.52**	0.000368 J	**0.559**			<0.000380		
	MW-66	Apr-15		0.00297	**2.17**			<0.00054		0.549	<0.00024	**0.201**		0.00565	<0.00038		0.000494 J
	MW-66	Apr-16		0.00279 J	**2.37**	0.321	<0.00080	<0.00270	<0.0013	0.715	<0.00120	**0.224**	<4.9E-05	0.00421 J	<0.00190	<0.00165	0.00166 J
	MW-66	Apr-17		0.0024	**2.49**	0.287	<0.001	<0.002	<0.002	0.117	<0.002	**0.202**	<0.0002	0.00386	<0.002	<0.01	0.000408 J
	MW-66	Apr-18		0.00247	**2.18**	0.306	<0.000160	<0.000540	<0.000260	0.683	0.000405 JB	**0.277**	<0.0000490	0.00666	<0.000380	<0.000330	0.000478 J
	MW-99	Apr-15		0.00305	0.155			<0.00054		0.317	0.002 J	0.0828			0.000714 J		
	MW-99	Apr-16		0.00883 J	0.981			<0.00270		<0.075	<0.00120	**0.236**			<0.00190		
	MW-99	Apr-17		0.00811	0.339			<0.002		<0.1	<0.002	**0.262**			0.000416 J		
	MW-99	Apr-18		0.00813	0.323			<0.000540		<0.0150	0.000684 JB	**0.233**			<0.000380		
	MW-101	Apr-15		**0.0767**	0.0565			<0.00054		**2.20**	<0.00024	**1.13**			0.000395 J		
	MW-101	Apr-16		**0.021**	0.0758			0.000621 J		**1.11**	<0.00024	**1.09**			0.00105 JB		
	MW-101	Apr-17		**0.0509**	0.0725			<0.002		0.0151 J	<0.002	**1.14**			<0.002		
	MW-101	Apr-18		**0.0700**	0.0506			<0.000540		**1.89**	<0.000240	**1.18**			<0.000380		
	MW-102	Apr-15		**0.0102**	**6.52**			<0.00054		0.078 J	0.00273 J	0.0433			0.0031		
	MW-102	Apr-16		**0.0109**	**7.68**			<0.00270		0.100 J	0.00205 J	0.0321			0.00549 J		
	MW-102	Apr-17		**0.013**	**5.01**			0.000792 J		0.021 J	0.00177 J	0.0252			0.000638 J		
	MW-102	Apr-18		**0.0139**	**5.87**			0.00158 J		0.146 B	0.00227	0.0315			0.000441 J		
	MW-103	Apr-15		0.00491	**8.03**			<0.00054		<0.0150	0.000809 J	0.00848			0.000642 J		
	MW-103	Apr-16		0.00489 J	**21.4**			<0.00270		<0.075	<0.00120	0.0227 J			<0.00190		
	MW-103	Apr-17		0.00797	**6.62**			<0.002		<0.1	**<0.2**	0.00621			<0.002		
	MW-103	Apr-18		0.00564	**3.80**			0.000882 J		<0.0150	0.00107 J	0.00187 J			<0.000380		
	MW-104	Apr-15	FD	0.000422 J	0.0182			<0.00054		<0.0150	<0.00024	0.0213			<0.00038		
	MW-104	Apr-15		0.000481 J	0.0212			<0.00054		0.0279 J	<0.00024	0.0222			0.000603 J		
	MW-104	Apr-16	FD	0.00158 J	0.0241			0.000672 J		<0.0150	<0.00024	0.00789			0.00352 B		
	MW-104	Apr-16		0.00181 J	0.0242			0.000747 J		<0.0150	0.00482	0.00779			**0.156** O1		
	MW-104	Apr-17	FD	**0.0578**	0.0448			<0.002		<0.1	<0.002	0.000952 J		<0.002			
	MW-104	Apr-17		**0.054**	0.044			<0.002		<0.1	<0.002	0.00112 J		<0.002			
	MW-104	Apr-18		**0.0209**	0.0358			0.00115 J		0.0187 JB	<0.000240	0.00414 J			<0.000380		
	MW-104	Apr-18	FD	**0.0205**	0.0322			0.000578 J		<0.0150	<0.000240	0.00432 J			<0.000380		
	MW-105	Apr-15		0.00829	0.114			0.000786 J		**2.07**	0.00032 J	0.111			0.00103 J		
	MW-105	Apr-16		**0.0139**	**1.22**			<0.00270		<0.075	<0.00120	0.188			0.00327 J		
	MW-105	Apr-17		**0.0142**	**2.85**			0.00138 J		0.0193 J	0.000346 J	0.0622			**0.0563**		
	MW-105	Apr-18		**0.0160**	0.944			0.00192 J		0.0327 JB	0.000440 JB	0.165			<0.000380		
	MW-106	Apr-15		0.00361	0.0936			<0.00054		0.172	0.00129 J	0.146			0.00795		
	MW-106	Apr-16		**0.0112**	0.0323			<0.00270		<0.075	0.00207 J	0.00654 J			0.0103		
	MW-106	Apr-17		**0.012**	0.0269			0.00107 J		<0.1	0.0011	0.00711			0.000512 J		
	MW-106	Apr-18		**0.0143**	0.0321			0.00245		0.0232 JB	0.00198 J	0.00685			0.00459		
	MW-107	Apr-15		0.01	**1.53** J			0.000581 J		0.59	<0.00120	0.15			0.00457 J		
	MW-107	Apr-16		0.00187 J	**2.06**			<0.00270		0.278 J	<0.00120	0.0956			<0.00190		
	MW-107	Apr-17		0.00128 J	**2.01**			<0.002		0.0388 J	<0.002	0.107			<0.002		
	MW-107	Apr-18		0.00157 J	**2.34**			<0.000540		**4.47**	0.000418 JB	0.152			0.000426 J		
	MW-109	Apr-15		0.00369	0.0313			<0.00054		0.155	<0.00024	0.162 J			0.00235 J		
	MW-109	Apr-16		0.00707 J	0.0472			<0.00270		0.0876 J	<0.00120	0.147			<0.00190		
	MW-109	Apr-17		0.00306	0.0336			<0.002		<0.1	<0.002	0.0728			0.000878 JB		
	MW-109	Apr-18		0.00185 J	0.0320			<0.000540		<0.0150	0.000253 J	0.0497			<0.000380		
	MW-110	Apr-15		0.00892	0.0573			<0.00054		0.117	<0.00024	**0.667**					
	MW-110	Apr-16		**0.0178**	0.0519			<0.00270		0.33 J	<0.00120	**1.25**			<0.00190		
	MW-110	Apr-17		0.00401	0.0567			<0.002		0.0716 J	<0.002	**0.55**			0.000559 JB		
	MW-110	Apr-18		0.00229 J	0.0717			<0.00270		<0.0750	<0.00120	**0.468**			<0.00190		
	RW-4	Apr-15		0.00189 J	0.0573			<0.00054		0.0571 J	<0.00024	0.11			0.000503 J		
	RW-4R	Apr-16		0.00323 J	0.0564			<0.00270		0.119 J	<0.00120	0.0702			0.00236 J		
	RW-4	Apr-17		0.00381	0.0709			0.00069 J		<0.1	<0.002	0.0245 O1			<0.002		
	RW-4	Apr-18		0.00301	0.0675			<0.000540		<0.0150	0.000410 JB	0.0535			<0.000380		
	RW-5R	Apr-15		0.00136 J	0.0275			<0.00054		0.0247 J	<0.00024	0.0167			<0.00038		
	RW-5R	Apr-16		0.00182 J	0.0307			<0.00270		0.146 J	<0.00120	0.0193 J			0.00542 J		
	RW-6	Apr-15		**0.0354**	0.857			0.000677 J		**17.5**	0.00129 J	**0.284**			<0.00038		
	RW-6R	Apr-16		**0.0615**	0.384			<0.00270		**3.37**	<0.00120	**0.537**			0.00213 J		
	RW-6	Apr-18		**0.0141**	**1.90**			<0.000540		**1.32**	0.000568 JB	**0.279**			0.000513 J		
	RW-15C	Apr-17		**0.0306**	0.896			<0.002		0.137	0.000501 J	**0.376**			<0.002		
	RW-15C	Apr-18		**0.0264**	**1.27** V			<0.000540		0.197	0.000585 J	**0.399**			0.000675 J		
South RO Reject Field	MW-114	Apr-15		0.00273	0.0127 J			<0.00054		<0.0150	<0.00024	**0.894**			0.0018 J		
	MW-114	Apr-16		0.00298 J	0.0148 J			<0.00270		<0.075	<0.00120	**1.00**			<0.00190		
	MW-114	Apr-17		0.00252	0.0147			<0.002		<0.1	<0.002	**1.01**			0.00152 JB		
	MW-114	Apr-18		0.00169 J	0.0106			<0.000540		<0.0150	0.000269 J	**0.672**			0.00926		
	MW-115	Apr-15		0.00797 J	0.00965 J			0.000735 J		0.0283 J	<0.00024	0.102			0.00313		
	MW-115	Apr-16		0.00477 J	0.00839 J			<0.00270		<0.075	<0.00120	0.06			<0.00190		
	MW-115	Apr-17		0.00303	0.00816			<0.002		<0.1	<0.002	0.0436			0.00108 JB		
	MW-115	Apr-18		0.00249	0.00618			<0.000540		<0.0150	0.000247 J	0.0439			<0.000380		
	MW-116	Apr-15		0.00507	0.00904 J			0.000586 J		<0.0150	<0.00024	0.00316 J			0.00417 J		
	MW-116	Apr-16		0.00339 J	0.00902 J			<0.00270		<0.075	<0.00120	0.00791 J			0.00564 J		
	MW-116	Apr-17		0.00347	0.008 B			<0.002		<0.1	<0.002	0.0449			<0.002		
	MW-116	Apr-18		0.00431	0.00837			<0.000540		<0.0150	0.000315 J	0.0218			0.00602		
TEL	MW-49	Apr-15		0.00329	0.0394			<0.00054		0.0291 J	0.000467 J	**0.240**		0.00656	0.00302 J		0.000493 J
	MW-49	Apr-16		0.00578 J	0.0492	0.708	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	**0.300**	<4.9E-05	0.00842 J	<0.00190	<0.00165	0.00123 J
	MW-49	Apr-17		0.00441	0.0471	0.591	<0.001	<0.002	<0.002	0.0602 J	<0.002	**0.248**	<0.0002	0.00535	<0.002	<0.01	0.000883 J
	MW-49	Apr-18		0.00484	0.0515	**0.764**	<0.000160	0.00163 JB	<0.000260	0.0200 JB	0.000500 J	0.196	<0.0000490	0.00712	<0.000380	<0.000330	0.000384 J
	TEL-1	Apr-15		0.0048	0.0113			0.00301		0.0488 J	<0.00120	0.052			0.00161 J		
	TEL-1	Apr-16		0.00441 J	0.0119 J			0.014		0.075 J	<0.00120	**0.204**			<0.00190		
	TEL-1	Apr-17		0.00533	0.013			0.00782		0.0488 J	<0.002	0.125			<0.002		
	TEL-1	Apr-18		**0.0132**	0.0145			0.00212		0.0315 J	<0.000240	0.0540			<0.000380		
	TEL-2	Apr-14		**0.0119**	0.0745			<0.00100		<0.0780	0.00246 J	0.0107			<0.00100		
	TEL-2	Apr-15		**0.0173**	0.0887			0.00111 J		0.0269 J	0.00254	0.00915			0.0136		
	TEL-2	Apr-16		**0.012**	0.0483			<0.00270		<0.075	0.00137 J	0.0224 J			<0.00190		
	TEL-2	Apr-18		**0.0166**	0.0431			0.000859 J		<0.0150	0.00255 B	0.0149			0.000571 J		
	TEL-3	Apr-15		0.00639	0.0123			0.00235		0.0316 J	0.000406 J	0.00717			0.0219		
	TEL-3	Apr-16		0.00979 J	0.0234 J			0.0035 J		<0.075	<0.00120	0.00813 J			<0.00190		
	TEL-3	Apr-17		0.00225	0.0173			0.00158 JB		<0.1	<0.002	0.0115			<0.002		
	TEL-3	Apr-18		0.00964	0.0219			0.0263		0.0526 J	0.000337 J	0.00609			0.000457 J		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2018 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
Analyte Group:				Dissolved Metals													
Analyte:				Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
Units:				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CGWSL:				0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
CGWSL Source:				WQCC HH	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	WQCC Irr	WQCC Dom	WQCC HH	WQCC Dom	WQCC HH	WQCC Irr	WQCC HH	WQCC HH	NMED TW
TEL	TEL-4	Apr-15	FD	0.00568	0.022			0.0298		0.149	0.00143 J	**0.835**			<0.00038		
	TEL-4	Apr-15		0.00563	0.0208			0.0139		0.0279 J	0.00114 J	**0.792**			0.000882 J		
	TEL-4	Apr-16	FD	0.00836 J	0.0249 J			0.0272		<0.075	0.00377 J	**0.808**			<0.00190		
	TEL-4	Apr-16		0.00738 J	0.0263			0.0266		<0.075	0.00351 J	**0.776**			<0.00190		
	TEL-4	Apr-17	FD	0.00692	0.0199			0.0101		<0.1	0.00051 J	**1.07**			0.000522 J		
	TEL-4	Apr-17		0.0066	0.0188			0.0114		<0.1	0.000416 J	**1.04**			0.000623 J		
	TEL-4	Apr-18		0.00619	0.0207			**0.0734**		0.233	0.000648 J	**1.46**			0.000680 J		
	TEL-4	Apr-18	FD	0.00629	0.0205			**0.0748**		0.229	0.000498 J	**1.45**			0.000471 J		
	MW-8	Apr-15		0.00679	0.01			0.000644 J		<0.0150	<0.00024	**0.464**			0.0174		
	MW-8	Apr-16		0.00676 J	0.0113 J			<0.00270		<0.0750	<0.00120	**0.504**			0.00716 J		
	MW-8	Apr-17		0.00606	0.0119			<0.002		<0.1	<0.002	**0.494**			0.00637		
	MW-8	Apr-18		0.00655	0.0130			0.00334 B		0.0225 JB	<0.000240	**0.635**			0.0166		
	MW-16	Apr-14		0.00546	0.0144			<0.00100		<0.0780	<0.00070	0.125			<0.00100		
	MW-16	Apr-15		0.00465 J	0.0151 J			<0.00270		<0.0750	<0.00120	0.0513			0.00213 J		
	MW-16	Apr-17		0.00513	0.0164			<0.002		0.0333 J	<0.002	0.00335 J			0.0116		
	MW-16	Apr-18		0.00517	0.0134			<0.000540		<0.0150	<0.000240	0.0579			0.00361		
	MW-20	Apr-15		0.00586	0.00926			<0.00054		0.0359 J	<0.00024	0.00169 J			0.0254		
	MW-20	Apr-16		0.00646 J	0.0112 J			<0.00270		<0.075	<0.00120	0.00432 J			0.0266		
	MW-20	Apr-17		0.00614	0.0124			<0.002		<0.1	<0.002	0.00845			0.0192		
	MW-20	Apr-18		0.00603	0.0107			<0.000540		<0.0150	<0.000240	0.0107			0.0122		
	MW-21	Apr-15		0.00681 J	0.00852 J			<0.00270		<0.0750	<0.00120	**0.252**			0.0269		
	MW-21	Apr-16		0.00583 J	0.0104 J			<0.00270		0.283 JB	<0.00120	**0.323**			0.0327		
	MW-21	Apr-17		0.00536	0.00969			<0.002		<0.1	<0.002	0.191			0.0266		
	MW-21	Apr-18		0.00528	0.00984			0.000979 JB		<0.0150	<0.000240	**0.269**			0.0276		
	MW-25	Apr-15		**0.0104**	0.0196 J			<0.00270		<0.0750	<0.00120	**0.218**			0.0204		
	MW-25	Apr-16		0.00646 J	0.0161 J			<0.00270		<0.075	<0.00120	**0.319** V			0.00234 J		
	MW-25	Apr-17		0.00306	0.0129			<0.002		<0.1	<0.002	**0.29**			0.00234		
	MW-25	Apr-18		0.00236	0.0117			<0.000540		<0.0150	0.000260 J	**0.228**			0.00292		
	MW-26	Apr-15		0.00338	0.00842			<0.00054		<0.0150	<0.00024	**0.470**			0.0184		
	MW-26	Apr-16		0.00363 J	0.00913 J			<0.00270		<0.075	<0.00120	**0.534**			0.0186		
	MW-26	Apr-17		0.0033	0.00987			<0.002		0.0359 J	<0.002	**0.635**			0.0251		
	MW-26	Apr-18		0.00335	0.00897			<0.000540		<0.0150	<0.000240	**0.481**			0.0220		
	MW-27	Apr-15		0.00259	0.0218			<0.00054		<0.0150	<0.00024	0.029			0.0173		
	MW-27	Apr-16		0.00249 J	0.0185 J			<0.00270		<0.075	<0.00120	0.0164 J			0.0132		
	MW-27	Apr-17		0.00212	0.0182			<0.002		<0.1	0.000708 J	0.0173			0.00708		
	MW-27	Apr-18		0.00228	0.0147			<0.000540		0.0213 JB	0.000824 J	0.0491			0.0119		
	MW-46R	Apr-15		0.00293	0.0127			<0.00054		0.0873 J	<0.00024	0.102			0.00102 J		
	MW-46R	Apr-16		0.00276 J	0.0140 J			<0.00270		<0.0750	<0.00120	0.105			<0.00190		
	MW-46R	Apr-17		0.00247	0.0124			<0.002		<0.1	<0.002	0.131			0.00193 J		
	MW-46R	Apr-18		0.00260	0.0106			0.00175 J		0.0510 JB	0.000304 J	0.107			0.000587 J		
	MW-68	Apr-15		0.00272	0.0154			<0.00054		0.0904 J	<0.00024	0.00126 J			0.0115		
	MW-68	Apr-16		0.00267 J	0.0122 J			<0.00270		<0.075	<0.00120	0.0388			0.002 J		
	MW-68	Apr-17		0.0025	0.0125			<0.002		<0.1	<0.002	0.0929			0.00331		
	MW-68	Apr-18		0.00252	0.0113			<0.000540		0.0205 JB	0.000713 J	0.0527			0.00800		
	MW-71	Apr-15		0.00387	0.00817			<0.00054		<0.0150	<0.00024	0.000487 J		0.00116 J	0.0336		0.0215
	MW-71	Apr-16		0.00436 J	0.00939 J	0.649	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.0345	**0.0588**	0.0244 J
	MW-71	Apr-17		0.00408	0.00978	0.606	<0.001	<0.002	<0.002	<0.1	<0.002	0.000265 J	<0.0002	0.000892 J	0.0331	**0.0617**	0.026
	MW-71	Apr-18		0.00370	0.00985	0.662	<0.000160	<0.000540	<0.000260	<0.0150	<0.000240	0.00159 J	<0.0000490	0.00168 J	0.0328	**0.0634**	0.0255
	MW-89	Apr-15		0.00928 J	0.0167 J			<0.00270		<0.0750	<0.00120	0.0732			0.0291		
	MW-89	Apr-16		0.0078 J	0.0143 J			<0.00270		0.165 J	<0.00120	0.0917			0.0332		
	MW-89	Apr-17		0.00684	0.016			<0.002		<0.1	<0.002	0.0452			**0.0559**		
	MW-89	Apr-18		0.00953	0.0138			0.00168 JB		0.0243 JB	0.000551 J	**0.605**			0.00261		
Up-Gradient	UG-1	Apr-15		0.00124 J	0.0133			0.000833 J		<0.0150	<0.00024	0.000689 J		0.00139 J	0.0101 J		0.0109
	UG-1	Apr-16		<0.00125	0.0144 J	0.525	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	<0.00125	<4.9E-05	0.00179 J	0.0133	0.0264 J	0.0114 J
	UG-1	Apr-17		0.00113 J	0.0118	0.502	<0.001	0.000688 J	<0.002	<0.1	<0.002	0.00476	<0.0002	0.00225	0.00938	0.0273	0.012
	UG-1	Apr-18		0.00131 J	0.0119	**0.756**	<0.000160	0.000981 J	0.00125 J	<0.0150	<0.000240	0.000405 JB	<0.0000490	0.00218	0.00579	0.0273	0.0132
	UG-2	Apr-15		0.00205	0.015			<0.00054		<0.0150	<0.00024	0.00934		0.00543	0.00373 J		0.0116
	UG-2	Apr-16		0.00226 J	0.0153 J	0.315	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	0.0142 J	<4.9E-05	0.00595 J	0.00342 J	0.0156 J	0.0129 J
	UG-2	Apr-17		0.00206	0.0137	0.265	<0.001	<0.002	<0.002	<0.1	<0.002	0.0039	<0.0002	0.00342	0.00522	0.0155	0.0159
	UG-2	Apr-18		0.00194 J	0.0135	0.421	<0.000160	<0.000540	<0.000260	<0.0150	<0.000240	<0.000250	<0.0000490	0.00146 J	0.00622	0.0131	0.0158
	UG-3R	Apr-15		0.00157 J	0.0193			<0.00054		0.0534 J	<0.00024	0.00492 J		0.00114 J	0.00375 J		0.00934
	UG-3R	Apr-16		0.00171 J	0.0187 J	0.278	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	0.00182 J	<4.9E-05	<0.00175	0.00406 J	0.0126 J	0.0102 J
	UG-3R	Apr-17		0.00165 J	0.0167	0.219	<0.001	0.000573 J	0.000421 J	<0.1	<0.002	0.00217	<0.0002	0.00316	0.00371	0.0132	0.00992
	UG-3R	Apr-18		0.00161 J	0.0167	0.597	<0.000160	0.000691 J	<0.000260	0.0186 JB	<0.000240	0.000475 J	<0.0000490	0.000962 J	0.00298	0.0126	0.00919
	UG-4	Apr-16		0.00144 J	0.021 J	**1.21**	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.00673 J	**0.0365** J	0.00794 J
	UG-4	Apr-17		0.00103 J	0.0149	**0.958** O1V	<0.001	<0.002	<0.002	<0.1	<0.002	0.0062	<0.0002	0.00255	0.0142	**0.0373**	0.00736
	UG-4	Apr-18		0.00109 J	0.0163	**1.17**	<0.000160	<0.000540	<0.000260	<0.0150	<0.000240	<0.000250	<0.0000490	<0.000350	0.0173	**0.0335**	0.00710

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
WQCC Dom	NMED Groundwater standard for domestic exposure taken from 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC
WQCC Irr	NMED Groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**														
Cross-Gradient	KWB-13	Apr-15			<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00302	<0.000380	<0.000360	<0.000310	0.000456 J	<0.00390	<0.000360
	KWB-13	Apr-16			<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-13	Apr-17			<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-13	Apr-18			<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-17	Apr-14														
	NP-5	Apr-13			<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	NP-5	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	0.000804 J	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	NP-5	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-3156	Apr-14			<0.000500	**<0.000500**	<0.000500	<0.000400	<0.000500	<0.00050	<0.000400	<0.000500	**<0.000700**	<0.000600	<0.00100	
	RA-3156	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-3156	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RA-3156	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-136	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-136	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-136	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-136	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-136	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-136	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
Evaporation Ponds	MW-1R	Apr-15			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000360
	MW-1R	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-1R	Apr-17			<0.000319	**<0.000130**	<0.000383 J-4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-1R	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-2A	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-2A	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-2A	Apr-17			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365
	MW-2A	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-2A	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-2A	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Apr-16	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Oct-16	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000367 J
	MW-3	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Apr-17	FD		<0.000319	**<0.000130**	<0.000383 J-4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Oct-17	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Apr-18	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-3	Oct-18			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182
	MW-3	Oct-18	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-4A	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-4A	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000553 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000607 J
	MW-4A	Apr-17			<0.000319	**<0.000130**	<0.000383 J-4	<0.000259	<0.000398	0.000390 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000375 J
	MW-4A	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000369 J
	MW-4A	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000492 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-4A	Oct-18			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182
	MW-4B	Apr-13			<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-4B	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-4B	Apr-17			<0.000319	**<0.000130**	<0.000383 J-4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-5A	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-5A	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-5A	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000425 J
	MW-5A	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000456 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000693 J
	MW-5A	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-5A	Oct-18			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182
	MW-5B	Apr-13			<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-5B	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	0.000976 J	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-5B	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000499 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-5C	Apr-13			<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-5C	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-5C	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-6A	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-6A	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-6A	Apr-17			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365
	MW-6A	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-6B	Mar-13			<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-6B	Mar-13	FD		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-6B	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-6B	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-16	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-16	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-17	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-17	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-18	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-18			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182
	MW-7A	Oct-18	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-7B	Apr-13			<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-7B	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-7B	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-10	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-10	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-10	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-10	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-10	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-10	Oct-18			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182
	MW-11A	Apr-16			<0.00100	**<0.00100**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	**<0.00100**	<0.00100	<0.0100	<0.000365
	MW-11A	Oct-16														
	MW-11A	Apr-17			<0.000319	**<0.000130**	<0.000383 J-4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-11A	Oct-17														
	MW-11A	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-11A	Oct-18														
	MW-11B	Mar-13			<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-11B	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-11B	Apr-17			<0.000319	**<0.000130**	<0.000383 J-4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-12	Apr-14														
	MW-13	Apr-14														
	MW-15	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-15	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-15	Apr-17			<0.000319	**<0.000130**	<0.000383 J-4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-15	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-18A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-18A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-18A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-18A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-18A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-18A	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-18B	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500	
	MW-18B	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	MW-18B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-22A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-22A	Apr-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-22A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000660 J	
	MW-22A	Oct-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-22A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000625 J	
	MW-22A	Apr-17	FD	<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000401 J	
	MW-22A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000625 J	
	MW-22A	Oct-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000887 J	
	MW-22A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-22A	Apr-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-22A	Oct-18		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182	
	MW-22A	Oct-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-22B	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500	
	MW-22B	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	0.000381 J	
	MW-22B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-70	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-70	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-70	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-70	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-70	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-70	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-72	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	MW-72	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-72	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-72	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-73	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	0.00171	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	MW-73	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-73	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-73	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000735 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-74	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-74	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000718 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-74	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000893 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-74	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00124	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-74	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000852 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-74	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000732 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-75	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-75	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000631 J	<0.000381	<0.000361	**<0.000306**	0.00103	0.00429 J	0.00138	
	MW-75	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000433 J	
	MW-75	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000387 J	<0.000381	<0.000361	**<0.000306**	0.000912 J	<0.00393	0.00107	
	MW-75	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-75	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	0.000709 J	<0.00393	0.000955 J	
	MW-76	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-76	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00187	<0.000381	<0.000361	**<0.000306**	0.00166	<0.00393	0.000550 J	
	MW-76	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-76	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000428 J	<0.000381	<0.000361	**<0.000306**	0.000827 J	<0.00393	0.000521 J	
	MW-76	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-76	Oct-18		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182	
	MW-77	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	0.00161	<0.00393	0.00348	
	MW-77	Oct-16		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.00432 J	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.00392 J	
	MW-77	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.00384 J	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.00382 J	
	MW-77	Apr-18		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365	
	MW-78	Apr-15		<0.000319	**0.000305** J	<0.000380	<0.000260	<0.000400	0.00132	<0.000380	<0.000360	**<0.000310**	0.000829 J	<0.00390	0.000558 J	
	MW-78	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-78	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365	
	MW-78	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-79	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-79	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-79	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365	
	MW-79	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-79	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-79	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-80	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	MW-80	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-80	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-80	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-81	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	MW-81	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-81	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-81	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-82	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	MW-82	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-82	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-82	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-83	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-83	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-83	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365	
	MW-83	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000411 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-83	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000650 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-83	Oct-18		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182	
	MW-84	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-84	Oct-16		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.000365	
	MW-84	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365	
	MW-84	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-84	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-84	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-87	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-87	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-87	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-87	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-87	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-87	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-88	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-88	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-88	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-88	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-88	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-88	Oct-18		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-120	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-120	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-120	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365
	MW-120	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-120	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-120	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-121	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-121	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-121	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-121	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-121	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-121	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-122	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-122	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-122	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	<0.00365
	MW-122	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-122	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-122	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-123	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-123	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-123	Apr-17		<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-123	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-123	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-123	Oct-18		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182
	MW-124	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-124	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-124	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-124	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-124	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-124	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-1R	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-1R	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-1R	Apr-17		<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-1R	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-1R	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-1R	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-2A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-2A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-2A	Apr-17		<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-2A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-2A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-2A	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-3	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-3	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-3	Apr-17		<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-3	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-3	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-3	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-4	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-4	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-4	Apr-17		<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-4	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-4	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-4	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-5	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-5	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-5	Apr-17		<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-5	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-5	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-5	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-6	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-6	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-6	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-6	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-6	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-6	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-7AR	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-7AR	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00172	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-7AR	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000840 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-7AR	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00109	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-7AR	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-7AR	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00103	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-7B	Mar-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	OCD-7B	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	OCD-7B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-8A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000482 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-8A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00108	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-8A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000518 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-8A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000832 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-8A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000562 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-8A	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00124	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	OCD-8B	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	OCD-8B	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	OCD-8B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
Field East of Refinery	KWB-1A	Apr-16		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	KWB-1A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	KWB-1A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	KWB-1A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	KWB-1A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	KWB-1A	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	KWB-1C	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	KWB-1C	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	KWB-1C	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	KWB-7	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	**0.0766**	<0.000380	<0.000360	**<0.000310**	0.000982 J	<0.00390	0.0104
	KWB-7	Oct-15		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00557	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00808
	KWB-7	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0482	<0.000381	<0.000361	**<0.000306**	0.00903	<0.00393 J4	0.00607
	KWB-7	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00700	<0.000381	<0.000361	**<0.000306**	0.000877 J	<0.00393	0.00691
	KWB-7	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0115	<0.000381	<0.000361	**<0.000306**	<0.000387	0.0161	0.00714
	KWB-7	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0258	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00591
	KWB-7	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00186	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.00314
	KWB-8	Oct-16		<0.0638	**<0.0260**	<0.0766	<0.0518	<0.0796	**0.170 J**	<0.0762	<0.0722	**<0.0612**	<0.0774	<0.786	<0.0730
	KWB-8	Apr-17		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.380**	<0.0381	<0.0361	**<0.0306**	**0.0863 J**	<0.393	<0.0365
	KWB-8	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.114**	<0.000381	<0.000361	**<0.000306**	0.0225	0.0885	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Field East of Refinery	KWB-10R	Apr-16		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.323**	<0.0190	<0.0180	**<0.0153**	**0.0886**	<0.196	<0.0182	
	KWB-10R	Oct-16		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	**0.307**	<0.00762	<0.00722	**<0.00612**	**0.0765**	0.234	0.00903	J
	KWB-10R	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.360**	<0.0190	<0.0180	**<0.0153**	**0.0907**	<0.196	<0.0182	
	KWB-10R	Oct-17		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.302**	**<0.000381**	**<0.000361**	**<0.000306**	**0.0759**	**<0.00393**	**0.0126**	
	KWB-10R	Apr-18		<0.0798	**<0.0325**	<0.0958	**<0.0648**	**<0.0995**	**0.214**	**J**	**<0.0952**	**<0.0902**	**<0.0765**	**<0.0968**	**<0.982**	**<0.0912**
	KWB-10R	Oct-18		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	**0.215**	**J**	<0.0952	**<0.0902**	**<0.0765**	<0.0968	<0.982	<0.0912
	KWB-11A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.0256		**<0.000381**	**<0.000361**	**<0.000306**	**0.00122**	**<0.00393**	**0.00353**
	KWB-11A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.0341		**<0.000381**	**<0.000361**	**<0.000306**	**0.000945**	J	**<0.00393**	**0.00474**
	KWB-11A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.0142		**<0.000381**	**0.000409**	J	**<0.000306**	**<0.000387**	**<0.00393**	**0.00419**
	KWB-11A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0230		<0.000381	**<0.000361**	**<0.000306**	0.00129	<0.00393	**<0.000365**	
	KWB-11A	Apr-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.00290**		**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00328**	
	KWB-11A	Oct-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.00500**		**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00466**	
	KWB-11B	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-11B	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000394	J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-11B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-11B	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-11B	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-11B	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12A	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	0.000452	J	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	KWB-12A	Apr-15	FD	<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370		<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	KWB-12A	Oct-15		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12A	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Apr-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Oct-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Apr-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Oct-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Apr-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-12B	Oct-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	KWB-P4	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500		<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500	
	KWB-P4	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370		<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	KWB-P4	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-57	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-57	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-57	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-57	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-57	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-57	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-58	Apr-16		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.753**		<0.00381	<0.00361	**<0.00306**	0.0179	<0.0393	0.0112	
	MW-58	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.387**		<0.000381	<0.000361	**<0.000306**	0.00321	<0.00393	0.00811	
	MW-58	Apr-17		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.517**		<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365	
	MW-58	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.166**		<0.000381	<0.000361	**<0.000306**	0.00130	<0.00393	0.00872	
	MW-58	Apr-18		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.574**		<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182	
	MW-58	Oct-18		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	0.0235	J	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182	
	MW-111	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	**0.000539**	J	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-111	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00215		<0.000381	**0.000729**	J	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-111	Apr-17		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.00219**		**<0.000381**	**0.000698**		**<0.000306**	**<0.000387**	**<0.00393**	<0.000365	
	MW-111	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00188		<0.000381	**<0.000361**		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-111	Apr-18		<0.00798	**<0.00325**	<0.00958	<0.00648	**<0.00995**	<0.00932		**<0.00952**	**<0.00902**		**<0.00765**	**<0.00968**	**<0.0982**	<0.00912	
	MW-111	Oct-18		<0.00798	**<0.00325**	<0.00958	<0.00648	**<0.00995**	<0.00932		**<0.00952**	<0.00902		**<0.00765**	**<0.00968**	**<0.0982**	<0.00912	
	MW-113	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000753	J	<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-113	Apr-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000813	J	<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-113	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00977		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000418	J
	MW-113	Oct-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00933		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000379	J
	MW-113	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.00389		**<0.000381**	<0.000361		**<0.000306**	**<0.000387**	**<0.00393**	0.000379	J
	MW-113	Apr-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.00448		**<0.000381**	<0.000361		**<0.000306**	**<0.000387**	**<0.00393**	0.000417	J
	MW-113	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0229		<0.000381	<0.000361		**<0.000306**	0.000442	J	<0.00393	0.000988	J
	MW-113	Oct-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0212		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000880	J
	MW-113	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00240		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-113	Apr-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00274		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-113	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00393		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-113	Oct-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00388		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-125	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-125	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-125	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-125	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-125	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-125	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-126A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	J4	<0.000365	
	MW-126A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.0113		
	MW-126A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000715	J
	MW-126A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000746	J
	MW-126A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-126A	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.00201		
	MW-126B	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-126B	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-126B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-126B	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-126B	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-126B	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-127	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.0941**		<0.000381	<0.000361		**<0.000306**	0.00632	<0.00393	J4	0.00334	
	MW-127	Oct-16		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.0332		<0.00381	<0.00361		**<0.00306**	<0.00387	<0.0393	<0.00365		
	MW-127	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.0562**		<0.000381	<0.000361		**<0.000306**	0.00490	<0.00393	0.00427		
	MW-127	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0327		<0.000381	<0.000361		**<0.000306**	0.00452	<0.00393	0.00319		
	MW-127	Apr-18		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	0.0375		<0.00762	<0.00722		**<0.00612**	<0.00774	<0.0786	<0.00730		
	MW-127	Oct-18		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	0.0272		<0.00762	<0.00722		**<0.00612**	<0.00774	<0.0786	<0.00730		
	MW-128	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00209		<0.000381	**<0.000361**		**<0.000306**	<0.000387	<0.00393	<0.000365		
	MW-128	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00197		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	<0.000365		
	MW-128	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00276		<0.000381	**<0.000361**		**<0.000306**	<0.000387	<0.00393	0.000391	J	
	MW-128	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00233		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000380	J	
	MW-128	Apr-18		<0.00638	**<0.00260**	<0.00766	<0.00518	**<0.00796**	<0.00746		**<0.00762**	<0.00722		**<0.00612**	**<0.00774**	**<0.0786**	<0.00730		
	MW-128	Oct-18		<0.00638	**<0.00260**	<0.00766	<0.00518	**<0.00796**	<0.00746		**<0.00762**	<0.00722		**<0.00612**	**<0.00774**	**<0.0786**	<0.00730		
	MW-129	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00382		<0.000381	<0.000361		**<0.000306**	0.000880	J	<0.00393	J4	0.00103	
	MW-129	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00143		<0.000381	<0.000361		**<0.000306**	0.000479	J	<0.00393	0.00105		
	MW-129	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00101		<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000928	J	
	MW-129	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000452	J	<0.000381	<0.000361		**<0.000306**	<0.000387	<0.00393	0.000419	J	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	MW-130	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-130	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-130	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-130	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-130	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-130	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-131	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	0.0486	<0.000380	<0.000360	**<0.000310**	0.0119	<0.00390	0.00366
	MW-131	Oct-15		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0231	<0.000381	<0.000361	**<0.000306**	0.00694	<0.00393	0.00437
	MW-131	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0212	<0.000381	<0.000361	**<0.000306**	0.00562	<0.00393 J4	0.00318
	MW-131	Oct-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.0133	<0.00190	<0.00180	**<0.00153**	0.00398 J	<0.0196	0.00269 J
	MW-131	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0137	<0.000381	<0.000361	**<0.000306**	0.00348	<0.00393	0.00331
	MW-131	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.0932	<0.000381	<0.000361	**<0.000306**	0.00174	<0.00393	0.00286
	MW-133	Nov-14		<0.0320	**<0.0130**	<0.0380	<0.0260	<0.0400	**0.280**	<0.0380	<0.0360	**<0.0310**	0.0530 J	<0.390 J4J3	
	MW-133	Apr-15		<0.0319	**<0.0130**	<0.0380	<0.0260	<0.0400	**0.138**	<0.0380	<0.0360	**<0.0310**	<0.0390	<0.390	<0.0360
	MW-134	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-134	Apr-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-134	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-134	Oct-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-134	Apr-17		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-134	Apr-17	FD	<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-134	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-134	Oct-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-134	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-134	Apr-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-134	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-134	Oct-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-135	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-135	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-135	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-135	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-135	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-135	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4196	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4196	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4196	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4196	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4196	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4196	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	RA-4798	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.00221	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4798	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.00232	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4798	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.000793 J	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4798	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.00141	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4798	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-4798	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.000981 J	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	RW-12R	Apr-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.0145	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.00471 J
	RW-12R	Apr-17		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.0338	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0104
	RW-12R	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00448	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00564
	RW-13R	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0443	<0.000381	0.000758 J	**<0.000306**	0.00539	<0.00393	0.00270
	RW-13R	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0443	<0.000381	0.000655 J	**<0.000306**	0.000443 J	<0.00393	0.00378
	RW-18	Apr-15		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	RW-18	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RW-18A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RW-18A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RW-20	Apr-15		<0.00319	**<0.00130**	<0.00380	<0.00260	<0.00400	**0.539**	<0.00380	<0.00360	**<0.00310**	**0.113**	<0.0390	0.00931 J
	RW-22	Apr-15		<0.00319	**<0.00130**	<0.00380	<0.00260	<0.00400	**0.575**	<0.00380	<0.00360	**<0.00310**	**0.0853**	<0.0390	0.00967 J
North Refinery	MW-23	Apr-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0225
	MW-23	Oct-16		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	<0.00932	<0.00952	<0.00902	**<0.00765**	<0.00968	<0.0982	0.0201 J
	MW-23	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	0.00103	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0190
	MW-23	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000578 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0154
	MW-23	Apr-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	<0.0373	<0.0381	**<0.0361**	**<0.0306**	<0.0387	<0.393	**<0.0365**
	MW-23	Oct-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	<0.0373	<0.0381	**<0.0361**	**<0.0306**	<0.0387	<0.393	**<0.0365**
	MW-29	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-29	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-29	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-29	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-29	Apr-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-29	Oct-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	0.000405 J
	MW-39	Apr-16		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	0.0526	<0.00952	<0.00902	**<0.00765**	<0.00968	<0.0982	<0.00912
	MW-39	Oct-16		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.0673 J**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	MW-39	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.0710**	<0.00381	<0.00361	**<0.00306**	0.00534 J	<0.0393	0.00878 J
	MW-39	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.0599**	<0.000381	<0.000361	**<0.000306**	0.00604	<0.00393	0.00851
	MW-39	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.0678**	<0.000381	<0.000361	**<0.000306**	0.00685	<0.00393	0.00845
	MW-39	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0156	<0.000381	<0.000361	**<0.000306**	0.00347	<0.00393	0.00321
	MW-40	Apr-15		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	0.00460
	MW-40	Apr-16		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.000760 J**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.0146
	MW-40	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000538 J	<0.000381	**<0.000361**	**0.000706 J**	<0.000387	<0.00393	0.0167
	MW-40	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.0182
	MW-41	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	**<0.000360**	**<0.000310**	<0.000390	<0.00390	0.00220
	MW-41	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00444
	MW-41	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00499
	MW-41	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**0.00152**	<0.000387	<0.00393	0.00191
	MW-42	Apr-15		<0.00319	**<0.00130**	<0.00380	<0.00260	<0.00400	0.0247	<0.00380	<0.00360	**<0.00310**	<0.00390	<0.0390	0.00592 J
	MW-42	Apr-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.0169	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.00562
	MW-42	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00352	<0.000381	<0.000361	**0.000951 J**	<0.000387	<0.00393	0.00553
	MW-42	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00362	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00528
	MW-43	Apr-16		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	**0.502**	<0.0952	<0.0902	**<0.0765**	**0.112 J**	<0.982	<0.0912
	MW-43	Oct-16		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	**0.433**	<0.0952	<0.0902	**<0.0765**	<0.0968	<0.982	<0.0912
	MW-43	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.497**	<0.0190	<0.0180	**<0.0153**	**0.108**	<0.196	<0.0182
	MW-43	Oct-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.839**	<0.0190	<0.0180	**<0.0153**	**0.182**	<0.196	0.0204 J
	MW-43	Apr-18		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.665**	<0.0190	<0.0180	**<0.0153**	**0.151**	<0.196	<0.0182
	MW-43	Oct-18		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.585**	<0.0190	<0.0180	**<0.0153**	**0.131**	<0.196	<0.0182
	MW-59	Apr-15		<0.000319	**<0.000130**	<0.000380	**<0.000260**	**<0.000400**	**<0.000370**	**<0.000380**	**<0.000360**	**<0.000310**	**<0.000390**	**<0.00390**	**0.00132**
	MW-59	Apr-16		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00186**
	MW-59	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00297**
	MW-59	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00348**
	MW-60	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00309**
	MW-60	Apr-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.000402 J	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00268**
	MW-60	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000948 J	<0.000381	<0.000361	**<0.000306**	<0.000387	0.00609 J	0.00328
	MW-60	Oct-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000618 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00312
	MW-60	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00293
	MW-60	Apr-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00274
	MW-60	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000685 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00319
	MW-60	Oct-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000753 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00322
	MW-60	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00378
	MW-60	Apr-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00379
	MW-60	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00428
	MW-60	Oct-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00437

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**													
North Refinery	MW-61	Apr-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	**0.139**	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.00730	
	MW-61	Oct-16		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**0.119**	<0.00952	<0.00902	**<0.00765**	<0.00968	<0.0982	0.0114	J
	MW-61	Apr-17		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**0.118**	<0.00952	<0.00902	**<0.00765**	<0.00968	<0.0982	0.0110	J
	MW-61	Oct-17		<0.000319	**<0.000130**	<0.000383	0.000276 J	<0.000398	**0.141**	<0.000381	<0.000361	**<0.000306**	0.00349	<0.00393	0.0132	
	MW-61	Apr-18		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.198**	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182	
	MW-61	Oct-18		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.165**	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182	
	MW-62	Apr-16		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**0.502**	<0.00952	**<0.00902**	**<0.00765**	**0.114**	<0.0982	<0.00912	
	MW-62	Oct-16		<0.0319 J6	**<0.0130** J6	<0.0383 J6	<0.0259 J6	**<0.0398** J6	**0.620 J6**	**<0.0381** J6	**<0.0361** J6	**<0.0306** J6	**0.149 J6**	**<0.393** J6	<0.0365 J6	
	MW-62	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.646**	**<0.0190**	**<0.0180**	**<0.0153**	**0.149**	**<0.196**	<0.0182	
	MW-62	Oct-17		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.759**	<0.0381	**<0.0361**	**<0.0306**	**0.173**	<0.393	<0.0365	
	MW-62	Apr-18		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	**0.715**	**<0.0381**	**<0.0361**	**<0.0306**	**0.166**	**<0.393**	<0.0365	
	MW-62	Oct-18		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	**0.602**	**<0.0381**	**<0.0361**	**<0.0306**	**0.144**	**<0.393**	<0.0365	
	MW-67	Apr-16		<0.00638	**<0.00260**	<0.00766	<0.00518	**<0.00796**	<0.00746	**<0.00762**	**<0.00722**	**<0.00612**	**<0.00774**	**<0.0786**	**<0.00730**	
	MW-67	Oct-16		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**0.0108**	**<0.00381**	**<0.00361**	**<0.00306**	**<0.00387**	**<0.0393**	**0.00716**	J
	MW-67	Apr-17		<0.00160	**<0.000650**	<0.00192	<0.00130	**<0.00199**	0.00498 J	**<0.00190**	**<0.00180**	**<0.00153**	**<0.00194**	**<0.0196**	**0.00859**	
	MW-67	Oct-17		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.00119**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00570**	
	MW-67	Apr-18		<0.00160	**<0.000650**	<0.00192	**<0.00130**	**<0.00199**	**0.00206** J	**<0.00190**	**<0.00180**	**<0.00153**	**<0.00194**	**<0.0196**	**0.00834**	
	MW-67	Oct-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.000557** J	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00450**	
	MW-90	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	0.000888	J
	MW-90	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	MW-90	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00243	
	MW-90	Oct-17		<0.000319	**0.000359** J	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00425	
	MW-90	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00471	
	MW-90	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00606	
	MW-91	Apr-16		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.266**	<0.00190	<0.0180	**<0.0153**	**0.0719**	<0.196	<0.0182	
	MW-91	Oct-16		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	**0.218 J**	<0.0952	<0.0902	**<0.0765**	<0.0968	<0.982	<0.0912	
	MW-91	Apr-17		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.235**	<0.0381	<0.0361	**<0.0306**	**0.0634 J**	<0.393	<0.0365	
	MW-91	Oct-17		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.221**	<0.0381	<0.0361	**<0.0306**	**0.0693 J**	<0.393	<0.0365	
	MW-91	Apr-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.214**	<0.0381	<0.0361	**<0.0306**	**0.0671 J**	<0.393	<0.0365	
	MW-91	Oct-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.182**	<0.0381	<0.0361	**<0.0306**	0.0510 J	<0.393	<0.0365	
	MW-92	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	**0.0588**	**<0.000381**	**<0.000361**	**<0.000306**	**0.0174**	**<0.00393**	**0.00699**	
	MW-92	Oct-16		<0.00638	**<0.00260**	<0.00766	**<0.00518**	**<0.00796**	**0.0308**	**<0.00762**	**<0.00722**	**<0.00612**	**0.00835** J	**<0.0786**	**<0.00730**	
	MW-93	Apr-16		<0.00160	**<0.000650**	<0.00192	**<0.00130**	**<0.00199**	**0.0331**	**<0.00190**	**<0.00180**	**<0.00153**	**0.00543**	**<0.0196**	**0.00208**	J
	MW-93	Oct-16		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**0.103**	**<0.00381**	**<0.00361**	**<0.00306**	**0.0146**	**<0.0393**	**0.00379**	J
	MW-93	Apr-17		<0.00798	**<0.00325**	<0.00958	**<0.00648**	**<0.00995**	**0.148**	**<0.00952**	**<0.00902**	**<0.00765**	**0.0236** J	**<0.0982**	**<0.00912**	
	MW-93	Apr-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.116**	**<0.000381**	**<0.000361**	**0.00116**	**0.0260**	**<0.00393**	0.00564	
	MW-94	Oct-15		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.432**	<0.00381	**<0.00361**	**<0.00306**	**0.0857**	<0.0393	0.0283	
	MW-94	Apr-16		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.489**	**<0.0190**	<0.0180	**<0.0153**	**0.100**	**<0.196** J4	0.0403	J
	MW-94	Oct-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	**0.458**	<0.00190	<0.00180	**<0.00153**	**0.0917**	<0.0196	0.0303	
	MW-94	Apr-17		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**0.398**	<0.00952	**<0.00902**	**<0.00765**	**0.0785**	<0.0982	0.0317	
	MW-95	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	**<0.000400**	<0.000370	**<0.000380**	**<0.000360**	**<0.000310**	**<0.000390**	**<0.00390**	0.00288	
	MW-95	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393 J4	0.00330	
	MW-95	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	**0.00240**	
	MW-95	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.00305**	
	MW-96	Apr-16		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	<0.00746	<0.00762	**<0.00722**	**<0.00612**	<0.00774	<0.0786	**0.0104**	J
	MW-96	Oct-16		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	<0.0186	**<0.0190**	**<0.0180**	**<0.0153**	**<0.0194**	**<0.196**	**<0.0182**	
	MW-96	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	<0.0186	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182	
	MW-96	Oct-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	<0.0186	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182	
	MW-96	Apr-18		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	<0.0186	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182	
	MW-96	Oct-18		<0.319	**<0.130**	<0.383	<0.259	<0.398	<0.373	<0.381	<0.361	**<0.306**	<0.387	<3.93	<0.365	
	MW-98	Apr-16		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	**0.177**	**<0.0381**	<0.0361	**<0.0306**	**0.0462** J	**<0.393**	<0.0365	
	MW-98	Oct-16		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	**0.299**	**<0.0381**	<0.0361	**<0.0306**	**0.0823 J**	**<0.393**	<0.0365	
	MW-98	Apr-17		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	**0.382**	**<0.0381**	<0.0361	**<0.0306**	**0.0852 J**	**<0.393**	<0.0365	
	MW-98	Oct-17		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.488**	**<0.0190**	<0.0180	**<0.0153**	**0.118**	**<0.196**	<0.0182	
	MW-98	Apr-18		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.475**	**<0.0190**	<0.0180	**<0.0153**	**0.116**	**<0.196**	<0.0182	
	MW-98	Oct-18		<0.0160	**<0.00650**	**<0.0192**	**<0.0130**	**<0.0199**	**0.480**	**<0.0190**	**<0.0180**	**<0.0153**	**0.103**	**<0.196**	**<0.0182**	
	MW-137	Apr-16		<0.0798	**<0.0325**	<0.0958	**<0.0648**	**<0.0995**	**0.460**	**<0.0952**	**<0.0902**	**<0.0765**	**0.102 J**	**<0.982**	<0.0912	
	MW-137	Oct-16		<0.0798	**<0.0325**	<0.0958	**<0.0648**	**<0.0995**	**0.421**	**<0.0952**	**<0.0902**	**<0.0765**	**<0.0968**	**<0.982**	**<0.0912**	
	MW-137	Apr-17		<0.0638	**<0.0260**	<0.0766	**<0.0518**	**<0.0796**	**0.414**	**<0.0762**	**<0.0722**	**<0.0612**	**0.0969 J**	**<0.786**	**<0.0730**	
	MW-137	Oct-17		<0.0638	**<0.0260**	<0.0766	<0.0518	**<0.0796**	**0.559**	**<0.0762**	**<0.0722**	**<0.0612**	**0.137 J**	**<0.786**	**<0.0730**	
	MW-137	Apr-18		<0.0638	**<0.0260**	<0.0766	<0.0518	**<0.0796**	**0.531**	**<0.0762**	**<0.0722**	**<0.0612**	**0.125 J**	**<0.786**	**<0.0730**	
	MW-137	Oct-18		<0.0638	**<0.0260**	<0.0766	<0.0518	**<0.0796**	**0.342**	**<0.0762**	**<0.0722**	**<0.0612**	**<0.0774**	**<0.786**	**<0.0730**	
	MW-138	Apr-16		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**<0.00373**	**<0.00381**	**<0.00361**	**<0.00306**	**<0.00387**	**<0.0393**	**0.0138**	
	MW-138	Oct-16		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**<0.00373**	**<0.00381**	**<0.00361**	**<0.00306**	**<0.00387**	**<0.0393**	**0.0115**	
	MW-138	Apr-17		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**<0.00373**	**<0.00381**	**<0.00361**	**<0.00306**	**<0.00387**	**<0.0393**	**0.0116**	
	MW-138	Oct-17		<0.00160	**<0.000650**	<0.00192	**<0.00130**	**<0.00199**	**0.00547**	**<0.00190**	**<0.00180**	**<0.00153**	**<0.00194**	**<0.0196**	**0.0119**	
	MW-138	Apr-18		<0.00160	**<0.000650**	<0.00192	**<0.00130**	**<0.00199**	**0.0413**	**<0.00190**	**<0.00180**	**<0.00153**	**0.00633**	**<0.0196**	**0.0111**	
	MW-138	Oct-18		<0.00160	**<0.000650**	<0.00192	**<0.00130**	**<0.00199**	**0.0799**	**<0.00190**	**<0.00180**	**<0.00153**	**0.0121**	**<0.0196**	**0.00906**	
	RW-1	Apr-15		<0.0160	**<0.00650**	<0.0190	<0.0130	<0.0200	<0.0190	<0.0190	<0.0180	**<0.0150**	<0.0190	<0.200	<0.0180	
	RW-1R	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	0.000763 J	0.00369	<0.000381	<0.000361	**<0.000306**	0.000516 J	<0.00393	0.000968	J
	RW-1	Apr-17		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	<0.00373	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.00414	J
	RW-1	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	0.00110	0.0303	<0.000381	<0.000361	**<0.000306**	0.00550	<0.00393	0.00486	
	RW-2	Apr-15		<0.00319	**<0.00130**	<0.00380	<0.00260	<0.00400	**0.330**	<0.00380 J	<0.00360 J	**<0.00310**	**0.0772**	<0.0390 J	0.0120	
	RW-2R	Apr-16		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.188**	<0.0190	**<0.0180**	**<0.0153**	0.0419 J	<0.196	<0.0182	
	RW-2	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.271**	**<0.0190**	<0.0180	**<0.0153**	**0.0664**	**<0.196**	<0.0182	
	RW-2	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	0.00122	**0.329**	<0.000381	<0.000361	**0.000959** J	**0.0783**	<0.00393	0.0148	
	RW-7	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	**0.0818**	<0.000380	<0.000360	**<0.000310**	0.000663 J	<0.00390	0.0146	
	RW-7R	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365	
	RW-7	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	**<0.000365**	
	RW-7	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.00502	**<0.000381**	**<0.000361**	**<0.000306**	**0.000415** J	**<0.00393**	0.00386	
	RW-8	Apr-15		<0.00319	**<0.00130**	<0.00380	<0.00260	**<0.00400**	0.00710 J	**<0.00380**	**<0.00360**	**<0.00310**	**<0.00390**	**<0.0390**	**0.00942**	J
	RW-8	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.0928**	<0.000381	**0.00343**	**<0.000306**	0.0249	<0.00393	**0.0117**	
	RW-9	Apr-15		<0.0160	**<0.00650**	<0.0190	<0.0130	<0.0200	<0.0190	<0.0190	**<0.0180**	**<0.0150**	<0.0190	<0.200	<0.0180	
	RW-9	Apr-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.0283	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0126	
	RW-9	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000991 J	<0.000381	<0.000361	**0.00182**	<0.000387	<0.00393	0.0175	
	RW-9	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00314	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0194	
	RW-10	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	RW-10	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	<0.000365	
	RW-10	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	0.000569	J
	RW-10	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000631 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000567	J
	RW-16	Apr-15		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000360	
	RW-16	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	RW-16	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	RW-16	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	RW-17	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360	
	RW-17	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	RW-17	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	
	RW-17	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**													
North RO Reject Field	MW-117	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-117	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-117	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-117	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-117	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-117	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-118	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-118	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-118	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-118	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-118	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-118	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-119	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-119	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-119	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-119	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-119	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-119	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
NCL	MW-18	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-18	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-18	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-18	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-45	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-45	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-45	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-45	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-45	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-45	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-53	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-53	Apr-16		<0.000319	**<0.000130** J4	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-53	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-53	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-54A	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-54A	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-54A	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-54A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00118
	MW-54A	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-54A	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-54B	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	MW-54B	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-54B	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-55	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.0599**	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-55	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-55	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-55	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-55	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-55	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-56	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-56	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-56	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-56	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-108	Apr-16		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.0599**	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	<0.0182
	MW-108	Oct-16		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**0.0561**	<0.00952	<0.00902	**<0.00765**	<0.00968	<0.0982	<0.00912
	MW-108	Apr-17		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**0.0605**	<0.00952	<0.00902	**<0.00765**	<0.00968	<0.0982	<0.00912
	MW-108	Oct-17		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.0451	<0.00190	<0.00180	**<0.00153**	0.00330 J	<0.0196	0.00527
	MW-108	Apr-18		<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	0.0462	<0.00952	<0.00902	**<0.00765**	<0.00968	<0.0982	<0.00912
	MW-108	Oct-18		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	**0.0637**	<0.00190	<0.00180	**<0.00153**	0.00773	<0.0196	0.00781
	NCL-31	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.000595 J
	NCL-31	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.000554 J	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	NCL-31	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.000971 J
	NCL-31	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000489 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000428 J
	NCL-31	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.000514 J	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	NCL-31	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-32	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-32	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-32	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-32	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-32	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-32	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-33	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-33	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-33	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-33	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-33	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-33	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-34A	Apr-16		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.102**	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	0.0190 J
	NCL-34A	Oct-16		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.0754 J**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	NCL-34A	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	0.0560	<0.0190	<0.0180	**<0.0153**	<0.0194	<0.196	0.0184 J
	NCL-34A	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0290	<0.000381	<0.000361	**<0.000306**	0.00141	<0.00393	0.0216
	NCL-34A	Apr-18		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.0123	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.0188
	NCL-34A	Oct-18		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.00612 J	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.0136
	NCL-44	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.00144
	NCL-44	Oct-16		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.000672 J
	NCL-44	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	0.000618 J
	NCL-44	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000487 J
	NCL-44	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.000372 J
	NCL-44	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.00762	<0.00722	**<0.00612**	<0.00774	<0.0786	<0.000365
	NCL-49	Apr-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-16	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	NCL-49	Oct-17	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-18	FD	<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**													
South Refinery	KWB-2R	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0497	<0.000381	<0.000361	**<0.000306**	0.000489 J	<0.00393	0.00350
	KWB-2R	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0347	<0.000381	<0.000361	**<0.000306**	0.000427 J	<0.00393	0.00588
	KWB-2R	Apr-17		<0.000319	**0.000160** J	<0.000383	<0.000259	<0.000398	0.0341	<0.000381	<0.000361	**<0.000306**	<0.000387	0.0164	0.00279
	KWB-2R	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.150**	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00996
	KWB-5	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00535	<0.000381	<0.000361	**<0.000306**	0.000901 J	<0.00393	0.00242
	KWB-5	Oct-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	<0.00182
	KWB-5	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0172	<0.000381	<0.000361	**<0.000306**	0.00179	<0.00393	0.00280
	KWB-5	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.0932	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00202
	KWB-5	Apr-18		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	<0.0932	<0.0952	<0.0902	**<0.0765**	<0.0968	<0.982	<0.0912
	KWB-5	Oct-18		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	<0.0932	<0.0952	**<0.0902**	**<0.0765**	<0.0968	<0.982	<0.0912
	KWB-6	Apr-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	**0.876**	<0.00190	**0.00683**	**<0.00153**	**0.134**	<0.0196	0.00944
	KWB-6	Oct-16		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	**0.292**	<0.00762	<0.00722	**<0.00612**	0.0449	<0.0786	<0.00730
	KWB-6	Apr-17		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	**0.399**	<0.00190	0.00451 J	**<0.00153**	0.0517	<0.0196	0.00695
	KWB-6	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.206**	<0.000381	**<0.000361**	**<0.000306**	0.0302	<0.00393	0.00483
	KWB-6	Apr-18		<0.00638	**<0.00260**	<0.00766	**<0.00518**	**<0.00796**	**0.164**	**<0.00762**	**<0.00722**	**<0.00612**	**0.0557**	**<0.0786**	**<0.00730**
	KWB-6	Oct-18		<0.00638	**<0.00260**	<0.00766	**<0.00518**	**<0.00796**	**0.122**	**<0.00762**	**<0.00722**	**<0.00612**	**0.0611**	**<0.0786** J5 J4	**<0.00730**
	MW-28	Apr-16		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.113**	<0.00381	**<0.00361**	**<0.00306**	**0.00861** J	<0.0393	**0.00530** J
	MW-28	Oct-16		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.253**	**<0.0190**	**<0.0180**	**0.0789**	**0.0202** J	**<0.196**	<0.0182
	MW-28	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.168**	<0.0190	**<0.0180**	**<0.0153**	<0.0194	<0.196	<0.0182
	MW-28	Oct-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.142**	<0.0190	**<0.0180**	**<0.0153**	<0.0194	<0.196	<0.0182
	MW-28	Apr-18		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.110**	**<0.0190**	**<0.0180**	**<0.0153**	**<0.0194**	**<0.196**	<0.0182
	MW-28	Oct-18		<0.00638	**<0.00260**	<0.00766	<0.00518	**<0.00796**	0.0165 J	**<0.00762**	**<0.00722**	**<0.00612**	**<0.00774**	**<0.0786**	**<0.00730**
	MW-48	Apr-16		<0.00638	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.310**	<0.00762	**<0.00722**	**<0.00612**	0.0223	<0.0786	0.00987 J
	MW-48	Oct-16		<0.00160	**<0.000650**	<0.00192	<0.00130	**<0.00199**	**0.323**	**<0.00190**	**<0.00180**	**<0.00153**	**0.0284**	**<0.0196**	0.0114
	MW-48	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.482**	**<0.0190**	**<0.0180**	**<0.0153**	**0.0577**	**<0.196**	<0.0182
	MW-48	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	**0.368**	**<0.000381**	**<0.000361**	**<0.000306**	**0.0465**	**<0.00393**	<0.000365
	MW-48	Apr-18		<0.0798	**<0.0325**	<0.0958	<0.0648	**<0.0995**	**0.381**	**<0.0952**	**<0.0902**	**<0.0765**	**<0.0968**	**<0.982**	<0.0912
	MW-48	Oct-18		<0.0798	**<0.0325**	<0.0958	<0.0648	**<0.0995**	**0.377**	**<0.0952**	<0.0902	**<0.0765**	**<0.0968**	**<0.982** J5 J4	<0.0912
	MW-50	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-50	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.000625 J
	MW-50	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	<0.000365
	MW-50	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-50	Apr-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**<0.000365**
	MW-50	Oct-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.000478** J
	MW-52	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-52	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-52	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-52	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-52	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-52	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J5 J4	<0.000365
	MW-64	Apr-16		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.666**	<0.0190	<0.0180	**<0.0153**	**0.140**	<0.196 J4	<0.0182
	MW-64	Oct-16		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.435**	<0.0381	<0.0361 J5	**<0.0306**	**0.0904 J**	<0.393	<0.0365
	MW-64	Apr-17		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	**0.793**	<0.0952	<0.0902	**<0.0765**	**0.163 J**	<0.982	<0.0912
	MW-64	Oct-17		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	**0.643**	<0.0952	<0.0902	**<0.0765**	**0.130 J**	<0.982	<0.0912
	MW-64	Apr-18		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	0.0519	<0.00762	<0.00722	**<0.00612**	0.0107 J	<0.0786	<0.00730
	MW-64	Oct-18		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	**0.620**	<0.00762	<0.00722	**<0.00612**	**0.123**	<0.0786	0.00971 J
	MW-65	Apr-16		<0.00319	**<0.00130**	<0.00383	<0.00259	**<0.00398**	0.0309	**<0.00381**	**<0.00361**	**<0.00306**	**0.0165**	**<0.0393**	**0.00821** J
	MW-65	Oct-16		<0.00638	**<0.00260**	<0.00766	**<0.00518**	**<0.00796**	**<0.00746**	**<0.00762**	**<0.00722**	**<0.00612**	**<0.00774**	**<0.0786**	**<0.00730**
	MW-65	Apr-17		<0.0319	**<0.0130**	<0.0383	**<0.0259**	**<0.0398**	**<0.0373**	**<0.0381**	**<0.0361**	**<0.0306**	**<0.0387**	**<0.393**	**<0.0365**
	MW-65	Oct-17		<0.0319	**<0.0130**	<0.0383	**<0.0259**	**<0.0398**	**<0.0373**	**<0.0381**	**<0.0361**	**<0.0306**	**<0.0387**	**<0.393**	**<0.0365**
	MW-65	Apr-18		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	<0.0373	**<0.0381**	<0.0361	**<0.0306**	**<0.0387**	**<0.393**	<0.0365
	MW-65	Oct-18		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	<0.0373	**<0.0381**	**<0.0361**	**<0.0306**	**<0.0387**	**<0.393**	**<0.0365**
	MW-66	Apr-16		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.00940 J	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.00771 J
	MW-66	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.00241	**<0.000381**	<0.000361	**<0.000306**	**0.000547** J	**<0.00393**	0.00983
	MW-66	Apr-17		<0.0160	**<0.00650**	<0.0192	**<0.0130**	**<0.0199**	**<0.0186**	**<0.0190**	<0.0180	**<0.0153**	**<0.0194**	**<0.196**	<0.0182
	MW-66	Oct-17		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**<0.00373**	**<0.00381**	<0.00361	**<0.00306**	**<0.00387**	**<0.0393**	<0.00365
	MW-66	Apr-18		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**<0.00373**	**<0.00381**	<0.00361	**<0.00306**	**<0.00387**	**<0.0393**	0.0124
	MW-66	Oct-18		<0.00319	**<0.00130**	<0.00383	**<0.00259**	**<0.00398**	**<0.00373**	**<0.00381**	<0.00361	**<0.00306**	**<0.00387**	**<0.0393** J5 J4	0.0118
	MW-99	Apr-16		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.498**	<0.00381	<0.00361	**<0.00306**	0.0129	<0.0393	0.00922 J
	MW-99	Oct-16		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	**0.343**	<0.00762	<0.00722	**<0.00612**	<0.00774	<0.0786	0.00804 J
	MW-99	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	**0.252**	**<0.0190**	<0.0180	**<0.0153**	**0.0196** J	**<0.196**	<0.0182
	MW-99	Oct-17		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.152**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	MW-99	Apr-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.168**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	MW-99	Oct-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.284**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393 J5 J4	<0.0365
	MW-101	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.00151
	MW-101	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.000391 J
	MW-101	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.00132
	MW-101	Oct-17		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.000386 J
	MW-101	Apr-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.00111
	MW-101	Oct-18		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.000464 J
	MW-102	Apr-16		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.402**	<0.0381	<0.0361	**<0.0306**	**0.110**	<0.393	<0.0365
	MW-102	Oct-16		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.337**	<0.0381	<0.0361	**<0.0306**	**0.0773 J**	<0.393	<0.0365
	MW-102	Apr-17		<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	**0.291**	<0.00762	<0.00722	**<0.00612**	0.0282	<0.0786	0.0152 J
	MW-102	Oct-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.278**	<0.0190	<0.0180	**<0.0153**	0.0413 J	<0.196	0.0188 J
	MW-102	Apr-18		<0.160	**<0.0650**	<0.192	<0.130	<0.199	**0.288 J**	<0.190	<0.180	**<0.153**	<0.194	<1.96	<0.182
	MW-102	Oct-18		<0.160	**<0.0650**	<0.192	<0.130	<0.199	**0.196 J**	<0.190	<0.180	**<0.153**	<0.194	<1.96	<0.182
	MW-103	Apr-15		<0.000319	**<0.000130**	<0.000380	**<0.000260**	**<0.000400**	**0.0102**	**<0.000380**	**<0.000360**	**<0.000310**	**<0.000390**	**<0.00390**	**0.00396**
	MW-103	Apr-16		<0.00160	**<0.000650**	<0.00192	**<0.00130**	**<0.00199**	**<0.00186**	**<0.00190**	**<0.00180**	**<0.00153**	**<0.00194**	**<0.0196**	**0.00340** J
	MW-103	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	<0.0186	**<0.0190**	**<0.0180**	**<0.0153**	**<0.0194**	**<0.196**	<0.0182
	MW-103	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	0.00527
	MW-104	Apr-16		<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.0344**
	MW-104	Apr-16	FD	<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**<0.000373**	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**0.0380**
	MW-104	Oct-16		<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0346
	MW-104	Oct-16	FD	<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0380
	MW-104	Apr-17		<0.00319	**<0.00130**	**0.00750 J**	<0.00259	**<0.00398**	<0.00373	**<0.00381**	<0.00361	**<0.00306**	**<0.00387**	**<0.0393**	0.0327
	MW-104	Apr-17	FD	<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.00209 J	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0193
	MW-104	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000544 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0378
	MW-104	Oct-17	FD	<0.00160	**<0.000650**	**0.00973**	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0296
	MW-104	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0369
	MW-104	Apr-18	FD	<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0292
	MW-104	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0354
	MW-104	Oct-18	FD	<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.0303
	MW-105	Apr-16		<0.0798	**<0.0325**	<0.0958	<0.0648	<0.0995	**0.103 J**	<0.0952	<0.0902	**<0.0765**	<0.0968	<0.982	<0.0912
	MW-105	Oct-16		<0.0319	**<0.0130**	<0.0383	<0.0259	**<0.0398**	**0.141**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	MW-105	Apr-17		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.104**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	MW-105	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.0964**	<0.000381	<0.000361	**<0.000306**	0.0250	<0.00393	0.0119
	MW-105	Apr-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.0805 J**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	MW-105	Oct-18		<0.0319	**<0.0130**	<0.0383	<0.0259	<0.0398	**0.0751 J**	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393	<0.0365
	MW-106	Apr-16		<0.00798	**<0.00325**	<0.00958	**<0.00648**	**<0.00995**	**0.0824**	**<0.00952**	**<0.00902**	**<0.00765**	**0.0114** J	**<0.0982**	**<0.00912**
	MW-106	Oct-16		<0.0160	**<0.00650**	<0.0192	**<0.0130**	**<0.0199**	**0.126**	**<0.0190**	**<0.0180**	**<0.0153**	**0.0219** J	**<0.196**	<0.0182
	MW-106	Apr-17		<0.0160	**<0.00650**	<0.0192	**<0.0130**	**<0.0199**	**0.0853**	**<0.0190**	**<0.0180**	**<0.0153**	**<0.0194**	**<0.196**	<0.0182
	MW-106	Oct-17		<0.0160	**<0.00650**	<0.0192	<0.0130	<0.0199	**0.0731**	<0.0190	**<0.0180**	**<0.0153**	<0.0194	<0.196	<0.0182
	MW-106	Apr-18		<0.0638	**<0.0260**	<0.0766	**<0.0518**	**<0.0796**	**0.110 J**	**<0.0762**	**<0.0722**	**<0.0612**	**<0.0774**	**<0.786**	<0.0730
	MW-106	Oct-18		<0.160	**<0.0650**	<0.192	**<0.130**	**<0.199**	**<0.186**	**<0.190**	**<0.180**	**<0.153**	**<0.194**	**<1.96**	<0.182
	MW-107	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.00111	**<0.000381**	**<0.000361**	**<0.000306**	**0.000591** J	**<0.00393**	0.00613
	MW-107	Oct-16		<0.00160	**<0.000650**	<0.00192	<0.00130	**<0.00199**	0.00205 J	**<0.00190**	**<0.00180**	**<0.00153**	**<0.00194**	**<0.0196**	0.00592
	MW-107	Apr-17		<0.0160	**<0.00650**	<0.0192	<0.0130	**<0.0199**	<0.0186	**<0.0190**	**<0.0180**	**<0.0153**	**<0.0194**	**<0.196**	<0.0182
	MW-107	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.00228	**<0.000381**	**<0.000361**	**<0.000306**	**0.00425**	**<0.00393**	0.00830

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
South Refinery	MW-109	Apr-16			<0.00160	**<0.000650**	<0.00192	**<0.00130**	**<0.00199**	**0.00418** J	**<0.00190**	**<0.00180**	**<0.00153**	**<0.00194**	**<0.0196**	**0.00501**
	MW-109	Oct-16			<0.00638	**<0.00260**	<0.00766	**<0.00518**	**<0.00796**	**<0.00746**	**<0.00762**	**<0.00722**	**<0.00612**	**<0.00774**	**<0.0786**	**<0.00730**
	MW-109	Apr-17			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.00751	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.00698 J
	MW-109	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00547	<0.000381	<0.000361	**<0.000306**	0.00167	<0.00393	0.00870
	MW-109	Apr-18			<0.00638	**<0.00260**	<0.00766	<0.00518	**<0.00796**	<0.00746	**<0.00762**	<0.00722	**<0.00612**	**<0.00774**	**<0.0786**	0.00760 J
	MW-109	Oct-18			<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	<0.00746	<0.00762	<0.00722	**<0.00612**	<0.00774	<0.0786 J3 J4	0.00812 J
	MW-110	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000871 J	<0.000381	<0.000361	**<0.000306**	0.000525 J	<0.00393	0.00576
	MW-110	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	0.00126
	MW-110	Apr-17			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	0.0193	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.00963
	MW-110	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-110	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.0445	**<0.000381**	<0.000361	**<0.000306**	**0.00247**	**<0.00393**	0.00884
	MW-110	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393** J3 J4	0.00300
	RA-313	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	RA-313	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	RA-313	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RA-313	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	RW-4	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	0.00302
	RW-4R	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00269
	RW-4	Apr-17			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	<0.00180	**<0.00153**	<0.00194	<0.0196	0.00213 J
	RW-4	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000659 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00254
	RW-5R	Apr-15			<0.00319	**<0.00130**	<0.00380	<0.00260	<0.00400	**0.298**	<0.00380	<0.00360	**<0.00310**	0.0558	<0.0390	0.00691 J
	RW-5R	Apr-16			<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	**0.437**	<0.00762	<0.00722	**<0.00612**	**0.100**	<0.0786	0.0130 J
	RW-6	Apr-15			<0.00319	**<0.00130**	<0.00380	<0.00260	<0.00400	**0.134**	<0.00380	<0.00360	**<0.00310**	0.0280	<0.0390	0.00944 J
	RW-6R	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00555	<0.000381	<0.000361	**<0.000306**	0.00111	<0.00393	0.00590
	RW-6	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0143	<0.000381	<0.000361	**<0.000306**	0.00259	<0.00393	0.0148
	RW-15C	Apr-17			<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**1.46**	<0.00952	<0.00902	**<0.00765**	**0.231**	<0.0982	0.0194 J
	RW-15C	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**1.06**	<0.000381	**<0.000361**	**<0.000306**	**0.138**	<0.00393	0.0114
South RO Reject Field	MW-114	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**<0.000365**
	MW-114	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-114	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-114	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-114	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	<0.000373	**<0.000381**	**<0.000361**	**<0.000306**	**<0.000387**	**<0.00393**	**<0.000365**
	MW-114	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393 J3 J4	**<0.000365**
	MW-115	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-115	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-115	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-115	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-115	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-115	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J3 J4	<0.000365
	MW-116	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-116	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000389 J	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-116	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-116	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-116	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-116	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
TEL	MW-49	Apr-16			<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	0.0305	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.00730
	MW-49	Oct-16			<0.0319	**<0.0130** J4	<0.0383	<0.0259	<0.0398	0.0457 J	<0.0381	<0.0361	**<0.0306**	<0.0387	<0.393 J3	<0.0365
	MW-49	Apr-17			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.0409	<0.00381	<0.00361	**<0.00306**	0.00628 J	<0.0393	0.00406 J
	MW-49	Oct-17			<0.00638	**<0.00260**	<0.00766	<0.00518	<0.00796	**0.118**	<0.00762	<0.00722	**<0.00612**	0.0225	<0.0786	0.00830
	MW-49	Apr-18			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.0861**	<0.00381	<0.00361	**<0.00306**	0.0151	<0.0393	0.00648 J
	MW-49	Oct-18			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	**0.0921**	<0.00190	<0.00180	**<0.00153**	0.0159	<0.0196	0.00700
	TEL-1	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.000807 J	**<0.000381**	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00174
	TEL-1	Oct-16			<0.000319	**<0.000130**	<0.000383	**<0.000259**	**<0.000398**	**0.000939** J	**<0.000381**	<0.000361	**<0.000306**	**<0.000387**	**<0.00393**	0.00232
	TEL-1	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00050 J	<0.000381	<0.000361	**<0.000306**	<0.000387	0.00602 J	<0.000365
	TEL-1	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	**<0.000398**	0.00219	**<0.000381**	**<0.000361**	**<0.000306**	**0.000626** J	**<0.00393**	0.00198
	TEL-1	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.000848 J	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.000579 J
	TEL-1	Oct-18			<0.00160	**<0.000650**	<0.00192	<0.00130	<0.00199	<0.00186	<0.00190	**<0.00180**	**<0.00153**	<0.00194	<0.0196	<0.00182
	TEL-2	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	**0.125**	<0.000381	<0.000361	**<0.000306**	0.0143	<0.00393	0.00662
	TEL-2	Oct-16			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.0976**	<0.00381	<0.00361	**<0.00306**	0.00929 J	<0.0393	0.00607 J
	TEL-2	Apr-17			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.0706**	<0.00381	<0.00361	**<0.00306**	0.00599 J	<0.0393	0.00400 J
	TEL-2	Oct-17			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.108**	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.00974 J
	TEL-2	Apr-18			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.0855**	<0.00381	<0.00361	**<0.00306**	0.00503 J	<0.0393	0.00651 J
	TEL-2	Oct-18			<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	**0.115**	<0.00952	<0.00902	**<0.00765**	0.0165 J	<0.0982	<0.00912
	TEL-3	Apr-16			<0.00798	**<0.00325**	<0.00958	<0.00648	<0.00995	0.0128 J	<0.00952	**<0.00902**	**<0.00765**	<0.00968	<0.0982	0.0108 J
	TEL-3	Oct-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0157	<0.000381	**<0.000361**	**<0.000306**	0.00115	<0.00393	0.00596
	TEL-3	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0163	<0.000381	**<0.000361**	**<0.000306**	0.000748 J	<0.00393	0.00806
	TEL-3	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0200	<0.000381	**<0.000361**	**<0.000306**	0.000983 J	<0.00393	0.0117
	TEL-4	Apr-16			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.142**	<0.00381	**<0.00361**	**<0.00306**	<0.00387	<0.0393	0.0161
	TEL-4	Apr-16	FD		<0.000319	**<0.00130**	<0.00383	<0.00259	**<0.00398**	**0.147**	**<0.00381**	**<0.00361**	**<0.00306**	**<0.00387**	**<0.0393**	0.0165
	TEL-4	Oct-16			<0.00319	**<0.00130**	<0.00383	<0.00259	**<0.00398**	**0.0775**	**<0.00381**	<0.00361	**<0.00306**	**<0.00387**	**<0.0393**	0.0111
	TEL-4	Oct-16	FD		<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	**0.105**	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.0162
	TEL-4	Apr-17			<0.00319	**<0.00130**	<0.00383	<0.00259	<0.00398	0.0287	<0.00381	<0.00361	**<0.00306**	<0.00387	<0.0393	0.00766 J
	TEL-4	Apr-17	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0352	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0108
	TEL-4	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0387	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.0197
	TEL-4	Oct-17	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.0343	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.0184
	TEL-4	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00454	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.0105
	TEL-4	Apr-18	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00438	<0.000381	**<0.000361**	**<0.000306**	<0.000387	<0.00393	0.0111
	TEL-4	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00321	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.00981
	TEL-4	Oct-18	FD		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	0.00395	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	0.0115
TMD	MW-8	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-8	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-8	Apr-17			<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-8	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-16	Apr-14			<0.000500	**<0.000500**	<0.000500	<0.000400	<0.000500	<0.00050	<0.000400	<0.000500	**<0.000700**	<0.000600	<0.00100	
	MW-16	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380 J	<0.000360 J	**<0.000310**	<0.000390	<0.00390 J	<0.000360
	MW-16	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-16	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-20	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-20	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-20	Apr-17			<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-20	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-21	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-21	Oct-16			<0.000319	**<0.000130** J4	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J3	<0.000365
	MW-21	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-21	Oct-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-21	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-21	Oct-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-25	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380 J	<0.000360 J	**<0.000310**	<0.000390	<0.00390 J	<0.000360
	MW-25	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-25	Apr-17			<0.000319	**<0.000130**	<0.000383 J4	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-25	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-26	Apr-15			<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-26	Apr-16			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-26	Apr-17			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-26	Apr-18			<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	2.00E-01	1.00E-02	5.00E-03	2.50E-02	7.00E-03	5.60E-02	5.00E-05	5.00E-03	5.00E-03	6.00E-02	5.56E+00	2.00E+00
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	WQCC HH	USEPA TW	WQCC HH	WQCC HH	WQCC HH	USEPA TW	NMED TW	USEPA TW
Area	**Well ID**	**Date**	**Dup**													
TMD	MW-27	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-27	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-27	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-27	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-46R	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-46R	Oct-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-46R	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-46R	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-46R	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-46R	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-68	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-68	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-68	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-68	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-71	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	MW-71	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-71	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-71	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-89	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380 J	<0.000360 J	**<0.000310**	<0.000390	<0.00390 J	<0.000360
	MW-89	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	MW-89	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	MW-89	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NP-1	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.000526 J	**<0.000306**	<0.000387	<0.00393 J4	<0.000365
	NP-1	Oct-16		<0.000319	**<0.000130** J4	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.000446 J	**<0.000306**	<0.000387	<0.00393 J3	<0.000365
	NP-1	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.000408 J	**<0.000306**	<0.000387	<0.00393	<0.000365
	NP-1	Oct-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	0.000465 J	**<0.000306**	<0.000387	<0.00393	<0.000365
	NP-1	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NP-1	Oct-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	NP-2	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	NP-6	Apr-13		<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.0100	<0.00500
	NP-6	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380 J	<0.000360 J	**<0.000310**	<0.000390	<0.00390 J	<0.000360
	NP-6	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
Upgradient	UG-1	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	UG-1	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-1	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-1	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-2	Apr-15		<0.000500	**<0.000500**	<0.000500	<0.000400	<0.000500	<0.00050	<0.000400	<0.000500	**<0.000700**	<0.000600	<0.00100	
	UG-2	Apr-16		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	UG-2	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-2	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-3R	Apr-15		<0.000319	**<0.000130**	<0.000380	<0.000260	<0.000400	<0.000370	<0.000380	<0.000360	**<0.000310**	<0.000390	<0.00390	<0.000360
	UG-3R	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-3R	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-3R	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-4	Apr-16		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-4	Apr-17		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365
	UG-4	Apr-18		<0.000319	**<0.000130**	<0.000383	<0.000259	<0.000398	<0.000373	<0.000381	<0.000361	**<0.000306**	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Cross-Gradient	KWB-13	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-13	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-13	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-13	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-17	Apr-14			<0.00214											
	NP-5	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	NP-5	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NP-5	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-3156	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RA-3156	Apr-16			<0.00214	<0.0500	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-3156	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-3156	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
Evaporation Ponds	MW-1R	Apr-15			<0.00214	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-1R	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-1R	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-1R	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-2A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-16	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000282 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-16	FD		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000311 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-3	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-3	Oct-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000634 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-4B	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-4B	Apr-15			<0.00210	<0.0100	0.00183	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-4B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000320 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-5B	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-5B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5C	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5C	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-5C	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-6A	Apr-15			<0.00210	<0.0100	0.000715 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-6A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-6A	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-6A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-6B	Mar-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Mar-13	FD		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-6B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-16	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-16	FD		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-7A	Oct-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7B	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-7B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-7B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-11A	Apr-16			<0.0100	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-11A	Oct-16														
	MW-11A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-11A	Oct-17														
	MW-11A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-11A	Oct-18														
	MW-11B	Mar-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-11B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-11B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-12	Apr-14														
	MW-13	Apr-14														
	MW-15	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-15	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-15	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-15	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-18A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000378 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-18A	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18B	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-18B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-18B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-16	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	0.000948 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-16	FD		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-22A	Oct-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22B	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-22B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320 J	<0.000280
	MW-22B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000292 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-70	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-72	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-72	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-72	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-72	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-73	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-73	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-73	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-73	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Oct-16			<0.00214	0.0111 JJ4	<0.000331	<0.000380	<0.000866	0.000538 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Apr-16			<0.00214	<0.0100	0.00134	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Oct-16			<0.00214	0.0156 JJ4	<0.000331	<0.000380	<0.000866	0.00111	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Apr-17			<0.00214	<0.0100	0.00145	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Oct-16			<0.00214	0.0147 JJ4	0.00227	<0.000380	<0.000866	0.000396 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	0.000307 J
	MW-76	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-77	Apr-16			<0.00214	0.0313 J	0.00287	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-77	Oct-16			<0.0214	<0.100 J4	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-77	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-77	Apr-18			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-78	Apr-15			0.00230 J	0.0649	**0.0114**	<0.000380	<0.000870	0.000862 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	0.00045 J
	MW-78	Apr-16			<0.00214	0.0152 J	0.00275	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-78	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-78	Apr-18			<0.00214	0.0139 J	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	0.00104	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-79	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-80	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-80	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-80	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-80	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-81	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-81	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-81	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-81	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-82	Apr-15			<0.00210	<0.0100	0.000339 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-82	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-82	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-82	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Apr-16			<0.00214	0.0120 J	0.00114	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Oct-16			<0.00214	<0.0100 J3	0.000449 J	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-83	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Apr-18			<0.00214	<0.0100	0.00166	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-84	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-84	Oct-16			<0.0214	<0.100 J4	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-84	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	**<0.00379**	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-84	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-84	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-84	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000317 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-87	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-120	Apr-16			<0.00214	0.0108 J	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-120	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-120	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-120	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-120	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-120	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-121	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Apr-17			<0.0214	<0.100	<0.00331	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-122	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-124	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-124	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	OCD-4	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Oct-16			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	OCD-5	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7B	Mar-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-7B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000420 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-7B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8B	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-8B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-8B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
Field East of Refinery	KWB-1A	Apr-16			<0.00210	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1C	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-1C	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-1C	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Apr-15			<0.00210	<0.0100	**0.929**	<0.000380	<0.000870	<0.00280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-7	Oct-15			<0.00214	<0.0100	**0.0164**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Apr-16			<0.00214	<0.0100	**0.0365**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Oct-16			<0.00214	<0.0100	**0.0364**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Apr-17			<0.00214	<0.0100	**0.0135**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Oct-17			<0.00214	<0.0100	**0.0363**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Oct-18			<0.00214	<0.0100	**0.0247**	<0.000380	**<0.000866**	0.00891	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	KWB-8	Oct-16			<0.428	<2.00	**11.5**	<0.0760	**<0.173**	<0.0550	<0.0758	<0.0696	<0.0654	<0.0906	<0.0648	<0.0552
	KWB-8	Apr-17			<0.214	<1.00	**5.62**	<0.0380	**<0.0866**	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	KWB-8	Oct-17			<0.00214	0.0801	**12.5**	<0.000380	**<0.000866**	0.00427	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	KWB-10R	Apr-16		<0.107	<0.500	**5.26**	<0.0190	**<0.0433**	0.0329 J	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	KWB-10R	Oct-16		<0.0428	<0.200	**0.565**	<0.00760	**<0.0173**	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906 J4	<0.00648	<0.00552
	KWB-10R	Apr-17		<0.107	<0.500	**4.95**	<0.0190	**<0.0433**	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	0.0172 J	<0.0138
	KWB-10R	Oct-17		<0.00214	<0.0100	**7.06**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	KWB-10R	Apr-18		<0.535	<2.50	**3.06**	<0.0950	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	<0.0810	<0.0690
	KWB-10R	Oct-18		<0.535	<2.50	**3.81**	<0.0950	**<0.216**	<0.0688	<0.0948	<0.0870	<0.0818	<0.113 J4	<0.0810	<0.0690
	KWB-11A	Apr-16		<0.00214	<0.0100	**0.00541**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	KWB-11A	Oct-16		<0.00214	<0.0100	**0.00725**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	KWB-11A	Apr-17		<0.00214	<0.0100	0.00359	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	KWB-11A	Oct-17		<0.00214	<0.0100	**0.0116**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11A	Apr-18		<0.00214	<0.0100	0.000985 J	<0.000380	**<0.000866**	**<0.000275**	**<0.000379**	<0.000348	**<0.000327**	<0.000453	**<0.000324**	<0.000276
	KWB-11A	Oct-18		<0.00214	<0.0100	0.00333	<0.000380	**<0.000866**	**<0.000275**	**<0.000379**	<0.000348	**<0.000327**	<0.000453 J4	**<0.000324**	<0.000276
	KWB-11B	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	KWB-12A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-12A	Apr-15	FD	<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-12A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Oct-18		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000435 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-18	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	KWB-12B	Oct-18		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-18	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-P4	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-P4	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-P4	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Oct-16		<0.00214	<0.0100	0.000681 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Oct-18		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-58	Apr-16		<0.0214	<0.100	**4.12**	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-58	Oct-16		<0.00214	<0.0100	**5.92**	<0.000380	<0.000866	0.000345 JV3	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-58	Apr-17		<0.214	<1.00	**3.00**	<0.0380	<0.0866	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-58	Oct-17		<0.00214	<0.0100	**4.08**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-58	Apr-18		<0.107	<0.500	**4.12**	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-58	Oct-18		<0.107	<0.500 J3	**7.11**	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-111	Apr-16		<0.00214	<0.0100	**0.0299**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Oct-16		<0.00214	<0.0100	**0.0432**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Apr-17		<0.00214	<0.0100	**0.0205**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-111	Oct-17		<0.00214	<0.0100	<0.0331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Apr-18		<0.0535	<0.250	**0.0216 J**	<0.00950	**<0.0216**	<0.00688	**<0.00948**	<0.00870	**<0.00818**	<0.0113	<0.00810	<0.00690
	MW-111	Oct-18		<0.0535	<0.250	**0.0268**	<0.00950	**<0.0216**	<0.00688	**<0.00948**	<0.00870	**<0.00818**	<0.0113 J4	<0.00810	<0.00690
	MW-113	Apr-16		<0.00214	<0.0100	**0.0136**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-16	FD	<0.00214	<0.0100	**0.0148**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-16		<0.00214	<0.0100	**0.00660**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-16	FD	<0.00214	<0.0100	**0.00588**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-17		<0.00214	0.0424 J	**0.0136**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-113	Apr-17	FD	<0.00214	<0.0100	**0.0145**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-113	Oct-17		<0.00214	<0.0100	**0.0132**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-17	FD	<0.00214	<0.0100	**0.0138**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-18		<0.00214	0.0307 J	**0.00908**	<0.000380	**<0.000866**	0.000571 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-18	FD	<0.00214	<0.0100	**0.00996**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-113	Oct-18		<0.00214	<0.0100	0.00182	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-18	FD	<0.00214	<0.0100	0.00130	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-125	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Apr-17		<0.00214	<0.0100	0.000603 J	<0.000380	**<0.000866** J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Oct-17		<0.00214	<0.0100	0.000404 J	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Oct-16		<0.00214	<0.0100	**0.0503**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Apr-17		<0.00214	<0.0100	0.000354 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-126B	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000321 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-127	Apr-16		<0.00214	<0.0100	**2.01**	<0.000380	<0.000866	0.000424 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-127	Oct-16		<0.0214	<0.100	**0.644**	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-127	Apr-17		<0.00214	<0.0100	**1.04**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-127	Oct-17		<0.00214	<0.0100	**0.462**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-127	Apr-18		<0.0428	<0.200	**1.18**	<0.00760	<0.0173	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-127	Oct-18		<0.0428	<0.200	**1.15**	<0.00760	<0.0173	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906 J4	<0.00648	<0.00552
	MW-128	Apr-16		<0.00214	<0.0100	**0.0231**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Oct-16		<0.00214	<0.0100	**0.109**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Apr-17		<0.00214	<0.0100	**0.0563**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Oct-17		<0.00214	<0.0100	**0.0701**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Apr-18		<0.0428	<0.200	**0.122**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	**<0.00654**	<0.00906	<0.00648	<0.00552
	MW-128	Oct-18		<0.0428	<0.200	**0.729**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	**<0.00654**	<0.00906	<0.00648	<0.00552
	MW-129	Apr-16		<0.00214	<0.0100	<0.0166	<0.000380	**<0.000866**	0.000295 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-129	Oct-16		<0.00214	<0.0100	**0.00791**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-129	Apr-17		<0.00214	<0.0100	0.00299	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-129	Apr-18		<0.00214	<0.0100	**0.00731**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	MW-130	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-130	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-130	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Oct-18		<0.00214	<0.0100 J3	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Apr-15		<0.00210	<0.0100	**1.91**	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-131	Oct-15		<0.00214	<0.0100	**2.19**	<0.000380	<0.000866	<0.0138	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Apr-16		<0.00214	<0.0100	**2.42**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Oct-16		<0.0107	<0.0500	**1.58**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-131	Apr-17		<0.00214	<0.0100	**3.09**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Oct-17		<0.00214	<0.0100	**1.39**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-133	Nov-14		<0.210	<1.00	**0.620**	<0.0380	**<0.0870**	<0.0280	<0.0380	<0.0350	<0.0330	<0.0450	<0.0320	<0.0280
	MW-133	Apr-15		<0.210	<1.00	**0.788**	<0.0380	**<0.0870**	<0.0280	<0.0380	<0.0350	<0.0330	<0.0450	<0.0320	<0.0280
	MW-134	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000390 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-134	Apr-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-134	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000386 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-18	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-134	Oct-18		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-18	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	RA-4196	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Oct-18		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Oct-18		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-12R	Apr-16		<0.0107	<0.0500	**0.424**	<0.00190	<0.00433	0.00186 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-12R	Apr-17		<0.0107	<0.0500	**0.335**	<0.00190	<0.00433	0.00142 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-12R	Apr-18		<0.00214	0.0352 J	**0.0358**	<0.000380	<0.000866	0.00104	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-13R	Apr-16		<0.00214	<0.0100	**0.878**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-13R	Apr-18		<0.00214	0.0281 J	**0.0770**	<0.000380	<0.000866	0.000455 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-18	Apr-15		<0.00214	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-18	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000636 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-18A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-18A	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-20	Apr-15		<0.0210	<0.100	**1.87**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	RW-22	Apr-15		<0.0210	<0.100	**4.07**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
North Refinery	MW-23	Apr-16		<0.0107	<0.0500	**15.5**	<0.00190	<0.00433	0.00185 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-23	Oct-16		<0.0535	<0.250 J3	**12.2**	<0.00950	<0.0216	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-23	Apr-17		<0.00214	<0.0100	**8.49**	<0.000380	<0.000866 J4	0.000448 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-23	Oct-17		<0.00214	<0.0100	**8.11**	<0.000380	<0.000866	0.000451 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-23	Apr-18		<0.214	<1.00	**9.68**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-23	Oct-18		<0.214	<1.00	**6.27**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-29	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000551 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-29	Apr-17		<0.00214	<0.0100	0.000616 J	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Oct-17		<0.00214	<0.0100	0.000442 J	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453 J4	<0.000324	<0.000276
	MW-29	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-39	Apr-16		<0.0535	<0.250	**2.14**	<0.00950	<0.0117	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-39	Oct-16		<0.214	<1.00 J3	**3.62**	<0.0380	<0.0866	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-39	Apr-17		<0.0214	<0.100	**1.33**	<0.00380	<0.00866 J4	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-39	Oct-17		<0.00214	<0.0100	**0.476**	<0.000380	<0.000866	0.000647 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-39	Apr-18		<0.00214	<0.0100	**0.144**	<0.000380	<0.000866	0.000668 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-39	Oct-18		<0.00214	<0.0100	**0.0638**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	0.000300 J
	MW-40	Apr-15		<0.00214	<0.0100	**0.0198**	<0.000380	**<0.000870** J	0.000595 J	**<0.000380**	<0.000350	**<0.000330**	<0.000450	<0.000320	<0.000280
	MW-40	Apr-16		<0.00214	<0.0100	**0.0112**	<0.000380	**<0.000866**	0.00126	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-40	Apr-17		<0.00214	<0.0100	**0.00857**	<0.000380	**<0.000866**	0.00128	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-40	Apr-18		0.00447 J	0.0269 J	0.000769 J	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	0.00196 J	<0.000276
	MW-41	Apr-15		<0.00210	<0.0100	0.00190	<0.000380	**<0.000870**	0.000349 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-41	Apr-16		<0.00214	<0.0100	0.00360	<0.000380	**<0.000866**	0.00136	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-41	Apr-17		<0.00214	<0.0100	0.00339	<0.000380	**<0.000866** J4	0.000318 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-41	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000311 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-42	Apr-15		<0.0210	<0.100	**0.216**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-42	Apr-16		<0.0107	<0.0500	**0.103**	<0.00190	<0.00433	0.00212 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-42	Apr-17		<0.00214	<0.0100	**0.0240**	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-42	Apr-18		<0.00214	<0.0100	**0.0488**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-43	Apr-16		<0.535	<2.50	**12.4**	<0.0950	<0.216	<0.0688	<0.0948	<0.0870	<0.0818	<0.113	<0.0810	<0.0690
	MW-43	Oct-16		<0.535	<2.50 J3	**12.4**	<0.0950	<0.216	<0.0688	<0.0948	<0.0870	<0.0818	<0.113	<0.0810	<0.0690
	MW-43	Apr-17		<0.107	<0.500 J4	**9.62**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-43	Oct-17		<0.107	<0.500	**10.7**	<0.0190	**<0.0433**	0.0208 J	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-43	Apr-18		<0.107	<0.500	**38.5**	<0.0190	**<0.0433**	0.0177 J	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-43	Oct-18		<0.107	<0.500	**10.7**	<0.0190	**<0.0433**	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-59	Apr-15		<0.00210	<0.0100	**0.0119**	<0.000380	**<0.000870**	**0.000870** J	**<0.000380**	<0.000350	**<0.000330**	<0.000450	**<0.000320**	<0.000280
	MW-59	Apr-16		<0.00214	<0.0100	0.00329	<0.000380	**<0.000866**	**<0.000275**	**<0.000379**	<0.000348	**<0.000327**	<0.000453	**<0.000324**	<0.000276
	MW-59	Apr-17		<0.00214	<0.0100	0.00218	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-59	Apr-18		<0.00214	<0.0100	0.00105	<0.000380	**<0.000866**	0.000371 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-60	Apr-16		<0.00214	0.0368 J	0.00473	<0.000380	**<0.000866**	0.00442	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-60	Apr-16	FD	<0.00214	<0.0100	**0.00565**	<0.000380	**<0.000866**	0.000403 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-60	Oct-16		<0.00214	<0.0100	**0.00898**	<0.000380	**<0.000866**	0.000392 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-16	FD	<0.00214	<0.0100	**0.00574**	<0.000380	<0.000866	0.000370 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-17		<0.00214	<0.0100	0.00262	<0.000380	<0.000866	0.000535 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-17	FD	<0.00214	<0.0100	**0.00526**	<0.000380	<0.000866	0.000502 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-17		<0.00214	<0.0100	**0.0110**	<0.000380	<0.000866	0.000326 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-17	FD	<0.00214	<0.0100	**0.0122**	<0.000380	**<0.000866**	0.000369 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-18		<0.00214	<0.0100	0.00261	<0.000380	**<0.000866**	0.000496 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-18	FD	<0.00214	<0.0100	0.00176	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-60	Oct-18		<0.00214	<0.0100	**0.0265**	<0.000380	<0.000866	0.000588 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-18	FD	<0.00214	<0.0100	**0.0277**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
North Refinery	MW-61	Apr-16		<0.0107	<0.0500	**0.493**	<0.00190	**<0.00433**	0.00218 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-61	Oct-16		<0.0535	<0.250	**0.501**	<0.00950	**<0.0216**	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-61	Apr-17		<0.0535	0.267 J	**0.769**	<0.00950	<0.0216 J4	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-61	Oct-17		0.00300 J	<0.0100	**0.976**	<0.000380	<0.000866	0.00179	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-61	Apr-18		<0.107	<0.500	**1.36**	<0.0190	**<0.0433**	0.0187 J	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-61	Oct-18		<0.107	<0.500	**1.52**	<0.0190	**<0.0433**	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226 J4	<0.0162	<0.0138
	MW-62	Apr-16		<0.0535	<0.250	**1.12**	<0.00950	**<0.0117**	0.00903 J	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-62	Oct-16		<0.214 J6	<1.00 J6	**3.28 J6**	<0.0380 J6	**<0.0866**	<0.0275 J6	**<0.0379** J6	<0.0348 J6	**<0.0327** J6	<0.0453	<0.0324 J6	<0.0276 J6
	MW-62	Apr-17		<0.107	<0.500	**1.59**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-62	Oct-17		<0.214	<1.00	**0.984**	<0.0380	**<0.0866**	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-62	Apr-18		<0.214	<1.00	**1.59**	<0.0380	**<0.0866**	0.0289 J	**<0.0379**	<0.0348	**<0.0327**	<0.0453	<0.0324	<0.0276
	MW-62	Oct-18		<0.214	<1.00	**1.54**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	**<0.0327**	<0.0453 J4	<0.0324	<0.0276
	MW-67	Apr-16		<0.0428	<0.100	**0.223**	<0.00380	**<0.00866**	0.00300 J	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-67	Oct-16		<0.0214	<0.100 J3	**0.214**	<0.00380	**<0.00866**	0.00328 J	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-67	Apr-17		<0.0107	<0.0500	**0.191**	<0.00190	**<0.00433**	0.00144 J	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-67	Oct-17		<0.00214	<0.0100	**0.130**	<0.000380	**<0.000866**	0.000547 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-67	Apr-18		<0.0107	<0.0500	**0.147**	<0.00190	**<0.00433**	<0.00138	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-67	Oct-18		<0.00214	<0.0100	0.00480	<0.000380	**<0.000866**	0.000465 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-90	Apr-16		<0.00214	<0.0100	**0.00662**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-90	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-90	Apr-17		<0.00214	<0.0100	0.00225	<0.000380	**<0.000866**	0.000444 J	<0.000379 J4	<0.000348	<0.000327 J4	<0.000453	<0.000324	<0.000276
	MW-90	Oct-17		<0.00214	<0.0100	0.00311	<0.000380	**<0.000866**	0.000573 J	<0.000379	<0.000348	<0.000327	<0.000453	0.00116 J	<0.000276
	MW-90	Apr-18		<0.00214	<0.0100	0.000758 J	<0.000380	**<0.000866**	0.000427 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-90	Oct-18		<0.00214	<0.0100	0.00103	<0.000380	<0.000866	0.000349 J	<0.000379	<0.000348	<0.000327	<0.000453	0.000589 J	<0.000276
	MW-91	Apr-16		<0.107	<0.500	**3.85**	<0.0190	**<0.0433**	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-91	Oct-16		<0.535	<2.50 J3	**3.15**	<0.0950	<0.216	<0.0688	<0.0948	<0.0870	<0.0818	<0.113	<0.0810	<0.0690
	MW-91	Apr-17		<0.214	<1.00	**2.67**	<0.0380	<0.0866	0.0284 J	<0.0379 J4	<0.0348	<0.0327 J4	<0.0453	<0.0324	<0.0276
	MW-91	Oct-17		<0.214	<1.00	**3.36**	<0.0380	<0.0866	0.0295 J	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-91	Apr-18		<0.214	<1.00	**2.41**	<0.0380	<0.0866	0.0336 J	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-91	Oct-18		<0.214	<1.00	**2.86**	<0.0380	<0.0866	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-92	Apr-16		<0.00214	<0.0100	**2.87**	<0.000380	**<0.000866**	0.000589 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-92	Oct-16		<0.0428	<0.200 J3	**2.05**	<0.00760	**<0.0173**	**<0.00550**	**<0.00758**	<0.00696	**<0.00654**	<0.00906	**<0.00648**	<0.00552
	MW-93	Apr-16		<0.0107	<0.0500	**0.258**	<0.00190	**<0.00433**	0.00216 J	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-93	Oct-16		<0.0214	<0.100 J3	**0.567**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-93	Apr-17		<0.0535	<0.250	**0.633**	<0.00950	**<0.0216** J4	<0.00688	**<0.00948**	<0.00870	**<0.00818**	<0.0113	<0.00810	<0.00690
	MW-93	Apr-18		<0.00214	<0.0100	**0.857**	<0.000380	**<0.000866**	0.00180	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-94	Oct-15		<0.0214	<0.100	**0.339**	<0.00380	**<0.00866**	0.00445 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-94	Apr-16		<0.107	<0.500	**0.417**	<0.0190	**<0.0433**	0.0155 J	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-94	Oct-16		<0.0107	<0.0500 J3	**0.297**	<0.00190	**<0.00433**	0.00479 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-94	Apr-17		<0.0535	<0.250	**0.284**	<0.00950	**<0.0216** J4	0.0101 J	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-95	Apr-15		<0.00210	<0.0100	0.00148	<0.000380	**<0.000870**	0.00181	**<0.000380**	<0.000350	**<0.000330**	<0.000450	<0.000320	<0.000280
	MW-95	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000427 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-95	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-95	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453 J4	<0.000324	<0.000276
	MW-96	Apr-16		<0.0428	<0.200	<0.000331	<0.00760	**<0.0173**	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	MW-96	Oct-16		<0.107	<0.500 J3	<0.0166	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-96	Apr-17		<0.107	<0.500	<0.0166	<0.0190	<0.0433	<0.0138	<0.0190 J4	<0.0174	<0.0164 J4	<0.0226	<0.0162	<0.0138
	MW-96	Oct-17		<0.107	<0.500	<0.0166	<0.0190	<0.0433	0.0154 J	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-96	Apr-18		<0.107	<0.500	<0.0166	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-96	Oct-18		<2.14	<10.0	<0.331	<0.380	<0.866	<0.275	<0.379	<0.348	<0.327	<0.453	<0.324	<0.276
	MW-98	Apr-16		<0.214	<1.00	**4.07**	<0.0380	<0.0866	0.0306 J	**<0.0379**	<0.0348	**<0.0327**	<0.0453	<0.0324	<0.0276
	MW-98	Oct-16		<0.214	<1.00 J3	**3.59**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	**<0.0327**	<0.0453	<0.0324	<0.0276
	MW-98	Apr-17		<0.214	<1.00	**4.39**	<0.0380	**<0.0866**	0.0335 J	**<0.0379**	<0.0348	**<0.0327**	<0.0453	<0.0324	<0.0276
	MW-98	Oct-17		<0.107	<0.500	**4.09**	<0.0190	**<0.0433**	0.0215 J	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-98	Apr-18		<0.107	<0.500	**3.17**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-98	Oct-18		<0.107	<0.500	**2.64**	<0.0190	**<0.0433**	**<0.0138**	**<0.0190**	<0.0174	**<0.0164**	**<0.0226**	**<0.0162**	<0.0138
	MW-137	Apr-16		<0.535	<2.50	**9.65**	<0.0950	**<0.216**	0.0722 J	**<0.0948**	<0.0870	**<0.0818**	<0.113	<0.0810	<0.0690
	MW-137	Oct-16		<0.535	<2.50 J3	**10.5**	<0.0950	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	<0.0810	<0.0690
	MW-137	Apr-17		<0.428	<2.00 J4	**9.69**	<0.0760	**<0.173**	<0.0550	**<0.0758**	<0.0696	**<0.0654**	<0.0906	<0.0648	<0.0552
	MW-137	Oct-17		<0.428	<2.00	**12.5**	<0.0760	**<0.173**	0.0615 J	**<0.0758**	<0.0696	**<0.0654**	<0.0906	<0.0648	<0.0552
	MW-137	Apr-18		<0.428	<2.00	**9.63**	<0.0760	**<0.173**	0.0554 J	**<0.0758**	<0.0696	**<0.0654**	<0.0906	<0.0648	<0.0552
	MW-137	Oct-18		<0.428	<2.00	**10.6**	<0.0760	**<0.173**	<0.0550	**<0.0758**	<0.0696	**<0.0654**	<0.0906	<0.0648	<0.0552
	MW-138	Apr-16		<0.0214	<0.100	**1.46**	<0.00380	**<0.00866**	**0.00332** J	**<0.00379**	<0.00348	**<0.00327**	<0.00453	**<0.00324**	<0.00276
	MW-138	Oct-16		<0.0214	<0.100 J3	**0.494**	<0.00380	**<0.00866**	**<0.00275**	**<0.00379**	<0.00348	**<0.00327**	<0.00453	**<0.00324**	<0.00276
	MW-138	Apr-17		<0.0214	<0.100 J4	**0.484**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-138	Oct-17		<0.0107	<0.0500	**0.701**	<0.00190	**<0.00433**	<0.00138	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-138	Apr-18		<0.0107	<0.0500	**0.741**	<0.00190	**<0.00433**	0.00176 J	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-138	Oct-18		<0.0107	<0.0500	**0.628**	<0.00190	**<0.00433**	<0.00138	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	RW-1	Apr-15		<0.110	<0.500	**0.962**	<0.0190	**<0.0430**	<0.0140	**<0.0190**	<0.0170	<0.0160	<0.0230	<0.0160	<0.0140
	RW-1R	Apr-16		<0.00214	<0.0100	**0.426**	<0.000380	**<0.000866**	0.000422 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-1	Apr-17		<0.0214	<0.100	**0.696**	<0.00380	**<0.00866**	0.00277 J	**<0.00379**	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	RW-1	Apr-18		<0.00214	<0.0100	**1.52**	<0.000380	**<0.000866**	0.00134	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-2	Apr-15		<0.0210	0.334 J	**5.34**	<0.00380	**<0.00870**	0.00899 J	<0.00380	<0.00350	<0.00330 J	<0.00450	<0.00320	<0.00280
	RW-2R	Apr-16		<0.107	<0.500	**5.86**	<0.0190	**<0.0433**	0.0186 J	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	RW-2	Apr-17		<0.107	<0.500	**7.78**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	RW-2	Apr-18		<0.00214	<0.0100	**4.68**	<0.000380	**<0.000866**	0.00224	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-7	Apr-15		<0.00210	<0.0100	**0.0535**	<0.000380	**<0.000870**	0.00171	**<0.000380**	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-7R	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000326 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-7	Apr-17		<0.00214	0.0100 J	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-7	Apr-18		<0.00214	<0.0100	**0.0319**	<0.000380	**<0.000866**	0.000556 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453 J4	<0.000324	<0.000276
	RW-8	Apr-15		<0.0210	<0.100	**0.0412**	<0.00380	**<0.00870**	<0.00280	**<0.00380**	<0.00350	**<0.00330**	<0.00450	<0.00320	<0.00280
	RW-8	Apr-17		<0.00214	<0.0100	**0.0718**	<0.000380	**<0.000866**	0.00138	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-9	Apr-15		<0.110	<0.500	**0.790**	<0.0190	**<0.0430**	<0.0140	<0.0190	<0.0170	<0.0160	<0.0230	<0.0160	<0.0140
	RW-9	Apr-16		<0.0107	<0.0500	**0.466**	<0.00190	<0.00433	0.00169 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-9	Apr-17		<0.00214	<0.0100	**0.290**	<0.000380	<0.000866	0.00177	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000246
	RW-9	Apr-18		<0.00214	0.0433 J	**0.243**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-10	Apr-15		<0.00210	0.0100 J	<0.000330	<0.000380	**<0.000870**	<0.000280	**<0.000380**	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-10	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-10	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000571 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	RW-10	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-16	Apr-15		<0.00214	<0.0100	<0.000330	<0.000380	**<0.000870**	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-16	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-16	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-16	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	RW-17	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-17	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-17	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-17	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
North RO Reject Field	MW-117	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Oct-18			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Oct-18			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Oct-18			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
NCL	MW-18	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000695 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-18	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Apr-16			<0.00214	<0.0100	<0.000331	<0.00380	<0.00866	<0.000275	<0.000379	<0.000348	<0.00327	<0.000453	<0.000324	<0.000276
	MW-45	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Apr-17			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-53	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	**<0.000380**	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-53	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-53	Apr-17			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-53	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Apr-17			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.00112 B	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54B	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-54B	Apr-15			<0.00210	0.0128 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-54B	Apr-17			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-108	Apr-16			<0.107	<0.500	**0.504**	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-108	Oct-16			<0.0535	<0.250	**0.362**	<0.00950	<0.0216	0.0137 J	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-108	Apr-17			<0.0535	<0.250	**0.382**	<0.00950	<0.0216	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-108	Oct-17			<0.0107	<0.0500	**0.282**	<0.00190	<0.00433	0.00147 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-108	Apr-18			<0.0535	<0.250	**0.265**	<0.00950	<0.0216	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-108	Oct-18			<0.0107	<0.0500	**0.404**	<0.00190	<0.00433	0.00363 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	NCL-31	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	NCL-31	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	NCL-31	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	NCL-31	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-31	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	NCL-31	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000673 JB	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-34A	Apr-16			<0.107	<0.500	**3.25**	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	NCL-34A	Oct-16			<0.214	<1.00	**1.13**	<0.0380	<0.0866 J3	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	NCL-34A	Apr-17			<0.107	<0.500	**1.78**	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	NCL-34A	Oct-17			<0.00214	<0.0100	**0.805**	<0.000380	<0.000866	0.000296 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-34A	Apr-18			<0.0214	<0.100	**1.02**	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	NCL-34A	Oct-18			<0.0214	<0.100	**1.11**	<0.00380	<0.00866	0.0105 B	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	NCL-44	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	NCL-44	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000320 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	NCL-44	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000300 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	NCL-44	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-44	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-44	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-16	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-16	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-17			<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-17	FD		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.00152 B	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-18	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000727 JB	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
South Refinery	KWB-2R	Apr-16			<0.00214	<0.0100	**0.0558**	<0.000380	<0.000866	0.000363 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-2R	Oct-16			<0.00214	<0.0100	**0.398**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-2R	Apr-17			<0.00214	<0.0100	**0.0260**	<0.000380	<0.000866	0.000332 J	<0.000379	<0.000348	<0.000327	<0.000453	0.00360 J	<0.000276
	KWB-2R	Oct-17			<0.00214	<0.0100	**1.12**	<0.000380	<0.000866	0.000367 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Apr-16			<0.00214	<0.0100	**0.688**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Oct-16			<0.0107	<0.0500	**0.367**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	KWB-5	Apr-17			<0.00214	<0.0100	**0.525**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Oct-17			<0.00214	<0.0100	**0.336**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Apr-18			<0.535	<2.50	**0.411**	<0.0950	**<0.216**	<0.0688	<0.0948	<0.0870	<0.0818	<0.113	<0.0810	<0.0690
	KWB-5	Oct-18			<0.535	<2.50	**0.278**	<0.0950	**<0.216**	<0.0688	<0.0948	<0.0870	<0.0818	<0.113 J4	<0.0810	<0.0690
	KWB-6	Apr-16			<0.0107	<0.0500	**12.4**	<0.00190	**<0.00433**	0.00197 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	KWB-6	Oct-16			<0.0428	<0.200	**3.41**	<0.00760	**<0.0173**	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	KWB-6	Apr-17			<0.0107	<0.0500	**4.67**	<0.00190	**<0.00433**	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	KWB-6	Oct-17			<0.00214	<0.0100	**3.22**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-6	Apr-18			<0.0428	<0.200	**3.88**	<0.00760	**<0.0173**	**<0.00550**	**<0.00758**	<0.00696	**<0.00654**	<0.00906	**<0.00648**	<0.00552
	KWB-6	Oct-18			<0.0428	<0.200 J3	**2.64**	<0.00760	**<0.0173**	**<0.00550**	**<0.00758**	<0.00696	**<0.00654**	<0.00906	**<0.00648**	<0.00552
	MW-28	Apr-16			<0.0214	<0.100	**1.37**	<0.00380	**<0.00866**	0.00301 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-28	Oct-16			<0.107	<0.500	**2.55**	<0.0190	**<0.0433**	0.0152 J	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-28	Apr-17			<0.107	<0.500	**2.58**	<0.0190	**<0.0433** J4	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-28	Oct-17			<0.107	<0.500	**1.58**	<0.0190	**<0.0433**	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-28	Apr-18			<0.107	<0.500	**0.959**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-28	Oct-18			<0.0428	<0.200	**0.356**	<0.00760	**<0.0173**	0.00753 J	**<0.00758**	<0.00696	**<0.00654**	<0.00906	<0.00648	<0.00552
	MW-48	Apr-16			<0.0428	<0.200	**7.17**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	MW-48	Oct-16			<0.0107	<0.0500	**5.12**	<0.00190	**<0.00433**	<0.00138	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-48	Apr-17			<0.107	<0.500	**11.7**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-48	Oct-17			<0.00214	<0.0100	**11.0**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-48	Apr-18			<0.535	<2.50	**14.9**	<0.0950	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	<0.0810	<0.0690
	MW-48	Oct-18			<0.535	<2.50 J3	**7.97**	<0.0950	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	<0.0810	<0.0690
	MW-50	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-50	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-50	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-50	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000308 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-50	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	**<0.000275**	**<0.000379**	<0.000348	**<0.000327**	<0.000453	**<0.000324**	<0.000276
	MW-50	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	**<0.000275**	**<0.000379**	<0.000348	**<0.000327**	<0.000453	**<0.000324**	<0.000276
	MW-52	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Oct-18			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-64	Apr-16			<0.107	<0.500	**25.3**	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-64	Oct-16			<0.214	<1.00	**30.9**	<0.0380	<0.0866	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-64	Apr-17			<0.535	<2.50	**3.22**	<0.0950	<0.216	<0.0688	<0.0948	<0.0870	<0.0818	<0.113	<0.0810	<0.0690
	MW-64	Oct-17			<0.535	<2.50	**30.7**	<0.0950	<0.216	<0.0688	<0.0948	<0.0870	<0.0818	<0.113	<0.0810	<0.0690
	MW-64	Apr-18			<0.0428	<0.200	**2.37**	<0.00760	<0.0173	0.00554 J	<0.00758	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-64	Oct-18			<0.0428	<0.200	**38.6**	<0.00760	<0.0173	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906 J4	<0.00648	<0.00552
	MW-65	Apr-16			<0.0214	<0.100	**9.73**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-65	Oct-16			<0.0428	<0.200	**8.04**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	**<0.00654**	<0.00906	<0.00648	<0.00552
	MW-65	Apr-17			<0.214	<1.00	**6.70**	<0.0380	**<0.0866**	**<0.0275**	**<0.0379**	<0.0348	**<0.0327**	<0.0453	**<0.0324**	<0.0276
	MW-65	Oct-17			<0.214	<1.00	**6.25**	<0.0380	**<0.0866**	**<0.0275**	**<0.0379**	<0.0348	**<0.0327**	<0.0453	**<0.0324**	<0.0276
	MW-65	Apr-18			<0.214	<1.00	**4.39**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	**<0.0327**	<0.0453	<0.0324	<0.0276
	MW-65	Oct-18			<0.214	<1.00	**2.84**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	**<0.0327**	<0.0453 J4	<0.0324	<0.0276
	MW-66	Apr-16			<0.0214	<0.100	**3.09**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-66	Oct-16			<0.00214	<0.0100	**3.80**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-66	Apr-17			<0.107	<0.500	**1.89**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-66	Oct-17			<0.0214	<0.100	**0.276**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-66	Apr-18			<0.0214	<0.100	**2.27**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-66	Oct-18			<0.0214	<0.100 J3	**1.95**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-99	Apr-16			<0.0214	<0.100	**5.59**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-99	Oct-16			<0.0428	<0.200	**5.08**	<0.00760	**<0.0173**	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-99	Apr-17			<0.107	<0.500	**2.79**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-99	Oct-17			<0.214	<1.00	**2.58**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-99	Apr-18			<0.214	<1.00	**2.15**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-99	Oct-18			<0.214	<1.00 J3	**2.54**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-101	Apr-16			<0.00214	<0.0100	**0.0664 J6**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-101	Oct-16			<0.00214	<0.0100	0.000845 J	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-101	Apr-17			<0.00214	<0.0100	**0.00650**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-101	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-101	Apr-18			<0.00214	<0.0100	0.00149	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-101	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-102	Apr-16			<0.214	<1.00	**10.8**	<0.0380	**<0.0866**	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-102	Oct-16			<0.214	<1.00	**13.2**	<0.0380	<0.0866	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-102	Apr-17			<0.0428	<0.200	**8.38**	<0.00760	**<0.0173**	<0.00530	<0.00758	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-102	Oct-17			<0.107	<0.500	**9.24**	<0.0190	<0.0433	<0.0138	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-102	Apr-18			<1.07	<5.00	**7.63**	<0.190	<0.433	<0.138	<0.190	<0.174	<0.164	<0.226	<0.162	<0.138
	MW-102	Oct-18			<1.07	<5.00	**12.9**	<0.190	<0.433	<0.138	<0.190	<0.174	<0.164	<0.226 J4	<0.162	<0.138
	MW-103	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	**<0.000870**	0.000597 J	**<0.000380**	<0.000350	**<0.000330**	<0.000450	<0.000320	<0.000280
	MW-103	Apr-16			<0.0107	<0.0500	**1.35**	<0.00190	**<0.00433**	0.00139 J	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-103	Apr-17			<0.107	<0.500	**1.30**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-103	Apr-18			<0.00214	<0.0100	**1.75**	<0.000380	**<0.000866**	0.000406 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-104	Apr-16			<0.00214	<0.0100 J3	**0.0707**	<0.000380	**<0.000866**	**0.00110**	**<0.000379**	<0.000348	**<0.000327**	**<0.000453**	**<0.000324**	<0.000276
	MW-104	Apr-16	FD		<0.00214	<0.0100	**0.0685**	<0.000380	**<0.000866**	**0.00109**	**<0.000379**	<0.000348	**<0.000327**	**<0.000453**	**<0.000324**	<0.000276
	MW-104	Oct-16			<0.0107	<0.0500	**0.341**	<0.00190	<0.00433	0.00182 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-104	Oct-16	FD		<0.0107	<0.0500	**0.284**	<0.00190	**<0.00433**	0.00181 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-104	Apr-17			<0.0214	<0.100	**0.741**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	MW-104	Apr-17	FD		<0.0107	<0.0500	**0.529**	<0.00190	**<0.00433**	<0.00138	<0.00190 J4	<0.00174	<0.00164 J4	<0.00226	<0.00162	<0.00138
	MW-104	Oct-17			<0.00214	<0.0100	**0.144**	<0.000380	**<0.000866**	0.000538 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-104	Oct-17	FD		<0.0107	<0.0500	**0.15**	<0.00190	**<0.00433**	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-104	Apr-18			<0.00214	<0.0100	**0.142**	<0.000380	**<0.000866**	0.000748 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-104	Apr-18	FD		<0.0107	<0.0500	**0.139**	<0.00190	**<0.00433**	0.00144 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-104	Oct-18			<0.00214	<0.0100	**0.198**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453 J4	<0.000324	<0.000276
	MW-104	Oct-18	FD		<0.0107	<0.0500	**0.186**	<0.00190	**<0.00433**	0.00141 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-105	Apr-16			<0.535	<2.50	**13.5**	<0.0950	**<0.216**	<0.0688	<0.0948	<0.0870	<0.0818	<0.113	<0.0810	<0.0690
	MW-105	Oct-16			<0.214	<1.00	**18.2**	<0.0380	**<0.0866**	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-105	Apr-17			<0.214	<1.00	**13.3**	<0.0380	**<0.0866** J4	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-105	Oct-17			0.0145	<0.0100	**9.19**	<0.000380	**<0.000866**	0.00136	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-105	Apr-18			<0.214	<1.00	**8.04**	<0.0380	**<0.0866**	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-105	Oct-18			<0.214	<1.00	**6.29**	<0.0380	**<0.0866**	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453	<0.0324	<0.0276
	MW-106	Apr-16			<0.0535	<0.250	**12.7**	<0.00950	**<0.0117**	**0.0107** J	**<0.00948**	<0.00870	**<0.00818**	<0.0113	**<0.00810**	<0.00690
	MW-106	Oct-16			<0.107	<0.500	**11.3**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-106	Apr-17			<0.107	<0.500	**9.71**	<0.0190	**<0.0433**	0.0186 J	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-106	Oct-17			<0.107	<0.500	**10.6**	<0.0190	**<0.0433**	0.0144 J	<0.0190	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-106	Apr-18			<0.428	<2.00	**8.13**	<0.0760	**<0.173**	<0.0550	**<0.0758**	<0.0696	**<0.0654**	<0.0906	<0.0648	<0.0552
	MW-106	Oct-18			<1.07	<5.00	**11.6**	<0.190	**<0.433**	<0.138	**<0.190**	<0.174	**<0.164**	<0.226	<0.162	<0.138
	MW-107	Apr-16			<0.00214	<0.0100	**1.28**	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-107	Oct-16			<0.0107	<0.0500	**6.35**	<0.00190	**<0.00433**	<0.00138	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-107	Apr-17			<0.107	<0.500	**3.37**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	**<0.0164**	<0.0226	<0.0162	<0.0138
	MW-107	Apr-18			0.00375 J	<0.0100	**6.55**	<0.000380	**<0.000866**	0.000332 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
South Refinery	MW-109	Apr-16			<0.0107	<0.0500	**0.532**	<0.00190	**<0.00433**	<0.00138	**<0.00190**	<0.00174	**<0.00164**	<0.00226	<0.00162	<0.00138
	MW-109	Oct-16			<0.0428	<0.200	**0.995**	<0.00760	**<0.0173**	**<0.00550**	**<0.00758**	<0.00696	**<0.00654**	**<0.00906**	**<0.00648**	<0.00552
	MW-109	Apr-17			<0.0214	<0.100	**1.25**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-109	Oct-17			<0.00214	<0.0100	**1.30**	<0.000380	**<0.000866**	0.000638 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-109	Apr-18			<0.0428	<0.200	**1.54**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	**<0.00654**	<0.00906	<0.00648	<0.00552
	MW-109	Oct-18			<0.0428	<0.200 J3	**1.64**	<0.00760	**<0.0173**	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-110	Apr-16			<0.00214	<0.0100	**0.0132**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-110	Oct-16			<0.00214	<0.0100	0.000511 J	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-110	Apr-17			<0.0107	<0.0500	**0.299**	<0.00190	**<0.00433**	<0.00138	**<0.00190**	<0.00174	<0.00164	<0.00226	0.00406 J	<0.00138
	MW-110	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-110	Apr-18			<0.00214	0.0253 J	**0.173**	<0.000380	**<0.000866**	0.000511 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-110	Oct-18			<0.00214	<0.0100 J3	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	RA-313	Apr-15			<0.00210	<0.0100	0.000366 J	<0.000380	**<0.000870**	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RA-313	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-313	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-313	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-4	Apr-15			<0.00210	0.0289 J	**0.0167**	<0.000380	**<0.000870**	0.000854 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320 J	<0.000280
	RW-4R	Apr-16			<0.00214	<0.0100	**0.0140**	<0.000380	<0.000866	0.000466 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-4	Apr-17			<0.0107	0.0509 J	**0.0294**	<0.00190	<0.00433 J4	0.00239 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-4	Apr-18			<0.00214	<0.0100	**0.00821**	<0.000380	<0.000866	0.000447 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-5R	Apr-15			<0.00210	<0.100	**2.92**	<0.00380	<0.00870	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	RW-5R	Apr-16			<0.0428	<0.200	**3.48**	<0.00760	<0.0173	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	RW-6	Apr-15			<0.00210	<0.100	**0.636**	<0.00380	**<0.00870**	0.00771 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	RW-6R	Apr-16			<0.00214	<0.0100	**0.218**	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-6	Apr-18			<0.00214	<0.0100	**2.67**	<0.000380	**<0.000866**	0.000533 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-15C	Apr-17			0.0535	<0.250	**19.1**	<0.00950	**<0.0216**	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	RW-15C	Apr-18			<0.00214	<0.0100	**21.9**	<0.000380	**<0.000866**	0.000650 JV3	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
South RO Reject Field	MW-114	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-114	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-114	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-114	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-114	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	MW-114	Oct-18			<0.00214	<0.0100 J3	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Oct-18			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Oct-16			<0.00214	<0.0100	0.000536 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Apr-17			<0.00214	<0.0100	0.000430 J	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
TEL	MW-49	Apr-16			<0.0428	<0.200	**0.196**	<0.00760	<0.0173	<0.00550	<0.00758	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	MW-49	Oct-16			<0.214	<1.00 J3	**0.241**	<0.0380	<0.0866 J3	<0.0275	<0.0379	<0.0348	<0.0327	<0.0453 J3	<0.0324	**0.113 JB**
	MW-49	Apr-17			<0.0214	0.137 J	**0.227**	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	0.0119 J	<0.00276
	MW-49	Oct-17			<0.0428	<0.200	**0.573**	<0.00760	<0.0173	0.00552 J	<0.00758	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-49	Apr-18			<0.0214	<0.100	**0.542**	<0.00380	<0.00866	0.00351 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-49	Oct-18			<0.0107	<0.0500	**0.451**	<0.00190	<0.00433	0.00567	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	TEL-1	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	TEL-1	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	0.000460 J	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	TEL-1	Apr-17			<0.00214	0.0125 JJ3	0.000647 J	<0.000380	**<0.000866**	0.000420 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-1	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	**<0.000327**	<0.000453	<0.000324	<0.000276
	TEL-1	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-1	Oct-18			<0.0107	<0.0500	<0.00166	<0.00190	**<0.00433**	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	TEL-2	Apr-16			<0.00214	<0.0100	**0.709**	<0.000380	<0.000866	0.00124	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-2	Oct-16			<0.0214	<0.100	**0.962**	<0.00380	<0.00866	0.00325 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-2	Apr-17			<0.0214	<0.100	**0.556**	<0.00380	<0.00866	0.00376 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-2	Oct-17			<0.0214	<0.100	**0.590**	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-2	Apr-18			<0.0214	<0.100	**0.619**	<0.00380	<0.00866	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-2	Oct-18			<0.0535	<0.250	**0.936**	<0.00950	<0.0216	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	TEL-3	Apr-16			<0.0535	<0.250	**0.317**	<0.00950	**<0.0117**	<0.00688	<0.00948	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	TEL-3	Oct-16			<0.00214	0.0156 J	**0.0123**	<0.000380	**<0.000866**	0.000488 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-3	Apr-17			<0.00214	<0.0100	**0.0799**	<0.000380	**<0.000866**	0.000918 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-3	Apr-18			<0.00214	<0.0100	**0.392**	<0.000380	**<0.000866**	0.00114	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Apr-16			<0.0214	<0.100	**0.530**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Apr-16	FD		<0.0214	<0.100	**0.557**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	TEL-4	Oct-16			<0.0214	<0.100	**0.514**	<0.00380	**<0.00866**	<0.00275	**<0.00379**	<0.00348	**<0.00327**	<0.00453	<0.00324	<0.00276
	TEL-4	Oct-16	FD		<0.0214	<0.100	**0.479**	<0.00380	**<0.00866**	0.00628 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Apr-17			<0.0214	<0.100 J3	**0.0595**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Apr-17	FD		<0.00214	<0.0100	**0.0583**	<0.000380	**<0.000866**	0.000882 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Oct-17			<0.00214	<0.0100	**0.0161**	<0.000380	**<0.000866**	0.000420 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Oct-17	FD		<0.00214	<0.0100	**0.0149**	<0.000380	**<0.000866**	0.000526 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Apr-18			<0.00214	<0.0100	**0.0415**	<0.000380	**<0.000866**	0.000526 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Apr-18	FD		<0.00214	<0.0100	**0.0405**	<0.000380	**<0.000866**	0.000293 J	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Oct-18			<0.00214	<0.0100	0.00285	<0.000380	**<0.000866**	<0.000275	**<0.000379**	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Oct-18	FD		<0.00214	<0.0100	0.00289	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
TMD	MW-8	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	**<0.000870**	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-8	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-8	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J4
	MW-8	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	**<0.000866**	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-16	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-16	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000446 J	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	MW-16	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-16	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-20	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-20	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-20	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J4
	MW-20	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J3	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J3	<0.000324	0.00106 JB
	MW-21	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Oct-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-25	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000423 J	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	MW-25	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-25	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J4
	MW-25	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-26	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-26	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-26	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-26	Apr-18			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24E+00	14.1	0.005	8.00E-02	7.54E-03	8.10E-01	0.005	1.00E-01	8.00E-02	2.09E+01	0.080	0.0203
				CGWSL Source:	NMED TW	TMED TW	WQCC HH	USEPA MCL	NMED TW	NMED TW	WQCC HH	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
TMD	MW-27	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-27	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-27	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-27	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-68	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-68	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-68	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-68	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-71	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-71	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-71	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-71	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-89	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000752 J	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	MW-89	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-89	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-89	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J3	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J3	<0.000324	0.00103 JB
	NP-1	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Oct-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-2	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	NP-6	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	NP-6	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.00376	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	NP-6	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
Upgradient	UG-1	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	UG-1	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-1	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-1	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	0.000367 J	<0.000276
	UG-2	Apr-15		<0.00100	<0.0100	<0.000330	<0.000380	<0.000870	0.000348 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	UG-2	Apr-16		<0.00210	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-2	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-2	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-3R	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	UG-3R	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-3R	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-3R	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-4	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-4	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-4	Apr-18		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
Cross-Gradient	KWB-13	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	0.00254	<0.00380	<0.000370	0.00317 J	<0.000360	0.000373 J
	KWB-13	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-13	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-13	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-17	Apr-14													
	NP-5	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	NP-5	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	NP-5	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-3156	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	RA-3156	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	RA-3156	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-3156	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
Evaporation Ponds	MW-1R	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-1R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-1R	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 SS4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-1R	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-2A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.00327**	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00305	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-17	FD	<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 SS4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-3	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00149	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00200	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174
	MW-3	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-4A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00698	0.00166		0.000605 J	<0.00100	<0.000361	0.000357 J
	MW-4A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00690	0.00278		0.000516 J	<0.00100	<0.000361	0.000434 J
	MW-4A	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	0.00449	0.00105 J	<0.00382 SS4	0.000444 J	<0.00100 J4	<0.000361	<0.000349
	MW-4A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00336	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-4A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00352	0.00266	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-4A	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.00451 J	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174
	MW-4B	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-4B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.000462 J	0.000845 J	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-4B	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	0.000727 J	<0.000719	<0.00382 SS4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-5A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00212	<0.00100	<0.000361	<0.000349
	MW-5A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00130	<0.00100	<0.000361	<0.000349
	MW-5A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000991 J	<0.000719	<0.00382	0.00160	<0.00100	<0.000361	<0.000349
	MW-5A	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.00130**	<0.000719	<0.00382	0.00150	<0.00100	<0.000361	<0.000349
	MW-5A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000503 J	<0.000719	<0.00382	0.00147	<0.00100	<0.000361	<0.000349
	MW-5A	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.00181 J	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174
	MW-5B	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00148	<0.00100	<0.000360	<0.000350
	MW-5B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00140	<0.00100	<0.000361	<0.000349
	MW-5C	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5C	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.000507 J	<0.00100	<0.000360	<0.000350
	MW-5C	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000369 J	<0.00100	<0.000361	<0.000349
	MW-6A	Apr-15		<0.000260	<0.000420	<0.000350	**<0.00100**	<0.000380	**0.000440** J	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-6A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00116	0.000386 J	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-6A	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-6A	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	0.00117	**0.000931** J	0.00167 J	<0.00382	<0.000367	<0.00100	<0.000361	0.000460 J
	MW-6B	Mar-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Mar-13	FD	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-6B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719		0.00168	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00168	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719		0.00188	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-16	FD	<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719		0.00166	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00150	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00148	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00140	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00178	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00130	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00191	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174
	MW-7A	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00148	<0.00100	<0.000361	<0.000349
	MW-7B	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-7B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-7B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-10	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00216	<0.00100	<0.000361	<0.000349
	MW-10	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00190	<0.00100	<0.000361	<0.000349
	MW-10	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00195	<0.00100	<0.000361	<0.000349
	MW-10	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	0.00141	<0.00100	<0.000361	<0.000349
	MW-10	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00141	<0.00100	<0.000361	<0.000349
	MW-10	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174
	MW-11A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-11A	Oct-16													
	MW-11A	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 SS4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-11A	Oct-17													
	MW-11A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-11A	Oct-18													
	MW-11B	Mar-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-11B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-11B	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 SS4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-12	Apr-14													
	MW-13	Apr-14													
	MW-15	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.000387 J	<0.000720	<0.00380	0.000809 J	<0.00100	<0.000360	<0.000350
	MW-15	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719		0.000602 J	<0.00100	<0.000361	<0.000349
	MW-15	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 SS4	0.000373 J	<0.00100 J4	<0.000361	<0.000349
	MW-15	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000836 J	<0.00100	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-18A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.000490 J	<0.00100	<0.000361	<0.000349
	MW-18A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.000586 J	<0.00100	<0.000361	<0.000349
	MW-18A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000650 J	<0.00100	<0.000361	<0.000349
	MW-18A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000529 J	<0.00100	<0.000361	<0.000349
	MW-18A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000589 J	<0.00100	<0.000361	<0.000349
	MW-18A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000566 J	<0.00100	<0.000361	<0.000349
	MW-18B	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-18B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-18B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00907	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00887	<0.00100	<0.000361	<0.000349
	MW-22A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00805	<0.00100	0.000576 J	<0.000349
	MW-22A	Oct-16	FD	<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719		0.00620	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00774	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-17	FD	<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3J4	0.00654	<0.00100 J4	<0.000361	<0.000349
	MW-22A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00552	<0.00100	<0.000361	<0.000349
	MW-22A	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00631	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00458	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00580	<0.00100	<0.000361	<0.000349
	MW-22A	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	0.00351 J	<0.00500	<0.00180	<0.00174
	MW-22A	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00446	<0.00100	<0.000361	<0.000349
	MW-22B	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	0.00650	<0.00500	<0.00500	<0.00500
	MW-22B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00634	<0.00100	<0.000360	<0.000350
	MW-22B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00564	<0.00100	<0.000361	<0.000349
	MW-70	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-72	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-72	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-72	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-72	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-73	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00290	<0.00100	<0.000360	<0.000350
	MW-73	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00270	<0.00100	<0.000361	<0.000349
	MW-73	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00120	<0.00100 J4	<0.000361	<0.000349
	MW-73	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-74	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.000972 J	<0.00100	<0.000361	<0.000349
	MW-74	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-74	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000473 J	<0.00100 J4	<0.000361	<0.000349
	MW-74	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000527 J	<0.00100	<0.000361	<0.000349
	MW-74	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000608 J	<0.00100	<0.000361	<0.000349
	MW-74	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-75	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00144	<0.000719		0.00577	<0.00100	<0.000361	<0.000349
	MW-75	Oct-16		<0.000260	<0.000418	0.000603 J	<0.00100	<0.000384	0.0167	<0.000719		0.00407	<0.00100	0.000385 J	0.00123
	MW-75	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00303	<0.000719	<0.00382	0.00645	<0.00100	<0.000361	<0.000349
	MW-75	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0101	<0.000719	<0.00382	0.00224	<0.00100	<0.000361	0.000870 J
	MW-75	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000617 J	<0.000719	<0.00382	0.00467	<0.00100	<0.000361	<0.000349
	MW-75	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0106	<0.000719	<0.00382	0.00276	<0.00100	<0.000361	<0.000349
	MW-76	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0108	<0.000719		0.00756	<0.00100	<0.000361	0.000356 J
	MW-76	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000437 J	0.0276	0.00214		0.0245	<0.00100	<0.000361	0.00125
	MW-76	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0127	<0.000719	<0.00382	0.0130	<0.00100	<0.000361	0.000438 J
	MW-76	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0316	<0.000719	<0.00382	0.0143	<0.00100	<0.000361	0.000893 J
	MW-76	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0130	<0.000719	<0.00382	0.0127	<0.00100	<0.000361	0.000427 J
	MW-76	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.0138	<0.00360	<0.0191	0.0119	<0.00500	<0.00180	<0.00174
	MW-77	Apr-16		<0.000260	<0.000418	0.00264	<0.00100	0.00300	0.0230	0.00332		0.00647	<0.00100	0.000463 J	0.00578
	MW-77	Oct-16		<0.00260	<0.00418	<0.00350	<0.0100	0.00766 J	0.0259	<0.00719		0.00552 J	<0.0100	<0.00361	0.0122
	MW-77	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	0.0207	<0.00719	<0.0382	0.00452 J	<0.0100	<0.00361	0.00565 J
	MW-77	Apr-18		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	0.0131	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-78	Apr-15		<0.000260	<0.000420	0.000443 J	<0.00100	0.00262	0.00348	0.00146	<0.00380	0.000629 J	<0.00100	<0.000360	0.00390
	MW-78	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000942 J	0.00168	<0.000719		<0.000367	<0.00100	<0.000361	0.00152
	MW-78	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-78	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-79	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-80	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-80	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-80	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-80	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-81	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-81	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-81	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-81	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-82	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-82	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-82	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-82	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-83	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00143	<0.000719		<0.000367	<0.00100	<0.000361	0.000365 J
	MW-83	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00145	<0.000719		<0.000367	<0.00100	<0.000361	0.000696 J
	MW-83	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-83	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000439 J	0.00189	0.00120 J	<0.00382	<0.000367	<0.00100	<0.000361	0.000645 J
	MW-83	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00202	0.00258	<0.00382	0.000465 J	<0.00100	<0.000361	0.000438 J
	MW-83	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.00190 J	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174
	MW-84	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00129	<0.00100	<0.000361	<0.000349
	MW-84	Oct-16		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719		<0.00367	<0.0100	<0.00361	<0.00349
	MW-84	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	**<0.00326**	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-84	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000451 J	<0.000719	<0.00382	0.00174	<0.00100	<0.000361	<0.000349
	MW-84	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00124	<0.00100	<0.000361	<0.000349
	MW-84	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000476 J	<0.000719	<0.00382	0.00128	<0.00100	<0.000361	<0.000349
	MW-87	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.000646 J	<0.00100	<0.000361	<0.000349
	MW-87	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719		0.00107	<0.00100	<0.000361	<0.000349
	MW-87	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719	<0.00382	0.000665 J	<0.00100	<0.000361	<0.000349
	MW-87	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000728 J	<0.00100	<0.000361	<0.000349
	MW-87	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000710 J	<0.00100	<0.000361	<0.000349
	MW-87	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000736 J	<0.00100	<0.000361	<0.000349
	MW-88	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloro-ethene	cis-1,3-Dichloro-propene	Cymene	Dichloro-methane	Ethyl-benzene	Isopropyl-benzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butyl-benzene	N-Propyl-benzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-120	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-120	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-122	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-123	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00143	<0.00100	<0.000361	<0.000349
	MW-123	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00163	<0.00100	<0.000361	<0.000349
	MW-123	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719	<0.00382 J3J4	0.00114	<0.00100 J4	<0.000361	<0.000349
	MW-123	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00139	<0.00100	<0.000361	<0.000349
	MW-123	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00122	<0.00100	<0.000361	<0.000349
	MW-123	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	<0.00184	<0.00500	<0.00180	<0.00174
	MW-124	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-1R	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-2A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-3	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-4	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-5	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-6	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-7AR	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00141	<0.00100	<0.000361	<0.000349
	OCD-7AR	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00179	<0.00100	<0.000361	<0.000349
	OCD-7AR	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00110	<0.00100 J4	<0.000361	<0.000349
	OCD-7AR	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00107	<0.00100	<0.000361	<0.000349
	OCD-7AR	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00124	<0.00100	<0.000361	<0.000349
	OCD-7AR	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00139	<0.00100	<0.000361	<0.000349
	OCD-7B	Mar-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-7B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-7B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-8A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00475	<0.00100	<0.000361	<0.000349
	OCD-8A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00507	<0.00100	<0.000361	<0.000349
	OCD-8A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00420	<0.00100	<0.000361	<0.000349
	OCD-8A	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	0.00392	<0.00100	<0.000361	<0.000349
	OCD-8A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00380	<0.00100	<0.000361	<0.000349
	OCD-8A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00463	<0.00100	<0.000361	<0.000349
	OCD-8B	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-8B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00155	<0.00100	<0.000360	<0.000350
	OCD-8B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000919 J	<0.00100	<0.000361	<0.000349
Field East of Refinery	KWB-1A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1C	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-1C	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-1C	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-7	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.0285	0.0338	0.00342	<0.00380	0.0225	0.0120	0.00299	0.0317
	KWB-7	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	0.0240	0.0223	0.000839 J	<0.00382	0.00677	0.00225 J	0.00143	0.0221
	KWB-7	Apr-16		<0.000260	<0.000418	0.000952 J	<0.00100	0.0248	0.0140	0.0218		0.0104	0.0141	0.00365	0.0193
	KWB-7	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	0.0167	**0.0228**	0.0196		0.00582	0.00120 JJ4	0.000757 J	0.0158
	KWB-7	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00858	0.0136	0.00700	<0.00382	0.00678	0.00409 J	<0.000361	0.00992
	KWB-7	Oct-17		<0.000260	<0.000418	0.000418 J	<0.00100	0.0156	0.0103	0.0132	<0.00382	0.00510	0.00350 J	0.000456 J	0.0105
	KWB-7	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	0.00178	0.00504	0.00156 J	<0.00382	0.00928	<0.00100	<0.000361	0.00333
	KWB-8	Oct-16		<0.0520	<0.0836	<0.0700	<0.200	**0.828**	<0.0652	1.01		<0.0734	<0.200 J4	<0.0722	<0.0698
	KWB-8	Apr-17		<0.0260	<0.0418	<0.0350	<0.100	**1.24**	0.0467 J	1.92	<0.382	**0.129**	**0.141 J**	<0.0361	0.0852 J
	KWB-8	Oct-17		<0.000260	<0.000418	0.00112	<0.00100	0.617	0.0182	0.782	0.00515 J	**0.134**	**0.0519**	0.00209	0.0217

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	KWB-10R	Apr-16		<0.0130	<0.0209	<0.0175	<0.0500	0.437	0.0442 J	0.645		**3.71**	**0.150 J**	<0.0180	0.0616
	KWB-10R	Oct-16		<0.00520	<0.00836	<0.00700	<0.0200	0.513	0.0400	0.664		**3.62**	**0.133**	0.00990 J	0.0607
	KWB-10R	Apr-17		<0.0130	<0.0209	<0.0175	<0.0500	0.505	0.0486 J	0.716	<0.191	**3.65**	**0.156 J**	<0.0180	0.0714
	KWB-10R	Oct-17		<0.000260	**<0.000418**	0.0184	**<0.00100**	0.530	**0.0494**	**0.655**	<0.00382	**5.41**	**0.152**	<0.000361	**0.0748**
	KWB-10R	Apr-18		<0.0650	**<0.104**	<0.0875	**<0.250**	0.354	**<0.0815**	**0.457 J**	<0.955	**2.74**	<0.250	**<0.0902**	**<0.0872**
	KWB-10R	Oct-18		<0.0650	<0.104	<0.0875	<0.250	0.238 J	<0.0815	0.217 J	<0.955	**4.12**	<0.250	**<0.0902**	**<0.0872**
	KWB-11A	Apr-16		<0.000260	<0.000418	0.000374 J	**<0.00100**	<0.000384	**0.000412** J	<0.000719		0.00477	0.0134	**0.00134**	**<0.000349**
	KWB-11A	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.00244**	0.00110		0.00416	0.00936 J4	**0.000858 J**	**<0.000349**
	KWB-11A	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	0.00841	**<0.000361**	**<0.000349**
	KWB-11A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00518	0.000852 J	<0.00382	0.00273	0.00563	**0.00151**	**0.000796 J**
	KWB-11A	Apr-18		**<0.000260**	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**0.000355** J	<0.000719	<0.00382	0.00341	<0.00100	**<0.000361**	**<0.000349**
	KWB-11A	Oct-18		**<0.000260**	**<0.000418**	0.000647 J	**<0.00100**	<0.000384	**0.00390**	<0.000719	<0.00382	0.00290	0.00165 J	**0.000730 J**	**<0.000349**
	KWB-11B	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-11B	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	0.00153 JJ4	<0.000361	<0.000349
	KWB-11B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-11B	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000565 J	<0.00100	<0.000361	<0.000349
	KWB-11B	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000498 J	<0.00100	<0.000361	<0.000349
	KWB-11B	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00125	<0.00100	<0.000361	<0.000349
	KWB-12A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-12A	Apr-15	FD	<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-12A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000337 J	<0.000719		<0.000367	0.0139	<0.000361	0.000638 J
	KWB-12B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-P4	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-P4	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-P4	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-57	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	0.00273 J	<0.000361	<0.000349
	MW-57	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-58	Apr-16		<0.00260	<0.00418	0.00813 J	<0.0100	**1.11**	0.0594	0.830		**0.200**	**0.257**	0.00944 J	0.105
	MW-58	Oct-16		<0.000260	<0.000418	0.00572	<0.00100	**1.10**	0.0530	0.873		0.0468	**0.0867**	0.00517	0.0930
	MW-58	Apr-17		<0.0260	<0.0418	<0.0350	<0.100	**0.720**	0.0511 J	0.533	<0.382	<0.0367	**0.191 J**	<0.0361	0.0910 J
	MW-58	Oct-17		<0.000260	<0.000418	0.00399	<0.00100	0.0965	0.0456	0.220	<0.00382	0.0987	**0.0469**	0.00529	0.0842
	MW-58	Apr-18		<0.0130	<0.0209	<0.0175	<0.0500	**0.946**	0.0521	0.268	<0.191	0.0303 J	**0.267**	<0.0180	0.0965
	MW-58	Oct-18		<0.0130	<0.0209	<0.0175	<0.0500	0.0351 J	0.0461 J	<0.0360	<0.191	0.0624	<0.0500	<0.0180	0.0900
	MW-111	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00122	**0.000887** J	**<0.000719**		**1.54**	<0.00100	**<0.000361**	**0.000690 J**
	MW-111	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00226	0.000620 J	**0.00177 J**		**1.29**	0.00103 J	<0.000361	**0.000601 J**
	MW-111	Apr-17		<0.000260	**<0.000418**	<0.000350	**<0.00100**	0.000432 J	**0.00163**	**0.00237**	<0.00382	**0.955**	0.00310 J	<0.000361	**0.000769 J**
	MW-111	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.0384	0.00112	<0.0719	<0.00382	**1.40**	0.00175 J	<0.000361	**0.000622 J**
	MW-111	Apr-18		<0.00650	<0.0104	<0.00875	**<0.0250**	<0.00960	**<0.00815**	**<0.0180**	<0.0955	**1.25**	<0.0250	<0.00902	**<0.00872**
	MW-111	Oct-18		<0.00650	<0.0104	<0.00875	**<0.0250**	<0.00960	**<0.00815**	<0.0180	<0.0955	**1.47**	<0.0250	<0.00902	**<0.00872**
	MW-113	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00354	<0.000326	0.00518		0.0143	<0.00100	**<0.000361**	<0.000349
	MW-113	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.00364	<0.000326	0.00531		0.0143	<0.00100	**<0.000361**	<0.000349
	MW-113	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.0199	0.00140	0.0143		0.0137	0.00208 JJ4	**<0.000361**	0.00181
	MW-113	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.0175	0.00137	0.0127		0.0143	0.00200 JJ4	**<0.000361**	0.00163
	MW-113	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	0.0084	**0.000441** J	0.0133	<0.00382	0.0147	0.00157 J	**<0.000361**	0.000359 J
	MW-113	Apr-17	FD	<0.000260	<0.000418	<0.000350	**<0.00100**	0.00937	**0.000513** J	0.0148	<0.00382	0.0140	0.00176 J	**<0.000361**	0.000359 J
	MW-113	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.0269	0.00565	0.0279	<0.00382	0.0123	0.00420 J	<0.000361	0.00456
	MW-113	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.0215	0.00546	0.0234	<0.00382	0.0117	0.00399 J	<0.000361	0.00444
	MW-113	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	0.00604	0.000518 J	0.00849	<0.00382	0.0114	<0.00100	<0.000361	0.000598 J
	MW-113	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.00667	0.000449 J	0.00901	<0.00382	0.0120	<0.00100	<0.000361	0.000439 J
	MW-113	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	0.00885	0.000671 J	0.00867	<0.00382	0.0128	<0.00100	<0.000361	0.000882 J
	MW-113	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.00992	0.000612 J	0.00938	<0.00382	0.0100	0.00117 J	<0.000361	0.000794 J
	MW-125	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000495 J	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-126A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0591	<0.000719		<0.000367	<0.00100 J4	<0.000361	0.00794
	MW-126A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00333	0.00141 J	<0.00382	<0.000367	<0.00100	<0.000361	0.00226
	MW-126A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000649 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00285	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000426 J	<0.000719		<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-126B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-127	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.348	0.0198	0.112		**0.629**	**0.0425**	0.00229	0.0325
	MW-127	Oct-16		<0.00260	<0.00418	<0.00350	<0.0100	0.120	0.0120	0.0387		**0.575**	<0.0100 J4	<0.00361	0.0189
	MW-127	Apr-17		<0.000260	<0.000418	0.00108	<0.00100	0.186	0.0193	0.0711	<0.00382	**0.525**	0.0175	0.00216	0.0337
	MW-127	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.0937	0.0130	0.0445	<0.00382	**0.885**	0.00901	<0.000361	0.0185
	MW-127	Apr-18		<0.00520	<0.00836	<0.00700	<0.0200	0.121	0.0160 J	0.0654	<0.0764	**0.623**	<0.0200	<0.00722	0.0255
	MW-127	Oct-18		<0.00520	<0.00836	<0.00700	<0.0200	0.0797	0.0180 J	0.0458	<0.0764	**0.774**	<0.0200	<0.00722	0.0258
	MW-128	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00494	0.00111	0.00153		**0.846**	0.00104 J	**<0.000361**	**0.00135**
	MW-128	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00408	**0.000965** J	0.00370		**0.832**	0.00225 J	**<0.000361**	0.00136
	MW-128	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00166	0.00124	0.00159 J	<0.00382	**0.821**	0.00140 J	**<0.000361**	0.00181
	MW-128	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00128	0.00133	0.00336	<0.00382	**0.785**	0.00142 J	**<0.000361**	0.00170
	MW-128	Apr-18		<0.00520	<0.00836	<0.00700	**<0.0200**	<0.00768	**<0.00652**	<0.0144	<0.0764	**0.961**	**0.0422 J**	**<0.00722**	<0.00698
	MW-128	Oct-18		<0.00520	<0.00836	<0.00700	**<0.0200**	0.0247	**<0.00652**	<0.0144	<0.0764	**0.963**	<0.0200	**<0.00722**	0.00759 J
	MW-129	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.0192	0.00172	0.00199		**4.59**	0.00534	**0.000444** J	0.000863 J
	MW-129	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000985 J	0.00144	0.00124		**4.73**	0.00186 JJ4	**<0.000361**	0.000383 J
	MW-129	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000976 J	0.000737 J	<0.00382	**4.34**	0.00247 J	**<0.000361**	<0.000349
	MW-129	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	0.00130	0.000687 J	0.00125 J	<0.00382	**5.40**	0.00124 J	**<0.000361**	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloro-ethene	cis-1,3-Dichloro-propene	Cymene	Dichloro-methane	Ethyl-benzene	Isopropyl-benzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butyl-benzene	N-Propyl-benzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	MW-130	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719		0.000538 J	<0.00100	**<0.000361**	**<0.000349**
	MW-130	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719		0.00130	0.00112 J	**<0.000361**	<0.000349
	MW-130	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00130	<0.00100	**<0.000361**	<0.000349
	MW-130	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00136	<0.00100	**<0.000361**	<0.000349
	MW-130	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00134	<0.00100	**<0.000361**	<0.000349
	MW-130	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000976 J	<0.00100	**<0.000361**	<0.000349
	MW-131	Apr-15		<0.000260	<0.000420	0.00103	<0.00100	0.0692	0.0162	0.0840	<0.00380	**5.23**	**0.0468**	0.00368	0.0280
	MW-131	Oct-15		<0.000260	<0.000418	0.00105	<0.00100	0.0480	0.0220	0.0615	<0.00382	**4.54**	**0.0589**	0.00375	0.0370
	MW-131	Apr-16		<0.000260	<0.000418	0.000697 J	<0.00100	0.0535	0.0183	0.0513		**3.69**	**0.0353**	0.00308	0.0315
	MW-131	Oct-16		<0.00130	<0.00209	<0.00175	<0.00500	0.0324	0.0150	0.0431		**4.09**	0.0135 JJ4	0.00183 J	0.0241
	MW-131	Apr-17		<0.000260	<0.000418	0.000554 J	<0.00100	0.0532	0.0206	0.0735	<0.00382	**3.99**	0.0295	0.00255	0.0338
	MW-131	Oct-17		<0.000260	<0.000418	0.000701 J	<0.00100	<0.0960	0.0162	<0.180	<0.00382	**5.25**	**0.0303**	0.00185	0.0262
	MW-133	Nov-14		<0.0260	<0.0420	<0.0350	<0.100	0.300	0.0570 J	0.180 J	<0.380	**5.60**	<0.100	**<0.0360**	**0.0840** J
	MW-133	Apr-15		<0.0260	<0.0420	<0.0350	<0.100	0.199	<0.0330	0.108	<0.380	**6.67**	<0.100	**<0.0360**	**0.0451** J
	MW-134	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-134	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	**<0.000361**	<0.000349
	MW-134	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	**<0.000361**	<0.000349
	MW-134	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-134	Apr-17		<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-134	Apr-17	FD	<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-134	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-135	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00197	<0.00100	<0.000361	<0.000349
	MW-135	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.000685 J	<0.00100 J4	<0.000361	<0.000349
	MW-135	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-135	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-135	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-135	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-4196	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00507	<0.00100	<0.000361	<0.000349
	RA-4196	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00657	<0.00100 J4	<0.000361	<0.000349
	RA-4196	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00618	<0.00100	<0.000361	<0.000349
	RA-4196	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00763	<0.00100	<0.000361	<0.000349
	RA-4196	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00693	<0.00100	<0.000361	<0.000349
	RA-4196	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00753	<0.00100	<0.000361	<0.000349
	RA-4798	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.0121	<0.00100	<0.000361	<0.000349
	RA-4798	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.0124	<0.00100 J4	<0.000361	<0.000349
	RA-4798	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00360	<0.00100	<0.000361	<0.000349
	RA-4798	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00889	<0.00100	<0.000361	<0.000349
	RA-4798	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-4798	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00788	<0.00100	<0.000361	<0.000349
	RW-12R	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.00606	0.0359	0.0140		0.00568	<0.00500	<0.00180	0.0482
	RW-12R	Apr-17		<0.00130	<0.00209	0.00214 J	<0.00500	0.00823	0.0591	0.0239	<0.0191	0.00210 J	0.00877 J	<0.00180	0.0809
	RW-12R	Apr-18		<0.000260	<0.000418	0.000372 J	<0.00100	0.00269	0.0459	0.00648	<0.00382	0.00315	0.00130 J	0.00125	0.0634
	RW-13R	Apr-16		<0.000260	<0.000418	0.000561 J	<0.00100	0.0691	0.0117	0.0939		0.0779	0.0148	0.00124	0.0183
	RW-13R	Apr-18		<0.000260	<0.000418	0.00134	<0.00100	0.00855	0.0177	0.0283	<0.00382	0.0559	0.00114 J	0.00193	0.0319
	RW-18	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	RW-18	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	RW-18A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-18A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-20	Apr-15		<0.00260	<0.00420	0.00401 J	<0.0100	**0.973**	0.0456	1.30	<0.0380	**0.209**	**0.183**	0.00846 J	0.0980
	RW-22	Apr-15		<0.00260	<0.00420	0.00521 J	<0.0100	**1.09**	0.0525	0.850	<0.0380	**0.178**	**0.164**	0.00856 J	0.103
North Refinery	MW-23	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.179	0.161	0.0147		0.0297	**0.193**	0.0254	0.268
	MW-23	Oct-16		<0.00650	<0.0104	<0.00875	<0.0250	0.168	0.124	<0.0180		0.0433	**0.220**	0.0257	0.216
	MW-23	Apr-17		<0.000260	<0.000418	0.000602 J	<0.00100	0.0958	0.144	0.00361	<0.00382	0.0270	**0.190**	0.0169	0.137
	MW-23	Oct-17		<0.000260	<0.000418	0.000379 J	<0.00100	0.0421	0.125	0.00327	<0.00382	0.0203	**0.137**	0.0136	0.169
	MW-23	Apr-18		<0.0260	<0.0418	<0.0350	<0.100	0.114	**0.141**	**<0.0719**	<0.382	<0.0367	**0.247 J**	**<0.0361**	**0.213**
	MW-23	Oct-18		<0.0260	<0.0418	<0.0350	<0.100	0.0392 J	**0.108**	**<0.0719**	<0.382	<0.0367	**0.145 J**	**<0.0361**	**0.176**
	MW-29	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	**<0.000349**
	MW-29	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.000398** J	<0.000719		0.000424 J	<0.00100	<0.000361	**<0.000349**
	MW-29	Apr-17		<0.000260	<0.000418	0.00281	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	**<0.000349**
	MW-29	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000739 J	<0.000719	<0.00382	0.000990 J	<0.00100	<0.000361	**<0.000349**
	MW-29	Apr-18		<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	0.000482 J	<0.00100	<0.000361	**<0.000349**
	MW-29	Oct-18		<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**0.00163**	<0.000719	<0.00382	0.00403	<0.00100	<0.000361	**<0.000349**
	MW-39	Apr-16		<0.00650	<0.0104	<0.00875	<0.0250	0.0211 J	0.0339	0.145		<0.00918	<0.0250	<0.00902	0.0386
	MW-39	Oct-16		<0.0260	<0.0418	<0.0350	<0.100	<0.0384	0.0418 J	0.161		<0.0367	<0.100	<0.0361	0.0499 J
	MW-39	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	0.0284	0.0449	0.141	<0.0382	0.00429 J	0.0158 J	0.00439 J	0.0579
	MW-39	Oct-17		<0.000260	<0.000418	0.00232	<0.00100	0.0206	0.0369	0.113	<0.00382	0.00243	0.00239 J	0.00371	0.0449
	MW-39	Apr-18		<0.000260	<0.000418	0.00293	<0.00100	0.0263	0.0421	0.141	<0.00382	0.00147	0.00102 J	0.00336	0.0461
	MW-39	Oct-18		<0.000260	<0.000418	0.000843 J	<0.00100	0.0100	0.0198	0.0493	<0.00382	0.00180	<0.00100	0.00199	0.0165
	MW-40	Apr-15		<0.000260	<0.000420	<0.000350	**<0.00100**	0.000399 J	**0.0308**	0.00606	<0.00380	<0.000370	<0.00100	<0.000360	0.00319
	MW-40	Apr-16		<0.000260	**<0.000418**	<0.000350	**<0.00100**	0.000609 J	**0.0775**	0.0144		<0.000367	<0.00100	0.000770 J	**0.00468**
	MW-40	Apr-17		<0.000260	<0.000418	0.000356 J	<0.00100	0.000721 J	**0.0804**	0.0117	<0.00382	<0.000367	<0.00100	<0.000361	0.00806
	MW-40	Apr-18		<0.000260	<0.000418	0.000376 J	<0.00100	0.000567 J	0.0930	0.00619	<0.00382	<0.000367	<0.00100	0.000605 J	0.00369
	MW-41	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.00844	<0.000720	<0.00380	0.00440	<0.00100	<0.000360	<0.000350
	MW-41	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0170	<0.000719		0.00384	<0.00100	<0.000361	0.00125
	MW-41	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0148	<0.000719	<0.00382	0.00380	<0.00100	<0.000361	0.000572 J
	MW-41	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00791	<0.000719	<0.00382	0.00796	<0.00100	<0.000361	<0.000349
	MW-42	Apr-15		<0.00260	<0.00420	<0.00350	**0.0106 J**	<0.00380	0.0326	0.0484	<0.0380	0.0145	<0.0100	<0.00360	0.0205
	MW-42	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.0325	0.0380		0.0114	<0.00500	<0.00180	0.0138
	MW-42	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0278	0.00365	<0.00382	0.0104	<0.00100	<0.000361	0.00355
	MW-42	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0256	0.00420	<0.00382	0.00598	<0.00100	<0.000361	0.0030
	MW-43	Apr-16		<0.0650	<0.104	<0.0875	<0.250	**0.968**	<0.0815	1.23		<0.0918	<0.250	<0.0902	0.110 J
	MW-43	Oct-16		<0.0650	<0.104	<0.0875	<0.250	**0.810**	<0.0815	1.26		<0.0918	<0.250	<0.0902	0.0908 J
	MW-43	Apr-17		<0.0130	<0.0209	<0.0175	<0.0500	0.445	**0.0668**	1.26	<0.191	0.0484 J	**0.163 J**	<0.0180	0.112
	MW-43	Oct-17		<0.0130	<0.0209	<0.0175	<0.0500	0.197	0.0878	1.34	<0.191	0.0578	**0.305**	0.0299 J	0.164
	MW-43	Apr-18		<0.0130	<0.0209	<0.0175	<0.0500	0.215	0.0950	1.52	<0.191	0.0477 J	**0.303**	<0.0180	0.141
	MW-43	Oct-18		<0.0130	<0.0209	<0.0175	<0.0500	0.0818	0.0770	1.33	<0.191	0.0545	**0.235 J**	<0.0180	0.118
	MW-59	Apr-15		**<0.000260**	**<0.000420**	<0.000350	**<0.00100**	<0.000380	**0.00736**	**<0.000720**	<0.00380	<0.000370	<0.00100	<0.000360	**0.000389** J
	MW-59	Apr-16		**<0.000260**	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**0.0111**	**<0.000719**		<0.000367	<0.00100	<0.000361	**0.000518** J
	MW-59	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.0175**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	**0.000538** J
	MW-59	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.0236**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	**0.00246**
	MW-60	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	0.000604 J	**0.0194**	0.00283		<0.000367	<0.00100	<0.000361	**0.00162**
	MW-60	Apr-16	FD	<0.000260	<0.000418	<0.000350	**<0.00100**	0.000533 J	**0.0162**	0.00272		<0.000367	<0.00100	<0.000361	**0.00159**
	MW-60	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000935 J	0.0182	0.00736		<0.000367	<0.00100	0.000962 J	0.00398
	MW-60	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000825 J	0.0169	0.00552		<0.000367	<0.00100	0.000804 J	0.00274
	MW-60	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000481 J	0.0178	0.00195 J	<0.00382	<0.000367	<0.00100	<0.000361	0.00101
	MW-60	Apr-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000556 J	0.0174	0.00240	<0.00382	<0.000367	<0.00100	<0.000361	0.00135
	MW-60	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00137	0.0204	0.00622	<0.00382	<0.000367	<0.00100	<0.000361	0.00220
	MW-60	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.00121	0.0182	0.00514	<0.00382	<0.000367	<0.00100	<0.000361	0.00193
	MW-60	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	0.000526 J	0.0205	0.00229	<0.00382	<0.000367	<0.00100	<0.000361	0.00118
	MW-60	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000433 J	0.0200	0.00196 J	<0.00382	<0.000367	<0.00100	<0.000361	0.000948 J
	MW-60	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	0.00115	0.0240	0.00573	<0.00382	<0.000367	<0.00100	0.000837 J	0.00306
	MW-60	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000973 J	0.0242	0.00540	<0.00382	<0.000367	<0.00100	<0.000361	0.00334

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloro-ethene	cis-1,3-Dichloro-propene	Cymene	Dichloro-methane	Ethyl-benzene	Isopropyl-benzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butyl-benzene	N-Propyl-benzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
North Refinery	MW-61	Apr-16		<0.00130	<0.00209	0.00375 J	<0.00500	0.0292	0.0787	0.223		<0.00184	**0.0340**	0.00378 J	0.110
	MW-61	Oct-16		<0.00650	<0.0104	<0.00875	<0.0250	0.0353	0.104	0.225		<0.00918	**0.0335 J**	<0.00902	0.145
	MW-61	Apr-17		<0.00650	<0.0104	<0.00875	<0.0250	0.0225 J	0.0860	0.228	<0.0955	<0.00918	**0.0307 J**	<0.00902	0.131
	MW-61	Oct-17		<0.000260	<0.000418	0.00570	<0.00100	0.0420	0.114	0.375	<0.00382	<0.000367	**0.0522**	0.00713	0.157
	MW-61	Apr-18		0.0379 J	<0.0209	<0.0175	<0.0500	0.0846	0.118	0.450	<0.191	<0.0184	**0.250 J**	<0.0180	0.155
	MW-61	Oct-18		<0.0130	<0.0209	<0.0175	<0.0500	0.0367 J	0.0978	0.353	<0.191	<0.0184	**0.0940 J**	<0.0180	0.140
	MW-62	Apr-16		<0.00650	<0.0104	<0.00875	<0.0250	0.356	0.0729	1.80		<0.00918	**0.236**	<0.00902	**0.132**
	MW-62	Oct-16		<0.0260 J6	<0.0418 J6	<0.0350 J6	**<0.100**	0.0535 JJ6	**0.123** J6	1.14 J6		<0.0367 J6	**0.189 JJ6**	<0.0361 J6	**0.234** J6
	MW-62	Apr-17		<0.0130	<0.0209	<0.0175	**<0.0500**	0.248	**0.107**	1.13	<0.191	<0.0184	**0.204 J**	<0.0180	**0.220**
	MW-62	Oct-17		<0.0260	<0.0418	<0.0350	<0.100	0.268	0.113	1.35	<0.382	<0.0367	**0.206 J**	<0.0361	**0.201**
	MW-62	Apr-18		<0.0260	<0.0418	<0.0350	**<0.100**	0.129	**0.128**	1.15	<0.382	<0.0367	**0.313 J**	<0.0361	**0.228**
	MW-62	Oct-18		<0.0260	<0.0418	<0.0350	**<0.100**	0.106	**0.112**	0.871	<0.382	<0.0367	**0.183 J**	<0.0361	**0.216**
	MW-67	Apr-16		0.00527 J	<0.00418	<0.00341	**<0.0100**	0.00869 J	**0.0321**	<0.00719		**0.359**	<0.0100	<0.00361	**0.0120**
	MW-67	Oct-16		0.00322 J	**<0.00418**	<0.00350	**<0.0100**	0.0124	**0.0346**	0.00797 J		**0.253**	0.0298 J	<0.00361	**0.0167**
	MW-67	Apr-17		0.00265	<0.00209	0.00186 J	**<0.00500**	0.0128	**0.0361**	0.0121	<0.0191	**0.195**	0.00571 J	0.00516	**0.0225**
	MW-67	Oct-17		0.00275	**<0.000418**	0.000487 J	**<0.00100**	0.00330	**0.0300**	0.00245	<0.00382	**0.201**	<0.00100	0.00196	**0.00976**
	MW-67	Apr-18		<0.00130	**<0.00209**	0.00191 J	**<0.00500**	0.00500	**0.0470**	0.00916 J	<0.0191	**0.219**	<0.00500	0.00588	**0.0323**
	MW-67	Oct-18		0.00122	**<0.000418**	0.000513 J	**<0.00100**	0.000620 J	**0.0231**	0.00113 J	<0.00382	**0.289**	<0.00100	0.00129	**0.00387**
	MW-90	Apr-16		0.000294 J	<0.000418	<0.000350	<0.00100	<0.000384	**0.00803**	<0.000719		<0.000367	0.00105 J	**<0.000361**	0.00142
	MW-90	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.000752** J	<0.000719		<0.000367	<0.00100	**<0.000361**	<0.000349
	MW-90	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0180	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	0.00336
	MW-90	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0337	<0.000719	<0.00382	<0.000367	<0.00100	**0.000443** J	0.00447
	MW-90	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0321	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	0.000888 J
	MW-90	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0355	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	0.00174
	MW-91	Apr-16		<0.0130	<0.0209	<0.0175	<0.0500	**0.899**	0.118	1.33		<0.0184	**0.124 J**	<0.0180	0.140
	MW-91	Oct-16		<0.0650	<0.104	<0.0875	<0.250	**0.816**	0.109 J	1.27		<0.0918	<0.250	<0.0902	0.113 J
	MW-91	Apr-17		<0.0260	<0.0418	<0.0350	<0.100	0.473	0.108	0.832	<0.382	<0.0367	<0.100	<0.0361	0.114
	MW-91	Oct-17		<0.0260	<0.0418	<0.0350	<0.100	0.384	0.116	0.756	<0.382	<0.0367	<0.100	<0.0361	0.115
	MW-91	Apr-18		<0.0260	<0.0418	<0.0350	<0.100	0.258	0.106	0.559	<0.382	<0.0367	**0.136 J**	<0.0361	0.122
	MW-91	Oct-18		<0.0260	<0.0418	<0.0350	<0.100	0.210	0.0813 J	0.552	<0.382	<0.0367	<0.100	<0.0361	0.0792 J
	MW-92	Apr-16		0.0640	<0.000418	0.00344	**<0.00100**	0.462	**0.0373**	**0.161**		**0.113**	**0.224 J**	0.00634	**0.0510**
	MW-92	Oct-16		**0.0968**	**<0.00836**	<0.00700	**<0.0200**	0.400	**0.0242**	**0.0947**		**0.134**	**0.174**	<0.00722	**0.0329**
	MW-93	Apr-16		<0.00130	**<0.00209**	<0.00175	**<0.00500**	0.0106	**0.0119**	0.0567		<0.00184	0.0113 J	<0.00180	**0.00919**
	MW-93	Oct-16		<0.00260	**<0.00418**	<0.00350	**<0.0100**	0.0114	**0.0258**	0.250		<0.00367	**0.0326 J**	<0.00361	**0.0309**
	MW-93	Apr-17		<0.00650	**<0.0104**	<0.00875	**<0.0250**	<0.00960	**0.0355**	0.326	<0.0955	<0.00918	**0.0422 J**	<0.00902	**0.0491**
	MW-93	Apr-18		0.000281 J	**<0.000418**	0.00268	**<0.00100**	0.00738	**0.0359**	0.332	<0.00382	<0.000367	0.0256	0.00367	**0.0492**
	MW-94	Oct-15		<0.00260	<0.00418	0.0301	<0.0100	0.509	0.0646	0.214	<0.0382	**0.798**	**0.202**	**0.0219**	**0.0923**
	MW-94	Apr-16		0.0149 J	<0.0209	**<0.0175**	**<0.0500**	0.553	**0.0776**	0.228		**0.621**	**0.228 J**	**0.0379** J	**0.12**
	MW-94	Oct-16		<0.00130	<0.00209	0.0163	<0.00500	0.564	0.0705	0.202		**2.01**	**0.128**	0.0207	0.104
	MW-94	Apr-17		<0.00650	<0.0104	0.0477	<0.0250	0.432	**0.0621**	0.168	<0.0955	**0.958**	**0.174**	0.0553	**0.0909**
	MW-95	Apr-15		<0.000260	<0.000420	<0.000350	**<0.00100**	<0.000380	**0.00700**	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	**<0.000350**
	MW-95	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0101	<0.000719		0.000379 J	<0.00100	<0.000361	<0.000349
	MW-95	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.0114**	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-95	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.0122**	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	**0.000352** J
	MW-96	Apr-16		<0.00520	<0.00836	<0.00700	<0.0200	<0.00768	0.0853	<0.0144		**32.9**	<0.0200	**<0.00722**	**0.0861**
	MW-96	Oct-16		<0.0130	<0.0209	<0.0175	**<0.0500**	<0.0192	**0.0675**	<0.0360		**39.6**	<0.0500	**<0.0180**	**0.0551**
	MW-96	Apr-17		<0.0130	<0.0209	<0.0175	<0.0500	<0.0192	0.0837	<0.0360	<0.191	**30.6**	<0.0500	<0.0180	0.0765
	MW-96	Oct-17		<0.0130	<0.0209	<0.0175	<0.0500	<0.0192	0.0852	<0.0360	<0.191	**40.0**	<0.0500	<0.0180	0.0664
	MW-96	Apr-18		<0.0130	<0.0209	<0.0175	<0.0500	<0.0192	0.118	<0.0360	<0.191	**29.4**	<0.0500	<0.0180	0.0996
	MW-96	Oct-18		<0.260	<0.418	<0.350	<1.00	<0.384	<0.326	<0.719	<3.82	**26.7**	<1.00	<0.361	<0.349
	MW-98	Apr-16		<0.0260	<0.0418	<0.0350	**<0.100**	0.430	**0.0409** J	0.865		<0.0367	**0.139 J**	**<0.0361**	0.0527 J
	MW-98	Oct-16		<0.0260	<0.0418	<0.0350	**<0.100**	0.698	**0.0710** J	1.37		<0.0367	<0.100	**<0.0361**	**0.080** J
	MW-98	Apr-17		<0.0260	<0.0418	<0.0350	**<0.100**	**1.05**	**0.0745** J	1.84	<0.382	<0.0367	**0.239 J**	**<0.0361**	**0.111**
	MW-98	Oct-17		<0.0130	<0.0209	<0.0175	**<0.0500**	**1.26**	**0.0983**	2.16	<0.191	<0.0184	**0.245 J**	**0.0211** J	**0.134**
	MW-98	Apr-18		<0.0130	<0.0209	<0.0175	**<0.0500**	**1.08**	**0.102**	1.88	<0.191	<0.0184	**0.327**	**<0.0180**	**0.141**
	MW-98	Oct-18		**<0.0130**	**<0.0209**	**<0.0175**	**<0.0500**	**1.09**	**0.0816**	2.13	<0.191	<0.0184	**0.257**	**<0.0180**	**0.118**
	MW-137	Apr-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**1.65**	**0.104** J	0.694		<0.0918	**0.262 J**	<0.0902	**0.159** J
	MW-137	Oct-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**1.54**	**0.0962** J	0.757		<0.0918	<0.250	<0.0902	**0.136** J
	MW-137	Apr-17		<0.0520	**<0.0836**	<0.0700	**<0.200**	**1.58**	**0.0899** J	**0.727**	<0.764	<0.0734	**0.272 J**	<0.0722	**0.142** J
	MW-137	Oct-17		<0.0520	<0.0836	<0.0700	**<0.200**	**1.53**	**0.113** J	**0.891**	<0.764	0.0754 J	**0.317 J**	<0.0722	**0.180** J
	MW-137	Apr-18		<0.0520	<0.0836	<0.0700	**<0.200**	**1.86**	**0.117** J	**0.905**	<0.764	0.0758 J	**0.373 J**	<0.0722	**0.162** J
	MW-137	Oct-18		<0.0520	<0.0836	<0.0700	**<0.200**	**1.09**	**0.0812** J	**0.523**	<0.764	0.0876 J	**0.237 J**	<0.0722	**0.101** J
	MW-138	Apr-16		**<0.00260**	**<0.00418**	<0.00341	**<0.0100**	0.309	**0.0759**	**0.00736** J		0.0955	**0.0959**	0.00732 J	**0.0867**
	MW-138	Oct-16		**<0.00260**	**<0.00418**	<0.00350	**<0.0100**	0.0149	**0.0640**	**<0.00719**		0.0935	**0.0364 J**	<0.00361	**0.0664**
	MW-138	Apr-17		<0.00260	**<0.00418**	<0.00350	**<0.0100**	0.0167	**0.0602**	**<0.00719**	<0.0382	**0.125**	**0.0639**	0.00404 J	**0.0674**
	MW-138	Oct-17		<0.00130	**<0.00209**	<0.00175	**<0.00500**	0.0244	**0.0579**	**0.00565** J	<0.0191	**0.163**	**0.0635**	0.00606	**0.0697**
	MW-138	Apr-18		<0.00130	**<0.00209**	<0.00175	**<0.00500**	0.222	**0.0572**	**0.0438**	<0.0191	**0.188**	**0.0667**	0.00518	**0.0680**
	MW-138	Oct-18		<0.00130	**<0.00209**	0.00303 J	**0.00504 J**	0.423	**0.0543**	**0.109**	<0.0191	**0.269**	**0.0379**	<0.00180	**0.0724**
	RW-1	Apr-15		**1.02**	<0.0210	<0.0180	<0.0500	0.0470 J	**<0.0160**	0.0365 J	<0.190	<0.0180	<0.0500	<0.0180	**0.0175** J
	RW-1R	Apr-16		**2.14**	<0.000418	<0.000350	<0.00100	0.0214	**<0.000326**	0.0111		0.0133	0.00762	0.000511 J	**0.00513**
	RW-1	Apr-17		**0.624**	<0.00418	<0.00350	<0.0100	0.0169	**0.00424** J	0.00743 J	<0.0382	0.0441	<0.0100	**0.00401** J	**0.00361** J
	RW-1	Apr-18		**0.681**	<0.000418	0.00204	<0.00100	0.0964	0.0316	0.0827	<0.00382	0.0292	0.0132	**0.00339**	**0.0336**
	RW-2	Apr-15		**0.619**	<0.00420	0.00554 J	<0.0100 J	**1.02**	0.0551	0.445	<0.0380 J	<0.00370	**0.157 J**	**0.0106**	**0.0813**
	RW-2R	Apr-16		**0.555**	<0.0209	<0.0175	<0.0500	0.591	**0.0332** J	0.253		0.0226 J	**0.145 J**	**<0.0180**	**0.0412** J
	RW-2	Apr-17		**0.828**	<0.0209	**<0.0175**	**<0.0500**	**0.837**	**0.0533**	0.413	<0.191	<0.0184	**0.145 J**	<0.0180	**0.0816**
	RW-2	Apr-18		**0.543**	<0.000418	**0.00776**	<0.00100	0.672	0.0769	0.440	<0.00382	0.0120	**0.190**	0.0139	0.104
	RW-7	Apr-15		<0.000260	<0.000420	**0.00705**	<0.00100	0.0185	**0.0362**	0.0350	<0.00380	0.0122	0.0112	0.00660	0.0441
	RW-7R	Apr-16		<0.000260	<0.000418	**<0.000350**	<0.00100	<0.000384	<0.000326	<0.000719		0.0687	<0.00100	<0.000361	<0.000349
	RW-7	Apr-17		<0.000260	<0.000418	**<0.000350**	<0.00100	<0.000384	**<0.000326**	**<0.000719**	<0.00382	0.0325	<0.00100	<0.000361	**<0.000349**
	RW-7	Apr-18		<0.000260	<0.000418	**0.000872** J	**<0.00100**	0.00132	**0.00650**	0.00431	<0.00382	0.0378	0.00204 J	0.00102	**0.00280**
	RW-8	Apr-15		<0.00260	<0.00420	**<0.00350**	**0.0113 J**	0.00801 J	**0.0204**	**<0.00720**	<0.0380	**2.41**	<0.0100	<0.00360	**0.00788** J
	RW-8	Apr-17		0.000478 J	<0.000418	**0.00735**	<0.00100	0.0198	0.0193	0.0386	<0.00382	**1.94**	**0.0320**	0.00837	**0.0191**
	RW-9	Apr-15		<0.0130	<0.0210	<0.0180	**0.0564 J**	<0.0190	0.0643	<0.0360	<0.190	<0.0180	<0.0500	<0.0180	0.0179 J
	RW-9	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.00775	0.0698	0.0708		0.00656	0.00554 J	0.00303 J	0.0367
	RW-9	Apr-17		<0.000260	<0.000418	0.000668 J	<0.00100	0.00105	0.0868	0.0193	<0.00382	0.00435	<0.00100	<0.000361	0.00499
	RW-9	Apr-18		<0.000260	<0.000418	0.000962 J	<0.00100	0.00159	0.100	0.0180	<0.00382	0.00409	<0.00100	0.00212	0.0130
	RW-10	Apr-15		<0.000260	<0.000420	<0.000350	0.00120 J	<0.000380	**<0.000330**	<0.000720	<0.00380	<0.000370	<0.00100	**<0.000360**	<0.000350
	RW-10	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	**<0.000361**	**<0.000349**
	RW-10	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	0.000403 J	**0.00399**	0.000792 J	<0.00382	<0.000367	<0.00100	<0.000361	**<0.000349**
	RW-10	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	0.000727 J	0.00307	0.00126 J	<0.00382	<0.000367	<0.00100	0.00108	<0.000349
	RW-16	Apr-15		<0.000260	<0.000420	<0.000350	0.00114 J	<0.000380	<0.000330	<0.000720	<0.00380	0.0190	<0.00100	<0.000360	<0.000350
	RW-16	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.0186	<0.00100	<0.000361	<0.000349
	RW-16	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0152	<0.00100	<0.000361	<0.000349
	RW-16	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00172	<0.00100	<0.000361	<0.000349
	RW-17	Apr-15		<0.000260	<0.000420	<0.000350	0.00112 J	<0.000380	<0.000330	<0.000720	<0.00380	0.00772	<0.00100	<0.000360	<0.000350
	RW-17	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		**0.195**	<0.00100	<0.000361	<0.000349
	RW-17	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.189**	<0.00100	<0.000361	<0.000349
	RW-17	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.107**	<0.00100	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloro-ethene	cis-1,3-Dichloro-propene	Cymene	Dichloro-methane	Ethyl-benzene	Isopropyl-benzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butyl-benzene	N-Propyl-benzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
North RO Reject Field	MW-117	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	MW-117	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	J4	<0.000361	<0.000349
	MW-117	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-117	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		**<0.000361**	<0.000349
	MW-117	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		**<0.000361**	<0.000349
	MW-117	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		**<0.000361**	<0.000349
	MW-118	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	MW-118	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	J4	<0.000361	<0.000349
	MW-118	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-118	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-118	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-118	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-119	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	MW-119	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	J4	<0.000361	<0.000349
	MW-119	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-119	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-119	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-119	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
NCL	MW-18	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100		<0.000360	<0.000350
	MW-18	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	MW-18	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-18	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-45	Apr-16		<0.000418	<0.000418	<0.000326	<0.00100	<0.000384	<0.000326	<0.000719		0.00152	<0.00100		<0.000361	<0.000349
	MW-45	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00206	<0.00100		<0.000361	<0.000349
	MW-45	Apr-17		0.00152	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00316	<0.00100		<0.000361	<0.000349
	MW-45	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00305	<0.00100		<0.000361	<0.000349
	MW-45	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00506	<0.00100		<0.000361	<0.000349
	MW-45	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00766	<0.00100		<0.000361	<0.000349
	MW-53	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100		<0.000360	<0.000350
	MW-53	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	MW-53	Apr-17		0.000391 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-53	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-54A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	MW-54A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	MW-54A	Apr-17		0.000888 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-54A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-54A	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-54A	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-54B	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500		<0.00500	<0.00500
	MW-54B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100		<0.000360	<0.000350
	MW-54B	Apr-17		0.000616 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	MW-55	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.0163	<0.00100		<0.000361	<0.000349
	MW-55	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00521	<0.00100		<0.000361	<0.000349
	MW-55	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0535	<0.00100		<0.000361	<0.000349
	MW-55	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	0.0390	<0.00100		<0.000361	<0.000349
	MW-55	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0302	<0.00100		<0.000361	<0.000349
	MW-55	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0604	<0.00100		<0.000361	<0.000349
	MW-56	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.0160	<0.00100		<0.000361	<0.000349
	MW-56	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.00819	<0.00100		<0.000361	<0.000349
	MW-56	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0222	<0.00100		<0.000361	<0.000349
	MW-56	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00328	<0.00100		<0.000361	<0.000349
	MW-108	Apr-16		<0.0130	<0.0209	<0.0175	<0.0500	<0.0192	0.0360 J	0.0795		<0.0184	<0.0500		<0.0180	0.0380 J
	MW-108	Oct-16		<0.00650	<0.0104	<0.00875	<0.0250	<0.00960	0.0293	0.0721		<0.00918	<0.0250		<0.00902	0.0319
	MW-108	Apr-17		<0.00650	<0.0104	<0.00875	<0.0250	<0.00960	0.0384	0.0815	<0.0955	<0.00918	<0.0250		<0.00902	0.0396
	MW-108	Oct-17		<0.00130	<0.00209	0.00210 J	<0.00500	0.00404 J	0.0249	0.0602	<0.0191	<0.00184	0.00744 J		0.00296 J	0.0263
	MW-108	Apr-18		<0.00650	<0.0104	<0.00875	<0.0250	<0.00960	0.0302	0.0646	<0.0955	<0.00918	<0.0250		<0.00902	0.0319
	MW-108	Oct-18		<0.00130	<0.00209	0.00337 J	<0.00500	0.00532	0.0398	0.0852	<0.0191	<0.00184	<0.00500	J4	0.00413 J	0.0373
	NCL-31	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.000678** J	<0.000719		<0.000367	<0.00100		<0.000361	**<0.000349**
	NCL-31	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.00483**	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	NCL-31	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.00180**	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-31	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-31	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-31	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000334 J	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-32	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.000751 J	<0.00100		<0.000361	<0.000349
	NCL-32	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.000385 J	<0.00100		<0.000361	<0.000349
	NCL-32	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-32	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-32	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-32	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-33	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	NCL-33	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	NCL-33	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-33	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-33	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-33	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000618 J	<0.00100		<0.000361	<0.000349
	NCL-34A	Apr-16		<0.0130	<0.0209	<0.0175	<0.0500	0.0758	0.100	0.188		<0.0184	<0.0500		<0.0180	0.112
	NCL-34A	Oct-16		<0.0260	<0.0418	<0.0350	<0.100	<0.0384	0.0901 J	0.111		<0.0367	<0.100		<0.0361	0.0971 J
	NCL-34A	Apr-17		<0.0130	<0.0209	<0.0175	<0.0500	<0.0192	0.0914	0.100	<0.191	<0.0184	<0.0500		<0.0180	0.101
	NCL-34A	Oct-17		<0.000260	<0.000418	0.00832	<0.00100	0.00230	0.109	0.0762	<0.00382	0.000379 J	0.00132 J		0.00733	0.112
	NCL-34A	Apr-18		<0.00260	<0.00418	0.00522 J	<0.0100	<0.00384	0.0979	0.0390	<0.0382	<0.00367	<0.0100		0.00788 J	0.100
	NCL-34A	Oct-18		<0.00260	<0.00418	<0.00350	<0.0100	0.00672 J	0.0828	0.0266	<0.0382	<0.00367	<0.0100		0.00458 J	0.0768
	NCL-44	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.00618**	<0.000719		<0.000367	<0.00100		<0.000361	**<0.000349**
	NCL-44	Oct-16		<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**0.00177**	<0.000719		<0.000367	<0.00100		<0.000361	**<0.000349**
	NCL-44	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.00130**	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	**<0.000349**
	NCL-44	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00115	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-44	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.00122**	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-44	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.00101**	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Apr-17		0.000449 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Apr-17	FD	0.000303 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349
	NCL-49	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100		<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
South Refinery	KWB-2R	Apr-16		<0.000260	<0.000418	0.000603 J	<0.00100	0.0483	0.0187	0.0496		0.0231	0.00806	0.00205	0.0314
	KWB-2R	Oct-16		<0.000260	<0.000418	0.000596 J		0.0130	0.0330	0.0270		0.0184	0.00440 J	0.00303	0.0544
	KWB-2R	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00543	0.00816	0.0273	<0.00382	0.0192	0.00609	<0.000361	0.0121
	KWB-2R	Oct-17		<0.000260	<0.000418	0.00198	<0.00100	0.325	0.0635	0.183	<0.00382	0.0202	**0.0675**	0.00453	0.111
	KWB-5	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00678	0.0105	0.0123		**12.6**	0.0114	0.00148	0.0181
	KWB-5	Oct-16		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.00860	<0.00360		**9.88**	0.00511 JJ4	<0.00180	0.0132
	KWB-5	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.0103	0.0138	0.0387	<0.00382	**8.84**	**0.0302**	0.00176	0.0247
	KWB-5	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.0960	0.00852	<0.180	<0.00382	**12.4**	0.0131	0.00118	0.0134
	KWB-5	Apr-18		<0.0650	<0.104	<0.0875	<0.250	<0.0960	<0.0815	<0.180	<0.955	**10.3**	<0.250	<0.0902	<0.0872
	KWB-5	Oct-18		<0.0650	<0.104	<0.0875	<0.250	<0.0960	<0.0815	<0.180	<0.955	**10.8**	<0.250	<0.0902	**<0.0872**
	KWB-6	Apr-16		<0.00130	<0.00209	0.00591	<0.00500	**0.799**	0.0477	1.64		**0.138**	**0.137**	**0.00837**	0.0883
	KWB-6	Oct-16		<0.00520	<0.00836	<0.00700	<0.0200	0.241	0.0173 J	0.394		**0.135**	**0.0549 J**	**<0.00722**	0.0320
	KWB-6	Apr-17		<0.00130	<0.00209	0.00450 J	<0.00500	0.346	0.0344	0.373	<0.0191	**0.154**	**0.0563**	**0.00434** J	**0.0737**
	KWB-6	Oct-17		<0.000260	<0.000418	0.00825	<0.00100	0.183	0.0199	0.275	<0.00382	**0.102**	**0.0436**	**<0.000361**	0.0386
	KWB-6	Apr-18		**<0.00520**	**<0.00836**	0.00807 J	**<0.0200**	0.156	**0.0252**	0.223	<0.0764	**0.122**	**0.0587 J**	**<0.00722**	**0.0486**
	KWB-6	Oct-18		**<0.00520**	**<0.00836**	0.00755 J	**<0.0200**	0.102	**0.0133** J	0.356	<0.0764	**0.120**	**0.0469 J**	**<0.00722**	**0.0234**
	MW-28	Apr-16		<0.00260	<0.00418	<0.00341	<0.0100	0.0276	0.0433	**0.156**		**0.261**	0.0247 J	**<0.00361**	**0.0577**
	MW-28	Oct-16		<0.0130	<0.0209	<0.0175	**<0.0500**	0.0796	**0.0876**	0.338		**0.630**	**0.0504 J**	**0.0552**	**0.117**
	MW-28	Apr-17		<0.0130	<0.0209	<0.0175	<0.0500	0.0489 J	0.0613	0.238	<0.191	**0.423**	**0.0668 J**	**<0.0180**	**0.0909**
	MW-28	Oct-17		<0.0130	<0.0209	<0.0175	<0.0500	0.0578	0.0520	0.216	<0.191	**0.158**	<0.0500	**<0.0180**	**0.0638**
	MW-28	Apr-18		<0.0130	<0.0209	<0.0175	**<0.0500**	0.0408 J	**0.0361** J	0.144	<0.191	0.0977	**0.0604 J**	**<0.0180**	**0.0501**
	MW-28	Oct-18		<0.00520	<0.00836	<0.00700	**<0.0200**	0.00788 J	**0.00981** J	0.0301 J	<0.0764	0.0425	<0.0200	**<0.00722**	**0.0117** J
	MW-48	Apr-16		<0.00520	<0.00836	<0.00700	<0.0200	**0.790**	**0.0670**	0.671		**0.326**	**0.101**	**<0.00722**	0.0983
	MW-48	Oct-16		<0.00130	<0.00209	0.00520	**<0.00500**	0.448	**0.0689**	0.502		**0.851**	**0.0832**	**0.00827**	**0.111**
	MW-48	Apr-17		<0.0130	<0.0209	<0.0175	**<0.0500**	**1.27**	**0.0828**	1.04	<0.191	**0.214**	**0.224 J**	**<0.0180**	**0.144**
	MW-48	Oct-17		<0.000260	<0.000418	0.00678	**<0.00100**	**0.917**	**0.0884**	0.705	<0.00382	**0.263**	**0.138**	**0.0102**	**0.137**
	MW-48	Apr-18		<0.0650	<0.104	<0.0875	**<0.250**	**1.36**	**<0.0815**	0.954	<0.955	**0.171 J**	<0.250	<0.0902	**0.118** J
	MW-48	Oct-18		<0.0650	<0.104	<0.0875	**<0.250**	0.479	**0.0962** J	0.358 J	<0.955	**0.611**	<0.250	<0.0902	0.145 J
	MW-50	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	**<0.000719**		<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-50	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-50	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	**<0.000719**	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-50	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	**<0.000719**	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-50	Apr-18		**<0.000260**	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**<0.000326**	**<0.000719**	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-50	Oct-18		**<0.000260**	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-52	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-64	Apr-16		<0.0130	<0.0209	<0.0175	<0.0500	**3.11**	0.0817	5.26		**0.666**	**0.195 J**	<0.0180	0.122
	MW-64	Oct-16		<0.0260	<0.0418	<0.0350	<0.100	**2.61**	0.0602 J	3.79		**0.531**	**0.140 J**	<0.0361	0.0878 J
	MW-64	Apr-17		<0.0650	<0.104	<0.0875	<0.250	**3.35**	0.0986 J	5.49	<0.955	**0.408**	<0.250	<0.0902	0.146 J
	MW-64	Oct-17		<0.0650	<0.104	<0.0875	<0.250	**3.20**	0.0919 J	4.57	<0.955	**0.484**	<0.250	<0.0902	0.120 J
	MW-64	Apr-18		<0.00520	<0.00836	<0.00700	<0.0200	0.237	0.00783 J	0.360	<0.0764	0.0359	0.0238 J	<0.00722	0.0101 J
	MW-64	Oct-18		<0.00520	<0.00836	0.00781 J	<0.0200	**2.47**	0.0804	3.66	<0.0764	**0.510**	**0.158**	<0.00722	0.119
	MW-65	Apr-16		<0.00260	<0.00418	<0.00341	**<0.0100**	0.288	**0.0444**	**0.0822**		**3.71**	**0.155**	**0.00732** J	**0.0577**
	MW-65	Oct-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.0574	**0.0450**	**0.0205** J		**2.70**	**0.194**	**0.00791** J	**0.0628**
	MW-65	Apr-17		**<0.0260**	**<0.0418**	<0.0350	**<0.100**	0.0768 J	**0.0479** J	**0.0736** J	<0.382	**2.27**	**0.205 J**	**<0.0361**	**0.0493** J
	MW-65	Oct-17		**<0.0260**	**<0.0418**	<0.0350	**<0.100**	0.0507 J	**0.0570** J	**<0.0719**	<0.382	**2.13**	**0.223 J**	**<0.0361**	**0.0730** J
	MW-65	Apr-18		<0.0260	<0.0418	<0.0350	**<0.100**	0.0528 J	**0.0594** J	<0.0719	<0.382	**1.73**	**0.253 J**	<0.0361	0.0716 J
	MW-65	Oct-18		<0.0260	<0.0418	<0.0350	**<0.100**	<0.0384	**0.0545** J	**<0.0719**	<0.382	**2.38**	<0.100	**<0.0361**	**0.0881** J
	MW-66	Apr-16		<0.00260	<0.00418	<0.00341	<0.0100	0.0181	**0.0337**	0.0285		**1.48**	**0.0638**	**0.00609** J	**0.0523**
	MW-66	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	0.0214	**0.0617**	0.0228		**1.48**	**0.0979**	**0.00948**	**0.104**
	MW-66	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	**0.0311** J	<0.0360	<0.191	**1.21**	**0.104 J**	**0.0236** J	**0.0525**
	MW-66	Oct-17		<0.00260	**<0.00418**	<0.00350	**<0.0100**	<0.00384	**0.00696** J	<0.00719	<0.0382	**0.134**	0.0147 J	**<0.00361**	**0.0118**
	MW-66	Apr-18		<0.00260	**<0.00418**	<0.00350	**<0.0100**	0.00776 J	**0.0694**	0.0118 J	<0.0382	**1.78**	**0.186**	**0.0110**	**0.114**
	MW-66	Oct-18		<0.00260	**<0.00418**	<0.00350	**<0.0100**	0.00686 J	**0.0634**	0.0102 J	<0.0382	**2.05**	**0.161**	**<0.00361**	**0.104**
	MW-99	Apr-16		<0.00260	<0.00418	0.00375 J	<0.0100	0.629	**0.0459**	0.531		**1.99**	**0.0656**	**0.00756** J	**0.0706**
	MW-99	Oct-16		<0.00520	<0.00836	<0.00700	<0.0200	0.635	0.0462	0.591		**2.45**	**0.0343 J**	**<0.00722**	**0.0710**
	MW-99	Apr-17		<0.0130	<0.0209	<0.0175	**<0.0500**	0.402	**0.0477** J	0.416	<0.191	**4.65**	<0.0500	**<0.0180**	**0.0667**
	MW-99	Oct-17		<0.0260	<0.0418	<0.0350	<0.100	0.146	**0.0522** J	0.228	<0.382	**2.71**	<0.100	**<0.0361**	0.0637 J
	MW-99	Apr-18		<0.0260	<0.0418	<0.0350	<0.100	0.275	**0.0594** J	0.285	<0.382	**2.99**	<0.100	**<0.0361**	**0.0695** J
	MW-99	Oct-18		<0.0260	<0.0418	<0.0350	<0.100	0.201	**0.0672** J	0.358	<0.382	**3.10**	<0.100	**<0.0361**	**0.101**
	MW-101	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00176	**0.00564**	<0.000719		**0.119**	<0.00100	**0.000427** J	**0.00597**
	MW-101	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.000381** J	<0.000719		**0.104**	<0.00100	**<0.000361**	**<0.000349**
	MW-101	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	0.000830 J	**0.00413**	<0.000719	<0.00382	**0.107**	<0.00100	**<0.000361**	**0.000928** J
	MW-101	Oct-17		<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	**0.132**	<0.00100	**<0.000361**	**<0.000349**
	MW-101	Apr-18		<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**0.00192**	<0.000719	<0.00382	0.0900	<0.00100	**<0.000361**	**<0.000349**
	MW-101	Oct-18		<0.000260	**<0.000418**	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	**0.125**	<0.00100	**<0.000361**	**<0.000349**
	MW-102	Apr-16		<0.0260	<0.0418	<0.0350	<0.100	**0.858**	0.0503 J	0.544		**2.07**	**0.278 J**	**<0.0361**	0.0846 J
	MW-102	Oct-16		<0.0260	<0.0418	<0.0350	<0.100	**1.03**	0.0524 J	0.624		**1.61**	**0.278 J**	**<0.0361**	0.0814 J
	MW-102	Apr-17		<0.00520	<0.00836	<0.00700	<0.0200	**0.726**	0.0401	0.372	<0.0764	**1.87**	**0.200**	**0.0125** J	0.0725
	MW-102	Oct-17		<0.0130	<0.0209	<0.0175	<0.0500	**0.897**	0.0503	0.466	<0.191	**1.89**	**0.483**	**<0.0180**	0.0717
	MW-102	Apr-18		<0.130	<0.209	<0.175	<0.500	**0.903**	<0.163	0.410 J	<1.91	**1.19**	<0.500	<0.180	<0.174
	MW-102	Oct-18		<0.130	<0.209	<0.175	<0.500	0.648	<0.163	0.478 J	<1.91	**1.68**	<0.500	**<0.180**	<0.174
	MW-103	Apr-15		<0.000260	**<0.000420**	0.00207	**<0.00100**	0.0879	**0.0247**	**0.00819**	<0.00380	0.000441 J	0.0220	**0.00291**	**0.0357**
	MW-103	Apr-16		<0.00130	**<0.00209**	<0.00175	**<0.00500**	0.0508	**0.0220**	**<0.00360**		<0.00184	0.0108 J	**0.00286** J	**0.0311**
	MW-103	Apr-17		<0.0130	<0.0209	<0.0175	**<0.0500**	<0.0192	**0.0192** J	**<0.0360**	<0.191	<0.0184	<0.0500	**<0.0180**	**0.0295** J
	MW-103	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	0.0384	**0.0303**	**0.00775**	<0.00382	<0.000367	**0.116**	**0.00391**	**0.0425**
	MW-104	Apr-16		**<0.000260**	**<0.000418**	**<0.000350**	**<0.00100**	0.00108	**0.0535** J6	**<0.000719**		0.00130	<0.00100	**0.000558** J	**0.00447**
	MW-104	Apr-16	FD	**<0.000260**	**<0.000418**	**<0.000350**	**<0.00100**	0.00107	**0.0602**	<0.000719		0.00120	<0.00100	**0.000602** J	**0.00513**
	MW-104	Oct-16		<0.00130	<0.00209	<0.00175	<0.00500	0.00837	0.0442	<0.00360		<0.00184	<0.00500	0.00434 J	0.00503
	MW-104	Oct-16	FD	<0.00130	<0.00209	<0.00175	<0.00500	0.00721	0.0475	<0.00360		0.00509	<0.00500	0.00422 J	0.0050 J
	MW-104	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0244	**0.0565**	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	**0.00933** J
	MW-104	Apr-17	FD	<0.00130	<0.00209	<0.00175	<0.00500	0.0168	0.0380	0.00402 J	<0.0191	0.0132	<0.00500	<0.00180	**0.00632**
	MW-104	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00651	0.0457	<0.000719	<0.00382	0.00837	0.00196 J	0.000421 J	0.00489
	MW-104	Oct-17	FD	<0.00130	<0.00209	<0.00175	<0.00500	0.00774	0.0371	<0.00360	<0.0191	0.00820	<0.00500	<0.00180	0.00405 J
	MW-104	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	0.000906 J	0.0430	<0.000719	<0.00382	0.00320	0.00239 J	0.000615 J	0.00374
	MW-104	Apr-18	FD	<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.0393	<0.00360	<0.0191	0.00393 J	<0.00500	<0.00180	0.00355 J
	MW-104	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	0.00315	**0.0408**	<0.000719	<0.00382	0.00661	0.00175 J	0.000466 J	0.00317
	MW-104	Oct-18	FD	<0.00130	<0.00209	<0.00175	<0.00500	0.00316 J	0.0341	<0.00360	<0.0191	0.00582	<0.00500	<0.00180	0.00273 J
	MW-105	Apr-16		<0.0650	<0.104	<0.0875	<0.250	**2.02**	0.104 J	0.379		<0.0918	<0.250	<0.0902	0.104 J
	MW-105	Oct-16		<0.0260	<0.0418	<0.0350	<0.100	**2.77**	0.136	0.683		<0.0367	**0.129 J**	<0.0361	0.147
	MW-105	Apr-17		<0.0260	<0.0418	<0.0350	<0.100	**1.71**	0.0921 J	0.446	<0.382	<0.0367	**0.104 J**	<0.0361	0.109
	MW-105	Oct-17		<0.000260	<0.000418	0.00692	<0.00100	**0.927**	0.0814	0.390	<0.00382	0.0209	**0.0737**	0.00608	0.0846
	MW-105	Apr-18		<0.0260	<0.0418	<0.0350	<0.100	0.517	0.0722 J	0.304	<0.382	<0.0367	**0.106 J**	<0.0361	0.0758 J
	MW-105	Oct-18		<0.0260	<0.0418	<0.0350	<0.100	0.257	0.0436 J	0.277	<0.382	<0.0367	<0.100	<0.0361	0.0508 J
	MW-106	Apr-16		**<0.00650**	**<0.0104**	<0.00875	**<0.0250**	0.0446	**0.0329**	**0.203**		0.0580	**0.0442 J**	<0.00902	**0.0430**
	MW-106	Oct-16		<0.0130	**<0.0209**	<0.0175		0.0440 J	**0.0469** J	**0.297**		**0.109**	**0.0690 J**	<0.0180	**0.0617**
	MW-106	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.0301 J	**0.0344** J	**0.236**	<0.191	0.0832	<0.0500	<0.0180	**0.0482** J
	MW-106	Oct-17		<0.0130	<0.0209	<0.0175	<0.0500	0.0438 J	0.0321 J	**0.195**	<0.191	0.0949	<0.0500	<0.0180	**0.0382** J
	MW-106	Apr-18		<0.0520	**<0.0836**	<0.0700	**<0.200**	0.0772 J	**<0.0652**	0.298 J	<0.764	0.0813 J	<0.200	<0.0722	**<0.0698**
	MW-106	Oct-18		<0.130	**<0.209**	<0.175	**<0.500**	<0.192	**<0.163**	<0.360	<1.91	<0.184	<0.500	<0.180	**<0.174**
	MW-107	Apr-16		<0.000260	<0.000418	0.00123	**<0.00100**	0.00466	**0.0417**	0.00427		**2.44**	0.00773	0.000878 J	**0.0602**
	MW-107	Oct-16		<0.00130	<0.00209	<0.00175	**<0.00500**	0.0192	0.0457	0.00857 J		**3.05**	**0.0614**	**0.00182** J	**0.0693**
	MW-107	Apr-17		<0.0130	<0.0209	<0.0175	**<0.0500**	<0.0192	**0.0334** J	<0.0360	<0.191	**2.78**	**0.0788 J**	<0.0180	**0.0528**
	MW-107	Apr-18		<0.000260	<0.000418	0.000710 J	**<0.00100**	0.0382	**0.0576**	0.0130	<0.00382	**3.02**	**0.143**	0.00377	**0.0857**

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
South Refinery	MW-109	Apr-16		<0.00130	**<0.00209**	<0.00175	**<0.00500**	0.00864	**0.0375**	0.0142		<0.00184	<0.00500	0.00210 J	**0.0359**
	MW-109	Oct-16		**<0.00520**	**<0.00836**	**<0.00700**	**<0.0200**	0.0115 J	**0.0438**	<0.0144		<0.00734	<0.0200	**<0.00722**	**0.0452**
	MW-109	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	0.0098 J	0.0536	0.0272	<0.0382	<0.00367	<0.0100	**0.00378** J	0.0569
	MW-109	Oct-17		<0.000260	<0.000418	0.00108	<0.00100	0.0124	0.0658	0.0230	<0.00382	<0.000367	0.00191 J	**0.00382**	**0.0633**
	MW-109	Apr-18		<0.00520	<0.00836	<0.00700	**<0.0200**	0.0122 J	**0.0632**	0.0257 J	<0.0764	<0.00734	<0.0200	**<0.00722**	**0.0646**
	MW-109	Oct-18		<0.00520	<0.00836	<0.00700	<0.0200	0.0111 J	0.0639	0.0220 J	<0.0764	<0.00734	<0.0200	**<0.00722**	**0.0670**
	MW-110	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000927 J	0.0260	0.000733 J		<0.000367	<0.00100	0.00224	0.0212
	MW-110	Oct-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.000780** J	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-110	Apr-17		<0.00130	<0.00209	0.00412 J	<0.00500	0.0262	**0.0536**	0.0161	<0.0191	<0.00184	<0.00500	0.00474 J	0.0589
	MW-110	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-110	Apr-18		<0.000260	<0.000418	0.00136	**<0.00100**	0.109	**0.0533**	0.0576	<0.00382	<0.000367	0.0135	0.00395	0.0577
	MW-110	Oct-18		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**0.00680**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.00579
	RA-313	Apr-15		<0.000260	<0.000420	<0.000350	0.00129 J	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	RA-313	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	RA-313	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-313	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-4	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.00245	0.00966	<0.000720	<0.00380	0.0902	<0.00100	0.000393 J	0.00458
	RW-4R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00999	<0.000719		**0.191**	<0.00100	<0.000361	0.00118
	RW-4	Apr-17		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.00716	<0.00360	<0.0191	**0.132**	<0.00500	<0.00180	0.00532
	RW-4	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00618	<0.000719	<0.00382	0.0583	0.00103 J	<0.000361	0.00113
	RW-5R	Apr-15		<0.00260	<0.00420	<0.00350	<0.0100	**1.03**	0.0398	1.39	<0.0380	**2.15**	**0.174**	0.00606 J	0.0598
	RW-5R	Apr-16		<0.00520	<0.00836	<0.00700	<0.0200	**1.20**	0.0643	1.68		**1.64**	**0.205**	0.0117 J	0.110
	RW-6	Apr-15		<0.00260	<0.00420	<0.00350	<0.0100	0.0476	0.0173	0.102	<0.0380	**2.27**	**0.0602**	0.00738 J	0.0237
	RW-6R	Apr-16		<0.000260	<0.000418	0.000401 J	<0.00100	0.00474	0.00797	0.00472		**2.68**	0.00574	**0.00138**	0.00731
	RW-6	Apr-18		<0.000260	<0.000418	0.000996 J	<0.00100	0.0838	0.0299	0.0926	<0.00382	<0.000367	0.0290	**0.00631**	0.0329
	RW-15C	Apr-17		<0.00650	<0.0104	<0.00875	<0.0250	**4.19**	0.143	4.92	<0.0955	**4.25**	**0.383**	0.0168 J	0.296
	RW-15C	Apr-18		<0.000260	<0.000418	0.00545	<0.00100	**3.93**	**0.114**	**2.98**	<0.00382	**3.02**	<0.500	**0.00683**	**0.190**
South RO Reject Field	MW-114	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	**<0.000719**		<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-114	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**<0.000326**	<0.000719		<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-114	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	**<0.000361**	<0.000349
	MW-114	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-114	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	**<0.000719**	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-114	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	**<0.000719**	<0.00382	<0.000367	<0.00100	**<0.000361**	**<0.000349**
	MW-115	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
TEL	MW-49	Apr-16		<0.00520	<0.00836	<0.00700	<0.0200	<0.00768	0.0219	0.0540		0.0535	<0.0200	<0.00722	0.0206
	MW-49	Oct-16		<0.0260	<0.0418	<0.0350	<0.100	<0.0384	<0.0326	0.0831 J		0.0628 J	<0.100	<0.0361	<0.0349
	MW-49	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	0.00427 J	0.0218	0.0564	<0.0382	0.0811	<0.0100	<0.00361	0.0266
	MW-49	Oct-17		<0.00520	<0.00836	<0.00700	<0.0200	0.0184 J	0.0706	0.195	<0.0764	0.0712	<0.0200	<0.00722	0.0659
	MW-49	Apr-18		<0.00260	<0.00418	<0.00350	<0.0100	0.0135	0.0393	0.133	<0.0382	**0.113**	0.0159 J	0.00413 J	0.0427
	MW-49	Oct-18		<0.00130	<0.00209	0.00239 J	<0.00500	0.0143	0.0436	0.130	<0.0191	**0.124**	0.00585 JJ4	0.00396 J	0.0426
	TEL-1	Apr-16		<0.000260	<0.000418	<0.000350	**<0.00100**	0.000718 J	**0.00136**	<0.000719		0.00229	<0.00100	<0.000361	<0.000349
	TEL-1	Oct-16		<0.000260	**<0.000418**	<0.000350	**<0.00100**	0.000666 J	**0.00100**	<0.000719		0.000724 J	<0.00100	<0.000361	**<0.000349**
	TEL-1	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000506 J	**0.000391** J	<0.000719	<0.00382	0.00231	<0.00100	<0.000361	<0.000349
	TEL-1	Oct-17		<0.000260	<0.000418	<0.000350	**<0.00100**	0.00119	**0.00311**	0.00169 J	<0.00382	0.00285	<0.00100	<0.000361	0.000492 J
	TEL-1	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	0.000482 J	**0.00114**	0.000870 J	<0.00382	0.00337	<0.00100	**<0.000361**	<0.000349
	TEL-1	Oct-18		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	0.00255 J	<0.00500	**<0.00180**	<0.00174
	TEL-2	Apr-16		<0.000260	<0.000418	0.00438	<0.00100	0.00692	0.0380	0.136		0.0156	0.00966	0.00424	0.0484
	TEL-2	Oct-16		<0.00260	<0.00418	<0.00350	<0.0100	0.00418 J	0.0325	0.116		0.0110	<0.0100	0.00404 J	0.0376
	TEL-2	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	0.0230	0.0837	<0.0382	0.0104	<0.0100	<0.00361	0.0270
	TEL-2	Oct-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	0.0442	0.101	<0.0382	0.00964 J	<0.0100	<0.00361	0.0408
	TEL-2	Apr-18		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	0.0303	0.0962	<0.0382	0.00795 J	<0.0100	<0.00361	0.0322
	TEL-2	Oct-18		<0.00650	<0.0104	<0.00875	<0.0250	0.0121 J	0.0354	0.123	<0.0955	<0.00918	<0.0250	<0.00902	0.0429
	TEL-3	Apr-16		<0.00650	<0.0104	<0.00875	<0.0250	<0.00960	0.0593	<0.0180		0.0445	<0.0250	<0.00902	<0.00872
	TEL-3	Oct-16		<0.000260	<0.000418	0.000629 J	<0.00100	0.000539 J	**0.0336**	0.00823		0.00109	0.00107 J	0.00134	0.00792
	TEL-3	Apr-17		<0.000260	<0.000418	0.000657 J	<0.00100	0.000764 J	**0.0465**	0.00827	<0.00382	0.00327	<0.00100	0.00121	0.00869
	TEL-3	Apr-18		<0.000260	<0.000418	0.000823 J	<0.00100	0.00162	**0.0556**	0.0188	<0.00382	0.0637	<0.00100	0.00174	0.00998
	TEL-4	Apr-16		<0.00260	<0.00418	<0.00341	<0.0100	0.0160	**0.0745**	0.142		**0.105**	<0.0100	0.00421 J	0.0955
	TEL-4	Apr-16	FD	<0.00260	<0.00418	<0.00341	**<0.0100**	0.0161	**0.0771**	0.147		0.0945	<0.0100	0.00450 J	0.0984
	TEL-4	Oct-16		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	**0.0503**	0.0668		0.0415	<0.0100	0.00422 J	0.0666
	TEL-4	Oct-16	FD	<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	0.0700	0.0863		0.0476	<0.0100	<0.00361	0.0860
	TEL-4	Apr-17		<0.00260	<0.00418	<0.00350	<0.0100	<0.00384	0.0344	0.0243	<0.0382	0.0522	<0.0100	<0.00361	0.0423
	TEL-4	Apr-17	FD	<0.000260	<0.000418	0.000555 J	<0.00100	0.000616 J	0.0442	0.0281	<0.00382	0.0492	<0.00100	0.0043	0.0522
	TEL-4	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000587 J	**0.0621**	0.0261	<0.00382	0.0975	<0.00100	**0.00372**	0.0691
	TEL-4	Oct-17	FD	<0.000260	<0.000418	0.000981 J	<0.00100	0.000497 J	**0.0596**	0.0235	<0.00382	0.0874	<0.00100	0.00336	0.0648
	TEL-4	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.0266**	0.00408	<0.00382	0.0670	<0.00100	0.00236	0.0295
	TEL-4	Apr-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.0266**	0.00401	<0.00382	0.0671	<0.00100	0.00245	0.0299
	TEL-4	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	**0.0228**	0.00185 J	<0.00382	0.00101	<0.00100	0.00120	0.0195
	TEL-4	Oct-18	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0254	0.00221	<0.00382	0.000874 J	<0.00100	0.00148	0.0230
TMD	MW-8	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-8	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-8	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	0.00228	<0.00100 J4	<0.000361	<0.000349
	MW-8	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0388	<0.00100	<0.000361	<0.000349
	MW-16	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-16	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	<0.000370	<0.00100 J	<0.000360	<0.000350
	MW-16	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-16	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-20	Apr-15		<0.000260	<0.000420	<0.000350 J	<0.00100	<0.000380	<0.000330 J	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-20	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-20	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-20	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-21	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.0101	<0.00100	<0.000361	<0.000349
	MW-21	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		0.0112	<0.00100	<0.000361	<0.000349
	MW-21	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0149	<0.00100	<0.000361	<0.000349
	MW-21	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0180	<0.00100	<0.000361	<0.000349
	MW-21	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0382	<0.00100	<0.000361	<0.000349
	MW-21	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0695	<0.00100	<0.000361	<0.000349
	MW-25	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	<0.000370	<0.00100 J	<0.000360	<0.000350
	MW-25	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-25	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-25	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-26	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-26	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-26	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-26	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloro-ethene	cis-1,3-Dichloro-propene	Cymene	Dichloro-methane	Ethyl-benzene	Isopropyl-benzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butyl-benzene	N-Propyl-benzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.070	4.70E-03	---	0.005	0.700	4.47E-01	---	---	0.10	0.030	1.00E+00	6.60E-01
				CGWSL Source:	WQCC HH	USEPA TW		WQCC HH	WQCC HH	WQCC TW			WQCC Dom	WQCC HH	WQCC TW	WQCC TW
Area	**Well ID**	**Date**	**Dup**													
TMD	MW-27	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-27	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-27	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-27	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-68	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-68	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-68	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-68	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-71	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-71	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-71	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-71	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-89	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	<0.000370	<0.00100 J	<0.000360	<0.000350
	MW-89	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	MW-89	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-89	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NP-1	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		**0.213**	<0.00100	<0.000361	<0.000349
	NP-1	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		**0.283**	<0.00100	<0.000361	<0.000349
	NP-1	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.391**	<0.00100	<0.000361	<0.000349
	NP-1	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.407**	<0.00100	<0.000361	<0.000349
	NP-1	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.132**	<0.00100	<0.000361	<0.000349
	NP-1	Oct-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.547**	<0.00100	<0.000361	<0.000349
	NP-2	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	**<0.00500**	<0.00500
	NP-6	Apr-13		<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	**<0.00500**	<0.00500
	NP-6	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	0.00878	<0.00100 J	**<0.000360**	<0.000350
	NP-6	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0353	<0.00100	**<0.000361**	<0.000349
Upgradient	UG-1	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	**<0.000360**	<0.000350
	UG-1	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	**<0.000361**	<0.000349
	UG-1	Apr-17		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-1	Apr-18		<0.000260	<0.000418	<0.000350	**<0.00100**	<0.000384	**<0.000326**	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-2	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	UG-2	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	UG-2	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-2	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-3R	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	UG-3R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	UG-3R	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-3R	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-4	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719		<0.000367	<0.00100	<0.000361	<0.000349
	UG-4	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-4	Apr-18		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
Cross-Gradient	KWB-13	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	0.00254 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-13	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-13	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-13	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-17	Apr-14											
	NP-5	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	NP-5	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	NP-5	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-3156	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	RA-3156	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RA-3156	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.0000469	<0.000398	<0.000259
	RA-3156	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-136	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-136	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-136	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-136	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-136	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-136	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
Evaporation Ponds	MW-1R	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-1R	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-1R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-1R	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-2A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-2A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-2A	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-2A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-2A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-2A	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-3	Apr-16	FD	<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-3	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-3	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-3	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-3	Oct-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Apr-16		0.000352 J	<0.00100	<0.000372	<0.000780	0.00201 J	<0.000396	<0.000419		<0.000398	<0.000259
	MW-4A	Oct-16		0.000870 J	<0.000307	<0.000372	<0.000780	0.00365	<0.000396	<0.000419		<0.000398	<0.000259
	MW-4A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Oct-17		0.000597 J	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	0.00266 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-4B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-4B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-4B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-5A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-5A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-5A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-5B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-5B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-5B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5C	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-5C	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-5C	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-6A	Apr-15		0.000920 J	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	**<0.000400**	<0.000260
	MW-6A	Apr-16		0.00119	<0.00100	<0.000372	<0.000780	0.00119 J	<0.000396	<0.000419		<0.000398	<0.000259
	MW-6A	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-6A	Apr-18		0.00192	<0.000307	<0.000372	0.00139	0.00360	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-6B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-6B	Mar-13	FD	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-6B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-6B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-7A	Apr-16	FD	<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-7A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-7A	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-7A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-7A	Oct-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-7B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-7B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-10	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-10	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-10	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-11A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-11A	Oct-16											
	MW-11A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-11A	Oct-17											
	MW-11A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-11A	Oct-18											
	MW-11B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-11B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-11B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-12	Apr-14											
	MW-13	Apr-14											
	MW-15	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-15	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-15	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-15	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
Evaporation Ponds	MW-18A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-18A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-18A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18A	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-18B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-18B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-22A	Apr-16	FD	<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-22A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-22A	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-22A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-22A	Oct-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	MW-22B	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-22B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-70	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-70	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-70	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-72	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-72	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-72	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-72	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-73	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-73	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-73	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-73	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-74	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-74	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-75	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-75	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-76	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00214 J	<0.000396	<0.000419		<0.000398	<0.000259
	MW-76	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-77	Apr-16		0.000583 J	<0.00100	<0.000372	0.00138 J	0.00390	<0.000396	<0.000419		<0.000398	<0.000259
	MW-77	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	<0.0106	<0.00396	<0.00419		<0.00398	<0.00259
	MW-77	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-77	Apr-18		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-78	Apr-15		0.00356	<0.000310	<0.000370	0.00385 J	0.00502	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-78	Apr-16		0.00135	<0.00100	<0.000372	0.00125 J	0.00135 J	<0.000396	<0.000419		<0.000398	<0.000259
	MW-78	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-78	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-79	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-79	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-79	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-79	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-79	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-79	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-80	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-80	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-80	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-80	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-81	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-81	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-81	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-81	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-82	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-82	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-82	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-82	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-83	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-83	Oct-16		0.000569 J	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-83	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-83	Oct-17		0.00120	<0.000307	<0.000372	<0.000412	0.00240 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-83	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	0.00258 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-83	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-84	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-84	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	<0.0106	<0.00396	<0.00419		<0.00398	<0.00259
	MW-84	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-84	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-84	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-84	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-87	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-87	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-88	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-88	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
Evaporation Ponds	MW-120	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-120	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-120	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-120	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-120	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-120	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-121	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-121	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-122	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-122	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-122	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-122	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-122	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-122	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-123	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-123	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-124	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-124	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-124	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-1R	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-1R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-2A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-2A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-3	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-3	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-4	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-4	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-5	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-5	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-6	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-6	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-7AR	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-7AR	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	OCD-7B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-7B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-8A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	OCD-8A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	OCD-8A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	OCD-8B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-8B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
Field East of Refinery	KWB-1A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-1A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-1A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	KWB-1A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1A	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1C	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	KWB-1C	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-1C	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Apr-15		0.00377	<0.000310	<0.000370	0.00213 J	0.00718	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-7	Oct-15		0.000608 J	<0.000307	<0.000372	<0.000780	0.00145 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Apr-16		0.00167	<0.000307	<0.000372	<0.000780	0.0235	<0.000396	<0.000419 J4		<0.000398	<0.000259
	KWB-7	Oct-16		<0.000341	<0.000307	<0.000372	0.00155 J	0.0196	<0.000396	<0.000419		**<0.000398**	<0.000259
	KWB-7	Apr-17		0.000576 J	<0.000307	<0.000372	<0.000412	0.00757	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Oct-17		0.00112	<0.000307	<0.000372	<0.000412	0.0143	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	0.00156 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-8	Oct-16		0.150 J	<0.0614	<0.0744	**1.48**	**1.16**	<0.0792	<0.0838		<0.0796	<0.0518
	KWB-8	Apr-17		0.145	<0.0307	<0.0372	0.747	**2.07**	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	KWB-8	Oct-17		0.0133	<0.000307	<0.000372	0.336	**0.795**	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
Field East of Refinery	KWB-10R	Apr-16			0.184	<0.0154	<0.0186	0.0937 J	**0.829**	<0.0198	<0.0210		<0.0199	<0.0130
	KWB-10R	Oct-16			**0.196**	<0.00614	<0.00744	0.110	**0.860**	<0.00792	<0.00838		<0.00796	<0.00518
	KWB-10R	Apr-17			**0.198**	<0.0154	<0.0186	0.0605	**0.914**	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	KWB-10R	Oct-17			0.112 J	<0.000307	<0.000372	0.0588	**0.767**	**<0.000396**	**<0.000419**	<0.000469	**<0.000398**	<0.000259
	KWB-10R	Apr-18			0.0922 J	<0.0768	<0.0930	<0.103	**0.549** J	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	KWB-10R	Oct-18			<0.0852	<0.0768	<0.0930	<0.103	<0.265	<0.0990	**<0.105**	<0.117	<0.0995	<0.0648
	KWB-11A	Apr-16			0.000423 J	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	**<0.000419**		**<0.000398**	<0.000259
	KWB-11A	Oct-16			0.000483 J	<0.000307	**<0.000372**	<0.000780	**0.00158** J	<0.000396	**<0.000419**		**<0.000398**	<0.000259
	KWB-11A	Apr-17			<0.000341	<0.000307	**<0.000372**	<0.000412	**<0.00106**	<0.000396	**<0.000419**	<0.000469	**<0.000398**	<0.000259
	KWB-11A	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	**<0.000419**	<0.000469	<0.000398	<0.000259
	KWB-11A	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	KWB-11A	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	KWB-11B	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-11B	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-11B	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Apr-15			<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-12A	Apr-15	FD		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-12A	Oct-15			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-12A	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-12A	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	KWB-12B	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-12B	Apr-16	FD		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-12B	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-12B	Oct-16	FD		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-12B	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Apr-17	FD		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-17	FD		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Apr-18	FD		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	KWB-12B	Oct-18	FD		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-P4	Apr-13			<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200
	KWB-P4	Apr-15			<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-P4	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-57	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-57	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-57	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	MW-58	Apr-16			0.0183	<0.00307	<0.00372	0.00806 J	**0.848**	<0.00396	<0.00419		<0.00398	<0.00259
	MW-58	Oct-16			0.0201	<0.000307	<0.000372	0.0159	**0.893**	<0.000396	<0.000419		<0.000398	<0.000259
	MW-58	Apr-17			<0.0341	<0.0307	<0.0372	<0.0412	0.533	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-58	Oct-17			0.00179	<0.000307	<0.000372	0.0101	0.222	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-58	Apr-18			<0.0170	<0.0154	<0.0186	<0.0206	0.268	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-58	Oct-18			<0.0170	<0.0154	<0.0186	<0.0206	<0.0530	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130 J3
	MW-111	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	**<0.000419**		<0.000398	<0.000259
	MW-111	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	0.00177 J	<0.000396	**<0.000419**		<0.000398	<0.000259
	MW-111	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	**0.00237** J	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-111	Oct-17			<0.0341	<0.000307	<0.000372	<0.000412	<0.106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-111	Apr-18			<0.00852	<0.00768	<0.00930	<0.0103	**<0.0265**	<0.00990	<0.0105	<0.0117	**<0.00995**	<0.00648
	MW-111	Oct-18			<0.00852	<0.00768	<0.00930	<0.0103	**<0.0265**	<0.00990	<0.0105	<0.0117	**<0.00995**	<0.00648
	MW-113	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	0.00518	<0.000396	<0.000419		<0.000398	<0.000259
	MW-113	Apr-16	FD		<0.000341	<0.000307	<0.000372	<0.000780	0.00531	<0.000396	<0.000419		<0.000398	<0.000259
	MW-113	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	0.0143	<0.000396	<0.000419		<0.000398	<0.000259
	MW-113	Oct-16	FD		<0.000341	<0.000307	<0.000372	<0.000780	0.0127	<0.000396	<0.000419		<0.000398	<0.000259
	MW-113	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	**0.0133**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-113	Apr-17	FD		<0.000341	<0.000307	<0.000372	<0.000412	**0.0148**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-113	Oct-17			<0.000341	<0.000307	<0.000372	0.000501 J	0.0279	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-17	FD		<0.000341	<0.000307	<0.000372	0.000660 J	0.0234	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	0.00849	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Apr-18	FD		<0.000341	<0.000307	<0.000372	<0.000412	0.00901	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	0.00867	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-18	FD		<0.000341	<0.000307	<0.000372	<0.000412	0.00939	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-125	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-125	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4		<0.000398	<0.000259
	MW-126A	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-126A	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	0.00141 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-126B	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-126B	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-127	Apr-16			0.0375	<0.000307	<0.000372	0.287	0.149	<0.000396	<0.000419 J4		<0.000398	<0.000259
	MW-127	Oct-16			0.0127	<0.00307	<0.00372	0.0877	0.0514	<0.00396	<0.00419		<0.00398	<0.00259
	MW-127	Apr-17			0.00990	<0.000307	<0.000372	0.0958	0.0810	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-127	Oct-17			0.00373	<0.000307	<0.000372	0.0396	0.0482	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-127	Apr-18			<0.00682	<0.00614	<0.00744	0.0424	0.0654	<0.00792	<0.00838	<0.00938	<0.00796	<0.00518
	MW-127	Oct-18			<0.00682	<0.00614	<0.00744	0.0397	0.0458 J	<0.00792	<0.00838	<0.00938	<0.00796	<0.00518
	MW-128	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	0.00153 J	<0.000396	<0.000419		<0.000398	<0.000259
	MW-128	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	0.00370	<0.000396	<0.000419		<0.000398	<0.000259
	MW-128	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	0.00159 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-128	Oct-17			<0.000341	<0.000307	<0.000372	0.000781 J	0.00336	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-128	Apr-18			<0.00682	<0.00614	<0.00744	<0.00824	**<0.0212**	<0.00792	<0.00838	<0.00938	**<0.00796**	<0.00518
	MW-128	Oct-18			<0.00682	<0.00614	<0.00744	<0.00824	**<0.0212**	<0.00792	<0.00838	<0.00938	**<0.00796**	<0.00518
	MW-129	Apr-16			0.000796 J	<0.000307	<0.000372	<0.0390	0.00278 J	<0.000396	<0.000419 J4		<0.000398	<0.000259
	MW-129	Oct-16			<0.000341	<0.000307	<0.000372	0.000920 J	0.00124 J	<0.000396	<0.000419		<0.000398	<0.000259
	MW-129	Apr-17			<0.000341	<0.000307	<0.000372	0.000543 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-129	Apr-18			<0.000341	<0.000307	<0.000372	0.000816 J	0.00125 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
Field East of Refinery	MW-130	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-130	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-130	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	MW-131	Apr-15		0.0606	<0.000310	<0.000370	0.215	0.145	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-131	Oct-15		0.0243	<0.000307	<0.000372	0.0522	0.0859	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-131	Apr-16		0.0370	<0.000307	<0.000372	0.142	0.0883	<0.000396	<0.000419 J4		<0.000398	<0.000259
	MW-131	Oct-16		0.0182	<0.00154	<0.00186	0.0299	0.0613	<0.00198	<0.00210		<0.00199	<0.00130
	MW-131	Apr-17		0.0406	<0.000307	<0.000372	0.153	0.114	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-131	Oct-17		<0.0852	<0.000307	<0.000372	0.0627	<0.265	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-133	Nov-14		0.0380 J	<0.0310	<0.0370	0.100 J	0.220 J	<0.0400	<0.0420		<0.0400	<0.0260
	MW-133	Apr-15		<0.0340	<0.0310	<0.0370	<0.0780	<0.110	<0.0400	<0.0420	<0.0470	<0.0400	<0.0260
	MW-134	Apr-16		<0.00100	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4		<0.000398	<0.000259
	MW-134	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4		<0.000398	<0.000259
	MW-134	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-134	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-134	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-134	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-134	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Apr-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	MW-134	Oct-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-135	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-135	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RA-4196	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RA-4196	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	RA-4798	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RA-4798	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RA-4798	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	RW-12R	Apr-16		<0.00170	<0.00154	<0.00186	<0.00390	0.0140 J	<0.00198	<0.00210		<0.00199	<0.00130
	RW-12R	Apr-17		0.00177 J	<0.00154	<0.00186	0.00354 J	0.0257	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	RW-12R	Apr-18		<0.000341	<0.000307	<0.000372	0.00157	0.00648	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-13R	Apr-16		0.0139	<0.000307	<0.000372	0.0175	0.108	<0.000396	<0.000419		<0.000398	<0.000259
	RW-13R	Apr-18		0.00159	<0.000307	<0.000372	0.00322	0.0299	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-18	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-18	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RW-18A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-18A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-20	Apr-15		0.0590	<0.00310	<0.00370	0.211	**1.35**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	RW-22	Apr-15		0.0952	<0.00310	<0.00370	0.216	**0.945**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
North Refinery	MW-23	Apr-16		0.00284 J	<0.00154	<0.00186	0.00412 J	0.0176	<0.00198	<0.00210		<0.00199	<0.00130
	MW-23	Oct-16		<0.00852	<0.00768	<0.00930	<0.0195	<0.0265	<0.00990	<0.0105		<0.00995	<0.00648
	MW-23	Apr-17		0.00188	<0.000307	<0.000372	0.00243	0.00549	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-23	Oct-17		0.00198	<0.000307	<0.000372	0.00561	0.00525	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-23	Apr-18		<0.0341	<0.0307	<0.0372	<0.0412	<0.106	<0.0396	**<0.0419**	<0.0469	<0.0398	<0.0259
	MW-23	Oct-18		<0.0341	<0.0307	<0.0372	<0.0412	<0.106	<0.0396	**<0.0419**	<0.0469	<0.0398	<0.0259
	MW-29	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-29	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-29	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-29	Oct-17		<0.000341	<0.000307	<0.000372	0.000676 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-29	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-29	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-39	Apr-16		0.0365	<0.00768	<0.00930	0.0293 J	0.181	<0.00990	<0.0105		<0.00995	<0.00648
	MW-39	Oct-16		0.0428 J	<0.0307	<0.0372	<0.0780	0.204 J	<0.0396	<0.0419		<0.0398	<0.0259
	MW-39	Apr-17		0.0454	<0.00307	<0.00372	0.0251	0.186	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	MW-39	Oct-17		0.0368	<0.000307	<0.000372	0.00816	0.150	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-39	Apr-18		0.0452	<0.000307	<0.000372	0.00472	0.186	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-39	Oct-18		0.0244	<0.000307	<0.000372	0.00321	0.0737	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-40	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	**0.00606**	<0.000400	<0.000420	<0.000470	**<0.000400**	0.000999 J
	MW-40	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	**0.0144**	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-40	Apr-17		<0.000341	<0.000307	<0.000372	0.000732 J	0.0117	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-40	Apr-18		<0.000341	<0.000307	<0.000372	0.000543 J	0.00619	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-41	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-41	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-41	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-41	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-42	Apr-15		<0.00340	<0.00310	<0.00370	<0.00780	0.0484	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-42	Apr-16		<0.00170	<0.00154	<0.00186	<0.00390	0.0380	<0.00198	<0.00210		<0.00199	<0.00130
	MW-42	Apr-17		<0.000341	<0.000307	<0.000372	0.000845 J	0.00365	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-42	Apr-18		<0.000341	<0.000307	<0.000372	0.000959 J	0.00420	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-43	Apr-16		**0.626**	<0.0768	<0.0930	**1.66**	**1.86**	<0.0990	<0.105		<0.0995	<0.0648
	MW-43	Oct-16		**0.555**	<0.0768	<0.0930	0.618 J	**1.81**	<0.0990	<0.105		<0.0995	<0.0648
	MW-43	Apr-17		**0.539**	<0.0154	<0.0186	0.519	**1.80**	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-43	Oct-17		**0.421**	<0.0154	<0.0186	0.285	**1.76**	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-43	Apr-18		**0.264**	<0.0154	<0.0186	0.124	**1.78**	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-43	Oct-18		**0.237**	<0.0154	<0.0186	0.239	**1.57**	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-59	Apr-15		<0.000340	<0.000310	**<0.000370**	<0.000780	**<0.00110**	**<0.000400**	**<0.000420**	<0.000470	**<0.000400**	<0.000260
	MW-59	Apr-16		<0.000341	<0.000307	**<0.000372**	<0.000780	**<0.00106**	<0.000396	**<0.000419**		**<0.000398**	<0.000259
	MW-59	Apr-17		<0.000341	<0.000307	**<0.000372**	<0.000412	**<0.00106**	<0.000396	**<0.000419**	<0.000469	**<0.000398**	<0.000259
	MW-59	Apr-18		<0.000341	<0.000307	**<0.000372**	<0.000412	**<0.00106**	<0.000396	**<0.000419**	<0.000469	**<0.000398**	<0.000259
	MW-60	Apr-16		<0.000341	<0.000307	**<0.000372**	<0.000780	**0.00283** J	<0.000396	**<0.000419**		**<0.000398**	<0.000259
	MW-60	Apr-16	FD	<0.000341	<0.000307	**<0.000372**	<0.000780	**0.00272** J	<0.000396	**<0.000419**		**<0.000398**	<0.000259
	MW-60	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00736	<0.000396	<0.000419		<0.000398	<0.000259
	MW-60	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	0.00552	<0.000396	<0.000419		<0.000398	<0.000259
	MW-60	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	0.00195 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	0.00240 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-17		<0.000341	<0.000307	<0.000372	0.000476 J	0.00622	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	0.00514	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	0.00229 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	0.00196 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-18		<0.000341	<0.000307	<0.000372	0.000664 J	0.00573	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-18	FD	<0.000341	<0.000307	<0.000372	0.000704 J	0.00540	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
North Refinery	MW-61	Apr-16		0.00263 J	<0.00154	<0.00186	0.0185 J	0.226	<0.00198	<0.00210		<0.00199	<0.00130
	MW-61	Oct-16		<0.00852	<0.00768	<0.00930	0.0260 J	0.225	<0.00990	<0.0105		<0.00995	<0.00648
	MW-61	Apr-17		<0.00852	<0.00768	<0.00930	0.0312	0.228	<0.00990	<0.0105	<0.0117	<0.00995	<0.00648
	MW-61	Oct-17		0.00327	<0.000307	<0.000372	0.0612	0.378	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-61	Apr-18		<0.0170	<0.0154	<0.0186	0.0844	0.450	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-61	Oct-18		<0.0170	<0.0154	<0.0186	0.0795	0.353	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-62	Apr-16		<0.00852	<0.00768	<0.00930	<0.0195	**1.80**	<0.00990	<0.0105		<0.00995	<0.00648
	MW-62	Oct-16		<0.0341 J6	<0.0307 J6	<0.0372 J6	<0.0780 J6	**1.14 J6**	<0.0396 J6	<0.0419 J6		**<0.0398** J6	<0.0259 J6
	MW-62	Apr-17		<0.0170	<0.0154	<0.0186	<0.0206	**1.13**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-62	Oct-17		<0.0341	<0.0307	<0.0372	<0.0412	**1.35**	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-62	Apr-18		<0.0341	<0.0307	<0.0372	<0.0412	**1.15**	<0.0396	<0.0419	<0.0469	**<0.0398**	<0.0259
	MW-62	Oct-18		<0.0341	<0.0307	<0.0372	<0.0412	**0.871**	<0.0396	<0.0419	<0.0469	**<0.0398**	<0.0259
	MW-67	Apr-16		<0.00341	<0.00307	<0.00372	<0.00780	**<0.0106**	<0.00396	**<0.00419** J4		**<0.00398**	<0.00259
	MW-67	Oct-16		0.00407 J	<0.00307	<0.00372	<0.00780	**0.0120** J	<0.00396	**<0.00419**		**<0.00398**	<0.00259
	MW-67	Apr-17		<0.00170	<0.00154	<0.00186	0.00361 J	**0.0121** J	<0.00198	**<0.00210**	<0.00234	**<0.00199**	<0.00130
	MW-67	Oct-17		<0.000341	<0.000307	<0.000372	0.00140	**0.00245** J	<0.000396	**<0.000419**	<0.000469	**0.000515** J	<0.000259
	MW-67	Apr-18		<0.00170	<0.00154	<0.00186	0.00261 J	**0.00916** J	<0.00198	**<0.00210**	<0.00234	**<0.00199**	<0.00130
	MW-67	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	**0.00113** J	<0.000396	**<0.000419**	<0.000469	**0.000424** J	<0.000259
	MW-90	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-90	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-90	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-90	Oct-17		0.000368 J	<0.000307	<0.000372	0.000744 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-90	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-90	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-91	Apr-16		**0.365**	<0.0154	<0.0186	**4.01**	**1.69**	<0.0198	<0.0210		<0.0199	<0.0130
	MW-91	Oct-16		**0.310**	<0.0768	<0.0930	**3.33**	**1.58**	<0.0990	<0.105		<0.0995	<0.0648
	MW-91	Apr-17		**0.216**	<0.0307	<0.0372	**1.61**	**1.05**	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-91	Oct-17		**0.219**	<0.0307	<0.0372	**1.12**	**0.975**	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-91	Apr-18		0.138	<0.0307	<0.0372	**1.23**	**0.697**	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-91	Oct-18		0.164	<0.0307	<0.0372	**1.24**	**0.716**	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-92	Apr-16		0.0268	<0.000307	**0.000488** J	0.0173	**0.188**	**0.000917** J	**<0.000419**		**<0.000398**	0.000399 J
	MW-92	Oct-16		0.0151 J	<0.00614	**<0.00744**	<0.0156	**0.110**	**<0.00792**	**<0.00838**		**<0.00796**	<0.00518
	MW-93	Apr-16		<0.00170	<0.00154	**<0.00186**	<0.00390	**0.0567**	**<0.00198**	**<0.00210**		**<0.00199**	<0.00130
	MW-93	Oct-16		<0.00341	<0.00307	**<0.00372**	<0.00780	**0.250**	**<0.00396**	**<0.00419**		**<0.00398**	<0.00259
	MW-93	Apr-17		<0.00852	<0.00768	<0.00930	<0.0103	**0.326**	**<0.00990**	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-93	Apr-18		0.00452	<0.000307	<0.000372	0.00797	**0.336**	**<0.000396**	**<0.000419**	<0.000469	**<0.000398**	<0.000259
	MW-94	Oct-15		**0.360**	<0.00307	<0.00372	0.553	0.574	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-94	Apr-16		**0.387**	<0.0154	<0.0186	0.687	**0.615**	<0.0198	<0.0210 J4		**<0.0199**	<0.0130
	MW-94	Oct-16		**0.390**	<0.00154	<0.00186	0.468	0.592	<0.00198	<0.00210		<0.00199	<0.00130
	MW-94	Apr-17		**0.292**	<0.00768	<0.00930	0.435	0.460	<0.00990	<0.0105	<0.0117	<0.00995	<0.00648
	MW-95	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	**<0.00110**	<0.000400	<0.000420	<0.000470	**<0.000400**	<0.000260
	MW-95	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4		<0.000398	<0.000259
	MW-95	Apr-17		<0.000341	<0.000307	**<0.000372**	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-95	Apr-18		<0.000341	<0.000307	**<0.000372**	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-96	Apr-16		<0.00682	<0.00614	**<0.00744**	<0.0156	<0.0212	<0.00792	<0.00838		<0.00796	<0.00518
	MW-96	Oct-16		<0.0170	<0.0154	**<0.0186**	<0.0390	**<0.0530**	<0.0198	<0.0210		**<0.0199**	<0.0130
	MW-96	Apr-17		<0.0170	<0.0154	<0.0186	<0.0206	<0.0530	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-96	Oct-17		<0.0170	<0.0154	<0.0186	<0.0206	<0.0530	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-96	Apr-18		<0.0170	<0.0154	<0.0186	<0.0206	<0.0530	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-96	Oct-18		<0.341	<0.307	<0.372	<0.412	<1.06	<0.396	<0.419	<0.469	<0.398	<0.259
	MW-98	Apr-16		<0.0341	<0.0307	<0.0372	0.220 J	**0.865**	<0.0396	<0.0419		**<0.0398**	<0.0259
	MW-98	Oct-16		<0.0341	<0.0307	<0.0372	0.245 J	**1.37**	<0.0396	<0.0419		**<0.0398**	<0.0259
	MW-98	Apr-17		0.0443 J	<0.0307	<0.0372	0.356	**1.88**	<0.0396	<0.0419	<0.0469	**<0.0398**	<0.0259
	MW-98	Oct-17		0.0525	<0.0154	<0.0186	0.421	**2.21**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-98	Apr-18		0.0245 J	<0.0154	<0.0186	0.282	**1.90**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-98	Oct-18		0.0272 J	<0.0154	**<0.0186**	**0.269**	**2.16**	<0.0198	**<0.0210**	**<0.0234**	**<0.0199**	<0.0130
	MW-137	Apr-16		**0.539**	<0.0768	<0.0930	**2.53**	**1.23**	<0.0990	**<0.105**		**<0.0995**	<0.0648
	MW-137	Oct-16		**0.343**	<0.0768	<0.0930	**1.51**	**1.10**	<0.0990	**<0.105**		**<0.0995**	<0.0648
	MW-137	Apr-17		**0.427**	<0.0614	<0.0744	**2.08**	**1.15**	<0.0792	**<0.0838**	<0.0938	**<0.0796**	<0.0518
	MW-137	Oct-17		**0.265**	<0.0614	<0.0744	**1.54**	**1.16**	<0.0792	**<0.0838**	<0.0938	**<0.0796**	<0.0518
	MW-137	Apr-18		**0.398**	<0.0614	<0.0744	**1.83**	**1.30**	<0.0792	**<0.0838**	<0.0938	**<0.0796**	<0.0518
	MW-137	Oct-18		0.165 J	<0.0614	<0.0744	**0.977**	**0.688**	<0.0792	**<0.0838**	<0.0938	**<0.0796**	<0.0518
	MW-138	Apr-16		<0.00341	<0.00307	**<0.00372**	0.0158 J	**<0.0106**	**<0.00396**	**<0.00419**		**<0.00398**	<0.00259
	MW-138	Oct-16		<0.00341	<0.00307	**<0.00372**	<0.00780	**<0.0106**	**<0.00396**	**<0.00419**		**<0.00398**	<0.00259
	MW-138	Apr-17		<0.00341	<0.00307	**<0.00372**	<0.00412	**<0.0106**	**<0.00396**	**<0.00419**	<0.00469	**<0.00398**	<0.00259
	MW-138	Oct-17		<0.00170	<0.00154	**<0.00186**	0.00577	**0.00565** J	**<0.00198**	**<0.00210**	<0.00234	**<0.00199**	<0.00130
	MW-138	Apr-18		0.00541	<0.00154	**<0.00186**	0.0128	**0.0492**	**<0.00198**	**<0.00210**	<0.00234	**<0.00199**	<0.00130
	MW-138	Oct-18		0.00635	<0.00154	<0.00186	0.00806	**0.115**	**<0.00198**	**<0.00210**	<0.00234	**<0.00199**	<0.00130
	RW-1	Apr-15		<0.0170	<0.0150	<0.0190	<0.0390	<0.0530	<0.0200	<0.0210	<0.0230	<0.0200	<0.0130
	RW-1R	Apr-16		0.00110	<0.000307	0.00258	0.00542	0.0122	0.0250	<0.000419		**0.00959**	**0.00116**
	RW-1	Apr-17		<0.00341	<0.00307	<0.00372	0.0102	<0.0106	0.0108	<0.00419	<0.00469	**0.00896 J**	<0.00259
	RW-1	Apr-18		0.00282	<0.000307	0.00413	0.0176	0.0855	0.0173	<0.000419	<0.000469	**0.0169**	**0.00131**
	RW-2	Apr-15		0.0853	<0.00310	<0.0930	0.115	0.530	<0.00400	<0.00420	<0.00470 J	**0.0326**	<0.00260
	RW-2R	Apr-16		0.0461 J	<0.0154	<0.0186	0.0569 J	0.299	<0.0198	<0.0210		**0.0285 J**	<0.0130
	RW-2	Apr-17		0.0183 J	<0.0154	**0.0218 J**	0.0430 J	**0.431**	<0.0198	<0.0210	<0.0234	**0.0249 J**	<0.0130
	RW-2	Apr-18		0.00601	<0.000307	0.00335	0.0312	0.446	0.00825	<0.000419	<0.000469	**0.00521**	<0.000259
	RW-7	Apr-15		0.00176	<0.000310	<0.000370	0.00396 J	0.0367	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-7R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4		<0.000398	<0.000259
	RW-7	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-7	Apr-18		0.00114	<0.000307	<0.000372	0.00106	**0.00545**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	RW-8	Apr-15		<0.00340	<0.00310	<0.00370	<0.00780	**<0.0110**	<0.00400	<0.00420	<0.00470	**<0.00400**	<0.00260
	RW-8	Apr-17		0.0112	<0.000307	<0.000372	0.00213	0.0498	<0.000396	<0.000419	<0.000469	0.00110	<0.000259
	RW-9	Apr-15		<0.0170	<0.0150	<0.0190	<0.0390	<0.0530	<0.0200	<0.0210	<0.0230	<0.0200	<0.0130
	RW-9	Apr-16		<0.00170	<0.00154	<0.00186	<0.00390	0.0708	<0.00198	<0.00210		<0.00199	<0.00130
	RW-9	Apr-17		<0.000341	<0.000307	<0.000372	0.00184	0.0193	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-9	Apr-18		<0.000341	<0.000307	<0.000372	0.00218	0.0180	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-10	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-10	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RW-10	Apr-17		0.00299	<0.000307	<0.000372	0.00119	**0.00378**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	RW-10	Apr-18		0.00346	<0.000307	<0.000372	0.00163	0.00474	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-16	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-16	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RW-16	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-16	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-17	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-17	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	RW-17	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-17	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
North RO Reject Field	MW-117	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-117	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-117	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-117	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-117	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-117	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	J3
	MW-118	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-118	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-118	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	J3
	MW-119	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-119	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-119	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	J3
NCL	MW-18	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-18	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-18	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-18	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-45	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-45	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-53	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-53	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-53	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-53	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-54A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-54A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500	<0.00500	<0.00500	<0.00200	
	MW-54B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-54B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-55	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-55	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259	
	MW-55	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-56	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-56	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-56	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-56	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-108	Apr-16		<0.0170	<0.0154	<0.0186	<0.0390	0.0795 J	<0.0198	<0.0210		<0.0199	<0.0130	
	MW-108	Oct-16		<0.00852	<0.00768	<0.00930	<0.0195	0.0721 J	<0.00990	<0.0105		<0.00995	<0.00648	
	MW-108	Apr-17		<0.00852	<0.00768	<0.00930	<0.0103	0.0815	<0.00990	<0.0105	<0.0117	<0.00995	<0.00648	
	MW-108	Oct-17		0.00238 J	<0.00154	<0.00186	0.00383 J	0.0626	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130	
	MW-108	Apr-18		<0.00852	<0.00768	<0.00930	<0.0103	0.0646 J	<0.00990	<0.0105	<0.0117	<0.00995	<0.00648	
	MW-108	Oct-18		0.00363 J	<0.00154	<0.00186	0.00660	0.0888	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130	
	NCL-31	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259	
	NCL-31	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259	
	NCL-31	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259	
	NCL-31	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-31	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259	
	NCL-31	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-32	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-32	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-33	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-33	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-34A	Apr-16		<0.0170	<0.0154	<0.0186	<0.0390	0.188	<0.0198	<0.0210		<0.0199	<0.0130	
	NCL-34A	Oct-16		<0.0341	<0.0307	<0.0372	<0.0780	0.111 J	<0.0396	<0.0419		<0.0398	<0.0259	
	NCL-34A	Apr-17		<0.0170	<0.0154	<0.0186	<0.0206	0.100 J	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130	
	NCL-34A	Oct-17		0.000631 J	<0.000307	<0.000372	<0.000412	0.0768	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-34A	Apr-18		<0.00341	<0.00307	<0.00372	<0.00412	0.0390	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	NCL-34A	Oct-18		<0.00341	<0.00307	<0.00372	<0.00412	0.0266 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	NCL-44	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259	
	NCL-44	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259	
	NCL-44	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259	
	NCL-44	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-44	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-44	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-49	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-49	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-49	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	NCL-49	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
South Refinery	KWB-2R	Apr-16			0.00189	<0.000307	<0.000372	0.00152 J	0.0515	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-2R	Oct-16			0.00185	<0.000307	<0.000372	0.00290 J	0.0289	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-2R	Apr-17			0.000772 J	<0.000307	<0.000372	<0.000412	0.0281	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-2R	Oct-17			0.00977	<0.000307	<0.000372	0.0161	0.193	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-5	Apr-16			0.00349	<0.000307	<0.000372	0.00412 J	0.0158	<0.000396	<0.000419		<0.000398	<0.000259
	KWB-5	Oct-16			<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210		<0.00199	<0.00130
	KWB-5	Apr-17			0.00472	<0.000307	<0.000372	0.00470	0.0434	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-5	Oct-17			<0.0852	<0.000307	<0.000372	0.00156	<0.265	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-5	Apr-18			<0.0852	<0.0768	<0.0930	<0.103	<0.265	<0.0990	<0.105	<0.117	<0.0995	<0.0648
	KWB-5	Oct-18			<0.0852	<0.0768	<0.0930	<0.103	<0.265	<0.0990	<0.105	<0.117	<0.0995	<0.0648
	KWB-6	Apr-16			**0.243**	<0.00154	<0.00186	0.120	**1.88**	<0.00198	<0.00210		<0.00199	<0.00130
	KWB-6	Oct-16			0.0232	<0.00614	<0.00744	0.0167 J	0.417	<0.00792	<0.00838		<0.00796	<0.00518
	KWB-6	Apr-17			0.0179	<0.00154	<0.00186	0.0205	0.391	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	KWB-6	Oct-17			0.00804	<0.000307	<0.000372	0.0122	0.283	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-6	Apr-18			0.035	<0.00614	<0.00744	0.00879 J	**0.258**	<0.00792	<0.00838	<0.00938	**<0.00796**	<0.00518
	KWB-6	Oct-18			0.0234	<0.00614	<0.00744	0.0126 J	**0.379**	<0.00792	<0.00838	<0.00938	**<0.00796**	<0.00518 J3
	MW-28	Apr-16			0.00496 J	<0.00307	**<0.00372**	0.0350 J	0.161	<0.00396	**<0.00419**		<0.00398	<0.00259
	MW-28	Oct-16			<0.0170	<0.0154	<0.0186	0.0683 J	**0.338**	<0.0198	<0.0210		**<0.0199**	<0.0130
	MW-28	Apr-17			<0.0170	<0.0154	<0.0186	0.0587	0.238	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-28	Oct-17			<0.0170	<0.0154	<0.0186	0.0474 J	0.216	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-28	Apr-18			<0.0170	<0.0154	<0.0186	0.0316 J	**0.144** J	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-28	Oct-18			<0.00682	<0.00614	<0.00744	<0.00824	**0.0301** J	<0.00792	<0.00838	<0.00938	**<0.00796**	<0.00518
	MW-48	Apr-16			0.0788	<0.00614	<0.00744	0.214	**0.750**	<0.00792	<0.00838		<0.00796	<0.00518
	MW-48	Oct-16			0.0356	<0.00154	<0.00186	0.214	**0.538**	<0.00198	<0.00210		**<0.00199**	<0.00130
	MW-48	Apr-17			0.115	<0.0154	<0.0186	0.667	**1.16**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-48	Oct-17			0.0924	<0.000307	<0.000372	0.722	**0.797**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-48	Apr-18			<0.0852	<0.0768	<0.0930	**1.02**	**0.955**	<0.0990	<0.105	<0.117	**<0.0995**	<0.0648
	MW-48	Oct-18			<0.0852	<0.0768	<0.0930	<0.103	**0.358** J	<0.0990	<0.105	<0.117	**<0.0995**	<0.0648 J3
	MW-50	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	**<0.000419**		**<0.000398**	<0.000259
	MW-50	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-50	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	**<0.000419**	<0.000469	**<0.000398**	<0.000259
	MW-50	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	**<0.000419**	<0.000469	<0.000398	<0.000259
	MW-50	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	**<0.000396**	**<0.000419**	<0.000469	**<0.000398**	<0.000259
	MW-50	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-52	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-52	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-52	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-52	Oct-17			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-52	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-52	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3
	MW-64	Apr-16			**2.44**	<0.0154	<0.0186	**18.8**	**7.70**	<0.0198	<0.0210 J4		<0.0199	<0.0130
	MW-64	Oct-16			**1.51**	<0.0307	<0.0372	**11.6**	**5.30**	<0.0396	<0.0419		<0.0398	<0.0259
	MW-64	Apr-17			**2.09**	<0.0768	<0.0930	**13.2**	**7.58**	<0.0990	<0.105	<0.117	<0.0995	<0.0648
	MW-64	Oct-17			**1.44**	<0.0768	<0.0930	**9.81**	**6.01**	<0.0990	<0.105	<0.117	<0.0995	<0.0648
	MW-64	Apr-18			0.122	<0.00614	<0.00744	**0.816**	0.482	<0.00792	<0.00838	<0.00938	<0.00796	<0.00518
	MW-64	Oct-18			**1.06**	<0.00614	<0.00744	**13.0**	**4.72**	<0.00792	<0.00838	<0.00938	<0.00796	<0.00518
	MW-65	Apr-16			0.0149	<0.00307	**<0.00372**	0.0211 J	**0.0971**	**<0.00396**	**<0.00419**	<0.117	**<0.00398**	<0.00259
	MW-65	Oct-16			0.00937 J	<0.00614	**<0.00744**	0.0271 J	**0.0298** J	**<0.00792**	**<0.00838**	<0.0469	**<0.00796**	<0.00518
	MW-65	Apr-17			<0.0341	<0.0307	**<0.0372**	<0.0412	**<0.106**	**<0.0396**	**<0.0419**	<0.117	**<0.0398**	<0.0259
	MW-65	Oct-17			<0.0341	<0.0307	**<0.0372**	<0.0412	**<0.106**	**<0.0396**	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-65	Apr-18			<0.0341	<0.0307	<0.0372	<0.0412	**<0.106**	**<0.0396**	<0.0419	<0.0469	**<0.0398**	<0.0259
	MW-65	Oct-18			<0.0341	<0.0307	**<0.0372**	<0.0206	**<0.106**	**<0.0396**	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-66	Apr-16			<0.00341	<0.00307	<0.00372	<0.00780	0.0285 J	<0.00396	<0.00419		<0.00398	<0.00259
	MW-66	Oct-16			0.00365	<0.000307	<0.000372	0.0109	**0.0265**	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-66	Apr-17			<0.0170	<0.0154	<0.0186	<0.0206	**<0.0530**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-66	Oct-17			<0.00341	<0.00307	<0.00372	<0.00412	**<0.0106**	<0.00396	<0.00419	<0.00469	**<0.00398**	<0.00259
	MW-66	Apr-18			<0.00341	<0.00307	<0.00372	0.00814 J	**0.0118** J	<0.00396	<0.00419	<0.00469	**<0.00398**	<0.00259
	MW-66	Oct-18			<0.00341	<0.00307	<0.00372	0.00704 J	**<0.0106**	<0.00396	<0.00419	<0.00469	**<0.00398**	<0.00259 J3
	MW-99	Apr-16			0.0843	<0.00307	<0.00372	0.0427 J	0.615	<0.00396	<0.00419		<0.00398	<0.00259
	MW-99	Oct-16			0.108	<0.00614	<0.00744	0.190	**0.699**	<0.00792	<0.00838		<0.00796	<0.00518
	MW-99	Apr-17			0.106	<0.0154	<0.0186	0.0860	**0.522**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-99	Oct-17			<0.0341	<0.0307	<0.0372	<0.0412	0.228 J	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-99	Apr-18			0.0467 J	<0.0307	<0.0372	0.0896 J	0.332	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-99	Oct-18			<0.0341	<0.0307	<0.0372	<0.0412	0.358	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259 J3
	MW-101	Apr-16			<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259
	MW-101	Oct-16			<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	**<0.000419**		**<0.000398**	<0.000259
	MW-101	Apr-17			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-101	Oct-17			<0.000341	<0.000307	<0.000372	0.000439 J	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-101	Apr-18			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-101	Oct-18			<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-102	Apr-16			0.0881 J	<0.0307	<0.0372	0.541	**0.632**	<0.0396	<0.0419		<0.0398	<0.0259
	MW-102	Oct-16			0.0952 J	<0.0307	<0.0372	0.626	**0.719**	<0.0396	<0.0419		<0.0398	<0.0259
	MW-102	Apr-17			0.0189 J	<0.00614	<0.00744	0.243	0.391	<0.00792	<0.00838	<0.00938	<0.00796	<0.00518
	MW-102	Oct-17			0.0353 J	<0.0154	<0.0186	0.275	0.501	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-102	Apr-18			<0.170	<0.154	<0.186	<0.206	<0.530	<0.198	<0.210	<0.234	<0.199	<0.130
	MW-102	Oct-18			<0.170	<0.154	<0.186	**0.889**	<0.530	<0.198	<0.210	<0.234	<0.199	<0.130
	MW-103	Apr-15			0.00549	<0.000310	<0.000370	0.0154	**0.0137**	<0.000400	**<0.000420**	<0.000470	**<0.000400**	<0.000260
	MW-103	Apr-16			0.00422 J	<0.00154	<0.00186	0.0153 J	**<0.00530**	<0.00198	**<0.00210**		**<0.00199**	<0.00130
	MW-103	Apr-17			<0.0170	<0.0154	<0.0186	<0.0206	**<0.0530**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-103	Apr-18			0.00461	<0.000307	<0.000372	0.0408	**0.0124**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259
	MW-104	Apr-16			<0.000341	<0.000307	<0.000372	**<0.000780**	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-104	Apr-16	FD		<0.000341	<0.000307	<0.000372	**<0.000780**	**<0.00106**	**<0.000396**	<0.000419		**<0.000398**	<0.000259
	MW-104	Oct-16			<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210		<0.00199	<0.00130
	MW-104	Oct-16	FD		<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210		<0.00199	<0.00130
	MW-104	Apr-17			<0.00341	<0.00307	<0.00372	<0.00412	**<0.0106**	<0.00396	<0.00419	<0.00469	**<0.00398**	<0.00259
	MW-104	Apr-17	FD		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-104	Oct-17			<0.000341	0.000402 J	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-104	Oct-17	FD		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-104	Apr-18			<0.000341	<0.000307	<0.000372	0.000415 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-104	Apr-18	FD		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-104	Oct-18			<0.000341	<0.000307	<0.000372	0.000463 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-104	Oct-18	FD		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-105	Apr-16			<0.0852	<0.0768	<0.0930	<0.195	0.379 J	<0.0990	<0.105		<0.0995	<0.0648
	MW-105	Oct-16			<0.0341	<0.0307	<0.0372	<0.0780	**0.683**	<0.0396	<0.0419		<0.0398	<0.0259
	MW-105	Apr-17			<0.0341	<0.0307	<0.0372	<0.0412	0.446	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-105	Oct-17			<0.0341	<0.000307	<0.000372	0.0192	0.39	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-105	Apr-18			<0.0341	<0.0307	<0.0372	<0.0412	0.304	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-105	Oct-18			<0.0341	<0.0307	<0.0372	<0.0412	0.277 J	<0.0396	<0.0419	<0.0469	<0.0398	<0.0259
	MW-106	Apr-16			<0.00852	<0.00768	<0.00930	0.124 J	**0.203**	<0.00990	<0.0105		**<0.00995**	<0.00648
	MW-106	Oct-16			<0.0170	<0.0154	<0.0186	0.146 J	**0.297**	<0.0198	**<0.0210**		**<0.0199**	<0.0130
	MW-106	Apr-17			<0.0170	<0.0154	<0.0186	0.116	**0.236**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-106	Oct-17			<0.0170	<0.0154	<0.0186	0.272	0.195	<0.0198	<0.0210	<0.0234	<0.0199	<0.0130
	MW-106	Apr-18			<0.0682	<0.0614	<0.0744	0.237	**0.299** J	<0.0792	<0.0838	<0.0938	**<0.0796**	<0.0518
	MW-106	Oct-18			<0.170	<0.154	<0.186	0.250 J	**<0.530**	<0.198	<0.210	<0.234	**<0.199**	<0.130
	MW-107	Apr-16			0.00145	<0.000307	<0.000372	0.00399 J	**0.00572**	<0.000396	<0.000419		**<0.000398**	<0.000259
	MW-107	Oct-16			0.00265 J	<0.00154	<0.00186	0.00800 J	**0.0112** J	<0.00198	<0.00210		**<0.00199**	<0.00130
	MW-107	Apr-17			<0.0170	<0.0154	<0.0186	<0.0206	**<0.0530**	<0.0198	<0.0210	<0.0234	**<0.0199**	<0.0130
	MW-107	Apr-18			0.00279	<0.000307	<0.000372	0.0142	**0.0159**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
South Refinery	MW-109	Apr-16		<0.00170	<0.00154	<0.00186	0.00837 J	**0.0142** J	<0.00198	<0.00210		**<0.00199**	<0.00130	
	MW-109	Oct-16		<0.00682	<0.00614	<0.00744	**<0.0156**	**<0.0212**	<0.00792	<0.00838		**<0.00796**	<0.00518	
	MW-109	Apr-17		<0.00341	<0.00307	<0.00372	0.0172	0.0272 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	MW-109	Oct-17		<0.000341	<0.000307	<0.000372	0.0182	0.0230	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-109	Apr-18		<0.00682	<0.00614	<0.00744	0.0208	**0.0257** J	<0.00792	<0.00838	<0.00938	**<0.00796**	<0.00518	
	MW-109	Oct-18		<0.00682	<0.00614	<0.00744	0.0204	0.0220 J	<0.00792	<0.00838	<0.00938	<0.00796	<0.00518 J3	
	MW-110	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-110	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	**<0.00106**	<0.000396	<0.000419		**<0.000398**	<0.000259	
	MW-110	Apr-17		<0.00170	<0.00154	<0.00186	0.00378 J	0.0161	<0.00198	<0.00210	<0.0234	<0.00199	<0.00130	
	MW-110	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-110	Apr-18		0.000580 J	<0.000307	<0.000372	0.00447	**0.0582**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259	
	MW-110	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	**<0.00106**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259 J3	
	RA-313	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	RA-313	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4		<0.000398	<0.000259	
	RA-313	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	RA-313	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	RW-4	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	RW-4R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	RW-4	Apr-17		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130	
	RW-4	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	RW-5R	Apr-15		**0.522**	<0.00310	<0.00370	**2.26**	**1.91**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260	
	RW-5R	Apr-16		**0.570**	<0.00614	<0.00744	**2.51**	**2.25**	<0.00792	<0.00838		<0.00796	<0.00518	
	RW-6	Apr-15		0.0558	<0.00310	<0.00370	0.0126 J	0.158	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260	
	RW-6R	Apr-16		0.00275	<0.000307	<0.000372	0.00683	0.00747	<0.000396	<0.000419		<0.000398	<0.000259	
	RW-6	Apr-18		0.0570	<0.000307	<0.000372	0.448	0.15	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	RW-15C	Apr-17		**0.472**	<0.00768	<0.00930	0.172	**5.39**	<0.00990	<0.0105	<0.0117	<0.00995	<0.00648	
	RW-15C	Apr-18		0.0285	<0.000307	**<0.000372**	0.111	**3.01**	**<0.000396**	**<0.000419**	<0.000469	<0.000398	<0.000259	
South RO Reject Field	MW-114	Apr-16		<0.000341	<0.000307	**<0.000372**	<0.000780	**<0.00106**	**<0.000396**	**<0.000419**		**<0.000398**	<0.000259	
	MW-114	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-114	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-114	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-114	Apr-18		<0.000341	<0.000307	**<0.000372**	<0.000412	**<0.00106**	<0.000396	**<0.000419**	<0.000469	**<0.000398**	<0.000259	
	MW-114	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	**<0.000419**	<0.000469	<0.000398	<0.000259 J3	
	MW-115	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-115	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-115	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-115	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-115	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-115	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259 J3	
	MW-116	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-116	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-116	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-116	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-116	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-116	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
TEL	MW-49	Apr-16		<0.00682	<0.00614	<0.00744	<0.0156	0.0540 J	<0.00792	<0.00838		<0.00796	<0.00518	
	MW-49	Oct-16		<0.0341	<0.0307	<0.0372	<0.0780	<0.106	<0.0396	<0.0419		<0.0398	<0.0259	
	MW-49	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	0.0564	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	MW-49	Oct-17		<0.00682	<0.00614	<0.00744	0.0109 J	0.195	<0.00792	<0.00838	<0.00938	<0.00796	<0.00518	
	MW-49	Apr-18		<0.00341	<0.00307	<0.00372	0.00637 J	0.133	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	MW-49	Oct-18		0.00182 J	<0.00154	<0.00186	0.00918	0.132	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130	
	TEL-1	Apr-16		0.00160	<0.000307	<0.000372	0.000793 J	**0.00160** J	<0.000396	<0.000419		**<0.000398**	<0.000259	
	TEL-1	Oct-16		0.00183	<0.000307	<0.000372	<0.000780	**0.00183** J	<0.000396	<0.000419		**<0.000398**	<0.000259	
	TEL-1	Apr-17		0.000572 J	<0.000307	<0.000372	0.000539 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-1	Oct-17		0.00319	<0.000307	<0.000372	0.00203	**0.00488**	<0.000396	<0.000419	<0.000469	**<0.000398**	<0.000259	
	TEL-1	Apr-18		0.00136	<0.000307	<0.000372	0.000872 J	0.00223 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-1	Oct-18		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130	
	TEL-2	Apr-16		0.0102	<0.000307	<0.000372	0.0243	0.146	<0.000396	<0.000419		<0.000398	<0.000259	
	TEL-2	Oct-16		0.00660 J	<0.00307	<0.00372	0.0218 J	0.123	<0.00396	<0.00419		<0.00398	<0.00259	
	TEL-2	Apr-17		0.00370 J	<0.00307	<0.00372	0.00914 J	0.0874	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	TEL-2	Oct-17		<0.00341	<0.00307	<0.00372	0.0143	0.101	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	TEL-2	Apr-18		<0.00341	<0.00307	<0.00372	0.0134	0.0962	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	TEL-2	Oct-18		<0.00852	<0.00768	<0.00930	0.0209 J	0.123	<0.00990	<0.0105	<0.0117	<0.00995	<0.00648	
	TEL-3	Apr-16		<0.00852	<0.00768	<0.00930	<0.0195	<0.0265	<0.00990	<0.0105		<0.00995	<0.00648	
	TEL-3	Oct-16		0.00232	<0.000307	<0.000372	0.00119 J	0.0105	<0.000396	<0.000419		<0.000398	<0.000259	
	TEL-3	Apr-17		0.00192	<0.000307	<0.000372	0.00219	0.0102	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-3	Apr-18		0.00313	<0.000307	<0.000372	0.00394	0.0219	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-4	Apr-16		<0.00341	<0.00307	<0.00372	0.0132 J	0.142	<0.00396	<0.00419		<0.00398	<0.00259	
	TEL-4	Apr-16	FD	<0.00341	<0.00307	<0.00372	0.0128 J	**0.147**	<0.00396	<0.00419		**<0.00398**	<0.00259	
	TEL-4	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	**0.0668**	<0.00396	<0.00419		**<0.00398**	<0.00259	
	TEL-4	Oct-16	FD	<0.00341	<0.00307	<0.00372	<0.00780	0.0863	<0.00396	<0.00419		<0.00398	<0.00259	
	TEL-4	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	0.0243 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	TEL-4	Apr-17	FD	0.000606 J	<0.000307	<0.000372	0.00218	0.0287	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-4	Oct-17		0.000782 J	<0.000307	<0.000372	0.00131	0.0269	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-4	Oct-17	FD	0.000684 J	<0.000307	<0.000372	0.00118	0.0242	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-4	Apr-18		<0.000341	<0.000307	<0.000372	0.00124	0.00408	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-4	Apr-18	FD	<0.000341	<0.000307	<0.000372	0.00126	0.00401	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-4	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	0.00185 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	TEL-4	Oct-18	FD	<0.000341	<0.000307	<0.000372	<0.000412	0.00221 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
TMD	MW-8	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-8	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-8	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-8	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-16	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400	
	MW-16	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470 J	<0.000400	<0.000260	
	MW-16	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-16	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-20	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-20	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4		<0.000398	<0.000259	
	MW-20	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-20	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-21	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-21	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419		<0.000398	<0.000259	
	MW-21	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-21	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-21	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-21	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-25	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470 J	<0.000400	<0.000260	
	MW-25	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4		<0.000398	<0.000259	
	MW-25	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-25	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-26	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-26	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4		<0.000398	<0.000259	
	MW-26	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-26	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds									
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	1.00E-01	5.00E-03	0.750	0.620	1.00E-01	4.70E-03	---	5.00E-03	1.00E-03
				CGWSL Source:	WQCC TW	WQCC HH	WQCC HH	WQCC HH	WQCC HH	WQCC HH	USEPA TW		WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
TMD	MW-27	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	<0.000400	<0.000260
	MW-27	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100	J4		<0.000398	<0.000259
	MW-27	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-27	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-46R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	MW-46R	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	MW-46R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-46R	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-46R	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-46R	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-68	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	<0.000400	<0.000260
	MW-68	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	MW-68	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-68	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-71	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	<0.000400	<0.000260
	MW-71	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	MW-71	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-71	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-89	Apr-15		0.000538	J <0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	J <0.000400	<0.000260
	MW-89	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100	J4		<0.000398	<0.000259
	MW-89	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	MW-89	Apr-18		0.000421	J <0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	NP-1	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100	J4		<0.000398	<0.000259
	NP-1	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	NP-1	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	NP-1	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	NP-1	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	NP-1	Oct-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	NP-2	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500		<0.00500	<0.00500	<0.00200
	NP-6	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	<0.00500		<0.00500	<0.00500	<0.00200
	NP-6	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	J <0.000400	<0.000260
	NP-6	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
Upgradient	UG-1	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	<0.000400	<0.000260
	UG-1	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	UG-1	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	**<0.000398**	<0.000259
	UG-1	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	**<0.000398**	<0.000259
	UG-2	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	<0.000400	<0.000260
	UG-2	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	UG-2	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	UG-2	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	UG-3R	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000470	<0.000400	<0.000260
	UG-3R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	UG-3R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	UG-3R	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	UG-4	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419			<0.000398	<0.000259
	UG-4	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259
	UG-4	Apr-18		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419		<0.000469	<0.000398	<0.000259

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TPH	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table 6-4 TPH Groundwater Screening Levels
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
TPH	Total Petroleum Hydrocarbons
USEPA TW	United States Environmental Protection Agency Tap Water Screening Level, "Regional Screening Levels (RSL) Summary Table", November 2018
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2018
WQCC Dom	NMED Groundwater standard for domestic exposure, 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Cross-Gradient	KWB-13	Apr-15		474	**788**	0.704	6.65	148	**1970**	**3060**	**15.3**	<0.00180	
	KWB-13	Apr-16		626	148	0.630	2.26 J	258	**2500**	**3720**	**13.7**	<0.00120	
	KWB-13	Apr-17		526	180	0.803	1.18	200	**2390**	**3600**	**16.1**	<0.00180	
	KWB-13	Apr-18		558	136	0.704	1.66	227	**2470**	**3580**	**15.3**	<0.00180	
	MW-17	Apr-14		395	174	1.19	2.31	72.2	**1200**	**2340**	2.19		
	NP-5	Apr-13		465	**413**	**2.58**	<0.400	253	**3090**	**5980**	2.33		
	NP-5	Apr-15		448	**993**	**2.13**	0.484 J	209	**3030**	**6060 J**	1.38		
	NP-5	Apr-17		514	**444**	**1.63**	0.422 J	212	**3770**	**4810**	2.22		
	RA-3156	Apr-14		<0.500	**278**	0.299	2.67		**1800**	**3280**	7.89		
	RA-3156	Apr-16		370	**1140**	0.478	3.67 J	695	**1070**	**3050**	<0.197		
	RA-3156	Apr-17		337	**568**	0.668	2.41	292	**1080**	**2400**	0.330 J		
	RA-3156	Apr-18		341	**813**	0.470	2.63	444	**1020**	**2580**	<0.0197 J6		
	MW-136	Apr-16		699	**336**	1.23	2.95 J	149	**2870**	**4250**	9.76	<0.00120	
	MW-136	Oct-16		651	**355**	**1.66**	2.81	140	**2530**	**4400**	**12.4**	0.00188 J	
	MW-136	Apr-17		643	**401**	**1.81**	2.81	140	**2370**	**4360**	**17.1**	<0.00180	
	MW-136	Oct-17		671	**357**	1.50	2.61	148	**2470**	**3850**	**10.5**	<0.00180	
	MW-136	Apr-18		666	**352**	**1.61**	2.74	147	**2640**	**4270**	**10.3**	<0.00180	
	MW-136	Oct-18		689	**327**	**1.82**	3.52	148	**2610**	**4250**	7.86	0.0359	
Evaporation Ponds	MW-1R	Apr-15		765 J	**1970**	0.821	4.52 J	1080 J	**2400**	**5020**	<0.0200		
	MW-1R	Apr-16		1030	**3330**	0.603 J6	6.54	2090	**3320**	**10100**	<0.197		
	MW-1R	Apr-17		763	**2880**	0.736	5.11	1830	**3010**	**9180**	0.402 J		
	MW-1R	Apr-18		623 V	**2200**	0.679	4.56	1520 V	**2740**	**6900**	0.0640 J		
	MW-2A	Apr-16		933	**8400**	1.53	7.35	5280	**7640**	**20700**	0.501 J		
	MW-2A	Oct-16		598	**3290**	**3.43**	4.91	2270	**3450**	**9660**	0.122		
	MW-2A	Apr-17		720	**6650**	**2.19**	6.21	4310	**6010**	**19000**	0.0220 J		
	MW-2A	Oct-17		323	**1980**	**3.25**	3.65	1350	**2500**	**6060**	0.0340 J		
	MW-2A	Apr-18		702	**6270**	1.35	5.75	4870	**5800**	**18800**	0.0470 J		
	MW-2A	Oct-18		512	**4270**	**1.89**	5.36	3110	**4430**	**13300 J4**	0.0330 J		
	MW-3	Apr-16		728	**1360**	**1.87**	5.64	1160	**2640**	**6260**	0.404 J		
	MW-3	Apr-16	FD	690	**1290**	**1.87**	5.47	1140	**2530**	**6240**	0.231 J		
	MW-3	Oct-16		574	**1290**	**2.21**	5.69	865	**2380**	**5180**	0.0520 J		
	MW-3	Oct-16	FD	591	**1270**	**2.20**	5.85	854	**2380**	**5040**	0.0490 J		
	MW-3	Apr-17		603	**1330**	**1.94**	4.57	944	**2480**	**5080**	<0.197		
	MW-3	Apr-17	FD	599	**1330**	**1.98**	4.57	876	**2380**	**5190**	<0.0197		
	MW-3	Oct-17		549	**1340**	**2.39**	6.28	829	**2470**	**4640**	<0.0197		
	MW-3	Oct-17	FD	578	**1290**	**1.99**	6.35	803	**2430**	**4660**	<0.0197		
	MW-3	Apr-18		606	**1170**	**1.90**	4.99	916	**2420**	**5030**	0.249		
	MW-3	Apr-18	FD	626	**1150**	**1.87**	5.03	869	**2520**	**5040**	0.212		
	MW-3	Oct-18		591	**1110**	**1.91**	5.19	856	**2610**	**4370**	0.535		
	MW-3	Oct-18	FD	620	**1060**	**1.67**	5.74	832	**2440**	**4820 Q**	0.481		
	MW-4A	Apr-16		507	**1860**	**1.78**	4.03 J	1060	**2990**	**5090**	<0.197		
	MW-4A	Oct-16		393	**1510**	**2.06**	4.06	890	**1970**	**4610**	0.0640 J		
	MW-4A	Apr-17		417	**1480**	**1.93**	3.51	919	**2070**	**4550**	<0.0197		
	MW-4A	Oct-17		434	**1470**	**1.85**	5.42	913	**2050**	**4500**	<0.0197		
	MW-4A	Apr-18		428	**1350**	**1.99**	5.05	899	**1820**	**4170**	0.0240 J		
	MW-4A	Oct-18		415	**1300**	**1.65**	4.58	988	**1800**	**3880**	<0.0197 J6		
	MW-4B	Apr-13		371	**928**	0.870	3.64	556	**1330**	**3660**	<1.00		
	MW-4B	Apr-15		367	**1110**	0.963	2.32	696	**1340**	**3410 J**	<0.0200		
	MW-4B	Apr-17		360	**1330**	0.985	2.55	758	**1410**	**3690**	<0.0197		
	MW-5A	Apr-16		472	**3010**	**3.11**	7.39	2990	**5610**	**13700**	1.72		
	MW-5A	Oct-16		500	**3500**	**3.43**	6.34	3880	**7950**	**16300**	0.0440 JJ6		
	MW-5A	Apr-17		439	**3010**	**2.92**	7.27	3360	**5840**	**12500**	0.212		
	MW-5A	Oct-17		436	**2580**	**2.83**	8.93	2440	**4960**	**9500**	<0.0197		
	MW-5A	Apr-18		478	**3040**	**2.83**	7.82	2890	**6030**	**13700**	0.0530 J		
	MW-5A	Oct-18		415	**2800**	**1.80**	7.38	2620	**5720**	**11400**	<0.0197		
	MW-5B	Apr-13		473	**1840**	**2.20**	10.8	1600	**2950**	**7500**	2.93		
	MW-5B	Apr-15		482	**1590**	1.41	9.01	1580	**3510**	**5980**	<0.0200		
	MW-5B	Apr-17		420	**1560**	**1.73**	9.18	1650	**2590**	**6290**	0.0210 J		
	MW-5C	Apr-13		420	**639**	1.20	4.21	446	**1580**	**3620**	<1.00		
	MW-5C	Apr-15		427	**585**	0.910	3.97 J	485	**2020**	**3290**	<0.0200		
	MW-5C	Apr-17		383	**576**	0.971	3.90	500	**1740**	**3110**	<0.0197		
	MW-6A	Apr-15		809	**2010**	**1.85**	2.14 J	1090	**2240**	**6500**	0.875		
	MW-6A	Apr-16		449	**1300**	1.52	1.74 J	835	**2360**	**4290**	0.461 J		
	MW-6A	Apr-17		353	**904**	**1.62**	1.38	770	**2080**	**4660**	<0.197		
	MW-6A	Apr-18		303	**763**	1.59	1.31	776	**1690**	**3330**	0.0800 J		
	MW-6B	Mar-13		530	**1370**	0.533	4.31	710	**1640**	**4480**	<1.00		
	MW-6B	Mar-13	FD	478	**1420**	0.814	4.87	753	**1690**	**4510**	<1.00		
	MW-6B	Apr-15		568	**1740**	0.669 J	5.09	873	**2280**	**4760**	<0.0200		
	MW-6B	Apr-17		418	**1250**	0.694	3.97	738	**1730**	**4150**	<0.197		
	MW-7A	Apr-16		459	**2500**	1.24	4.18 J	1810	**3360**	**7620**	<0.197		
	MW-7A	Apr-16	FD	423	**2550**	1.24	3.94 J	1690	**3710**	**7540**	<0.197 J6		
	MW-7A	Oct-16		406	**2790**	1.49	4.22	1600	**3420**	**7460**	0.0260 J		
	MW-7A	Oct-16	FD	395	**2240**	1.45	4.01	1550 O1V	**2790**	**7340**	0.0470 J		
	MW-7A	Apr-17		371	**2240**	1.31	3.79	2000	**2700**	**6690**	0.0360 J		
	MW-7A	Apr-17	FD	434	**2230**	1.07	3.89 O1	1780	**2930**	**7810**	<0.0197		
	MW-7A	Oct-17		366	**2300**	1.23	3.97	1550	**2990**	**7100**	<0.0197		
	MW-7A	Oct-17	FD	386	**2520**	1.24	3.94	1650	**3290**	**6820**	<0.0197		
	MW-7A	Apr-18		358	**2080**	1.40	3.91	1580	**2670**	**5380**	0.140		
	MW-7A	Apr-18	FD	354	**2170**	1.41	3.89	1590	**2780**	**5430**	0.0580 J		
	MW-7A	Oct-18		343	**2070**	1.09	3.93	1580	**2840**	**6440**	<0.0197		
	MW-7A	Oct-18	FD	348	**2000**	1.10	4.24	1550	**2770**	**6530 Q**	<0.0197		
	MW-7B	Apr-13		545	**1030**	**3.09**	6.66	540	**1800**	**4280**	<1.00		
	MW-7B	Apr-15		556	**1060**	0.795	6.27	672	**2200**	**4640**	<0.0200		
	MW-7B	Apr-17		530	**1060**	0.966	6.71	652	**1750**	**4720**	0.0670 J		
	MW-10	Apr-16		523	**1530**	0.826	3.83 J	1110	**2220**	**5120**	<0.197		
	MW-10	Oct-16		647	**2100**	1.18	3.54	1180	**3740**	**6550**	0.0970 J		
	MW-10	Apr-17		460	**1460**	0.825	3.41	996	**2030**	**4850**	**593**		
	MW-10	Oct-17		475	**1370**	0.808	3.34	973	**2060**	**4830**	<0.0197		
	MW-10	Apr-18		472	**1300**	0.857	3.75	977	**1920**	**3380**	0.0550 J		
	MW-10	Oct-18		454	**1300**	0.854	3.35	1060	**2100**	**3800**	<0.0197		
	MW-11A	Apr-16		1280 V	**9440**	0.414 J6	19.0	5150	**3510**	**18600**	0.715 JJ6		
	MW-11A	Oct-16		1230	**9180**	0.752	20.8	4850	**3250**	**16600**	0.0480 JB		
	MW-11A	Apr-17		1280	**10200**	0.683	20.1	5130	**3290**	**19500**	0.305 J		
	MW-11A	Oct-17		1130	**9650**	0.340	19.8	4460	**3510**	**17900**	<0.0197		
	MW-11A	Apr-18		1250	**9560**	0.601	20.1	5210	**3570**	**14900**	0.562		
	MW-11A	Oct-18		1110	**11000**	**3.15 J**	20.7	4520	**3140**	**17400**	<0.0197		
	MW-11B	Mar-13		855	**6560**	<0.500	35.2	3340	**3030**	**15100**	<1.00		
	MW-11B	Apr-15		1070	**6000**	0.562	36.6	4040	**3860**	**12700**	<0.0200		
	MW-11B	Apr-17		979	**6050**	0.825	35.2	3660	**2890**	**14000**	<0.197		
	MW-12	Apr-14		728	**2460**	0.685	5.57	1280	**2490**	**7960**	4.1		
	MW-13	Apr-14		682	**1780**	0.354	5.56	914	**2180**	**6520**	0.463 J		
	MW-15	Apr-15		565	**2150**	**2.12**	5.01	1300	**2000**	**5470**	**16.0**		
	MW-15	Apr-16		487	**611**	**2.01**	5.53	795	**1240**	**4720**	3.99		
	MW-15	Apr-17		285	**612**	1.58	4.31	447	**1100**	**2640**	0.485 J		
	MW-15	Apr-18		477	**1040**	**1.70 J5**	5.35	657	**1720**	**3580**	0.758		

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Evaporation Ponds	MW-18A	Apr-16		704	**6820**	**2.83**	46.6	4730	**6360**	**20500**	0.371 J	<0.00180
	MW-18A	Oct-16		662	**7270**	**3.22**	42.4	4740	**6870**	**20200**	0.0300 J	<0.00180
	MW-18A	Apr-17		623	**5790**	1.46	38.8	3940	**6330**	**17100**	0.0220 J	<0.00180
	MW-18A	Oct-17		713	**7090**	1.60	40.7	4020	**7410**	**15100**	<0.0197	<0.00180
	MW-18A	Apr-18		683	**6680**	**2.44**	42.1	4260	**6780**	**13100**	0.0720 J	<0.00180
	MW-18A	Oct-18		674	**6810**	1.25	42.6	3820	**7270**	**17900**	<0.0197	0.00485 J
	MW-18B	Apr-13		592	**803**	1.10	6.32	474	**1870**	**4060**	<1.00	
	MW-18B	Apr-15		581	**763**	0.931	5.91	460	**1840**	**4410**	0.0280 J	
	MW-18B	Apr-17		576	**860**	0.797	5.91	481	**2070**	**4080**	<0.0197	
	MW-22A	Apr-16		548	**1890**	0.645	4.08 J	1440	**2340**	**6190**	<0.197	
	MW-22A	Apr-16	FD	541	**1900**	0.660	4.04 J	1440	**2560**	**6160**	<0.197	
	MW-22A	Oct-16		570	**1940**	0.752	3.96	1490	**2380**	**6970**	0.219 B	
	MW-22A	Oct-16	FD	563	**2030**	0.733	3.88	1450	**2400**	**7220**	0.0490 JB	
	MW-22A	Apr-17		493	**2090**	0.632	3.71	1350	**2530**	**6630**	<0.197	
	MW-22A	Apr-17	FD	503	**1860**	0.743	3.73	1340	**2160**	**4210**	<0.0197	
	MW-22A	Oct-17		491	**1990**	0.614	3.49	1380	**2450**	**6010**	<0.0197	
	MW-22A	Oct-17	FD	505	**2210**	0.655	3.43	1340	**2610**	**5910**	<0.0197	
	MW-22A	Apr-18		473	**1780**	0.687	3.67	1290	**2270**	**4860 J3**	0.0680 J	
	MW-22A	Apr-18	FD	468	**1840**	0.738	3.57	1310	**2380**	**4320 J3**	0.0660 J	
	MW-22A	Oct-18		444	**1650**	0.677	3.37	1360	**2370**	**5730**	<0.0197	
	MW-22A	Oct-18	FD	473	**1650**	0.584	3.81	1250	**2190**	**5930 Q**	<0.0197	
	MW-22B	Apr-13		530	**1470**	0.619	4.48	932	**2240**	**5460**	<1.00	
	MW-22B	Apr-15		477	**1400**	0.823	4.02 J	1150	**2170**	**5590**	<0.0200	
	MW-22B	Apr-17		396	**1400**	0.771	4.15	1150	**2080**	**5670**	0.408 J	
	MW-70	Apr-16		720	**1370**	0.775	5.46	908	**2240**	**5730**	0.416 J	
	MW-70	Oct-16										
	MW-70	Apr-17		673	**1290**	0.626	4.87	852	**2460**	**4660**	<0.0197	
	MW-70	Oct-17										
	MW-70	Apr-18		766	**1490**	0.694	5.51	825	**2720**	**5810**	0.0660 J	
	MW-70	Oct-18										
	MW-72	Apr-15		896	**5240**	**3.91**	13.3	3030	**3800**	**12900**	6.37	
	MW-72	Apr-16		700	**3310**	**5.88**	8.82	2060	**3400**	**9140**	1.88	
	MW-72	Apr-17		670	**3460**	**6.25**	9.30	2510	**2950**	**9140**	1.56	
	MW-72	Apr-18		707	**3540**	**5.82**	8.82	2490	**3010**	**8800**	2.99	
	MW-73	Apr-15		659	**2480**	**1.94**	3.12 J	2200	**4560**	**9360**	0.757	
	MW-73	Apr-16		597	**2790**	**1.96**	2.32 J	2240	**5090**	**9360**	0.501 J	
	MW-73	Apr-17		571	**2390**	**2.11**	2.55	2690	**3940**	**8880**	0.313	
	MW-73	Apr-18		589	**2350**	**1.95**	2.48	2490	**4020**	**8360**	0.348	
	MW-74	Apr-16		632	**1640**	**7.44**	35.6	2080	**3100**	**8280**	0.796 J	
	MW-74	Oct-16		566	**1900**	**8.61**	44.9	3120	**4880**	**10200**	**211**	
	MW-74	Apr-17		557	**2030**	**7.23**	39.9	2690	**4490**	**9080**	**55.7**	
	MW-74	Oct-17		576	**2050**	**7.68**	41.1	2170	**4470**	**9220**	**44.7**	
	MW-74	Apr-18		600	**1950**	**7.01**	37.3	2280	**3700**	**7860**	6.72	
	MW-74	Oct-18		534	**1560**	**8.06**	42.9	2310	**4870**	**9420**	**171**	
	MW-75	Apr-16		374	**1530**	**7.62**	21.5	1640	**1940**	**5940**	<0.197	
	MW-75	Oct-16		351	**1400**	**7.88**	17.5	1480	**2080**	**6000**	0.0490 JB	
	MW-75	Apr-17		333	**1550**	**7.16**	17.5	1510	**2520**	**6100**	3.35	
	MW-75	Oct-17		358	**1490**	**7.81**	18.2	1350	**2240**	**5020**	<0.0197	
	MW-75	Apr-18		340	**1470**	**7.64**	17.9	1350	**2000**	**4670**	1.00 J6	
	MW-75	Oct-18		345	**1370**	**7.35**	18.0	1410	**2100**	**5890 J4**	<0.0197	
	MW-76	Apr-16		531	**1180**	**2.96**	29.4	1110	**2250**	**5220**	<0.197	
	MW-76	Oct-16		553	**1200**	**3.26**	28.6	1130	**2490**	**6010**	0.0470 JB	
	MW-76	Apr-17		485	**1380**	**2.54**	25.9	969	**2850**	**5750**	<0.197	
	MW-76	Oct-17		479	**1300**	**3.06**	26.5	993	**2440**	**4630**	<0.0197	
	MW-76	Apr-18		468	**1220**	**2.86**	26.5	1200	**2300**	**5240**	0.0790 J	
	MW-76	Oct-18		464	**1130**	**2.95**	25.6	1130	**2420**	**4130**	<0.0197	
	MW-77	Apr-16		589	**378**	**3.03**	82.9	1610	**4010**	**7110**	0.406 J	
	MW-77	Oct-16		579	**294**	**3.14**	82.1	1380	**4000**	**7850**	0.0470 JB	
	MW-77	Apr-17		534	**393**	**2.43**	67.1	1280	**4900**	**6950**	<0.197	
	MW-77	Apr-18		521	**310**	**2.56**	68.8	1240	**3770**	**7230**	0.109	
	MW-78	Apr-15		576	63.2	0.0979 J	18.9	320	19.6 J	**2560**	4.24	
	MW-78	Apr-16		659	72.5	**9.96**	22.9	540	**2690**	**5270**	<0.197	
	MW-78	Apr-17		537	98.0	**9.91**	17.4	366	**2640**	**4290**	0.372 J	
	MW-78	Apr-18		331	239	**15.3**	19.2	393	**1800**	**3730**	2.70	
	MW-79	Apr-16		603	**1390**	**7.08**	8.43	1140	**2040**	**5320**	1.87	
	MW-79	Oct-16		525 V	**1380**	**7.01**	7.28	869 V	**2000**	**5180**	0.070 JB	
	MW-79	Apr-17		527 V	**1590**	**7.33**	7.58	987	**2330**	**5040**	2.26	
	MW-79	Oct-17		598	**1700**	**6.17**	6.86	871	**2320**	**5190**	0.188	
	MW-79	Apr-18		586	**1700**	**6.56**	7.90	1130	**2240**	**5390 J3**	2.16	
	MW-79	Oct-18		679	**2020**	**6.21**	7.84	1100	**2350**	**7700**	1.44	
	MW-80	Apr-15		693	**1600**	**3.15**	3.08 J	1210	**2700**	**5600**	0.519	
	MW-80	Apr-16		875	**1970**	**3.30**	4.07 J	1240	**2270**	**6340**	0.523 J	
	MW-80	Apr-17		759	**2530**	**3.59**	3.53	1230	**2640**	**7920**	2.63	
	MW-80	Apr-18		506	**1190**	**2.97**	7.13	1110	**2310**	**5180 J3**	0.461	
	MW-81	Apr-15		583	**1110**	**6.20**	9.40	1380	**2800**	**6260**	**99.5**	
	MW-81	Apr-16		687	**1120**	**5.93**	12.2	1690	**2790**	**6730**	**105**	
	MW-81	Apr-17		560	**1370**	**7.55**	9.28	1260	**3050**	**6880**	**80.5**	
	MW-81	Apr-18		542	**1270**	**6.69**	17.9	1170	**2340**	**5600**	**19.8**	
	MW-82	Apr-15		284	**1110**	**10.7**	9.28	1700	**2200**	**5770**	<0.0200	
	MW-82	Apr-16		350	**1360**	**12.1**	9.87	1790	**2350**	**5410**	0.262 J	
	MW-82	Apr-17		347	**1500**	**11.4**	8.92	1400	**2380**	**5630**	0.0820 J	
	MW-82	Apr-18		391	**1420**	**11.4**	9.36	1510	**2350**	**5460**	0.734	
	MW-83	Apr-16		483	**769**	**4.80**	36.7	563	**3770**	**4980**	<0.197	
	MW-83	Oct-16		417	11.0	**6.99**	45.9	139	**3300**	**4610**	0.101	
	MW-83	Apr-17		483	45.4	**4.80**	49.4	256	**3840**	**5900**	<0.197	
	MW-83	Oct-17		462	**291**	**4.74**	48.2	293	**3590**	**5240**	<0.0197	
	MW-83	Apr-18		309	**1360 J3**	**4.80**	28.2	965	**2220 P1**	**4190**	0.0680 J	
	MW-83	Oct-18		562	221	**5.14**	48.6	363	**4240**	**4860**	0.495	
	MW-84	Apr-16		643	**1410**	**5.54**	10.2	1840	**4550**	**9480**	<0.197	
	MW-84	Oct-16		561	**1230**	**5.96**	12.2	1460	**5280**	**9560**	0.0480 J	
	MW-84	Apr-17		573	**1850**	**5.68**	8.06	1430	**4690**	**9360**	<0.197	
	MW-84	Oct-17		589	**1860**	**5.22**	6.56	1520	**4670**	**8460**	0.0570 J	
	MW-84	Apr-18		595	**1710**	**4.49**	7.29	1630	**4220**	**9640**	0.0630 J	
	MW-84	Oct-18		574	**1750**	**4.62**	6.34	1560	**4420**	**9300**	<0.0197	
	MW-87	Apr-16		728 V	**4180**	1.40	27.9 V	3230 V	**4310**	**12000**	<0.197	
	MW-87	Oct-16										
	MW-87	Apr-17		648	**4340**	1.02	24.3	3560	**5020**	**13500**	<0.0197	
	MW-87	Oct-17										
	MW-87	Apr-18		677	**4150**	1.48	24.2	2930	**4570**	**11600**	0.0610 J	
	MW-87	Oct-18										
	MW-88	Apr-16		417	**1610**	1.22	3.10 J	1220	**2600**	**5800**	<0.197	
	MW-88	Oct-16										
	MW-88	Apr-17		406	**1710**	1.04	3.00	1100	**2410**	**6300**	<0.197	
	MW-88	Oct-17										
	MW-88	Apr-18		421 V	**1650**	1.15	3.09	1110	**2360**	**4640**	0.0750 J	
	MW-88	Oct-18										

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Evaporation Ponds	MW-120	Apr-16		939	**3690**	**2.56**	4.25 J	1910	**2510**	**9100**	<0.197	
	MW-120	Oct-16		919	**3830**	**2.68**	3.71	1520	**2410**	**9080**	0.0470 JJ6	
	MW-120	Apr-17		728	**3070**	**3.15**	3.11	1600	**2730**	**8460**	<0.197	
	MW-120	Oct-17		671	**2970**	**3.24**	3.33	1240	**3580**	**7120**	<0.0197	
	MW-120	Apr-18		556	**1760**	**2.79**	6.26	1310	**2670**	**6480**	0.0720 J	
	MW-120	Oct-18		583 UJ V	**1670**	**3.66**	2.60	1320	**3320**	**5380**	0.168	
	MW-121	Apr-16		718	**1520**	**4.34**	3.39 J	968	**3790**	**5550**	2.13	
	MW-121	Oct-16		588	**1150**	**5.24**	3.18	834	**3070**	**5470**	1.69	
	MW-121	Apr-17		597	**1210**	**4.69**	2.87	862	**2840**	**5100**	1.19	
	MW-121	Oct-17		610	**1050**	**5.14**	3.19	780	**3070**	**5440**	1.39	
	MW-121	Apr-18		594	**999**	**4.29**	2.88	859	**2820**	**5430**	1.15 J6	
	MW-121	Oct-18		579	**833**	**5.05**	3.25	716	**2820**	**5800**	1.06	
	MW-122	Apr-16		549	**1920**	**3.57**	4.78 J	1350	**3430**	**6700**	0.499 J	
	MW-122	Oct-16		491	**1760**	**3.29**	4.31	1160	**2270**	**5730**	0.0280 J	
	MW-122	Apr-17		632	**2700**	**3.71**	5.19	1770	**3900**	**9060**	<0.197	
	MW-122	Oct-17		397	**1610**	**3.02**	3.93	950	**2640**	**4580**	<0.0197	
	MW-122	Apr-18		368	**1170**	**3.20**	3.73	1050	**1980**	**4830**	0.137	
	MW-122	Oct-18		324	**845**	**2.32**	3.48	742	**1730**	**3860**	<0.0197	
	MW-123	Apr-16		570	**1880**	1.09	3.73 J	1320	**2410**	**5850**	<0.197	
	MW-123	Oct-16		510	**1600**	1.200	3.59	1090	**2420**	**4990**	0.0470 J	
	MW-123	Apr-17		514 V	**1730**	1.22	3.72	1240 V	**2190**	**6200**	0.0540 JP1	
	MW-123	Oct-17		516	**1580**	1.08	3.46	1030	**2360**	**5000**	<0.0197	
	MW-123	Apr-18		513	**1570**	1.13	5.10	1080	<0.0774	**4490**	0.0660 J	
	MW-123	Oct-18		519	**1390**	0.894	3.49	1150	**2040**	**4380**	<0.0197	
	MW-124	Apr-16		929	**1490**	1.20	8.45	2150	**1720**	**9800**	0.415 J	
	MW-124	Oct-16		719	**3270**	1.31	6.37	1670	**3930**	**9340**	0.0470 J	
	MW-124	Apr-17		715	**3110**	0.739	6.44	2140	**3950**	**9780**	<0.0197	
	MW-124	Oct-17		781	**3510**	0.871	6.24	1830	**4440**	**8860**	<0.0197	
	MW-124	Apr-18		786	**3110**	1.02	6.67	1820	**3700**	**8980**	<0.0197	
	MW-124	Oct-18		798 V	**3700**	0.848	7.16	1730	**4440**	**9520**	<0.0197	
	OCD-1R	Apr-16		641	**2570**	**2.9**	4.54 J	2220	**3550**	**8960**	0.928 J	
	OCD-1R	Oct-16		701	**2560**	**3.36**	4.76	1800	**3060**	**8900**	0.0530 JB	
	OCD-1R	Apr-17		570	**2490**	**3.60**	4.22	1960	**3020**	**8460**	0.213 J	
	OCD-1R	Oct-17		607	**2280**	**3.08**	4.07	1570	**3110**	**7220**	0.0720 J	
	OCD-1R	Apr-18		493	**1870**	**3.48**	3.79	1740	**3100**	**6760**	0.599	
	OCD-1R	Oct-18		514	**1610**	**2.61**	3.64	1310	**2760**	**4720**	0.206	
	OCD-2A	Apr-16		678	**1800**	0.705	5.98	1340	**2750**	**5870**	0.417 J	
	OCD-2A	Oct-16										
	OCD-2A	Apr-17		655	**1840**	0.800	5.49	995	**1860**	**5850**	<0.197	
	OCD-2A	Oct-17										
	OCD-2A	Apr-18		530	**1160**	0.813	4.88	825	**1990**	**4530**	0.187	
	OCD-2A	Oct-18										
	OCD-3	Apr-16		746	**1640**	0.899	14.5	1100	**3080**	**5890**	<0.197	
	OCD-3	Oct-16										
	OCD-3	Apr-17		733	**2030**	0.998	14.4	1120	**2160**	**6440**	<0.197	
	OCD-3	Oct-17										
	OCD-3	Apr-18		842	**2110**	0.845	14.7	1070	**2750**	**6220**	0.194	
	OCD-3	Oct-18										
	OCD-4	Apr-16		927	**5320**	0.608	36.2	3400	**3610**	**12700**	0.446 J	
	OCD-4	Oct-16										
	OCD-4	Apr-17		809	**4110**	0.908	33.7	2330	**2850**	**11000**	0.0390 JP1	
	OCD-4	Oct-17										
	OCD-4	Apr-18		847	**4550**	0.759	34.0	2540	**3430**	**9500**	0.101	
	OCD-4	Oct-18										
	OCD-5	Apr-16		900	**5030**	0.774 J3J6	41.2	2960	**3780**	**9960**	0.222 J	
	OCD-5	Oct-16		851	**4700**	0.892	39.0	2830	**3080**	**12700**	0.0520 JBJ6	
	OCD-5	Apr-17		829	**4720**	0.872	40.0	2780	**2990**	**12100**	<0.197	
	OCD-5	Oct-17		906	**7230**	0.669	35.5	2710	**5020**	**11200**	<0.0197	
	OCD-5	Apr-18		882	**5050**	0.765	40.7	2990	**3440**	**11300**	0.0860 J	
	OCD-5	Oct-18		834	**5130**	0.324	36.0	2690	**3570**	**11200**	<0.0197	
	OCD-6	Apr-16		866	**4440**	**2.47**	17.0	2700	**3410**	**10600**	1.22	
	OCD-6	Oct-16		790	**4110**	**2.79**	14.1	2600	**2850**	**10200**	0.0920 J	
	OCD-6	Apr-17		834	**4030**	**2.39**	15.8	2870	**2570**	**11000**	1.02	
	OCD-6	Oct-17		855	**4770**	**2.66**	15.4	2580	**3190**	**11600**	<0.0197	
	OCD-6	Apr-18		881	**4510**	**2.15**	16.6	2800	**2960**	**10800**	1.06	
	OCD-6	Oct-18		850	**4910**	**1.98**	16.1	2600	**3110**	**14200 J4**	<0.0197	
	OCD-7AR	Apr-16		694	**2550**	**2.78**	6.27	2580	**4740**	**8480**	1.03	
	OCD-7AR	Oct-16		596	**3020**	**3.50**	5.78	2410	**4870**	**8860**	0.0430 J	
	OCD-7AR	Apr-17		600	**2550**	**2.72**	5.59	2870	**3970**	**8960**	0.0420 J	
	OCD-7AR	Oct-17		618	**2700**	**3.02**	5.71	2450	**4190**	**9920**	<0.0197	
	OCD-7AR	Apr-18		603	**2400**	**2.77**	5.90	2790	**3830**	**8960**	0.0620 J	
	OCD-7AR	Oct-18		612	**2460**	**2.45**	6.30	2520	**3680**	**10500 J4**	<0.0197	
	OCD-7B	Mar-13		552	**867**	1.33	12.2	650	**2270**	**4670**	<1.00	
	OCD-7B	Apr-15		641	**910**	0.852	11.9	685	**2580**	**4520**	<0.0200	
	OCD-7B	Apr-17		564	**960**	1.05	11.0	629	**2100**	**4540**	<0.0197	
	OCD-8A	Apr-16		762	**3480**	**1.88**	9.09	2410	**3630**	**11000**	<0.197	<0.00180
	OCD-8A	Oct-16		680	**3270**	**2.39**	9.22	2380	**3660**	**9600**	0.0870 J	0.00182 J
	OCD-8A	Apr-17		658	**2870**	**2.16**	8.50	2510	**3410**	**8960**	0.0300 J	<0.00180
	OCD-8A	Oct-17		696	**2960**	**2.27**	8.54	2030	**4140**	**9000**	<0.0197	<0.00180
	OCD-8A	Apr-18		680	**2630**	**2.87**	8.52	2090	**3730**	**9840**	0.181	<0.00180
	OCD-8A	Oct-18		664	**2750**	**1.73**	9.02	2260	**4160**	**9500**	<0.0197	<0.00180
	OCD-8B	Apr-13		716	**2180**	0.980	8.75	1330	**2880**	**7400**	<1.00	
	OCD-8B	Apr-15		680	**2020**	0.934	9.51	1520	**2910**	**7110**	0.0233 J	
	OCD-8B	Apr-17		660	**2030**	0.925	9.07	1800	**2620**	**7390**	0.0320 J	
Field East of Refinery	KWB-1A	Apr-16		619	**575**	1.26	1.37 J	271	**3080**	**4990**	4.61	<0.00120
	KWB-1A	Oct-16		553	**553**	1.21	1.21	274	**2950**	**4600**	0.514 B	<0.00180
	KWB-1A	Apr-17		566	**530**	1.39	1.19	269	**2940**	**4930**	1.09	<0.00180
	KWB-1A	Oct-17		514	**387**	1.12	0.966 J	266	**2990**	**4520**	0.409	<0.00180
	KWB-1A	Apr-18		511	**354**	1.21	1.00	272	**2930**	**4690**	0.341	<0.00180
	KWB-1A	Oct-18		457	**339**	1.48	1.53 JB	251	**2670**	**4060**	0.219	<0.00180
	KWB-1C	Apr-13		474	**380**	1.03	5.68	161	**2150**	**4420**	1.75	
	KWB-1C	Apr-15		619	**1160**	**25.3**	1.23	210	**2920**	**5340**	0.180	
	KWB-1C	Apr-17		560	**508**	1.25	1.36	267	**2860**	**5000**	0.0350 JP1	
	KWB-7	Apr-15		279	**301**	0.754	0.209 J	238	**886**	**2100**	<0.200	<0.00180 J
	KWB-7	Oct-15		320	**358**	0.813	0.152 J	252	**1120**	**2570**	0.202 J	<0.00180
	KWB-7	Apr-16		325	**281**	0.917	0.236 J	248	**953**	**2830**	<0.197	0.00500 J
	KWB-7	Oct-16		355	**420**	0.933	0.194 J	281	**1160**	**3030**	0.0580 JB	<0.00180
	KWB-7	Apr-17		306	**305**	0.822	0.225 J	230	**1070**	**2540**	0.0600 J	<0.00180
	KWB-7	Oct-17		345	**354**	0.599	0.230 J	268	**907**	**3080**	<0.0197	<0.00180
	KWB-7	Oct-18		326	**360**	0.754	0.419 JB	248	**1120**	**2630**	<0.0197 J6	<0.00180 P1
	KWB-8	Oct-16		251	**579**	0.467	0.351 J	443	**701**	**3120**	0.0380 JB	<0.00900
	KWB-8	Apr-17		237	**574**	0.623	0.414 J	320	442	**2400**	0.0510 J	<0.00180
	KWB-8	Oct-17		273	**913**	0.467	0.411 J	462	417	**3270**	<0.985	<0.00180

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Field East of Refinery	KWB-10R	Apr-16		149	190	1.42	0.573 J	153	<0.0774	**1090**	<0.197	
	KWB-10R	Oct-16		148	189	1.28	0.548 J	135	110	**1160**	0.364 B	
	KWB-10R	Apr-17		134	230	1.57	0.521 J	131	0.475 J	**1130**	<0.0197	
	KWB-10R	Oct-17		138	186	1.39	0.453 J	123	3.08 J	**1080**	0.440	
	KWB-10R	Apr-18		138	183	1.35	0.430 J	122	<0.0774	**1060**	0.0250 J	
	KWB-10R	Oct-18		130	188	1.33	0.836 JB	110	<0.0774	**1040**	<0.0197	
	KWB-11A	Apr-16		710	**1600**	0.642	0.797 J	426	**1570**	**5840**	**42.4**	0.0230
	KWB-11A	Oct-16		647	**1460**	0.742	0.719 J	450	**1590**	**5940**	**30.9**	<0.00180
	KWB-11A	Apr-17		607	**1310**	0.487	0.903 J	372	**1540**	**4960**	**33.9**	<0.00180
	KWB-11A	Oct-17		406	**788**	0.474	0.566 J	379	**979**	**3550**	1.95	<0.00180
	KWB-11A	Apr-18		461	**849**	0.567	0.856 J	335	**1060**	**3570**	4.51	<0.00180
	KWB-11A	Oct-18		433	**786**	0.851	1.17 B	359	**1220**	**3410**	0.0410 J	<0.00180
	KWB-11B	Apr-16		438	218	0.441	2.11 JO1	81.3 V	**1200**	**2160**	2.43	<0.00120
	KWB-11B	Oct-16		408	239	0.479	2.00	81.0	**1290**	**2410**	2.17	<0.00180
	KWB-11B	Apr-17		479	**291**	0.369	2.37	89.5	**1660**	**2710**	3.48	<0.00180
	KWB-11B	Oct-17		476	230	0.280	2.13	87.5	**1300**	**2590**	3.54	<0.00180
	KWB-11B	Apr-18		497	**300**	0.418	2.21	91.8	**1580**	**2650**	3.32	<0.00180
	KWB-11B	Oct-18		484	**314**	0.399	2.65 B	86.8	**1580**	**2620**	3.33	<0.00180
	KWB-12A	Apr-15		528	**668**	**18.5**	0.723 J	128	**2380**	**3660**	4.31	<0.00180
	KWB-12A	Apr-15	FD	493	133	0.605	0.630 J	123	**2110**	**3630**	4.34	<0.00180
	KWB-12A	Oct-15		560	138	0.618	0.963 J	155	**2730**	**3490**	4.55	<0.00180
	KWB-12A	Apr-16		579	**539**	0.879	0.811 J	155	**2360**	**3670**	6.18	<0.00180
	KWB-12A	Oct-16		549	163	0.757	1.15	161	**2400**	**3930**	7.34	<0.00180
	KWB-12A	Apr-17		541	136	0.446	0.786 J	131	**2280**	**4260**	7.12	<0.00180
	KWB-12A	Oct-17		511	133	0.512	0.999 J	127	**2230**	**3640**	8.21	<0.00180
	KWB-12A	Oct-18		475	92.4	0.439	0.696 J	120	**1890**	**2850**	9.14	<0.00180
	KWB-12B	Apr-16		528	121	0.438	0.466 J	132	**2520**	**3600**	6.42	<0.00120
	KWB-12B	Apr-16	FD	500	108	0.459	0.445 J	123	**1930**	**3930**	4.30	<0.00120
	KWB-12B	Oct-16		497	129	0.500	0.565 J	128	**2210**	**3620**	5.44	<0.00180
	KWB-12B	Oct-16	FD	505	116	0.474	0.584 J	129	**2190**	**3740**	5.56	<0.00180
	KWB-12B	Apr-17		554	144	0.419	0.641 J	135	**2410**	**3880**	6.87	<0.00180
	KWB-12B	Apr-17	FD	556	146	0.310	0.720 J	149	**2980**	**3520**	7.57	<0.00180
	KWB-12B	Oct-17		542	136	0.353	0.603 J	139	**2370**	**3730**	7.26	<0.00180
	KWB-12B	Oct-17	FD	526	115	0.332	0.584 J	134	**2310**	**3910**	6.71	<0.00180
	KWB-12B	Apr-18		571	121	0.346	0.699 J	150	**2390**	**3560**	7.78	<0.00180
	KWB-12B	Apr-18	FD	581	129	0.377	0.745 J	144	**2280**	**3480**	7.88	<0.00180
	KWB-12B	Oct-18		507	104	0.312	0.739 J	128	**1330**	**3340**	8.52	<0.00180
	KWB-12B	Oct-18	FD	538	106	0.307	0.653 J	129	**1660**	**3380 J3**	8.26	<0.00180
	KWB-P4	Apr-13										
	KWB-P4	Apr-15										
	KWB-P4	Apr-17										
	MW-57	Apr-16		593	**386**	**2.02**	1.59 J	368	**2350**	**3660**	**11.0**	
	MW-57	Oct-16		538	210	**2.99**	2.00	387	**2710**	**4730**	**33.3**	
	MW-57	Apr-17		538	**336**	**2.38**	1.62	342	**2630**	**4530**	**13.8**	
	MW-57	Oct-17		570	179	**2.39**	1.81	402	**3110**	**5100**	**33.3**	
	MW-57	Apr-18		506	185	**2.22**	1.57	315	**2430**	**3660 J3**	7.42	
	MW-57	Oct-18		536	159	**1.91**	1.28	386	**2220**	**4850**	**25.6**	
	MW-58	Apr-16		262	**278 J**	1.24	0.421 J	123	134	**1510**	0.518 J	<0.00120
	MW-58	Oct-16		210	174	1.57	0.392 J	94.2	3.77 J	**1140**	0.0620 JB	<0.00180
	MW-58	Apr-17		229	**280**	1.40	0.370 J	123	106	**1550**	0.0380 J	<0.00180
	MW-58	Oct-17		235	249	1.26	0.553 J	116	13.1	**1340**	<0.0197	<0.00180
	MW-58	Apr-18		215	207	1.37	0.290 J	98.5	2.59 J	**1250**	<0.0985	<0.00180
	MW-58	Oct-18		176	151	1.06	1.20	74.3	56.9	**1040**	<0.394	<0.00180 J3J6
	MW-111	Apr-16		248	**402**	1.33	<0.185	229	355	**2130**	0.0640 J	
	MW-111	Oct-16		224	**426**	1.39	0.222 JB	192	390	**1820**	0.0880 JB	
	MW-111	Apr-17		232	**456 J3**	1.28	0.203 J	211	366 P1	**2250**	0.266 J	
	MW-111	Oct-17		217	**392**	1.31	0.102 J	234	317	**1880**	<0.0197	
	MW-111	Apr-18		242	**421**	0.830	0.158 J	240	435	**1630**	<0.0197	
	MW-111	Oct-18		203	**412**	1.46	0.588 JB	221	331	**1810**	<0.0197	
	MW-113	Apr-16		314	199	0.294 J3	0.611 J	154	**1090**	**2370**	0.393 J	
	MW-113	Apr-16	FD	327	207	0.389	0.612 J	167	**1080**	**2400**	0.0480 J	
	MW-113	Oct-16		298 V	182	0.488	0.429 J	156	**925**	**2150**	0.0470 JB	
	MW-113	Oct-16	FD	299	195	0.594	0.408 J	160	**945**	**2240**	0.0510 JB	
	MW-113	Apr-17		304	193	0.459	0.525 J	158	**1070**	**2140**	<0.197	
	MW-113	Apr-17	FD	296	208	0.525	0.514 J	151	**940**	**2420**	<0.197	
	MW-113	Oct-17		294	148	0.331	0.405 J	150	**848**	**2430**	0.442	
	MW-113	Oct-17	FD	301	184	0.510	0.414 J	151	**1040**	**2240**	<0.0197	
	MW-113	Apr-18		318	174	0.515	0.538 J	164	**985**	**2210**	0.0350 J	
	MW-113	Apr-18	FD	329	191	0.521	0.629 J	160	**1070**	**2150**	<0.0197	
	MW-113	Oct-18		309 V	177	0.499	0.557 JB	156 V	**1060**	**2010**	<0.0197	
	MW-113	Oct-18	FD	327	186	0.542	0.555 J	161	**895**	**2050**	<0.0197	
	MW-125	Apr-16		577	**342**	1.18	1.39 J	245	**2900**	**4440**	0.537 J	
	MW-125	Oct-16		530	**294**	1.25	1.33	220	**2660**	**4370**	0.247 B	
	MW-125	Apr-17		495	**310**	1.33	1.27	218	**2810**	**4600**	0.751 J	
	MW-125	Oct-17		573	**313**	1.39	1.78	236	**3000**	**5200**	0.216	
	MW-125	Apr-18		548 V	**337**	1.32	1.28	234 V	**2680**	**3900 J3**	0.213	
	MW-125	Oct-18		534	**284**	0.995	1.31	211	**2300**	**3910**	0.440	
	MW-126A	Apr-16		342	245	1.02	0.465 J	124	**1270**	**2360**	0.258 J	
	MW-126A	Oct-16		192	78.9	1.28	0.379 J	132	**875**	**1860**	0.139 B	
	MW-126A	Apr-17		369	**271**	0.804	0.584 J	193	**1780**	**2850**	0.509 J	
	MW-126A	Oct-17		294	150	0.957	0.418 J	146	**1300**	**2410**	<0.0197	
	MW-126A	Apr-18		383	245	0.881	0.548 J	200	**1780**	**3350**	<0.0197	
	MW-126A	Oct-18		308	185	0.899	1.72 JB	179	**1310**	**2420**	0.0850 J	
	MW-126B	Apr-16		574	**314**	0.837	2.54 J	214	**2700**	**3590**	0.737 JB	
	MW-126B	Oct-16		542	**286**	0.862	2.19	220	**2210**	**3650**	0.295 B	
	MW-126B	Apr-17		524	**308**	0.649	2.27	206	**2550**	**3890**	0.342 J	
	MW-126B	Oct-17		524	**290**	0.729	2.17	197	**2410**	**3740**	0.419	
	MW-126B	Apr-18		534	**266**	0.764	2.36	202	**2310**	**3680**	0.436	
	MW-126B	Oct-18		561	**264**	0.930	3.07	213	**2290**	**3610**	0.639	
	MW-127	Apr-16		244	245	1.10	0.335 J	153	552	**1910**	<0.197	
	MW-127	Oct-16		248	237	1.14	0.282 J	146	**713**	**3840**	0.0490 JB	
	MW-127	Apr-17		242	**251**	0.949	0.264 J	146	**799**	**2140**	<0.197	
	MW-127	Oct-17		262	231	0.993	1.46	142	**776**	**1970**	0.146	
	MW-127	Apr-18		245	225	0.997	0.279 J	148	**677**	**2010**	<0.0985	
	MW-127	Oct-18		240	219	0.979	1.29 JB	135	**670**	**1940**	<0.0197	
	MW-128	Apr-16		1010	**266**	1.22	1.92 J	560	286	**1580**	1.28	
	MW-128	Oct-16		203	249	1.28	0.586 J	108	280	**1470**	0.0460 JB	
	MW-128	Apr-17		182	**264**	1.27	0.536 J	106	273	**1580**	0.0340 J	
	MW-128	Oct-17		186	200	1.29	0.354 J	107	248	**1370**	<0.0197	
	MW-128	Apr-18		181	175	1.23	0.764 J	115	207	**1280**	<0.0197	
	MW-128	Oct-18		161 V	170	1.13	0.412 J	97.3 O1V	147	**1650**	0.0230 JJ6	
	MW-129	Apr-16		170	**300**	1.10	0.331 J	210	44.1	**1520**	<0.197	
	MW-129	Oct-16		162	**293**	1.13	0.270 J	198	44.1	**1340**	0.0770 JB	
	MW-129	Apr-17		163	**300**	1.02	0.334 J	199	44.1	**1250**	<0.197 J5	
	MW-129	Apr-18		162	**282**	1.04	0.251 J	201	52.6	**1270**	<0.0197	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Field East of Refinery	MW-130	Apr-16		281	**293**	0.907	0.870 J	324	**1030**	**2570**	3.82 J6	
	MW-130	Oct-16		260	**253**	0.914	0.695 J	285	**1110**	**2600**	0.631	
	MW-130	Apr-17		263 V	**266**	0.778	0.676 J	290 V	**1020**	**2510**	3.26	
	MW-130	Oct-17		252	218	0.533	0.625 J	281	**880**	**2520**	2.75	
	MW-130	Apr-18		256	235	0.841	0.644 J	299	**999**	**2230**	1.87	
	MW-130	Oct-18		239	237	0.792	0.611 J	273	**985**	**2020 J4**	1.97	
	MW-131	Apr-15		168	**271**	0.683	0.328 J	157	9.57	**1980**	<0.0200	
	MW-131	Oct-15		197	**295**	0.787	0.622 J	161	16.1	**1180**	0.0380 J	
	MW-131	Apr-16		158	**288**	0.774	0.238 J	167	9.49	**1250**	<0.197	
	MW-131	Oct-16		158	**291**	0.868	0.250 J	158	9.61	**1270**	0.0530 JB	
	MW-131	Apr-17		151	**285**	0.773	0.275 J	153	10.3	**1230**	<0.197	
	MW-131	Oct-17		149	**284**	0.807	0.200 J	149	15.5	**1290**	<0.0197	
	MW-133	Nov-14		200	170	1.10	0.460 J	140 V	140	**1300**	<0.0200	
	MW-133	Apr-15		163	174	1.19	0.323 J	122	116	**1190**	<0.200	
	MW-134	Apr-16		576 V	**498**	1.24	1.70 J	311 V	**2800**	**4560**	2.79	
	MW-134	Apr-16	FD	565	**497**	1.24	1.69 J	303	**2780**	**4910**	2.73	
	MW-134	Oct-16		518	**460**	1.23	1.60	288	**2980**	**5020**	2.10	
	MW-134	Oct-16	FD	512	**473**	1.18	1.58	286	**2910**	**4860**	2.28	
	MW-134	Apr-17		528	**499**	0.944	1.56	247	**2880**	**4140**	3.37	
	MW-134	Apr-17	FD	527	**470**	0.902	1.61	269	**3170**	**4120**	4.03	
	MW-134	Oct-17		502	**373**	0.730	1.50	246	**2620**	**4480**	3.80	
	MW-134	Oct-17	FD	525	**425**	1.02	1.58	249	**2700**	**4960**	3.59	
	MW-134	Apr-18		555	**441**	1.11	1.65	270	**2790**	**4480**	3.89	
	MW-134	Apr-18	FD	574 V	**464**	1.08	1.71	271 V	**2760**	**4430**	3.85	
	MW-134	Oct-18		514	**392**	0.956	1.50	243	**1950**	**5090**	3.83	
	MW-134	Oct-18	FD	546	**405**	0.947	1.60	241	**2170**	**5460**	1.52	
	MW-135	Apr-16		2780	**1010**	0.993	5.74	2640	**2470**	**5320**	**34.7**	
	MW-135	Oct-16		590	**1310**	1.18	0.993 J	624	**2500**	**5980**	**58.9**	
	MW-135	Apr-17		608	**1200**	1.23	0.979 J	626	**2900**	**5050**	**63.3**	
	MW-135	Oct-17		569	**1100**	0.644	0.923 J	633	**2810**	**5650**	**54.5**	
	MW-135	Apr-18		493	**765**	1.09	0.904 J	599	**2530**	**5020**	**32.8**	
	MW-135	Oct-18		484	**716**	0.985	1.15 JB	573	**2730**	**5070**	**35.9**	
	RA-4196	Apr-16		422	122	0.344	2.36 J	103	**1150**	**2800**	0.070 J	
	RA-4196	Oct-16		382	151	0.299	2.11	103	**1310**	**2410**	0.0490 JBJ6	
	RA-4196	Apr-17		378	142	0.309	2.19	91.1	**1250**	**2220**	<0.197	
	RA-4196	Oct-17		376	109	0.242	2.10	99.4	**1100**	**2360**	<0.0197	
	RA-4196	Apr-18		379	131	0.354	2.22	97.9	**1290**	**2070**	<0.0197	
	RA-4196	Oct-18		345	119	0.291	1.98	90.5	**935**	**1960**	<0.0197	
	RA-4798	Apr-16		449	142	0.347	2.40 J	117	**1290**	**2290**	1.28	
	RA-4798	Oct-16		437	174	0.359	2.27	129	**1560**	**2880**	0.930	
	RA-4798	Apr-17		305	95.1	0.359	2.03	64.6	**1010**	**1820**	1.55	
	RA-4798	Oct-17		378	127	0.215	2.06	99.5	**1300**	**2220**	1.82	
	RA-4798	Apr-18		238 V	62.9	0.408	1.98	41.4	**783**	**1340**	0.878	
	RA-4798	Oct-18		335	110	0.317	1.97	83.1	**1270**	**2110**	1.16	
	RW-12R	Apr-16		448	174	0.334	0.437 J	181	**1610**	**3130**	0.326 J	
	RW-12R	Apr-17		392	189	0.623	0.293 J	152	**1740**	**2420 J3**	<0.197	
	RW-12R	Apr-18		378	155	0.700	0.220 J	171	**1400**	**2400**	<0.0197	
	RW-13R	Apr-16		202	222	0.691	0.346 J	167	341	**1190**	0.0460 J	
	RW-13R	Apr-18		242	207	0.650	0.378 J	183	525	**1700**	0.0260 JP1	
	RW-18	Apr-15		482	232	**2.46**	1.30	230	**3670**	**4440**	6.55	
	RW-18	Apr-16		542	193	**2.85**	1.13 J	186	**3800**	**4640**	2.79	<0.00120
	RW-18A	Apr-17		504	176	**2.51**	1.09	141	**2870**	**4400**	1.90	
	RW-18A	Apr-18		491	206	**1.82**	0.832 J	132	**2750**	**3940**	0.408	
	RW-20	Apr-15		228	**256**	0.530	<0.180	228	125	**1430**	<0.200	
	RW-22	Apr-15		184	**402**	0.860	0.319 J	274	78.4	**1680**	<0.200	
North Refinery	MW-23	Apr-16		110	**500**	**1.81**	2.14 J	561	1.84 J	**1990**	<0.197	
	MW-23	Oct-16		259	**445**	1.58	2.16	430	0.536 J	**2140**	<0.197	
	MW-23	Apr-17		102	**517**	**1.74**	1.59	446	5.27	**2040**	<0.197	
	MW-23	Oct-17		106	**438**	**1.64**	1.70	460	6.35	**1800**	<0.197	
	MW-23	Apr-18		112	**450**	**1.88**	1.47	472	10.9	**2080**	<0.0197	
	MW-23	Oct-18		104	**418**	1.49	1.41	429	10.8	**1830**	<0.0197	
	MW-29	Apr-16		465	134	1.04	1.29 J	210	**2620**	**3830**	0.105 J6	
	MW-29	Oct-16		398	**282**	0.919	0.964 J	227	**1660**	**3210**	0.502 J	
	MW-29	Apr-17		412 V	**268**	0.642	0.745 J	178 V	**1790**	**3670**	<0.197	
	MW-29	Oct-17		407	**278**	0.949	1.14	261	**1600**	**3370**	<0.0985	
	MW-29	Apr-18		501	**332**	1.29	1.61	298	**2120**	**3910**	<0.0197	
	MW-29	Oct-18		344	**263**	0.953	1.08	324	**1450**	**2990**	<0.0197	
	MW-39	Apr-16		113	**305**	**2.68**	0.459 J	1290	**951**	**4010**	0.530 J	
	MW-39	Oct-16		189	**334**	**2.35**	0.546 J	1510	**2360**	**5950**	<0.197	
	MW-39	Apr-17		84.0	**271**	**2.60**	0.347 J	1260	**957**	**3890**	<0.197	
	MW-39	Oct-17		73.3	148	**3.06**	0.303 J	989	**953**	**3040**	<0.0197	
	MW-39	Apr-18		72.9	131	**3.57**	0.331 J	1090	**1130**	**3020**	<0.0197	
	MW-39	Oct-18		51.5	95.9	**3.62**	0.295 J	779	**770**	**2490**	<0.0197	
	MW-40	Apr-15		571	**298**	**1.66**	1.89 J	134	**1380**	**2640**	<0.200	
	MW-40	Apr-16		504	146	**1.70**	1.76 J	127	**1680**	**2670**	<0.197	
	MW-40	Apr-17		474	156	**1.76**	1.62	110	**1550**	**3190**	<0.197	
	MW-40	Apr-18		425	141	**1.80**	1.41	107	**1440**	**2390**	<0.985	
	MW-41	Apr-15		313	**290**	1.07	0.648 J	501	**1410**	**2710**	<0.0200	
	MW-41	Apr-16		258	**312**	1.04	0.393 J	453	**1180**	**2530**	<0.197	
	MW-41	Apr-17		224	**328**	0.936	0.415 J	379	**1200**	**2890**	<0.197	
	MW-41	Apr-18		329	**682**	0.934	0.571 J	624	**1500**	**4060**	<0.0197	
	MW-42	Apr-15		309	**562**	0.962	0.579 J	611	**1110**	**3440**	<0.0200	
	MW-42	Apr-16		295	**457**	0.867	0.617 J	601	**1090**	**3010**	<0.197	
	MW-42	Apr-17		222	**406**	0.831	0.421 J	462	**1100**	**3410**	0.416 JP1	
	MW-42	Apr-18		241	**372**	0.984	0.433 J	445	**1180**	**2990 J3**	0.0310 JJ6	
	MW-43	Apr-16		178	**1010**	**2.27**	0.956 J	812	**747**	**4820**	0.270 J	<0.00120
	MW-43	Oct-16		212	**855**	**2.00**	1.23	664	**619**	**4470**	<0.197	<0.0180
	MW-43	Apr-17		180	**687**	**2.10**	0.905 J	559	450 J	**3530**	<0.197	0.0802
	MW-43	Oct-17		184	**756**	**2.17**	1.01	585	472	**3200**	<0.394	<0.00180
	MW-43	Apr-18		159	**697**	**1.93**	1.11	604	357	**3110**	<0.985	<0.180
	MW-43	Oct-18		155	**636**	**1.61**	1.01	483	311	**2900**	<0.985	<0.180
	MW-59	Apr-15		489 J	178	1.23	0.489 J	139	**1760**	**3300**	0.0241 J	
	MW-59	Apr-16		2370	126	1.28	2.61 J	711	**1790**	**3300**	0.374 J	
	MW-59	Apr-17		467	184	1.13	0.519 J	134	**1870**	**3160**	<0.197	
	MW-59	Apr-18		492	180	1.31	0.507 J	151	**1680**	**2760**	<0.0197 J6	
	MW-60	Apr-16		446	212	0.568	0.624 J	227	**2090**	**3980**	0.0410 J	<0.00120
	MW-60	Apr-16	FD	447	190	1.00	0.588 J	226	**2140**	**3200**	0.0650 JJ6	<0.00120
	MW-60	Oct-16		408	163	1.04	0.540 J	151	**2020**	**3610**	0.0710 JB	<0.00180
	MW-60	Oct-16	FD	410	162	1.05	0.509 J	149	**2050**	**3280**	0.0660 JBJ6	<0.00180
	MW-60	Apr-17		410	201	0.835	0.606 J	196	**2060**	**3470**	<0.197	<0.0900
	MW-60	Apr-17	FD	409	206	0.960	0.597 J	198	**1850**	**3650**	<0.197	<0.0900
	MW-60	Oct-17		422	222	1.07	0.717 J	233	**2040**	**3720**	<0.394	<0.00180
	MW-60	Oct-17	FD	412	212	0.885	0.707 J	230	**2000**	**3990**	<0.197	0.00553
	MW-60	Apr-18		444	221	0.974	0.769 J	233	**2080**	**3850**	<0.0197 J6	<0.0180
	MW-60	Apr-18	FD	447	231	0.969	0.746 J	218	**1980**	**3510**	<0.0197	<0.180
	MW-60	Oct-18		432	231	1.00	0.836 J	227	**2030**	**3020**	0.0640 JP1	0.00291 J
	MW-60	Oct-18	FD	432	230	0.978	0.750 J	223	**1730**	**4100**	0.0810 J	<0.0180

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
North Refinery	MW-61	Apr-16		439	240	**2.65**	2.82 J	278	**2120**	**2680**	0.552 J	
	MW-61	Oct-16		409	115	**3.14**	3.89	226	**1400**	**2430**	<0.197	
	MW-61	Apr-17		322	225	**2.08**	1.85	248	**1100**	**2600**	<0.197	
	MW-61	Oct-17		330	**303**	**1.93**	2.61	291	**933**	**3110**	<0.394	
	MW-61	Apr-18		289 V	**299**	1.55	1.24	293 V	**862**	**2200**	<0.394	
	MW-61	Oct-18		257	**279**	1.46	2.99 JB	258	**797**	**2180**	<0.985	
	MW-62	Apr-16		481	**276**	**1.92**	1.42 J	456	**1850**	**3830**	0.322 J	
	MW-62	Oct-16		371	243	**1.79**	1.15	359	**1390**	**3460**	<0.197	
	MW-62	Apr-17		358	**275**	**1.78**	1.20	358	**1180**	**3210**	<0.197	
	MW-62	Oct-17		341	**265**	**2.23**	1.92	349	**1030**	**2480**	<0.394	
	MW-62	Apr-18		338	**266**	**1.73**	1.36	360	**793**	**2330**	<0.394	
	MW-62	Oct-18		259	**264**	**1.91**	2.22 JB	270	500	**2100**	<0.985	
	MW-67	Apr-16		202	**312**	0.548	0.427 J	218	281	**1790**	<0.197	0.0440 J
	MW-67	Oct-16		205	**310**	0.620	0.574 J	211	303	**1880**	<0.0197 J6	<0.0180
	MW-67	Apr-17		199	**393**	0.570	0.565 J	229	275	**2010**	<0.197	<0.0900
	MW-67	Oct-17		207	**305**	0.568	0.50 J	200	388	**1740**	<0.0985	<0.00180
	MW-67	Apr-18		220	**328**	0.636	0.573 JB	245	404	**1660**	<0.197	<0.180
	MW-67	Oct-18		240	221	0.611	0.636 J	202	493	**1580**	<0.0197	<0.00180
	MW-90	Apr-16		411	85.9	**6.25**	1.69 J	246	**3250**	**5180**	0.377 J	
	MW-90	Oct-16		534	74.7	**8.22**	1.84	142	**3610**	**5730**	**14.7**	
	MW-90	Apr-17		363	161	**3.41**	1.61	189	**2740**	**3880**	<0.197	
	MW-90	Oct-17		322	116	**2.74**	1.34	182	**1930**	**3340**	<0.0985	
	MW-90	Apr-18		300	166	**2.11**	1.16 B	200	**1620**	**2510**	<0.197	
	MW-90	Oct-18		305	150	**2.32**	1.31	167	**1630**	**2990**	<0.197	
	MW-91	Apr-16		379	37.1	1.37	0.464 J	36.6	**776**	**2270**	0.320 J	
	MW-91	Oct-16		366	37.4	1.45	0.525 J	35.1	**862**	**2260**	<0.0197	
	MW-91	Apr-17		362	74.8	1.18	0.463 J	33.8	**790**	**2120**	<0.197	
	MW-91	Oct-17		389	115	0.897	0.620 J	39.2	**944**	**2520**	<0.394	
	MW-91	Apr-18		440	167	1.31	0.513 JB	40.0	**961**	**2170 J3**	<1.97	
	MW-91	Oct-18		433	221	1.27	0.639 J	35.2	**966**	**2820**	<0.985	
	MW-92	Apr-16		130 O1	**415**	1.30	1.73 J	450 O1V	24.1	**2310**	0.602 J	
	MW-92	Oct-16		134	**539**	**1.63**	2.02	454	14.6	**2150**	<0.985	
	MW-93	Apr-16		677	206	**3.06**	1.76 J	164	**2130**	**3270**	<0.197	
	MW-93	Oct-16		553 V	200	**2.78**	3.45 O1	167 V	**1630**	**3260**	<0.197	
	MW-93	Apr-17		489	192	**2.38**	2.97	167	**1430**	**2930**	<0.197	
	MW-93	Apr-18		537	193	**2.39**	3.55	191	**1400**	**2760**	<0.197	
	MW-94	Oct-15		109	245	1.01	0.224 J	355	75.8	**2530**	<0.197	
	MW-94	Apr-16		124	217	1.02	0.189 J	532	199	**2980**	<0.197	
	MW-94	Oct-16		137	172	1.04	0.467 J	319	175	**2530**	<0.0197	
	MW-94	Apr-17		95.6	196	0.874	0.331 J	427	85.7	**2660**	<0.197	
	MW-95	Apr-15		178	**275**	1.02	0.655 J	177	359	**1680**	<0.200	
	MW-95	Apr-16		191	**280**	0.805	0.518 J	180	326	**1670**	<0.197	
	MW-95	Apr-17		203 V	**349**	0.868	0.730 J	194 V	420	**1710**	<0.197	
	MW-95	Apr-18		229	**258**	0.884	0.602 J	163	471	**1770**	<0.0197	
	MW-96	Apr-16		187	159	1.18	1.1 J	234	255	**1590**	0.313 J	
	MW-96	Oct-16		210	169	1.19	1.03	225	456	**1990**	0.0230 J	
	MW-96	Apr-17		179	191	1.08	1.10	208	298	**1600**	<0.197	
	MW-96	Oct-17		173	159	0.785	0.907 J	199	535	**1680**	<0.0985	
	MW-96	Apr-18		188	159	1.18	1.23	229	178	**1450**	<1.97	
	MW-96	Oct-18		186	157	1.10	0.985 J	217	235	**1530**	<0.197	
	MW-98	Apr-16		539	74.2	1.43	<0.185	89.6	**1690**	**3040**	<0.197	
	MW-98	Oct-16		450	88.0	1.52	0.241 J	72.7	**1610**	**3370**	<0.197	
	MW-98	Apr-17		516	93.5	**1.68**	0.180 J	79.2	**1850**	**3200**	<0.197	
	MW-98	Oct-17		541	105	1.30	0.176 J	87.1	**1890**	**3520**	<0.394	
	MW-98	Apr-18		543	81.5	**1.70**	0.235 JB	106	**1790**	**2910**	<1.97	
	MW-98	Oct-18		490	98.3	**1.65**	0.249 J	93.9	**1640**	**2320 J3**	<0.985	
	MW-137	Apr-16		178	**343**	**1.87**	2.43 J	1740	**2160**	**3950**	<0.197	**0.348 J**
	MW-137	Oct-16		142	**445**	1.32	1.23	960	**1040**	**3550**	<0.197	<0.0450
	MW-137	Apr-17		139	**478**	1.54	1.53	1120	**1050**	**4230**	<0.197	0.116
	MW-137	Oct-17		141	**548**	1.11	0.979 J	759	**683**	**2910**	<0.394	<0.00180
	MW-137	Apr-18		143	**446**	1.41	1.23	955	**713**	**3420**	<0.985	<0.180
	MW-137	Oct-18		133	**406**	0.873	0.971 J	632	384	**2730**	<1.97	<0.180
	MW-138	Apr-16		160	**571**	1.13	2.03 J	568	164	**2180**	<0.197	0.0290 J
	MW-138	Oct-16		138	**527**	0.927	1.84	426	122	**2380**	<0.197	<0.0450
	MW-138	Apr-17		121	**571**	1.14	1.81	424	72.3	**1930**	<0.197	<0.00180
	MW-138	Oct-17		124	**453**	1.06	1.50	401	27.9	**2100**	<0.0985	<0.00180
	MW-138	Apr-18		130	**453**	0.874	1.58	436	26.8	**1910**	<0.0197	<0.00180
	MW-138	Oct-18		122	**408**	0.802	1.60	362	30.3	**1510**	<0.0197	<0.00180
	RW-1	Apr-15		358	224	1.33	3.57	210	**1330**	**2410**	<0.200	
	RW-1R	Apr-16		505	180	1.38	6.39	203	**1500**	**2990**	0.422 J	
	RW-1	Apr-17		558	246	1.41	7.37	268	**1860**	**3690**	<0.197	
	RW-1	Apr-18		363	**255**	0.913	2.24	247	**1030**	**1810**	<1.97	
	RW-2	Apr-15		726	**365**	**1.75**	5.55 J	383	**3510**	**5310**	<0.200	
	RW-2R	Apr-16		875	**430**	**2.09**	5.80	396	**2200**	**3810**	0.281 J	
	RW-2	Apr-17		519	**251**	**2.35**	2.86	261	**1200**	**3030**	<0.197	
	RW-2	Apr-18		402	**317**	**1.75**	2.25	335	**731**	**2600**	<0.394	
	RW-7	Apr-15		252	237	1.15	1.88 J	192	19.0	**1500**	<0.200	
	RW-7R	Apr-16		262	186	0.651	0.651 J	110	**624**	878	<0.197	
	RW-7	Apr-17		266	204	0.513	0.922 J	105	**693**	**1740**	<0.197	
	RW-7	Apr-18		295	217	1.22	2.54	149	475	**1820**	<0.985	
	RW-8	Apr-15		227	115	0.801	0.353 J	209	473	**1600**	<0.200	
	RW-8	Apr-17		218	163	0.731	0.360 J	161	**665**	**1820**	<0.197	
	RW-9	Apr-15		315	**313**	**1.68**	1.69	318	**1310**	**3150**	<0.200	
	RW-9	Apr-16		336	**313**	**1.69**	1.96 J	356	**1440**	**3370**	1.73	
	RW-9	Apr-17		355	**369**	**1.90**	2.26	326	**1370**	**3370**	<0.197	
	RW-9	Apr-18		322	**353**	**1.80**	2.13	351	**1170**	**2750**	<0.985	
	RW-10	Apr-15		494	187	**3.34**	9.04	172	**2010**	**3290**	0.639	
	RW-10	Apr-16		638	159	**4.28**	13.2	176	**2040**	**3330**	1.21	
	RW-10	Apr-17		457	88.0	**3.53**	3.24	110	**1500**	**2660**	<0.197	
	RW-10	Apr-18		499	131	**3.41**	3.49	143	**1530**	**2670**	<0.985	
	RW-16	Apr-15		641	**534**	**4.61**	1.69 J	594	**3220**	**5430**	2.87	
	RW-16	Apr-16		604	**416**	**3.01**	1.15 J	502	**3360**	**5610**	2.45	
	RW-16	Apr-17		499	**291**	**4.90**	0.832 J	372	**2740**	**5030**	2.20	
	RW-16	Apr-18		546	43.5	**4.89**	0.788 J	259	**2660**	**4240**	0.894 J6	
	RW-17	Apr-15		683	**494**	**2.58**	9.10	631	**4180**	**5840**	**31.6**	
	RW-17	Apr-16		2840	**377**	**2.22**	28.7	1800	**3400**	**5880**	4.77	
	RW-17	Apr-17		568	**398**	**2.61**	4.02	306	**2950**	**4820**	3.33	
	RW-17	Apr-18		635	**358**	**2.31**	3.87	345	**3080**	**4430**	0.0920 J	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
North RO Reject Field	MW-117	Apr-16		554	94.4	**3.45**	5.82	112	**2060**	**3390**	0.349	
	MW-117	Oct-16		592	**272**	**3.57**	6.90	115	**2240**	**3590**	0.137 BJ6	
	MW-117	Apr-17		548	245	**3.33**	6.50	96.7	**2090**	**3640**	0.266 J	
	MW-117	Oct-17		559	216	**2.05**	5.82	105	<0.0774	**3450**	0.196	
	MW-117	Apr-18		604	124	**3.20**	6.30	111	**1070**	**2920**	0.207	
	MW-117	Oct-18		577	**327**	**2.78**	6.12	105	**1940**	**3500**	0.102	
	MW-118	Apr-16		573	189	**5.86**	4.80 J	152	**2480**	**3950**	1.57	
	MW-118	Oct-16		559	131	**6.47**	5.92	164	**2640**	**4450**	6.71	
	MW-118	Apr-17		544	175	**5.98**	5.06	139	**2630**	**3830**	8.51	
	MW-118	Oct-17		550	192	**4.20**	5.72	118	**2890**	**3780**	6.27	
	MW-118	Apr-18		607	**292**	**5.55**	4.86	136	**2480**	**3300**	1.21	
	MW-118	Oct-18		559	**259**	**5.06**	4.98	136	**1730**	**4120**	1.88	
	MW-119	Apr-16		595	191	**2.50**	0.614 J	101	**1900**	**3330**	0.518 J	
	MW-119	Oct-16		619	**280**	**2.91**	0.991 J	132	**2010**	**3690**	0.189 B	
	MW-119	Apr-17		587	**290**	**2.86**	0.965 J	123	**2420**	**3650**	<0.197	
	MW-119	Oct-17		612	**268**	**2.77**	1.27	172	**2240**	**3750**	<0.0197	
	MW-119	Apr-18		616	**251**	**2.75**	1.10	177	**2240**	**2620**	0.288	
	MW-119	Oct-18		596	**439**	**2.56**	1.49	225	**1390**	**4200**	0.0610 J	
NCL	MW-18	Apr-15		407	185	1.45	7.18	66.7	**1600**	**3110 J**	**36.1**	<0.00180
	MW-18	Apr-16		504	178	1.39	3.69 J	107	**1600**	**2920**	**42.6**	0.00200 J
	MW-18	Apr-17		486	77.5	**3.44**	13.9	65.0	**1970**	**3420**	**51.0**	<0.00180
	MW-18	Apr-18		472	154	1.59	3.05	90.2	**1820**	**2580**	**37.9**	<0.00180
	MW-45	Apr-16		689	**524**	1.51	6.33	429	**2710**	**4760**	<0.197	<0.00180
	MW-45	Oct-16		640	**546**	1.48 J6	5.30	392	**2810**	**4730**	0.377 B	0.00953
	MW-45	Apr-17		625	**545**	1.27	5.69	394	**2840**	**5410**	0.0270 J	<0.00180
	MW-45	Oct-17		596	**544**	1.59	4.79	369	**2650**	**5740**	<0.0197	<0.00180
	MW-45	Apr-18		651	**523**	**1.62**	6.27	371	**2590**	**4480**	0.0220 J	<0.00180
	MW-45	Oct-18		624	**447**	1.36	5.03	372	**2680**	**3840**	<0.0197	0.00258 J
	MW-53	Apr-15		348	**1010**	0.922	1.16	104	**1290**	**2810 J**	**34.5**	
	MW-53	Apr-16		459	**346**	1.06	1.42 J	161	**1340**	**2890**	**25.3**	
	MW-53	Apr-17		340	222	0.904	1.12	130	**1330**	**2290**	**15.6**	
	MW-53	Apr-18		315	72.9	1.13	1.12 B	118	**1250**	**1860**	1.58 J6	
	MW-54A	Apr-16		381	176	1.12	0.303 J	69.4	**625**	**1780**	<0.197 J6	
	MW-54A	Oct-16		331	175	0.997	0.254 J	61.5	**670**	**1770**	0.134 J6B	
	MW-54A	Apr-17		330	193	0.987	0.289 J	59.8	**797**	**1800**	0.0860 J	
	MW-54A	Oct-17		359	204	1.34	0.271 J	67.2	**819**	**2060**	0.691	
	MW-54A	Apr-18		373 V	186	0.955	0.324 JB	61.7	**746**	**1650**	<0.0197	
	MW-54A	Oct-18		359	181	0.898	0.215 J	60.3	**821**	**1810**	<0.0197	
	MW-54B	Apr-13		345	176	<0.500	1.16	48.8	**747**	**2050**	<1.00	
	MW-54B	Apr-15		307	166	0.613	0.767 J	48.0	**752**	**1890 J**	0.0276 J	
	MW-54B	Apr-17		317	127	0.617	1.18	54.5	**1040**	**1840**	0.100 J	
	MW-55	Apr-16		472	**442**	1.04	0.829 J	253	**2080**	**4200**	2.26	<0.00120
	MW-55	Oct-16		465	219	**2.09**	0.732 J	174	**2190**	**3810**	3.65	<0.00180
	MW-55	Apr-17		378	**446**	1.44	0.745 J	206	**1550**	**3580**	3.14	<0.00180
	MW-55	Oct-17		444	**435**	**2.02**	0.675 J	228	**2020**	**3970**	3.45	<0.00180
	MW-55	Apr-18		455	**523**	1.58	0.838 J	214	**1770**	**3670**	1.41	<0.00180
	MW-55	Oct-18		447	**412**	1.59	1.04	227	**1810**	**3340**	2.86	<0.00180
	MW-56	Apr-16		559 V	**403**	1.10	2.32 JO1	379 V	**1970**	**3790**	2.76	
	MW-56	Oct-16		446 V	**263**	1.19	1.97	317 V	**1910**	**4110**	0.151 B	
	MW-56	Apr-17		501 V	**453**	1.00	2.10	338 V	**2070**	**4100**	3.93	
	MW-56	Apr-18		485	242	1.25	2.14	252	**2000**	**3080**	<0.0197	
	MW-108	Apr-16		333	79.6	**2.04**	1.28 J	92.6	**981**	**2120**	0.304 J	
	MW-108	Oct-16		343	112	**2.75**	3.88	116	**1340**	**2830**	0.0460 JB	
	MW-108	Apr-17		251	80.4	**1.90**	0.893 J	81.7	**717**	**1980**	0.0310 JJ6	
	MW-108	Oct-17		339	92.9	**1.88**	4.67	135	**1510**	**2660**	<0.0985	
	MW-108	Apr-18		426	71.0	**2.68**	3.17	137	**1790**	**2730 J3**	<0.394	
	MW-108	Oct-18		300	62.0	**1.64**	0.996 J	98.1	**1080**	**2260**	<0.985	
	NCL-31	Apr-16		340	78.9	1.14	0.272 J	109	**1420**	**3020**	0.385 J	
	NCL-31	Oct-16		445	67.8	1.57	0.564 J	148	**2400**	**3820**	0.0840 JB	
	NCL-31	Apr-17		369	65.7	1.19	0.434 J	111	**1890**	**3150**	0.127	
	NCL-31	Oct-17		341	53.7	1.44	0.362 J	103	**2020**	**3000**	<0.0197	
	NCL-31	Apr-18		325	53.0	1.39	0.422 J	97.4	**1600**	**2100**	0.0940 J	
	NCL-31	Oct-18		382	35.3	1.55	1.02	110	**2100**	**2860**	<0.0197	
	NCL-32	Apr-16		697	206	**2.05**	7.6	115	**1340**	**2740**	<0.197	
	NCL-32	Oct-16		390	128	1.48	3.26	102	**1220**	**2230**	1.77	
	NCL-32	Apr-17		387	155	1.54	3.19	102	**1310**	**2440**	4.90	
	NCL-32	Oct-17		398	117	1.31	2.94	109	**1490**	**2540**	6.14	
	NCL-32	Apr-18		425	130	1.51	3.41	116	**1450**	**2450**	2.72 J6	
	NCL-32	Oct-18		447	104 B	1.23	3.24	120	**1570**	**2270**	5.11	
	NCL-33	Apr-16		622	**280**	**2.82**	7.58	113	**1370**	**3200**	0.367 J	
	NCL-33	Oct-16		462	**400**	**2.65**	5.28	109	**900**	**2790**	0.0750 JB	
	NCL-33	Apr-17		514	**412**	**2.62**	5.98	101	**1220**	**2750**	0.0320 J	
	NCL-33	Oct-17		509	**458**	**2.77**	6.09	114	**1150**	**2820**	<0.0197	
	NCL-33	Apr-18		473	**486**	**2.63**	5.70	122	**870**	**2180**	<0.0197	
	NCL-33	Oct-18		454	**466**	**2.47**	5.35	128	**809**	**1880**	<0.0197	
	NCL-34A	Apr-16		347	**416**	1.31	2.20 J	140	82.2	**1540**	0.265 J	
	NCL-34A	Oct-16		249	238	1.43	1.27	107	95.0	**1370**	0.0470 JB	
	NCL-34A	Apr-17		270	**313**	1.27	1.36	108	76.1	**1440**	0.0570 JJ6	
	NCL-34A	Oct-17		214	202	1.37	1.08	111	131	**1400**	<0.0394	
	NCL-34A	Apr-18		276	**323**	1.36	1.32	113	85.2	**1520**	<0.197	
	NCL-34A	Oct-18		270	**289**	1.21 J3J5	1.25	111	117	**1710**	<0.394	
	NCL-44	Apr-16		414	234	1.59	2.62 J	98.3	**965**	**2120**	<0.197	
	NCL-44	Oct-16		373	222	**1.67**	2.29	94.9	**1030**	**2130**	0.0810 JB	
	NCL-44	Apr-17		360	198	**1.65**	2.31	99.7	**1070**	**2390**	0.0470 J	
	NCL-44	Oct-17		350	158	**1.69**	2.26	119	**1260**	**2480**	<0.0197	
	NCL-44	Apr-18		361	144	**1.88**	2.44	129	**1280**	**2200**	<0.0197 J3J6	
	NCL-44	Oct-18		376	146	1.60	2.33	131	**1330**	**2340**	0.0260 JJ6	
	NCL-49	Apr-16		468	119	0.685	0.749 J	136	**1570**	**2820**	5.71	
	NCL-49	Apr-16	FD	470	119	0.685	0.792 J	137	**1580**	**2790**	5.63	
	NCL-49	Oct-16		425	128	0.600	0.590 J	120	**1700**	**2770**	6.08	
	NCL-49	Oct-16	FD	429	130	0.600	0.597 J	122	**1670**	**3290**	6.01	
	NCL-49	Apr-17		451	172	0.576	0.632 J	133	**2010**	**3070**	9.84	
	NCL-49	Apr-17	FD	452	159	0.575	0.633 J	133	**1970**	**2990**	9.78	
	NCL-49	Oct-17		481	173	0.698	0.594 J	132	**2080**	**3200**	8.41	
	NCL-49	Oct-17	FD	458	169	0.713	0.605 J	131	**2050**	**3140**	8.41	
	NCL-49	Apr-18		522	169	0.640	0.736 JB	145	**2070**	**2560**	7.75	
	NCL-49	Apr-18	FD	525	171	0.651	0.995 JB	147	**2070**	**3060**	7.85	
	NCL-49	Oct-18		485	143	0.565 B	0.689 J	130	**2050**	**3370**	3.59	
	NCL-49	Oct-18	FD	448	144	0.572 B	0.635 J	122	**2040**	**3190**	3.59	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
South Refinery	KWB-2R	Apr-16		322	207	0.485	0.456 J	325	**1460**	**2910**	0.0340 JJ6	
	KWB-2R	Oct-16		275	215	0.901	0.433 J	282	**1150**	**2850**	0.0740 JB	
	KWB-2R	Apr-17		280	**279**	0.904	0.460 J	286	**1060**	**2550**	0.0220 J	
	KWB-2R	Oct-17		139	240	1.09	1.33	283	259	**1770**	<0.394	
	KWB-5	Apr-16		252	**5800**	0.392	1.66 J	222	235 J	**1760**	0.0400 J	
	KWB-5	Oct-16		228	**562**	0.910	1.34	220	6.46	**1560**	0.0460 JBJ6	
	KWB-5	Apr-17		224	**575**	0.936	1.48	204	14.8	**1580**	<0.197	
	KWB-5	Oct-17		220	**565**	0.877	1.41	208	21.9	**1560**	0.0530 J	
	KWB-5	Apr-18		233	**546**	0.861	1.95	215	9.96	**1730**	1.93	
	KWB-5	Oct-18		200	**546**	0.869	1.76 JB	208	11.8	**1450**	<0.0197	
	KWB-6	Apr-16		246	**313**	1.03	0.206 J	199	83.1	**1410**	<0.197	
	KWB-6	Oct-16		232	**280**	0.977	0.219 JB	109	275	**1590**	0.0770 JB	
	KWB-6	Apr-17		227	**260**	0.965	0.183 J	120	211	**1630**	0.556 J	
	KWB-6	Oct-17		256	**290**	0.842	0.162 J	131	377	**1890**	<0.394	
	KWB-6	Apr-18		248	248	0.897	0.268 J	138	272	**1600**	0.0380 J	
	KWB-6	Oct-18		223	240	0.801	0.230 J	122	324	**1680 J3**	<0.0197	
	MW-28	Apr-16		1500	135	1.42	4.06 J	450	**672**	**3040**	0.470 J	<0.00120
	MW-28	Oct-16		480	147	1.40	0.640 J	74.0	**1320**	**1900**	0.0460 JB	<0.0180
	MW-28	Apr-17		380	190	1.56	0.778 J	89.9	**1170**	**2420**	<0.197	<0.0900
	MW-28	Oct-17		376	146	1.51	1.37	90.3	**1180**	**2640**	<0.394	<0.00180
	MW-28	Apr-18		319	149	1.33	1.05	107	**1380**	**2290**	<0.394	<0.0180
	MW-28	Oct-18		212	151	1.08 J3	1.72 JB	97.0	**960**	**1810**	<0.985	0.00263 JP1
	MW-48	Apr-16		234	**1110**	1.45	1.80 J	314	20.5	**2950**	<0.197	
	MW-48	Oct-16		200	**580**	1.07	1.18	339	239	**2270**	0.0300 JB	
	MW-48	Apr-17		190	**909**	1.47	1.13	255	18.2	**2210**	0.202 J	
	MW-48	Oct-17		191	**820**	1.01	0.908 J	272	19.3	**2280**	<0.0197	
	MW-48	Apr-18		200	**689**	**1.90**	0.776 J	269	9.52	**2490**	0.0860 J	
	MW-48	Oct-18		172 V	**498**	1.20	0.863 J	293 V	125	**1730 J4**	<0.394	
	MW-50	Apr-16		645	**491**	**3.96**	8.60	969	**4280**	**4580**	**150**	
	MW-50	Oct-16		546	**511**	**3.86 J6**	12.4	912	**4690**	**9320**	0.594	
	MW-50	Apr-17		566	**463**	**2.21**	5.90	646	**3710**	**6840**	**155**	
	MW-50	Oct-17		572	**431**	**2.57**	5.57	620	**3580**	**6620**	**136**	
	MW-50	Apr-18		558	**415**	**2.12**	4.09	531	**3440**	**5320**	9.78	
	MW-50	Oct-18		402	**338**	**1.85**	2.56	291	**2150**	**3790**	0.507	
	MW-52	Apr-16		778	160	**1.79**	1.20 J	1350	**995**	**1920**	1.73	<0.00120
	MW-52	Oct-16		194	144	**1.77**	0.262 J	278	**1100**	**2370**	1.04	0.00182 J
	MW-52	Apr-17		181	154	**1.65**	0.283 J	297	**1060**	**2260**	3.27	<0.00180
	MW-52	Oct-17		238	114	1.09	0.245 J	275	**1270**	**2550**	9.42	<0.00180
	MW-52	Apr-18		195	119	**1.81**	0.193 J	301	**1090**	**2100**	0.893	<0.00180
	MW-52	Oct-18		175	115	**1.81**	0.209 J	272	**983**	**2420 J4**	4.22	<0.00180
	MW-64	Apr-16		109	**379**	1.08	0.754 J	396	39.9	**1510**	<0.197	
	MW-64	Oct-16		109	**356**	0.855	0.689 J	361	4.08 J	**1650**	0.0790 JB	
	MW-64	Apr-17		99.7	**382**	1.03	0.774 J	367	3.93 J	**1760**	0.0400 J	
	MW-64	Oct-17		96.6	**326**	0.984	0.656 J	351	7.90	**1590**	<0.394	
	MW-64	Apr-18		93.7	**323**	0.795	0.697 J	362	1.84 J	**1500**	<0.985	
	MW-64	Oct-18		77.9	**309**	0.958	1.36 JB	312	3.78 J	**1390**	<0.985	
	MW-65	Apr-16		155 V	**394**	1.28	0.691 J	311 V	0.323 J	**1750**	0.0490 JJ6	
	MW-65	Oct-16		157	**356**	1.48	1.46	287	0.431 J	**1380**	0.219 B	
	MW-65	Apr-17		134	**354**	1.38	1.01	279	0.822 J	**1430**	0.0330 J	
	MW-65	Oct-17		132	**314**	1.44	1.03	267	0.470 J	**1320**	<0.0197	
	MW-65	Apr-18		132	**306**	1.33	0.732 J	264	10.2	**1340**	<0.0985	
	MW-65	Oct-18		127	**284**	1.12	0.823 JB	229	4.80 J	**1280**	<0.0197 J6	
	MW-66	Apr-16		600	134	1.36	4.83 J	740	0.591 J	942	0.363 J	<0.00120
	MW-66	Oct-16		131	174	1.42	0.770 J	155	0.327 J	**1020**	0.0480 JB	<0.00180
	MW-66	Apr-17		115	184	1.55	0.830 J	143	0.360 J	976	0.0370 JP1	<0.00180
	MW-66	Oct-17		139	179	1.42	1.14	159	1.69 J	**1080**	<0.0197	<0.00180
	MW-66	Apr-18		147	196	1.38	0.867 J	191	<0.0774	**1110**	<0.0197	<0.00180
	MW-66	Oct-18		138	204	1.26	0.868 J	174	0.781 J	**1180**	<0.0197 J6	<0.00180
	MW-99	Apr-16		805	208	0.866	6.37	1100	153	**1410**	0.0330 JJ6	
	MW-99	Oct-16		137	192	0.656	3.60	168	39.0	**1200**	0.0350 JB	
	MW-99	Apr-17		161	**284**	0.758	0.819 J	205	169	**1370**	<0.197	
	MW-99	Oct-17		173	**256**	0.748	0.624 J	215	142	**1430**	<0.394	
	MW-99	Apr-18		179	**256**	0.686	0.745 J	237	128	**1410**	0.0540 J	
	MW-99	Oct-18		162	**254**	0.612	0.792 J	212	124	**1420**	<0.394	
	MW-101	Apr-16		220	239	0.940	0.522 J	169	168	**1270**	0.197 J	
	MW-101	Oct-16		183	229	1.00	0.509 J	112	191	**1400**	0.127 B	
	MW-101	Apr-17		197	234	0.926	0.587 J	139	160	**1390**	<0.197	
	MW-101	Oct-17		197	229	0.998	0.853 J	142	171	**1360**	<0.0197	
	MW-101	Apr-18		197	228	0.909	0.538 J	154	173	**1380**	<0.0197	
	MW-101	Oct-18		183	215	0.759	0.482 J	133	163	**1280 J3**	<0.0197	
	MW-102	Apr-16		127	245	0.901	0.372 J	437	2.35 J	**1530**	0.339 J	
	MW-102	Oct-16		176	**271**	1.28	0.772 J	418	217	**1740**	0.0620 JBJ6	
	MW-102	Apr-17		120	**258**	1.09	0.504 J	379	11.3	**1550**	<0.197	
	MW-102	Oct-17		124	**259**	1.16	0.507 J	373	7.70	**1730**	<0.394	
	MW-102	Apr-18		136	26.4	0.954	0.96 J	406	5.49	**1380**	<0.985 J5	
	MW-102	Oct-18		88.3	**254**	0.883	0.605 JB	377	6.33	**1490**	<0.985	
	MW-103	Apr-15		192	**7890**	**3.44**	2.46 J	6710	19.6	**12500**	<0.0200	
	MW-103	Apr-16		193	**13700**	**5.44**	3.73 J	7960	2.24 J	**21100**	0.430 J	
	MW-103	Apr-17		306	**12000**	1.39	3.12 J	10000	48.0	**22300**	0.0530 J	
	MW-103	Apr-18		94.1	**6800**	**7.41**	1.41	5980	60.4	**13400**	<0.394	
	MW-104	Apr-16		179 V	25.9	**2.49**	4.96 JJ5O1	43.6 V	408	819	0.455 JB	
	MW-104	Apr-16	FD	178	25.6	**2.51**	5.16	44.7	439	809	0.286 JB	
	MW-104	Oct-16		165	72.9	**1.94**	4.77	38.4	322	975	0.0640 JB	
	MW-104	Oct-16	FD	164	73.4	**1.90**	4.78	37.9	323	928	0.0820 JB	
	MW-104	Apr-17		203	209	**1.94**	5.56	50.9	217	986	0.0450 JJ6	
	MW-104	Apr-17	FD	197	230	**1.77**	5.20 O1	48.7 O1V	219	**1010**	<0.197	
	MW-104	Oct-17		213	178	1.58	5.84	60.5	258	**1070**	<0.394	
	MW-104	Oct-17	FD	213	201	1.19	5.73	59.2	281	**1140**	<0.0985	
	MW-104	Apr-18		207	102	**1.67**	5.95	74.9	417	**1110**	<0.394	
	MW-104	Apr-18	FD	229	106	**1.75**	7.12	76.8	437	**1110**	<0.0985	
	MW-104	Oct-18		275	123	**1.64**	8.34	86.6	**736**	**1610**	<0.985	
	MW-104	Oct-18	FD	313	126	1.57	8.09	92.8	**746**	**1640**	<0.197	
	MW-105	Apr-16		257	42.0	1.48	4.55 J	52.6	278	**1300**	0.414 J	
	MW-105	Oct-16		227	12.7	**2.06**	4.97	20.7	20.6	**1050**	0.105 B	
	MW-105	Apr-17		212	48.2	1.60	4.45	38.3	9.54	982	<0.197	
	MW-105	Oct-17		245	101	**1.62**	6.49	89.2	132	**1370**	<0.394	
	MW-105	Apr-18		279	129	**1.96**	6.16	120	226	**1400**	<0.394	
	MW-105	Oct-18		291	99.9	1.12	6.13	74.8	414	**1470**	<0.394	
	MW-106	Apr-16		422	185	1.51	4.40 J	271	**1380**	**3120**	<0.197	
	MW-106	Oct-16		347	216	1.30	1.37	240	**1410**	**3080**	0.0530 JB	
	MW-106	Apr-17		313	**302**	1.28	2.44	236	**1020**	**2630**	<0.197	
	MW-106	Oct-17		313	217	0.930	1.78	265	**1210**	**3050**	<0.985	
	MW-106	Apr-18		341	211	1.29	2.38	280	**1220**	**2180**	<1.97	
	MW-106	Oct-18		298	208	1.02	0.979 J	265	**979**	**2650**	<0.985	
	MW-107	Apr-16		727	**277**	**1.67**	3.22 J	381	6.07	**1850**	0.376 J	
	MW-107	Oct-16		186	**271**	**1.82**	0.965 J	80.1	72.4	**1480**	0.170 B	
	MW-107	Apr-17		140	**313**	**1.76**	0.655 J	75.4	<0.0774	**1260**	<0.197	
	MW-107	Apr-18		147	**269**	**1.66**	0.555 J	81.7	1.08 J	**1370**	0.0410 J	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
South Refinery	MW-109	Apr-16		707	204	**1.90**	4.01 J	2200	**848**	**2190**	0.384 J	
	MW-109	Oct-16		153	226	**2.06**	0.802 J	431	**751**	**2590**	0.0360 JB	
	MW-109	Apr-17		200	195	**1.99**	1.03	394	**1040**	**2700**	<0.197	
	MW-109	Oct-17		193	166	1.41	0.913 J	374	**814**	**2710**	<0.394	
	MW-109	Apr-18		173	170	**2.25**	0.992 J	395	**864**	**2220**	0.0460 J	
	MW-109	Oct-18		147	177	**2.23**	0.906 J	373	**764**	**2160 Q**	0.108 J6	
	MW-110	Apr-16		555	99.0	1.53	1.19 J	1380	**2100**	**1360**	0.765 J	
	MW-110	Oct-16		115	97.6	1.50	0.150 J	276	555	**1430**	0.0620 JB	
	MW-110	Apr-17		120	135	1.45	0.207 J	265	387	**1330**	<0.197	
	MW-110	Oct-17		106	97.3	0.903	0.0756 J	267	419	**1430**	<0.0197	
	MW-110	Apr-18		99.2	102	1.46	0.381 J	286	138	**1170**	0.0410 J	
	MW-110	Oct-18		112	113	1.38	0.367 J	268	499	**1390**	<0.0197	
	RA-313	Apr-15		150	19.1	0.914	1.04	17.8	**605**	808	<0.0200	
	RA-313	Apr-16		175	17.6	0.893	1.02 J	17.3	501	881	0.680 J	
	RA-313	Apr-17		167	15.0	0.893	1.26	16.4	455	937	0.447 J	
	RA-313	Apr-18		181	15.3	0.888	0.954 J	18.0	467	819	0.507	
	RW-4	Apr-15		202	**258**	0.845	1.67	144	468	**1710 J**	<0.0200	
	RW-4R	Apr-16		207	**351**	1.06	2.00 J	290	470	**1810**	0.346 J	
	RW-4	Apr-17		151	**280**	0.977	1.50	177	318	**1510**	<0.197	
	RW-4	Apr-18		181	242	0.909	1.52	172	410	**1550**	<0.0197	
	RW-5R	Apr-15		4.82	**260**	0.965	0.461 J	189	0.376 J	565	<0.0200	
	RW-5R	Apr-16		4.61 J	**262**	0.564	0.364 J	203	0.655 J	399	0.495 J	
	RW-6	Apr-15		168	**414**	0.628	0.686 J	205	129	**1650**	0.0335 J	
	RW-6R	Apr-16		191	**405**	0.747	0.356 J	226	104	**1470**	0.485 J	
	RW-6	Apr-18		183	**409**	0.804	0.684 J	224	45.6	**1530**	0.0460 J	
	RW-15C	Apr-17		160	**409**	0.774	1.59	269	19.4	**1610**	0.442 J	
	RW-15C	Apr-18		211 V	**652**	0.868	1.28	349 V	0.754 J	**1850**	<0.0197	
South RO Reject Field	MW-114	Apr-16		681	88.6	**1.87**	2.59 J	126	**1170**	**3710**	0.416 J	
	MW-114	Oct-16		569	231	**2.03**	2.49	89.3	**2100**	**4050**	4.69	
	MW-114	Apr-17		599	**266**	**1.78**	2.83	131	**2350**	**3480**	0.260 JJ5	
	MW-114	Oct-17		582	157	1.35	2.83	132	**1950**	**3700**	2.80	
	MW-114	Apr-18		665	181	**1.97**	2.74	138	**2260**	**3000**	1.50	
	MW-114	Oct-18		581	207	**1.77**	2.46	117	**1050**	**3730**	0.395	
	MW-115	Apr-16		2410	153	**1.93 J6**	2.64 J	1290	**2020**	**5390**	0.375 J	
	MW-115	Oct-16		541	**382**	**2.69**	0.395 JB	144	**2750**	**4990**	0.113 B	
	MW-115	Apr-17		394	**304**	1.51	0.514 J	183	**2770**	**4190**	<0.197	
	MW-115	Oct-17		450	249	1.01	0.558 J	213	**2910**	**4480**	0.0420 J	
	MW-115	Apr-18		455	**262**	**1.76**	0.580 J	232	**2830**	**3420**	0.0750 J	
	MW-115	Oct-18		397	231	1.47	0.549 J	191	**1720**	**4410**	0.325	
	MW-116	Apr-16		719	**500**	1.33	1.63 J	259	**3300**	**4580**	0.473 J	
	MW-116	Oct-16		569	196	**2.91**	4.26	114	**2040**	**3500**	0.0480 JB	
	MW-116	Apr-17		501	**270**	**2.00**	2.22	154	**2060**	**3450**	0.258 J	
	MW-116	Oct-17		614	233	**2.72**	4.47	147	**2080**	**3160**	1.40	
	MW-116	Apr-18		592	198	**2.55**	3.16	154	**2040**	**2950**	0.851	
	MW-116	Oct-18		557	226	1.15	1.18	170	**2150**	**4090**	0.727	
TEL	MW-49	Apr-16		203	**368**	1.38	2.19 J	347	584	**2270**	0.0580 J	<0.00180 J3J6
	MW-49	Oct-16		206	**364**	1.50	2.45	329	**602**	**1860**	0.179 BJ6	<0.00900
	MW-49	Apr-17		194	**373**	1.35	2.19	328	531	**2390**	<0.197	<0.0900
	MW-49	Oct-17		192	**373**	1.31	2.83	331	535	**2140**	<0.0197	<0.00180
	MW-49	Apr-18		226	**379**	1.42	3.12	341	585	**1870**	<0.985	<0.0180
	MW-49	Oct-18		209	**355**	1.29	2.58	335	520	**2150**	<0.985	<0.180
	TEL-1	Apr-16		389	113	**3.00**	1.72 J	373	**1510**	**2570**	0.0380 J	
	TEL-1	Oct-16		477	51.4	**3.39**	2.22	155	**1710**	**3090**	0.0730 JB	
	TEL-1	Apr-17		284	195	**2.73**	1.32	370	**1320**	**2940**	<0.197	
	TEL-1	Oct-17		208	243	**2.12**	0.896 J	480	**986**	**2350**	<0.394	
	TEL-1	Apr-18		188	**272**	**2.23**	1.06 B	465	**815**	**2230**	<0.0197 J6	
	TEL-1	Oct-18		160	238	**2.13**	0.650 J	474	**719**	**2080**	<0.394	
	TEL-2	Apr-16		224	**344**	1.08	0.954 J	419	**825**	**2720**	0.0460 J	
	TEL-2	Oct-16		228	**294**	1.04	1.14	406	**764**	**2830**	0.0390 JB	
	TEL-2	Apr-17		224	**302**	1.11	1.04	411	**865**	**2730**	<0.197	
	TEL-2	Oct-17		246	226	0.911	1.09	442	**1160**	**3000**	<0.0197	
	TEL-2	Apr-18		260	222	1.08	1.78 B	451	**1200**	**2770**	<0.0985	
	TEL-2	Oct-18		266	205	0.967	1.14	363	**1360**	**2730**	<0.394	
	TEL-3	Apr-16		473	**585**	**2.71**	7.31	364	**622**	**2900**	0.0420 J	
	TEL-3	Oct-16		427	25.1	**3.43**	5.27	20.6	**1020**	**1850**	0.0450 JB	
	TEL-3	Apr-17		463	55.1	**3.04**	5.21	39.8	**1070**	**1980**	0.269 J	
	TEL-3	Apr-18		302	**696**	**2.51**	6.00	308	442	**2440**	<0.0985	
	TEL-4	Apr-16		410	**524**	1.53	0.666 J	509	**2070**	**4260**	0.0440 J	
	TEL-4	Apr-16	FD	408	**519**	1.53	0.618 J	515	**1980**	**4040**	0.0400 JJ6	
	TEL-4	Oct-16		370	**336**	**1.69**	0.613 J	465	**2290**	**5350**	0.0340 JB	
	TEL-4	Oct-16	FD	370	**347**	1.58	0.608 J	454	**2240**	**5370**	0.0360 JB	
	TEL-4	Apr-17		432	**442**	1.36	0.587 J	542	**2680**	**6520**	0.404 J	
	TEL-4	Apr-17	FD	427	**436**	1.22	0.588 J	546	**2630**	**5570**	<0.197	
	TEL-4	Oct-17		343	**511**	0.862	0.512 J	468	**1660**	**4240**	<0.0985	
	TEL-4	Oct-17	FD	342	**501**	0.868	0.510 J	465	**1520**	**3600**	<0.0197	
	TEL-4	Apr-18		448	**360**	1.12	1.19 B	477	**2400**	**4330**	0.0230 J	
	TEL-4	Apr-18	FD	439	**362**	1.09	1.19 B	470	**2460**	**4490**	0.0280 J	
	TEL-4	Oct-18		242	28.5	1.48	0.449 J	286	**2050**	**2840**	<0.0197	
	TEL-4	Oct-18	FD	246	27.9	1.43	0.446 J	289	**2050**	**2910**	0.0700 J	
TMD	MW-8	Apr-15		390	**321**	1.51	1.59	328	**2940**	**4210**	1.10	
	MW-8	Apr-16		377	**275**	**2.02**	1.69 J	295	**2380**	**3690**	0.503 J	
	MW-8	Apr-17		346	**334**	**2.20**	1.44	262	**2100**	**3900**	1.04	
	MW-8	Apr-18		450	**443**	**1.99**	1.76	320	**2470**	**4040**	8.72	
	MW-16	Apr-14		531	**422**	**2.79**	8.99	388	**2170**	**4020**	0.269 J	
	MW-16	Apr-15		666	**660**	**2.32**	10.2	545	**2670**	**4890**	0.461	
	MW-16	Apr-17		558	**936**	**2.36 J6**	9.27	689	**2900**	**4150**	1.75	
	MW-16	Apr-18		600	**705**	**2.26**	9.59	643	**2820**	**4960**	0.428	
	MW-20	Apr-15		510	**429**	1.51	0.398 J	232	**3490**	**4790**	5.08	
	MW-20	Apr-16		594	**515**	**2.18**	0.370 J	274	**2790**	**4850**	8.09	
	MW-20	Apr-17		525	**588**	**2.27**	0.425 J	274	**2800**	**5650**	8.74	
	MW-20	Apr-18		537	**525**	**2.13**	0.562 J	291	**2790**	**4700 J3**	4.56	
	MW-21	Apr-16		590	**516**	**1.69**	2.31 J	440	**3150**	**5720**	**15.0**	
	MW-21	Oct-16		543	**474**	**1.74**	1.91	429	**3150**	**4240**	**12.0**	
	MW-21	Apr-17		507	**599**	**1.95**	1.88	423	**2860**	**6630**	**20.4**	
	MW-21	Oct-17		562	**574**	**1.81**	1.86	416	**3350**	**5000**	**17.1**	
	MW-21	Apr-18		550	**636**	**1.85**	2.03	425	**2900**	**4820**	**18.5**	
	MW-21	Oct-18		599 O1V	**620**	**1.92**	2.08 O1	448 O1V	**3290**	**4010**	**22.1**	
	MW-25	Apr-15		896	**6780**	1.03	8.34	3710	**5740**	**17000**	0.0974 J	
	MW-25	Apr-16		647	**4130**	1.13	6.61	2670	**4100**	**11800**	0.125	
	MW-25	Apr-17		484 V	**2330**	1.17	5.11	1540	**2800**	**6240**	0.152	
	MW-25	Apr-18		368 V	**1230**	1.25	4.32	875 V	**1770**	**4080**	0.156	
	MW-26	Apr-15		698	**1130**	1.15	5.42	704	**5950**	**8660**	0.268	
	MW-26	Apr-16		725	**1260**	**1.86**	5.75	695	**4520**	**8730**	0.301	
	MW-26	Apr-17		707	**1580**	**1.75**	5.90	760	**5120**	**8730**	0.580	
	MW-26	Apr-18		664	**1120**	**1.61**	5.46	731	**3830**	**7170**	0.986	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2018 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	WQCC HH	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
TMD	MW-27	Apr-15		607	246	0.928	11.2	128	**2320**	**3640**	0.703	
	MW-27	Apr-16		470	234	1.19	9.36	156	**3950**	**3150**	0.687	
	MW-27	Apr-17		410	138	1.29	8.43	136	**1550**	**2150**	1.22	
	MW-27	Apr-18		337	80.2	1.33	7.88	129	**1140**	**1870**	0.770	
	MW-46R	Apr-16		645	**290**	1.47	1.26 J	168	**2470**	**3980**	0.0520 JJ6	
	MW-46R	Oct-16		605 V	**339**	**1.97**	1.83	161	**2170**	**4010**	0.368	
	MW-46R	Apr-17		588	**315**	**1.70**	1.30	182	**2420**	**3930**	0.206	
	MW-46R	Oct-17		627	**275**	**1.63**	1.27	183	**2590**	**4040**	0.0920 J	
	MW-46R	Apr-18		613	**282**	**1.78**	1.43	192	**2310**	**3620**	<0.0197	
	MW-46R	Oct-18		582 V	207	1.42	1.22	174 V	**2330**	**3650**	0.0670 J	
	MW-68	Apr-15		552	**397**	1.15	4.65	242	**2610**	**4460**	4.52	
	MW-68	Apr-16		489	**263**	**1.75**	5.58	206	**1840**	**2980**	0.510	
	MW-68	Apr-17		381	237	**1.88**	4.60	165	**1620**	**2890**	0.381	
	MW-68	Apr-18		388	176	**1.82**	5.01	162	**1470**	**2150**	0.390	
	MW-71	Apr-15		642	**906**	1.09	3.59	447	**3150**	**6110**	**50.6**	<0.00180
	MW-71	Apr-16		669	**907**	**1.62**	3.72 J	502	**2890**	**5450**	**45.6**	<0.00180
	MW-71	Apr-17		601	**848**	**1.63**	3.62	491	**2940**	**5300**	**54.0**	<0.00180
	MW-71	Apr-18		638	**809**	1.51	3.77	516	**2970**	**5280**	**39.5**	<0.00180
	MW-89	Apr-15		528	**324**	**3.61**	13.5	302	**2200**	**3720**	2.34	
	MW-89	Apr-16		556	**399**	**3.58**	12.0	299	**1490**	**3640**	3.64	
	MW-89	Apr-17		550	**394**	**3.97**	12.2	289	**2170**	**3600**	4.77	
	MW-89	Apr-18		513	170	**2.64**	8.61	151	**1630**	**2430**	1.10	
	NP-1	Apr-16		470	**391**	**1.96**	3.12 J	403	**2620**	**4460**	0.494 J	
	NP-1	Oct-16										
	NP-1	Apr-17		421	**422**	**2.08**	2.73	340	**2440**	**4060**	9.95	
	NP-1	Oct-17										
	NP-1	Apr-18		421	**395**	**2.00**	4.52	342	**2210**	**3660**	5.66	
	NP-1	Oct-18										
	NP-2	Apr-13		517	**379**	**1.70**	1.63	258	**2660**	**5160**	1.74	
	NP-6	Apr-13										
	NP-6	Apr-15										
	NP-6	Apr-17										
Upgradient	UG-1	Apr-15		455 J	133	0.865	1.11	84.6	**1880**	**2920**	**14.4**	<0.00180	
	UG-1	Apr-16		512	102	0.926	1.07 J	99.7	**1920**	**4050**	**17.0**	0.00432 J	
	UG-1	Apr-17		471	178	0.928	1.14	99.1	**1830**	**3390**	**15.0**	<0.00180	
	UG-1	Apr-18		434	107	0.751	2.12	98.3	**1670**	**2600**	6.73	0.00224 JB	
	UG-2	Apr-15		337 J	72.2	**1.65**	1.73	82.6	**1080**	**1170**	4.62	<0.00180	
	UG-2	Apr-16		402	86.5	**1.75**	2.04 J	103	**1210**	**2240**	5.46	0.00511	
	UG-2	Apr-17		342	78.9	**1.67**	1.60	94.0	**1060**	**2270**	**16.3**	<0.00180	
	UG-2	Apr-18		321	72.5	**1.62**	1.33	85.4	**1050**	**1810**	**14.1**	<0.00180	
	UG-3R	Apr-15		420 J	27.5	0.716	2.36	59.1	**1450**	**1420**	1.03	<0.00180	
	UG-3R	Apr-16		440	47.7	0.690	1.86	75.8	**1350**	**2340**	1.73	<0.00180	
	UG-3R	Apr-17		393	61.1	0.707	1.74	70.7	**1310**	**2140**	2.60	<0.00180 J5	
	UG-3R	Apr-18		418	40.8	0.599	1.67	73.6	**1470**	**2190**	1.68	<0.00180	
	UG-4	Apr-16		590	49.2	0.668	1.99 J	224	**2480**	**4140**	0.407	<0.00180	
	UG-4	Apr-17		594 V	154	0.666	1.87	202 V	**2750**	**4350**	0.547 J	<0.00180	
	UG-4	Apr-18		620	125	0.574	1.77	201	**2680**	**4030**	0.515	<0.00180	

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
WQCC Dom	NMED Groundwater standard for domestic exposure, 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
P1	Relative percent difference value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.