GW-028

2016
AGWMR
Part 2 of 8

2017

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-25
Event: Spring 2016 (Annual)
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	
4.26.16	1155	NA	10.60	0.0	28.18	23.2	Yes	Yes	Yes	Yes	Subsidence	Weather: Sunny, 80s
4.27.16	1405	NA	10.63	0.0	28.18	23.2					under 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	
4.27.16	1410	11.01	0.5	7.32	22.0	17,080	2.3	3.5	6.2	Clear	*Low-flow groundwater sample:*
	1413	11.05	1.0	7.20	20.7	17,120	0.9	10.1	5.4		(A) peristaltic pump w/ ded tubing
	1415	11.05	1.5	7.16	20.6	17,040	0.8	12.7	3.9		B) ded bladder pump
	1418	11.05	2.0	7.13	20.6	16,980	0.8	14.3	3.2		C) non-ded bladder pump; or
	1420	11.05	2.5	7.11	20.7	16,950	0.8	16.8	2.8		*Standard groundwater sample:*
	1423	11.05	3.0	7.09	20.7	16,920	0.7	17.2	2.6		D) bailer due to limited column; or
	1425	11.05	3.5	7.08	20.8	16,900	0.7	17.9	2.3		E) recovery well cycling sample
↓	1428	11.05	4.0	7.07	20.8	16,890	0.7	18.3	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
4.27.16	1430	MW-25	11.05	7.07	20.8	16,890	0.7	18.3	2.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Not in Sampling Program

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NP-8 (Gauge only)
Event: Spring 2016 (Annual)
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	
4-26-16	1159	NA	12.37	0.0	15.20	NA	Issue	Issue	Yes	Yes		Weather: Sunny, wind, 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		PVC well is approx. 2.0' feet below top						A) peristaltic pump w/ ded tubing
			1.5		of metal protective casing. Unable to						B) ded bladder pump
			2.0		access top of well, so no cap is present.						C) non-ded bladder pump; or
			2.5		DTW + TOC measured from top of metal						*Standard groundwater sample:*
			3.0		casing. Metal protective casing needs						D) bailer due to limited column; or
			3.5		to be cut down.						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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-1R
Event: Spring 2016 (Annual)
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	
4-26-16	1205	NA	10.68	0.0	20.63	15.6	Yes	Issue	Yes	Yes		Weather: Sunny, 80s
4-27-16	1455	NA	10.70	0.0	20.63	15.6		↳ casing & lid are bent, making closure & locking 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	
4-27-16	1500	10.86	0.5	7.40	19.5	13,880	2.6	-101.8	187.0	clear w/ orange	*Low-flow groundwater sample:*
	1503	10.86	1.0	7.31	18.8	13,910	1.2	-110.2	125.0	algae	(A) peristaltic pump w/ ded tubing
	1505	10.86	1.5	7.27	18.6	13,930	0.8	-114.5	86.0		B) ded bladder pump
	1508	10.86	2.0	7.23	18.6	13,870	0.5	-116.4	52.0		C) non-ded bladder pump; or
	1510	10.86	2.5	7.21	18.6	13,840	0.5	-118.1	48.1		*Standard groundwater sample:*
	1513	10.86	3.0	7.19	18.5	13,820	0.6	-120.2	46.2		D) bailer due to limited column; or
	1515	10.86	3.5	7.18	18.5	13,800	0.6	-121.8	48.5		E) recovery well cycling sample
↓	1518	10.86	4.0	7.16	18.5	13,790	0.6	-122.7	51.0	↓	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
4-27-16	1520	MW-1R	10.86	7.16	18.5	13,790	0.6	-122.7	51.0	DRO	HCL	8015M
										~~GRO~~	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-15
Event: Spring 2016 (Annual)
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	
4-26-16	1218	NA	11.57	0.0	21.70	17.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70s
4-27-16	1235	NA	11.60	0.0	21.70	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	
4-27-16	1240	11.64	0.5	7.79	20.4	8010	2.7	50.8	6.1	Clear	*Low-flow groundwater sample:*
	1243	11.64	1.0	7.60	19.7	7420	1.3	53.0	4.8		(A) peristaltic pump w/ ded tubing
	1245	11.64	1.5	7.51	19.4	6940	0.9	55.4	3.9		B) ded bladder pump
	1248	11.64	2.0	7.36	19.4	6580	0.6	57.1	3.3		C) non-ded bladder pump; or
	1250	11.64	2.5	7.29	19.4	6290	0.6	59.3	2.8		*Standard groundwater sample:*
	1253	11.64	3.0	7.25	19.4	6180	0.5	60.8	2.4		D) bailer due to limited column; or
	1255	11.64	3.5	7.22	19.5	6150	0.5	61.4	2.1		E) recovery well cycling sample
	1258	11.64	4.0	7.20	19.5	6130	0.6	62.7	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: ESC Lab Sciences, Mt. Juliet, TN
4-27-16	1300	MW-15	11.64	7.20	19.5	6130	0.6	62.7	1.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-1R
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in) 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	
4-26-16	1230	NA	12.27	0.0	23.90	18.6	Yes	Issue	Issue	Yes		Weather: Sunny, 50s
4-27-16	735	NA	12.29	0.0	23.90	18.6						

↳ Casing lid does not fully close. PVC casing needs to be cut down to allow full closure.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-16	740	12.48	0.5	7.47	16.6	13,370	4.1	21.4	8.0	clear	*Low-flow groundwater sample:*
	743	12.50	1.0	7.36	16.7	13,220	2.0	22.9	5.1		(A) peristaltic pump w/ ded tubing
	745	12.50	1.5	7.30	16.7	13,160	1.5	24.0	3.9		B) ded bladder pump
	748	12.51	2.0	7.28	16.8	13,120	1.2	25.7	3.6		C) non-ded bladder pump; or
	750	12.51	2.5	7.25	16.8	13,080	1.1	28.2	3.2		*Standard groundwater sample:*
	753	12.51	3.0	7.24	16.9	13,060	1.0	31.6	2.8		D) bailer due to limited column; or
	755	12.51	3.5	7.22	17.0	13,040	0.9	32.8	2.4		E) recovery well cycling sample
↓	758	12.51	4.0	7.21	17.0	13,030	0.9	33.4	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: ESC Lab Sciences, Mt. Juliet, TN
4-27-16	800	OCD-1R	12.51	7.21	17.0	13,030	0.9	33.4	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	6010/6020 and/or 7470
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2A
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in j stickup) 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	
4.26.16	1240	NA	12.28	0.0	27.58	22.3	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4.27.16	825	NA	12.30	0.0	27.58	22.3						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.27.16	830	12.42	0.5	7.46	17.6	10,840	2.8	-67.5	30.8	clear w/ orange	*Low-flow groundwater sample:*
	833	12.42	1.0	7.33	17.5	10,810	1.2	-75.6	20.7	algae particles	(A) peristaltic pump w/ ded tubing
	835	12.42	1.5	7.27	17.4	10,800	0.9	-82.1	16.2	↓	B) ded bladder pump
	838	12.42	2.0	7.25	17.4	10,750	0.9	-84.9	14.0	clear	C) non-ded bladder pump; or
	840	12.42	2.5	7.24	17.4	10,680	0.8	-87.0	12.8		*Standard groundwater sample:*
	843	12.42	3.0	7.24	17.3	10,620	0.7	-88.3	9.6		D) bailer due to limited column; or
	845	12.42	3.5	7.23	17.3	10,590	0.7	-89.9	8.7		E) recovery well cycling sample
↓	848	12.42	4.0	7.23	17.4	10,570	0.6	-90.6	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
4.27.16	850	OCD-2A	12.42	7.23	17.4	10,570	0.6	-90.6	7.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Not in sampling program

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2B (Gauge only)
Event: Spring 2016 (Annual)
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	
4.26.16	1243	NA	11.11	0.0	50.39	NA	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-3
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in; 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	
4-26-16	1250	NA	12.78	0.0	25.48	20.2	Yes	Yes	Yes	Yes	Pad is	Weather: Sunny, 60s
4-27-16	915	NA	12.79	0.0	25.48	20.2					destroyed	

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-16	920	12.93	0.5	7.44	19.3	8410	3.4	57.7	51.0	Clear w/ orange	*Low-flow groundwater sample:*
	923	12.94	1.0	7.33	19.0	8360	2.6	58.2	38.2	algae particles	(A) peristaltic pump w/ ded tubing
	925	12.94	1.5	7.29	18.8	8320	2.1	59.4	26.4		B) ded bladder pump
	928	12.94	2.0	7.23	18.8	8296	1.6	58.0	14.7		C) non-ded bladder pump; or
	930	12.94	2.5	7.18	18.8	8260	1.3	56.2	10.8		*Standard groundwater sample:*
	933	12.94	3.0	7.16	18.7	8240	1.2	54.1	9.4		D) bailer due to limited column; or
	935	12.94	3.5	7.15	18.7	8230	1.1	52.0	8.3		E) recovery well cycling sample
	938	12.94	4.0	7.15	18.7	8210	1.1	50.8	6.9		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
4-27-16	940	OCD-3	12.94	7.15	18.7	8210	1.1	50.8	6.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-4
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in j stickup) Initials: BFH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.26.16	1255	NA	12.03	0.0	25.44	20.1	Yes	Yes	Yes	Yes	Subsidence	Weather: Sunny, 60s
4.27.16	1005	NA	12.07	0.0	25.44	20.1					water 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	
4.27.16	1010	12.08	0.5	7.24	19.4	18,460	2.5	71.6	60.0	clear w/ orange	*Low-flow groundwater sample:*
	1013	12.08	1.0	7.15	19.0	18,940	1.2	66.2	48.2	algae particles	(A) peristaltic pump w/ ded tubing
	1015	12.08	1.5	7.11	18.8	19,350	0.9	60.4	29.5		B) ded bladder pump
	1018	12.08	2.0	7.08	18.7	19,420	0.6	48.4	24.1		C) non-ded bladder pump; or
	1020	12.08	2.5	7.06	18.7	19,480	0.5	39.1	16.3		*Standard groundwater sample:*
	1023	12.08	3.0	7.06	18.6	19,510	0.4	36.5	14.5		D) bailer due to limited column; or
	1025	12.08	3.5	7.05	18.5	19,530	0.4	31.2	13.8		E) recovery well cycling sample
	1028	12.08	4.0	7.05	18.4	19,560	0.4	29.6	13.2		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
4.27.16	1030	OCD-4	12.08	7.05	18.4	19,560	0.4	29.6	13.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11A
Event: Spring 2016 (Annual)
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	
4-26-16	1305	NA	9.49	0.0	22.00	17.0	Yes	Yes	Yes	Yes		Weather: Sunny, 70s
4-27-16	1135	NA	9.50	0.0	22.00	17.0						

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	
4-27-16	1140	9.60	0.5	7.18	21.0	28,900	3.0	67.1	16.7	clear	*Low-flow groundwater sample:*
|	1143	9.61	1.0	7.08	19.9	29,500	1.5	59.6	12.2	|	(A) peristaltic pump w/ ded tubing
|	1145	9.62	1.5	7.03	19.7	30,400	0.8	52.9	8.8	|	B) ded bladder pump
|	1148	9.62	2.0	6.98	19.5	30,700	0.7	48.5	5.6	|	C) non-ded bladder pump; or
|	1150	9.62	2.5	6.97	19.4	31,000	0.6	44.1	4.8	|	*Standard groundwater sample:*
|	1153	9.62	3.0	6.97	19.4	31,100	0.5	41.0	4.1	|	D) bailer due to limited column; or
|	1155	9.62	3.5	6.96	19.3	31,200	0.5	39.6	3.7	|	E) recovery well cycling sample
V	1158	9.62	4.0	6.96	19.2	31,200	0.4	38.2	3.2	V	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (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
4-27-16	1200	MW-11A	9.62	6.96	19.2	31,200	0.4	38.2	3.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11B (Gauge only)
Event: Spring 2016 (Annual)
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	
4.26.16	1308	NA	9.45	0.0	47.30	42.3	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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
								Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)			HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-5
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in; Stick up)

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	
4-26-16	1300	NA	10.19	0.0	25.42	20.6	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-27-16	1050	NA	10.21	0.0	25.42	20.6						

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	
4-27-16	1055	10.28	0.5	7.54	20.0	16,750	3.1	46.0	187.0	Clear w/ orange	*Low-flow groundwater sample:*
	1058	10.29	1.0	7.44	19.3	16,660	1.2	28.2	98.0	algae particles	(A) peristaltic pump w/ ded tubing
	1100	10.29	1.5	7.39	19.0	16,660	0.8	18.6	59.0		B) ded bladder pump
	1103	10.29	2.0	7.35	19.0	16,600	0.6	-1.2	52.0		C) non-ded bladder pump; or
	1105	10.29	2.5	7.32	19.0	16,600	0.5	-7.8	48.7		*Standard groundwater sample:*
	1108	10.29	3.0	7.29	19.0	16,590	0.5	-13.4	48.1		D) bailer due to limited column; or
	1110	10.29	3.5	7.28	18.9	16,590	0.6	-18.1	46.9		E) recovery well cycling sample
	1113	10.29	4.0	7.26	18.9	16,580	0.6	-20.7	47.3		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
4-27-16	1115	OCD-5	10.29	7.26	18.9	16,580	0.6	-20.7	47.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Trip Blank-EP-03
4-27-16

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-87
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4in; 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	
4-26-16	1502	NA	8.27	0.0	20.39	15.1	Yes	Yes	Yes	Yes		Weather: Sunny, 80s
4-27-16	1550	NA	8.30	0.0	20.39	15.1						

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	
4-27-16	1555	8.42	0.5	7.61	20.9	17,310	2.6	-122.8	8.0	clear	*Low-flow groundwater sample:*
↓	1558	8.47	1.0	7.55	19.8	17,520	1.6	-130.1	59	↓	(A) peristaltic pump w/ ded tubing
	1600	8.52	1.5	7.49	19.4	17,680	1.2	-136.2	4.2		B) ded bladder pump
	1603	8.55	2.0	7.45	19.2	17,730	0.9	-140.7	3.8		C) non-ded bladder pump; or
	1605	8.58	2.5	7.41	19.1	17,760	0.8	-143.5	3.6		*Standard groundwater sample:*
	1608	8.61	3.0	7.38	19.0	17,790	0.8	-147.2	3.1		D) bailer due to limited column; or
	1610	8.64	3.5	7.36	19.0	17,810	0.8	-150.8	2.9		E) recovery well cycling sample
↓	1613	8.67	4.0	7.35	19.1	17,830	0.8	-152.1	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: ESC Lab Sciences, Mt. Juliet, TN
4-27-16	1615	MW-87	8.67	7.35	19.1	17,830	0.8	-152.1	2.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18A
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4in) 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	
4.26.16	1515	NA	10.03	0.0	22.59	17.9	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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	
4.26.16	1520	10.25	0.5	6.70	20.0	27,400	3.8	5.2	6.9	clear	*Low-flow groundwater sample:*
	1523	10.33	1.0	6.91	19.9	27,200	1.8	5.3	5.0		(A) peristaltic pump w/ ded tubing
	1525	10.40	1.5	6.99	19.8	27,100	1.3	4.6	3.4		B) ded bladder pump
	1528	10.47	2.0	7.05	19.8	27,000	1.0	3.0	2.8		C) non-ded bladder pump; or
	1530	10.53	2.5	7.16	19.7	26,900	0.9	-1.8	2.1		*Standard groundwater sample:*
	1533	10.57	3.0	7.21	19.6	26,800	0.9	-5.2	1.8		D) bailer due to limited column; or
	1535	10.60	3.5	7.23	19.6	26,800	0.8	-7.8	1.4		E) recovery well cycling sample
↓	1538	10.63	4.0	7.25	19.5	26,700	0.8	-10.4	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
4.26.16	1540	MW-18A	10.63	7.25	19.5	26,700	0.8	-10.4	1.2	DRO	HCL	8015M
										~~GRO~~	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18B
Event: Spring 2016 (Annual)
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	
4.26.16	1508	NA	10.01	0.0	50.60	NA	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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	
4.26.16			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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH 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 2016 (Annual)
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	
4/26/16	1510	NA	9.80	0.0	50.40	NA	NO	ISSUE	ISSUE	Yes		Weather: Sunny, windy, 80s
			↳ Measured from highest point on PVC					(missing lid)	(Lock won't resolve issue)			

↳ Top of PVC Shattered. Needs repairs to allow usage of a 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	
			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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-70
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4in; 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	
4.26.16	1615	NA	7.71	0.0	22.05	16.8	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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	
4.26.16	1620	7.78	0.5	7.46	20.6	9060	2.8	-117.5	88.0	Clear w/ orange	*Low-flow groundwater sample:*
	1623	7.79	1.0	7.31	20.2	8450	1.1	-119.8	51.0	algae particles	(A) peristaltic pump w/ ded tubing
	1625	7.79	1.5	7.24	20.0	8140	0.8	-115.2	32.6		B) ded bladder pump
	1628	7.79	2.0	7.20	19.8	8020	0.5	-114.9	28.5		C) non-ded bladder pump; or
	1630	7.79	2.5	7.19	19.5	7940	0.4	-115.4	22.6		*Standard groundwater sample:*
	1633	7.79	3.0	7.17	19.4	7900	0.4	-115.8	21.9		D) bailer due to limited column; or
	1635	7.79	3.5	7.16	19.4	7880	0.4	-116.1	20.8		E) recovery well cycling sample
↓	1638	7.79	4.0	7.15	19.4	7870	0.5	-116.3	21.3	↓	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
4.26.16	1640	MW-70	7.79	7.15	19.4	7870	0.5	-116.3	21.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

+EB-EP-02
(for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-124
Event: Spring 2016 (Annual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in j stick up) 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	
4.26.16	1700	NA	8.25	0.0	22.02	17.0	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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	
4.26.16	1705	8.28	0.5	7.25	19.1	12,650	2.7	-63.2	52.0	Clear w/ orange	*Low-flow groundwater sample:*
	1708	8.28	1.0	7.18	18.6	12,890	1.3	-64.4	31.7	algae particles	(A) peristaltic pump w/ ded tubing
	1710	8.28	1.5	7.14	18.5	12,940	1.0	-65.1	26.4		B) ded bladder pump
	1713	8.28	2.0	7.10	18.5	12,980	0.8	-66.9	18.1		C) non-ded bladder pump; or
	1715	8.28	2.5	7.08	18.4	12,990	0.7	-68.2	16.2		*Standard groundwater sample:*
	1718	8.28	3.0	7.07	18.4	13,000	0.6	-70.1	15.8		D) bailer due to limited column; or
	1720	8.28	3.5	7.06	18.3	13,010	0.5	-70.9	14.7		E) recovery well cycling sample
	1723	8.28	4.0	7.06	18.2	13,020	0.5	-71.4	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
4.26.16	1725	MW-124	8.28	7.06	18.2	13,020	0.5	-71.4	14.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1740	EB-EP-02								Same as above	Same	Same
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Not is 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 (Gauge only)
Event: Spring 2016 (Annual)
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	
9-26-16	1418	NA	12.11	0.0	21.10	NA	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

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 (Gauge only)
Event: Spring 2016 (Annual)
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	
4.26.16	1410	NA	11.39	0.0	22.51	NA	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

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 (Gauge only)
Event: Spring 2016 (Annual)
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	
4.26.16	1405	NA	10.66	0.0	17.93	NA	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

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 (Gauge only)
Event: Spring 2016 (Annual)
Area of Concern: EP

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	
4.26.16	1340	NA	12.28	0.0	23.51	NA	Yes	Yes	Issue	Yes		Weather: Sunny, windy, 80s

↳ Hasp/Hinge broken. Has a lock but well won't close.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. 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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

not in Sampling Program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-14 (Gauge only)
Event: Spring 2016 (Annual)
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	
4.26.16	1348	NA	11.71	0.0	711.93	NA	Yes	Issue	Yes	Yes		Weather: Sunny, windy, 80s
								↳ Blockage at 11.93' 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: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

System off due to water rights issue?

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-12R
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

If active and if sampled; (sample port)

Initials: BT

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1546	NA	23.38	0.0	nm	top of pump	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/28/16	1725	NA	23.33									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1730	23.36	0.5	9.98	23.2	3818	0.9	-241.9	14.6	Clear (Strong HC Odor)	*Low-flow groundwater sample:*
	1733	23.36	1.0	9.94	22.3	3562	0.7	-262.8	11.2	" "	(A) peristaltic pump w/ ded tubing
	1735	23.36	1.5	9.86	21.8	3679	0.5	-275.4	10.3	" "	B) ded bladder pump
	1738	23.36	2.0	9.78	21.6	3636	0.4	-282.8	9.8	" "	C) non-ded bladder pump; or
	1740	23.36	2.5	9.75	21.5	3613	0.4	-285.9	9.7	" "	*Standard groundwater sample:*
	1743	23.36	3.0	9.73	21.4	3608	0.4	-288.6	9.7	" "	D) bailer due to limited column; or
	1745	23.36	3.5	9.71	21.4	3601	0.3	-290.2	9.9	" "	E) recovery well cycling sample
	1748	23.36	4.0	9.70	21.4	3598	0.3	-291.3	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
4/28/16	1750	RW-12R	23.36	9.70	21.4	3598	0.3	-291.3	9.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

+EB-Rest-01
+Dup-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 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in; 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	
4/26/16	1600	NA	23.20	0.0	37.80	33.8	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/28/16	1615	NA	23.07									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1620	23.10	0.5	6.61	23.9	3307	1.6	-12.7	12.9	Clear	*Low-flow groundwater sample:*
	1623	23.10	1.0	6.51	22.7	3109	1.2	-03.6	10.2	"	(A) peristaltic pump w/ ded tubing
	1625	23.10	1.5	6.47	22.4	3075	1.0	+05.8	9.4	"	B) ded bladder pump
	1628	23.10	2.0	6.45	22.2	3061	0.9	+1.9	8.9	"	C) non-ded bladder pump; or
	1630	23.10	2.5	6.44	22.1	3057	0.8	4.7	8.6	"	*Standard groundwater sample:*
	1633	23.10	3.0	6.44	22.0	3054	0.7	6.2	8.5	"	D) bailer due to limited column; or
	1635	23.10	3.5	6.44	22.0	3051	0.7	6.8	8.2	"	E) recovery well cycling sample
↓	1638	23.10	4.0	6.44	22.0	3049	0.7	7.3	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
4/28/16	1640	MW-113	23.10	6.44	22.0	3049	0.7	7.3	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
4/28/16	1655	EB-Rest-01							→	Same as above	Same	Same
4/28/16	1500	Dup-Rest-01	23.10	6.44	22.0	3049	0.7	7.3	8.1	Same as above	Same	Same

If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KwB-8
Event: Spring 2016 (Annual)
Area of Concern: Rest

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	
4/26/16	16.04	21.36	22.47	1.11	35.80	NA	Yes	Yes	Yes	Yes		Weather: Sunny 70's
						30.8' if 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	Not sampled due to							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5	LNAPL ≥ 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
		KwB-8								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: Rw-22
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(Active RW; sample port; hoses in well) 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	
4/26/16	1612	21.60	21.63	0.03	nm	NA	Yes	Yes	Yes	Yes		Weather: Sunny 60's
4/27/16	915	21.61	21.65	0.04								

Well Purging Record

Screen (11.5-39) (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	
			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
		Rw-22								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

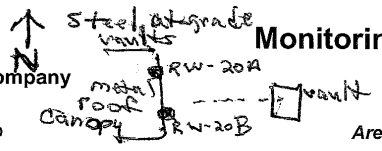
If <0.03 feet of PSH present, remove PSH and sample groundwater

(Corrected field labeling per Doming 0, 4/26/16)

[HMI replaced former reference to "RW-20" with RW-20A and RW-20B, see sketch.]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico



Well: RW-20 (A+B)
Event: Spring 2016 (Annual)
Area of Concern: Rest

(Reported IHS as the only RW with permission to run)

(Both Active RWs; Sample ports)

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: Cap	Casing	Well Secured	Label	Other	Comments
A	4/26/16	1453	19.68	20.08	0.40	nm	NA	NA	Yes	Yes	Yes		Weather Sunny 60's
B	4/26/16	1456	19.69	20.04	0.35	nm	NA						

Well Purging Record RW

*Pumps in wells

	Date	Time	Depth to Water (Ft-TOC)	Cum. 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
A	4/27/16	900	19.66	20.01								
B	4/27/16	903	19.63	19.99								

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (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-20								DRO	HCL	8015M
										~~GRO~~	HCL	~~8015M~~
										VOC	HCL	8260
										Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)	HNO_3	6010/6020
										Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: Rw-13R
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(Active Rw; Sample Port) 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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1504	NA	21.62	0.0	nm	top of pump	Yes	Yes	Yes	Yes		Weather: Sunny 60's
4/27/16	925	NA	21.62		Pump in Well							

Well Purging Record *Unable to gauge with tube in guide pipe for purge & 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	
4/27/16	930	nm	0.5	7.67	22.6	2340	4.1	-89.9	8.6	Clear (Strong HC odor)	*Low-flow groundwater sample:*
	933		1.0	7.56	22.3	2521	3.6	-100.8	5.4	" "	(A) peristaltic pump w/ ded tubing
	935		1.5	7.54	22.2	2515	3.1	-118.4	4.1	" "	B) ded bladder pump
	938		2.0	7.68	22.3	2513	3.0	-121.2	4.0	" "	C) non-ded bladder pump; or
	940		2.5	7.71	22.3	2512	2.9	-125.9	3.8	" "	*Standard groundwater sample:*
	943		3.0	7.72	22.4	2512	2.8	-127.3	3.8	" "	D) bailer due to limited column; or
	945		3.5	7.73	22.5	2511	2.8	-128.4	3.9	" "	(E) recovery well cycling sample
	948		4.0	7.73	22.5	2511	2.8	-128.8	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
4/27/16	950	Rw-13R	nm	7.73	22.5	2511	2.8	-128.8	3.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-14R
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Active RW; Sample Port 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	
4/26/16	1514	17.98	18.12	0.14	(Pump in well) nm	NA 5' off bottom as needed	Yes	Yes	Yes	Yes		Weather: Sunny 70's

Well Purging Record

(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	
			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		LNAPL	≥ 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
		RW-14R								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-133
Event: Spring 2016 (Annual)
Area of Concern: Rest

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	
4/26/16	1520	16.75	17.06	0.31	37.66	27.9	Yes	Yes	Yes	Yes		Weather: Sunny 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					(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0	to	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-133								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)	HNO_3	6010/6020
										Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

+ EB - Rest-03
+ Dup- Rest-03
(both for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-134
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in) 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	
4/26/16	1525	NA	14.32	0.0	32.93	28.4	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/27/16	1755	NA	14.32	0.0	~~32.93~~							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	1800	14.33	0.5	7.08	19.3	5450	3.1	35.2	17.9	Clear	*Low-flow groundwater sample:*
|	1803	14.33	1.0	6.96	18.9	5603	2.4	50.8	14.7	"	(A) peristaltic pump w/ ded tubing
|	1805	14.33	1.5	6.63	18.8	5629	1.7	63.7	13.6	"	B) ded bladder pump
|	1808	14.33	2.0	6.49	18.7	5635	1.3	75.2	12.9	"	C) non-ded bladder pump; or
|	1810	14.33	2.5	6.42	18.6	5643	1.2	78.6	12.4	"	*Standard groundwater sample:*
|	1813	14.33	3.0	6.40	18.6	5645	1.1	79.9	11.8	"	D) bailer due to limited column; or
|	1815	14.33	3.5	6.39	18.6	5647	1.0	80.4	11.8	"	E) recovery well cycling sample
V	1818	14.33	4.0	6.39	18.6	5648	1.0	80.7	11.7	"	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
4/27/16	1820	MW-134	14.33	6.39	18.6	5648	1.0	80.7	11.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
4/27/16	1845	EB-Rest-03								Same as above	same	Same
4/27/16	1500	Dup-Rest-03	14.33	6.39	18.6	5648	1.0	80.7	11.7	same as above	same	same

If <0.03 feet of PSH present, remove PSH and sample groundwater

Active irrigation well; Inside green, black bldg; NO Purge; Sample port (faucet)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4798
Event: Spring 2016 (Annual)
Area of Concern: Rest

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	
4/27/16	850	NA	NA	NA	NA	NA	NA	NA	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							Clear	*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	(No purge, active well with 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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	850	RA-4798	NA	7.04	18.9	3042	1.6	-9.2	1.2	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						~~Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or~~				Cations (Ca,K,Na)	HNO_3	6010/6020 (Cations only)
							~~Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45 u~~
							~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Active irrigation well; Inside green, black bldg; No purge; sample port (faucet) (FB-REST-01)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4196
Event: Spring 2016 (Annual)
Area of Concern: REST
Screen: 280 -292 ft-bgs

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	
4/27/16	835	NA	NA	NA	NA	NA	NA	NA	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							Clear	*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	(No purge, active well w/ 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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	835	RA-4196	NA	6.94	22.9	2573	1.8	-88.7	1.7	~~DRO~~	HCL	~~8015M~~
										~~GRO~~	HCL	~~8015M~~
										VOC	HCL	8260
						~~Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or~~				Cations (Ca,K,Na)	HNO_3	6010/6020 (Cations only)
							~~Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH 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 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Screen 194-246 ft-bgs

Well Inspection Information Initials:

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												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		DO	NOT	ADDRESS				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							Formerly	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals,(As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA - 3156
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Screen: 182 to (unknown)

Initials: BS 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	
4/28/16	1200	NA	NA	NA	NA	NA	NA	NA	no	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							Clear (Tiny Blk Particles)	*Low-flow groundwater sample:*
			1.0		No	purge, irrigation well					A) peristaltic pump w/ ded tubing
			1.5		with	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1200	RA-3156	nm	7.02	20.2	4691	2.9	-63.2	10.3	~~DRO~~	HCL	8015M
										~~GRO~~	HCL	8015M
										VOC	HCL	8260
										~~Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or~~ Cations (Ca,K,Na)	HNO_3	6010/6020 (Cations only)
										~~Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

shift foreman Doug Coltrane

Across the street (east) of MW-101 Tank 465

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-313
Event: Spring 2016 (Annual)
Area of Concern: Rest

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	
4/27/16	1400	NA	NA	NA	NA	NA	NA	NA	NA	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							Clear	*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
4/27/16	1400	RA-313	NM	6.71	22.6	1249	2.1	29.7	1.0	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	HCL	8015M
										VOC	HCL	8260
						~~Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or~~				Cations (Ca,K,Na)	HNO_3	6010/6020 (Cations only)
							~~Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

(Sock removed by navajo person to gauging on 4/26/16; plan was to replace sock)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-7
Event: Spring 2016 (Annual)
Area of Concern: Rest (2in; stick up)

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1345	20.84	20.85	0.01	34.83	30.6	Yes	Yes	Yes	Yes		Weather: Sunny 70s
4/27/16	1425	19.62	19.63	0.01								

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	
4/27/16	1430	19.65	0.5	7.41	21.5	3461	1.7	-63.4	12.8	Clear (HC odor)	*Low-flow groundwater sample:*
|	1433	19.65	1.0	7.21	20.8	3490	1.1	-67.2	11.2	" "	(A) peristaltic pump w/ ded tubing
|	1435	19.65	1.5	6.98	20.5	3517	0.9	-71.8	9.3	" "	B) ded bladder pump
|	1438	19.65	2.0	6.91	20.3	3527	0.7	-74.2	7.5	" "	C) non-ded bladder pump; or
|	1440	19.65	2.5	6.85	20.2	3533	0.6	-76.3	6.9	" "	*Standard groundwater sample:*
|	1443	19.65	3.0	6.83	20.2	2536	0.5	-77.1	6.7	" "	D) bailer due to limited column; or
|	1445	19.65	3.5	6.81	20.1	3538	0.5	-77.8	6.5	" "	E) recovery well cycling sample
V	1448	19.65	4.0	6.80	20.0	3540	0.5	-78.2	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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	1450	KWB-7	19.65	6.80	20.0	3540	0.5	-78.2	6.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

[HMI - dedicated bladder Pump]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-135
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in jat-grade) 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	
4/26/16	1351	NA	27.34	0.0	65.55	50.0	Yes	Yes	Yes	Yes		Weather Sunny 70's
4/29/16	1100	NA	26.83	0.0								

Well Purging Record

(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	
4/29/16	1105	26.84	0.5	6.72	19.0	7548	2.8	118.7	89.6	Cloudy	*Low-flow groundwater sample:*
	1108	26.84	1.0	6.67	18.8	7272	2.2	131.8	80.2	"	A) peristaltic pump w/ ded tubing
	1110	26.84	1.5	6.65	18.6	6932	2.1	135.4	71.8	"	(B) ded bladder pump
	1113	26.84	2.0	6.58	18.5	6843	2.1	137.3	47.3	Slightly cloudy	C) non-ded bladder pump; or
	1115	26.84	2.5	6.55	18.4	6800	2.1	137.8	32.4	Clear	*Standard groundwater sample:*
	1118	26.84	3.0	6.53	18.4	6792	2.1	138.3	30.8	"	D) bailer due to limited column; or
	1120	26.84	3.5	6.52	18.3	6785	2.1	138.7	29.9	"	E) recovery well cycling sample
	1123	26.84	4.0	6.52	18.3	6783	2.1	139.1			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
4/29/16	1125	MW-135	26.84	6.52	18.3	6783	2.1	139.1	29.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-20
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1317	NA	10.73	0.0	26.66	21.9	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/28/16	1110	AA	10.78	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	
4/28/16	1115	10.82	0.5	6.94	22.3	5091	3.0	62.1	7.1	Clear	*Low-flow groundwater sample:*
	1118	10.83	1.0	6.87	21.5	5573	2.8	86.8	3.0	"	(A) peristaltic pump w/ ded tubing
	1120	10.83	1.5	6.85	21.4	5647	2.7	98.1	2.8	"	B) ded bladder pump
	1123	10.83	2.0	6.84	21.4	5650	2.3	101.7	1.9	"	C) non-ded bladder pump; or
	1125	10.83	2.5	6.84	21.4	5652	1.9	102.9	1.6	"	*Standard groundwater sample:*
	1128	10.83	3.0	6.83	21.4	5654	1.7	103.0	1.2	"	D) bailer due to limited column; or
	1130	10.83	3.5	6.83	21.4	5655	1.6	103.4	1.0	"	E) recovery well cycling sample
	1133	10.83	4.0	6.83	21.4	5657	1.6	103.6	1.0	"	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
4/28/16	1135	MW-20	10.83	6.83	21.4	5657	1.6	103.6	1.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

NOT in Sampling Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-3 (Gauge only)
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1320	NA	12.28	0.0	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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Not in Sampling Program

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NP-4 (Gauge only)
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1325	NA	18.34	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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH 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 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1330	NA	13.34	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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-1
Event: Spring 2016 (Annual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in j stick up)

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	
4/26/16	1334	NA	11.53	0.0	21.88	19.6	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/28/16	1020	NA	11.70	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	
4/28/16	1025	11.71	0.5	7.76	20.4	4871	2.5	98.3	4.2	Clear	*Low-flow groundwater sample:*
	1028	11.71	1.0	7.01	19.3	5183	2.0	107.2	2.7	"	(A) peristaltic pump w/ ded tubing
	1030	11.71	1.5	6.83	18.9	5367	1.7	109.4	2.1	"	B) ded bladder pump
	1033	11.71	2.0	6.78	18.7	5412	1.5	113.7	1.8	"	C) non-ded bladder pump; or
	1035	11.71	2.5	6.75	18.6	5420	1.4	115.6	1.7	"	*Standard groundwater sample:*
	1038	11.71	3.0	6.73	18.6	5423	1.4	116.2	1.7	"	D) bailer due to limited column; or
	1040	11.71	3.5	6.73	18.5	5426	1.4	117.0	1.5	"	E) recovery well cycling sample
	1043	11.71	4.0	6.73	18.5	5428	1.3	117.4	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1045	NP-1	11.71	6.73	18.5	5428	1.3	117.4	1.3	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						~~Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or~~ Cations (Ca,K,Na)					HNO3	6010/6020 (Cations only)
								~~Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-16 (Gauge only)
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1340	NA	8.72	0.0	19.98	15.4	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	
			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
						~~Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)~~					~~HNO_3~~	~~6010/6020~~
							~~Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							~~Anions (Chloride,Fluoride,Sulfate)~~				Neat	300
										~~Nitrate-Nitrite~~	~~H_2SO_4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-8
Event: Spring 2016 (Annual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

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	
4/28/16	1256	NA	8.43	0.0	20.12	15.3	Yes	Yes	Yes	Yes		Weather: Sunny 70s
4/28/16	1240	NA	7.98	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	
4/28/16	1245	8.01	0.5	7.34	20.7	4315	2.7	56.5	9.6	Clear	*Low-flow groundwater sample:*
	1248	8.01	1.0	7.25	20.7	4291	1.9	65.9	8.2	"	(A) peristaltic pump w/ ded tubing
	1250	8.01	1.5	7.13	20.6	4087	1.4	68.4	7.9	"	B) ded bladder pump
	1253	8.01	2.0	7.02	20.5	4033	1.0	70.1	6.2	"	C) non-ded bladder pump; or
	1255	8.01	2.5	6.98	20.4	3996	0.8	71.3	5.3	"	*Standard groundwater sample:*
	1258	8.01	3.0	6.96	20.4	3992	0.7	71.8	4.7	"	D) bailer due to limited column; or
	1300	8.01	3.5	6.95	20.3	3990	0.7	72.1	4.5	"	E) recovery well cycling sample
	1303	8.01	4.0	6.94	20.3	3989	0.7	72.3	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
4/28/16	1305	MW-8	8.01	6.94	20.3	3989	0.7	72.3	4.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-21
Event: Spring 2016 (Annual)
Area of Concern: TMD (4in) stickup

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	
4/26/16	1300	NA	9.93	0.0	25.12	19.9	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/28/16	1520	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	
4/28/16	1525	9.43	0.5	7.43	25.6	5194	2.7	66.9	5.2	Clear	*Low-flow groundwater sample:*
	1528	9.43	1.0	7.03	21.8	6061	2.2	57.3	3.8	"	A) peristaltic pump w/ ded tubing
	1530	9.43	1.5	6.89	21.3	6108	1.9	89.1	2.5	"	B) ded bladder pump
	1533	9.44	2.0	6.82	20.9	6178	1.7	90.2	2.1	"	C) non-ded bladder pump; or
	1535	9.44	2.5	6.79	20.7	6203	1.6	90.8	1.8	"	*Standard groundwater sample:*
	1538	9.44	3.0	6.77	20.6	6208	1.6	91.1	1.6	"	D) bailer due to limited column; or
	1540	9.44	3.5	6.76	20.6	6210	1.6	91.4	1.5	"	E) recovery well cycling sample
	1543	9.44	4.0	6.76	20.5	6211	1.5	91.7	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1545	MW-21	9.44	6.76	20.5	6211	1.5	91.7	1.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Not in Sampling Program

(Replaced lock 4/26/16)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-9 (Gauge only)
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1304	NA	9.12	0.0	20.19	not sample	Yes	Yes	Yes	Yes	cracked pad	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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Trip Blank - TMB-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-71
Event: Spring 2016 (Annual)
Area of Concern: TMD

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1309	NA	10.77	0.13	21.87	16.9	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/28/16	835	NA	10.27	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	
4/28/16	840	10.30	0.5	7.03	20.0	6695	3.6	66.8	7.2	Clear	*Low-flow groundwater sample:*
	843	10.30	1.0	6.71	19.6	6954	2.9	92.3	6.3	"	(A) peristaltic pump w/ ded tubing
	845	10.30	1.5	6.58	19.2	6971	2.3	103.4	5.9	"	B) ded bladder pump
	848	10.30	2.0	6.54	18.9	6950	2.3	116.9	4.7	"	C) non-ded bladder pump; or
	850	10.30	2.5	6.52	18.7	6943	2.3	117.3	4.4	"	*Standard groundwater sample:*
	853	10.30	3.0	6.51	18.6	6941	2.4	118.2	4.1	"	D) bailer due to limited column; or
	855	10.30	3.5	6.51	18.6	6939	2.4	118.9	4.0	"	E) recovery well cycling sample
	858	10.30	4.0	6.51	18.6	6938	2.3	119.1	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
4/28/16	900	MW-71	10.30	6.51	18.6	6938	2.3	119.1	3.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-68
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1318	NA	16.14	0.0	26.52	21.5	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/28/16	925	NA	16.25	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	
4/28/16	930	16.25	0.5	7.21	22.0	4209	2.0	73.4	8.6	Clear	*Low-flow groundwater sample:*
	933	16.25	1.0	6.91	21.5	4555	1.5	91.0	8.0	"	(A) peristaltic pump w/ ded tubing
	935	16.25	1.5	6.80	21.2	4362	1.2	95.8	7.4	"	B) ded bladder pump
	938	16.25	2.0	6.71	21.0	4101	1.1	97.6	6.9	"	C) non-ded bladder pump; or
	940	16.25	2.5	6.68	20.9	4096	1.0	98.2	6.7	"	*Standard groundwater sample:*
	943	16.25	3.0	6.65	20.8	4090	0.9	98.5	6.6	"	D) bailer due to limited column; or
	945	16.25	3.5	6.64	20.8	4086	0.9	99.1	6.6	"	E) recovery well cycling sample
	948	16.25	4.0	6.63	20.8	4084	0.9	99.3	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
4/28/16	950	MW-68	16.25	6.63	20.8	4084	0.9	99.3	6.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-27
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1356	NA	16.23	0.0	30.28	25.0	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/27/16	1705	NA	16.02	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	
4/27/16	1710	16.04	0.5	8.03	20.7	3087	2.2	22.3	9.2	Clear	*Low-flow groundwater sample:*
	1713	16.04	1.0	7.19	20.4	3204	1.7	40.8	8.4	"	(A) peristaltic pump w/ ded tubing
	1715	16.04	1.5	6.82	20.2	3568	1.4	49.3	7.9	"	B) ded bladder pump
	1718	16.04	2.0	6.71	20.1	3623	1.1	57.2	7.3	"	C) non-ded bladder pump; or
	1720	16.04	2.5	6.67	20.1	3648	0.9	60.8	7.0	"	*Standard groundwater sample:*
	1723	16.04	3.0	6.64	20.1	3671	0.8	62.6	6.8	"	D) bailer due to limited column; or
	1725	16.04	3.5	6.63	20.0	3674	0.7	62.9	6.9	"	E) recovery well cycling sample
↓	1728	16.04	4.0	6.63	20.0	3676	0.7	63.7	6.9	"	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
4/27/16	1730	MW-27	16.04	6.63	20.0	3676	0.7	63.7	6.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-89
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1400	NA	10.40	0.0	20.28	15.2	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/27/16	1615	NA	10.43	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	
4/27/16	1620	10.45	0.5	7.48	18.6	4124	2.1	18.1	7.1	Clear	*Low-flow groundwater sample:*
	1623	10.45	1.0	7.01	18.5	4221	1.6	27.4	5.8	"	(A) peristaltic pump w/ ded tubing
	1625	10.45	1.5	6.74	18.5	4372	1.4	30.4	4.9	"	B) ded bladder pump
	1628	10.45	2.0	6.67	18.4	4402	1.2	33.6	4.6	"	C) non-ded bladder pump; or
	1630	10.45	2.5	6.62	18.4	4410	1.1	35.7	4.3	"	*Standard groundwater sample:*
	1633	10.45	3.0	6.60	18.4	4414	1.1	36.4	3.9	"	D) bailer due to limited column; or
	1635	10.45	3.5	6.59	18.4	4417	1.0	37.1	3.7	"	E) recovery well cycling sample
	1638	10.45	4.0	6.59	18.4	4419	1.0	37.3	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
4/27/16	1620	MW-89	10.45	6.59	18.4	4419	1.0	37.3	3.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

MW-16 removed from sampling program by Navajo, 4-14-15

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-16 (gauge only)
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/28/16	1404	NA	8.24	0.0	21.23	16.2	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
										Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)	HNO_3	6010/6020
										Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										Total Metals (Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-26
Event: Spring 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1408	NA	9.35	0.0	27.58	22.6	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/27/16	1525	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	
4/27/16	1530	9.49	0.5	7.56	19.1	8410	1.4	63.5	9.8	Clear	*Low-flow groundwater sample:*
↓	1533	9.52	1.0	7.41	18.9	8905	1.0	66.4	7.1	"	(A) peristaltic pump w/ ded tubing
	1535	9.53	1.5	7.17	18.8	9032	0.8	67.3	6.2	"	B) ded bladder pump
	1538	9.53	2.0	7.03	18.7	9058	0.7	68.4	5.4	"	C) non-ded bladder pump; or
	1540	9.53	2.5	6.98	18.7	9067	0.6	68.7	4.8	"	*Standard groundwater sample:*
	1543	9.53	3.0	6.96	18.7	9074	0.6	69.0	4.5	"	D) bailer due to limited column; or
	1545	9.53	3.5	6.95	18.6	9081	0.5	69.2	4.3	"	E) recovery well cycling sample
↓	1548	9.53	4.0	6.94	18.6	9084	0.5	69.5	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
4/27/16	1550	MW-26	9.53	6.94	18.6	9084	0.5	69.5	4.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH 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 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4in) stickup)

Initials: TS

Date	Time	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
4/26/16	1415	NA	21.17	0.0	42.27	37.0	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/27/16	1030	NA	21.09	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	
4/27/16	1035	21.11	0.5	6.52	21.8	7457	4.9	38.3	4.7	Clear (HC odor)	*Low-flow groundwater sample:*
	1038	21.12	1.0	6.31	20.7	7599	2.0	41.9	3.8	" "	A) peristaltic pump w/ ded tubing
	1043	21.12	1.5	6.26	20.3	7670	1.1	50.1	2.9	" "	B) ded bladder pump
	1048	21.12	2.0	6.24	20.1	7683	0.9	53.6	2.6	" "	C) non-ded bladder pump; or
	1048	21.12	2.5	6.23	20.1	7689	0.8	54.1	2.3	" "	*Standard groundwater sample:*
	1048	21.12	3.0	6.23	20.0	7692	0.7	55.3	2.1	" "	D) bailer due to limited column; or
	1050	21.12	3.5	6.22	20.0	7695	0.7	55.8	2.1	" "	E) recovery well cycling sample
	1053	21.12	4.0	6.21	20.0	7696	0.6	56.2	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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	1055	KWB-11A	21.12	6.21	20.0	7696	0.6	56.2	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
												If <0.03 feet of PSH present, remove PSH 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 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4 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	
4/26/16	1418	NA	21.81	0.0	72.49	62.2	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/27/16	1115	NA	21.76	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	
4/27/16	1120	21.79	0.5	6.23	21.8	3562	2.2	31.9	5.3	Clear	*Low-flow groundwater sample:*
	1123	21.81	1.0	6.17	21.0	3254	1.5	40.5	3.8	"	(A) peristaltic pump w/ ded tubing
	1125	21.82	1.5	6.15	20.7	3051	1.3	48.6	2.9	"	B) ded bladder pump
	1128	21.82	2.0	6.14	20.5	3016	1.2	50.7	2.5	"	C) non-ded bladder pump; or
	1130	21.82	2.5	6.13	20.4	2996	1.2	51.3	2.2	"	*Standard groundwater sample:*
	1133	21.82	3.0	6.13	20.3	2990	1.2	51.9	2.0	"	D) bailer due to limited column; or
	1135	21.82	3.5	6.13	20.2	2987	1.1	52.4	1.9	"	E) recovery well cycling sample
	1138	21.82	4.0	6.13	20.2	2985	1.1	52.6	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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	1140	KWB-11B	21.82	6.13	20.2	2985	1.1	52.6	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Do not address this well, 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 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in; at-grade)

Initials:

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1421											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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW - 117
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in; 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	
4/26/16	1544	NA	9.25	0.0	27.22	19.7	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	
4/26/16	1750	9.26	0.5	7.07	17.9	3450	2.3	174.6	139	Colorless / Cloudy	*Low-flow groundwater sample:*
↓	1753	9.29	1.0	6.92	17.3	3450	1.9	177.9	148	↓	(A) peristaltic pump w/ ded tubing
	1755	9.29	1.5	6.88	17.1	3450	1.8	178.8	143		B) ded bladder pump
	1757	9.29	2.0	6.86	17.0	3450	1.7	179.7	136		C) non-ded bladder pump; or
	1800	9.29	2.5	6.83	16.8	3450	1.7	180.4	130		*Standard groundwater sample:*
	1803	9.29	3.0	6.82	16.7	3450	1.6	180.9	126		D) bailer due to limited column; or
	1805	9.29	3.5	6.81	16.5	3450	1.7	181.3	129		E) recovery well cycling sample
	1807	9.29	4.0	6.81	16.4	3450	1.6	181.4	125		F) irrigation well grab sample
	1810	9.29	4.5	6.80	16.4	3440	1.6	181.4	123		
↓	1813	9.29	5.0	6.80	16.4	3440	1.6	181.6	120	↓	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (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
4/26/16	1815	MW-117	9.29	6.80	16.4	3440	1.6	181.6	120	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-118
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in; stickup) Initials: CDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1548	NA	10.40	0.0	28.29	21.0	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	
4/26/16	1655	10.50	0.5	7.08	18.3	3950	4.6	179.2	116	Colorless / Cloudy	*Low-flow groundwater sample:*
	1657	10.50	1.0	6.94	17.9	3940	4.2	182.0	92.1	↓	(A) peristaltic pump w/ ded tubing
	1700	10.50	1.5	6.84	17.6	3950	4.0	183.6	69.9		B) ded bladder pump
	1703	10.50	2.0	6.80	17.5	3950	4.0	183.8	59.2		C) non-ded bladder pump; or
	1705	10.50	2.5	6.79	17.5	3950	3.9	184.0	53.6	sl. cloudy	*Standard groundwater sample:*
	1707	10.50	3.0	6.79	17.5	3950	3.9	184.0	46.8	sl. cloudy	D) bailer due to limited column; or
	1710	10.50	3.5	6.79	17.4	3950	3.8	184.0	43.1	sl. cloudy	E) recovery well cycling sample
	1713	10.50	4.0	6.77	17.4	3940	3.8	184.1	40.9	sl. cloudy	F) irrigation well grab sample
↓	1715	10.50	4.5	6.76	17.4	3940	3.8	184.1	38.9	↓ sl. cloudy	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (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
4/26/16	1720	MW-118	10.50	6.76	17.4	3940	3.8	184.1	38.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH 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 2016 (Annual)
Area of Concern: TMD

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	
4/26/16	1552	NA	8.71	0.0	25.89	Not Sampled	Yes	*Issue	*Issue	Yes		Weather: Sunny, 70's

*Needs New Monument Casing top; see photo log

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. 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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-119
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in; 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	
4/26/16	1605	NA	9.91	0.0	28.11	20.8	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	
4/26/16	1610	9.95	0.5	7.74	16.9	3510	2.5	154.3	22.4	Clear / colorless	*Low-flow groundwater sample:*
↓	1613	9.96	1.0	7.36	15.9	3580	1.5	167.9	18.2	↓	(A) peristaltic pump w/ ded tubing
	1615	9.96	1.5	7.27	15.4	3540	1.4	172.8	11.6		B) ded bladder pump
	1617	9.96	2.0	7.20	15.1	3540	1.3	174.6	8.9		C) non-ded bladder pump; or
	1620	9.96	2.5	7.10	15.2	3520	1.4	177.0	7.4		*Standard groundwater sample:*
	1623	9.96	3.0	7.06	15.2	3510	1.4	178.4	6.8		D) bailer due to limited column; or
	1625	9.96	3.5	7.03	15.2	3500	1.4	179.5	6.1		E) recovery well cycling sample
↓	1627	9.96	4.0	7.05	15.1	3490	1.4	180.3	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
4/26/16	1630	MW-119	9.96	7.05	15.1	3490	1.4	180.3	5.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Ca,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Ca,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-5 (Gauge only)
Event: Spring 2016 (Annual)
Area of Concern: Rest (Cross-Gradient)

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	
4/26/16	1518	NA	12.00	0.0	25.06	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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

* Installed 7.28.14

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-136
Event: Spring 2016 (Annual)
Area of Concern: REST (crossgradient; North of N. RO Field) (2in) 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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1529	NA	10.90	0.0	27.92	23.0	Yes	Yes	Yes	Yes		Weather: SUNNY, 70's
4/28/16	1450	NA	10.96		Lgsstr	base						

Well Purging Record Screen: 10-25

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1455	10.98	0.5	7.39	22.7	4230	2.2	10.0	7200	Colorless / Cloudy	*Low-flow groundwater sample:*
	1457	10.98	1.0	7.14	22.0	4250	1.4	20.2	7200		(A) peristaltic pump w/ ded tubing
	1500	10.98	1.5	6.99	21.5	4260	1.3	27.0	168		B) ded bladder pump
	1503	10.98	2.0	6.90	21.3	4260	1.3	31.2	137		C) non-ded bladder pump; or
	1505	10.98	2.5	6.86	21.0	4260	1.3	34.1	116		*Standard groundwater sample:*
	1507	10.98	3.0	6.83	20.9	4260	1.3	36.6	93.3		D) bailer due to limited column; or
	1510	10.98	3.5	6.81	20.8	4260	1.3	38.0	84.9		E) recovery well cycling sample
	1513	10.98	4.0	6.80	20.7	4260	1.2	39.4	79.2		F) irrigation well grab sample
	1515	10.98	4.5	6.79	20.7	4270	1.2	39.8	76.3		
↓	1517	10.98	5.0	6.79	20.8	4270	1.2	40.1	75.0	↓	

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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1520	MW-136	10.98	6.79	20.8	4270	1.2	40.1	75.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126A
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in) 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	
4/26/16	1236	NA	13.71	0.0	37.51	29.5	Yes	Yes	Yes	Yes		Weather: Sunny, 80's
4/27/16	1745	NA	13.75									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	1750	13.75	0.5	7.42	20.5	3120	3.9	-138.9	147	colorless / cloudy	*Low-flow groundwater sample:*
↓	1753	13.75	1.0	7.11	19.6	3150	1.3	-136.5	119	↓ ↓	(A) peristaltic pump w/ ded tubing
	1755	13.75	1.5	7.09	19.3	3170	1.0	-136.2	92.6		B) ded bladder pump
	1757	13.75	2.0	6.92	19.1	3160	0.9	-135.9	44.4		C) non-ded bladder pump; or
	1800	13.75	2.5	6.88	18.9	3120	0.9	-136.3	16.3	colorless / clear	*Standard groundwater sample:*
	1803	13.75	3.0	6.87	18.8	3090	0.9	-135.7	11.4	↓ ↓	D) bailer due to limited column; or
	1805	13.75	3.5	6.88	18.5	3050	0.9	-135.8	9.9		E) recovery well cycling sample
↓	1807	13.75	4.0	6.88	18.4	3040	0.9	-136.3	8.4		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
4/27/16	1815	MW-126A	13.75	6.88	18.4	3040	0.9	-136.3	8.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126B
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in) 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	
4/26/16	1239	~~NA~~	13.66	0.0	51.45	48.4	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/28/16	955	NA	13.75		49.5 soft	bottom						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1000	13.86	0.5	7.23	18.7	4150	4.4	-8.4	160	colorless / cloudy	*Low-flow groundwater sample:*
	1003	13.89	1.0	7.00	18.7	4140	1.6	-2.7	116	↓	(A) peristaltic pump w/ ded tubing
	1005	13.89	1.5	6.86	18.7	4140	1.3	1.9	56.3	↓	B) ded bladder pump
	1007	13.89	2.0	6.76	18.8	4140	1.1	3.9	32.0	sl. cloudy	C) non-ded bladder pump; or
	1010	13.89	2.5	6.72	18.9	4130	0.9	4.7	22.4	clear	*Standard groundwater sample:*
	1013	13.89	3.0	6.69	19.1	4140	0.7	4.8	21.9	↓	D) bailer due to limited column; or
	1015	13.89	3.5	6.68	19.1	4140	0.7	7.7	18.5	↓	E) recovery well cycling sample
↓	1017	13.89	4.0	6.66	19.2	4140	0.7	8.9	19.1	↓	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
4/28/16	1020	MW-126B	13.89	6.66	19.2	4140	0.7	8.9	19.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-127
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in; 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	
4/26/16	1230	NA	17.84	0.0	53.25	38.4	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/27/16	1650	NA	17.81									

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	
4/27/16	1655	17.85	0.5	6.87	23.5	2620	1.5	-194.2	80.5	colorless / sl. cloudy / white particles / odor	*Low-flow groundwater sample:*
↓	1657	17.85	1.0	6.75	22.8	2650	0.9	-209.9	73.3	↓	(A) peristaltic pump w/ ded tubing
	1700	17.85	1.5	6.72	22.6	2660	0.6	-222.5	45.4		B) ded bladder pump
	1703	17.85	2.0	6.70	22.3	2660	0.5	-233.4	18.0	colorless / clear / odor	C) non-ded bladder pump; or
	1705	17.85	2.5	~~6.67~~ 6.69	22.2	2670	0.5	-240.6	8.6	↓ ↓ ↓	*Standard groundwater sample:*
	1707	17.85	3.0	6.69	22.1	2670	0.5	-250.2	6.9		D) bailer due to limited column; or
	1710	17.85	3.5	6.69	21.7	2670	0.5	-261.7	6.1		E) recovery well cycling sample
↓	1713	17.85	4.0	6.68	21.7	2660	0.5	-263.6	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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	1720	MW-127	17.85	6.68	21.7	2660	0.5	-263.6	5.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~		~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~		~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
									-	Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-129
Event: Spring 2016 (Annual)
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	
4/26/16	1251	20.75	20.76	0.01	53.08	38.2	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/27/16	1555	20.72	20.73									

Well Purging Record ~~4~~ 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	
4/27/16	1600	20.75	0.5	6.82	25.5	2200	2.0	-95.1	165	colorless / cloudy / odor	*Low-flow groundwater sample:*
|	1603	20.75	1.0	6.75	25.0	2200	1.6	-90.9	152	| | |	(A) peristaltic pump w/ ded tubing
|	1605	20.75	1.5	6.72	24.3	2200	1.3	-88.6	124	| | |	B) ded bladder pump
|	1607	20.75	2.0	6.71	24.1	2210	1.2	-87.0	83.0	| | |	C) non-ded bladder pump; or
|	1610	20.75	2.5	6.71	23.9	2210	1.1	-89.8	52.6	↓ ↓ ↓	*Standard groundwater sample:*
|	1613	20.75	3.0	6.69	23.8	2210	1.1	-92.8	35.6	colorless / clear / odor	D) bailer due to limited column; or
|	1615	20.75	3.5	6.65	23.6	2210	1.0	-99.1	20.8	| | |	E) recovery well cycling sample
|	1617	20.75	4.0	6.66	23.4	2220	1.0	-103.8	11.4	| | |	F) irrigation well grab sample
|	1620	20.75	4.5	6.65	23.3	2210	1.0	-106.6	8.6	| | |	
↓	1623	20.75	5.0	6.65	23.3	2220	1.0	-108.9	7.0	↓ ↓ ↓	

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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	1625	MW-129	20.75	6.65	23.3	2220	1.0	-108.9	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

+ TRIP BLANK - BEST - 02
4/28/16

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW - #18A
Event: Spring 2016 (Annual)
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	
4/26/16	1157	NA	11.36	0.0	17.78	12.7	Yes	Yes	Yes	Yes		Weather: SUNNY, 70's
4/28/16	1245	NA	11.41									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1250	11.43	0.5	7.28	22.1	4780	2.3	27.5	5.8	Colorless/clear	*Low-flow groundwater sample:*
	1253	11.44	1.0	7.12	20.4	4680	1.6	32.2	5.0		(A) peristaltic pump w/ ded tubing
	1255	11.44	1.5	7.07	19.9	4670	1.4	33.9	4.3		B) ded bladder pump
	1257	11.44	2.0	7.04	19.7	4650	1.4	35.1	3.9		C) non-ded bladder pump; or
	1300	11.44	2.5	7.02	19.5	4640	1.3	36.5	3.9		*Standard groundwater sample:*
	1303	11.44	3.0	7.02	19.3	4640	1.3	37.1	3.5		D) bailer due to limited column; or
	1305	11.44	3.5	7.00	19.4	4640	1.3	37.6	3.2		E) recovery well cycling sample
	1307	11.44	4.0	7.00	19.4	4640	1.2	37.9	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1315	RW-#18A	11.44	7.00	19.4	4640	1.2	37.9	2.8	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1A
Event: Spring 2016 (Annual)
Area of Concern: Rest (2in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CDS

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	
4/26/16	1205	NA	12.95	0.0	33.49	25.8	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/28/16	1150	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	
4/28/16	1155	13.03	0.5	7.29	21.6	5080	2.5	11.1	14.5	colorless / clear	*Low-flow groundwater sample:*
↓	1157	13.03	1.0	6.97	20.5	5140	1.4	17.9	12.2	↓ ↓	(A) peristaltic pump w/ ded tubing
	1200	13.03	1.5	6.85	20.5	5160	1.1	19.8	9.6		B) ded bladder pump
	1203	13.03	2.0	6.76	20.2	5190	0.9	23.1	8.2		C) non-ded bladder pump; or
	1205	13.03	2.5	6.74	20.2	5190	0.7	23.2	7.6		*Standard groundwater sample:*
	1207	13.03	3.0	6.72	20.3	5190	0.6	22.5	7.1		D) bailer due to limited column; or
	1210	13.03	3.5	6.71	20.3	5190	0.6	22.4	6.8		E) recovery well cycling sample
↓	1213	13.03	4.0	6.71	20.3	5190	0.5	22.5	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
4/28/16	1220	KWB-1A	13.03	6.71	20.3	5190	0.5	22.5	6.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
										If <0.03 feet of PSH present, remove PSH 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 2016 (Annual)
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	
4/26/16	1208	NA	14.61	0.0	33.92	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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1C (Gauge only)
Event: Spring 2016 (Annual)
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	
4/26/16	1211	NA	15.21	0.0	52.71	42.7	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	
			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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

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

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-10R
Event: Spring 2016 (Annual)
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	
4/26/16	1217	NA	15.54	0.0	29.46	22.0	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/28/16	1100	*	15.53									

↳ Unmeasurable sheen on probe

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1105	15.65	0.5	6.78	21.9	2020	3.7	-102.4	19.5	colorless / clear / odor	*Low-flow groundwater sample:*
↓	1107	15.68	1.0	6.63	21.5	1933	0.9	-111.0	14.2	↓	(A) peristaltic pump w/ ded tubing
	1110	15.70	1.5	6.62	21.4	1920	0.8	-113.5	11.9		B) ded bladder pump
	1113	15.70	2.0	6.61	21.2	1881	0.8	-118.9	10.2		C) non-ded bladder pump; or
	1115	15.70	2.5	6.60	21.1	1862	0.7	-121.4	9.5		*Standard groundwater sample:*
	1117	15.70	3.0	6.59	21.1	1850	0.6	-124.8	8.9		D) bailer due to limited column; or
	1120	15.70	3.5	6.59	21.1	1845	0.6	-127.7	8.2		E) recovery well cycling sample
↓	1123	15.70	4.0	6.60	21.1	1841	0.6	-129.9	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1125	KWB-10R	15.70	6.60	21.1	1841	0.6	-129.9	7.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-131
Event: Spring 2016 (Annual)
Area of Concern: Rest (2in; 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	
4/26/16	1245	NA	22.19	0.0	53.41	38.1	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/27/16	1510	NA	22.13									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	1515	22.14	0.5	6.83	23.4	2150	2.1	-122.0	37.0	Colorless / clear	*Low-flow groundwater sample:*
↓	1517	22.14	1.0	6.71	23.0	2140	1.4	-122.6	23.5	↓	(A) peristaltic pump w/ ded tubing
	1520	22.14	1.5	6.61	22.4	2140	0.9	-123.9	12.3		B) ded bladder pump
	1523	22.14	2.0	6.60	22.4	2130	0.9	-121.8	9.0		C) non-ded bladder pump; or
	1525	22.14	2.5	6.60	22.4	2120	0.9	-122.6	7.3		*Standard groundwater sample:*
	1527	22.14	3.0	6.60	22.4	2120	0.9	-122.9	6.7		D) bailer due to limited column; or
	1530	22.14	3.5	6.58	22.3	2120	0.9	-124.5	6.4		E) recovery well cycling sample
↓	1533	22.14	4.0	6.60	22.3	2120	1.0	-123.2	6.9	↓	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
4/27/16	1535	MW-131	22.14	6.60	22.3	2120	1.0	-123.2	6.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KwB-5
Event: Spring 2016 (Annual)
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	
4/26/16	1300	NA	22.44	0.0	37.68	30.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/27/16	1155	NA	22.43									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	1200	22.45	0.5	6.74	25.4	2840	2.6	-88.9	13.5	Colorless / Clear	*Low-flow groundwater sample:*
	1203	22.47	1.0	6.67	25.1	2850	1.6	-88.5	11.6		(A) peristaltic pump w/ ded tubing
	1205	22.47	1.5	6.63	24.8	2860	1.4	-91.9	9.5		B) ded bladder pump
	1207	22.47	2.0	6.61	24.6	2850	1.3	-92.5	8.9		C) non-ded bladder pump; or
	1210	22.47	2.5	6.59	24.4	2850	1.2	-97.3	8.3		*Standard groundwater sample:*
	1213	22.47	3.0	6.58	24.4	2850	1.2	-97.7	7.7		D) bailer due to limited column; or
	1215	22.47	3.5	6.57	24.3	2850	1.2	-99.2	7.4		E) recovery well cycling sample
	1217	22.47	4.0	6.58	24.2	2850	1.2	-100.2	6.9		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
4/27/16	1220	KwB-5	22.47	6.58	24.2	2850	1.2	-100.2	6.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-111
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in; stickup) Initials: CDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1308	NA	23.60	0.0	40.81	35.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/27/16	1050	NA	23.63									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	1055	~~23.70~~	0.5	6.80	24.6	2880	3.2	25.2	118	colorless / cloudy	*Low-flow groundwater sample:*
	1057	23.71	1.0	6.67	24.5	3030	2.0	22.0	112	↓	(A) peristaltic pump w/ ded tubing
	1100	23.71	1.5	6.59	24.1	3010	1.7	18.3	109	↓	B) ded bladder pump
	1103	23.71	2.0	6.54	23.9	2950	1.5	18.3	76.2	↓	C) non-ded bladder pump; or
	1105	23.71	2.5	6.54	23.8	2910	1.3	16.4	36.2	colorless / clear	*Standard groundwater sample:*
	1107	23.71	3.0	6.52	23.8	2890	1.2	16.3	27.4	↓	D) bailer due to limited column; or
	1110	23.71	3.5	6.53	23.8	2870	1.2	16.0	20.3	↓	E) recovery well cycling sample
	1113	23.71	4.0	6.53	23.8	2860	1.3	12.3	14.7	↓	F) irrigation well grab sample
	1115	23.71	4.5	6.53	23.9	2850	1.3	11.7	10.3	↓	
↓	1117	23.71	5.0	6.53	23.9	2850	1.3	10.1	8.4	↓	

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: ESC Lab Sciences, Mt. Juliet, TN
4/27/16	1120	MW-111	23.71	6.53	23.9	2850	1.3	10.1	8.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-6
Event: Spring 2016 (Annual)
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	
4/26/16	1326	NA	21.73	0.0	36.44	27.4	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/28/16	855	NA	21.70									

Well Purging Record #Absorbent Sock removed by Navajo 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	
4/28/16	900	21.76	0.5	6.93	24.2	2440	1.9	-218.1	8.0	Dark tint / clear / odor	*Low-flow groundwater sample:*
	903	21.77	1.0	6.88	23.7	2490	0.9	-230.6	8.3		(A) peristaltic pump w/ ded tubing
	905	21.77	1.5	6.79	23.4	2480	0.8	-239.3	7.8		B) ded bladder pump
	907	21.77	2.0	6.77	23.2	2460	0.7	-246.4	7.4		C) non-ded bladder pump; or
	910	21.77	2.5	6.74	23.0	2440	0.7	-252.6	7.1		*Standard groundwater sample:*
	913	21.77	3.0	6.74	23.0	2440	0.7	-257.9	6.9		D) bailer due to limited column; or
	915	21.77	3.5	6.73	23.0	2430	0.7	-259.3	6.9		E) recovery well cycling sample
	917	21.77	4.0	6.73	22.9	2430	0.7	-260.9	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
4/28/16	925	KWB-6	21.77	6.73	22.9	2430	0.7	-260.9	7.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-112
Event: Spring 2016 (Annual)
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	
4/26/16	1317	20.62	20.65	0.03	37.54	32.5	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	
			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						*Standard groundwater sample:*
			3.0			≥ 0.03 ft					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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-132
Event: Spring 2016 (Annual)
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	
4/26/16	1354	19.25	19.62	0.37	42.66	NA	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		Not sampled due to well						C) non-ded bladder pump; or
			2.5		having LNAPL thickness						*Standard groundwater sample:*
			3.0		≥ 0.03 ft.						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
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-57
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in) 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	
4/26/16	1402	NA	18.82	0.0	34.32	32.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/27/16	1000	NA	18.89									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	1005	19.02	0.5	7.04	21.9	5080	2.3	156.1	23.4	Colorless / clear	*Low-flow groundwater sample:*
	1007	19.10	1.0	6.84	20.7	5130	1.2	160.4	28.3	↓ ↓	(A) peristaltic pump w/ ded tubing
	1010	19.20	1.5	6.78	20.3	5140	0.8	161.8	37.9	Colorless / sl. cloudy	B) ded bladder pump
	1013	19.23	2.0	6.74	20.2	5140	0.6	162.3	38.1		C) non-ded bladder pump; or
	1015	19.24	2.5	6.72	20.2	5130	0.5	162.9	36.8		*Standard groundwater sample:*
	1017	19.25	3.0	6.70	20.2	5090	0.5	162.6	38.1		D) bailer due to limited column; or
	1020	19.25	3.5	6.69	20.2	5070	0.4	162.0	42.4		E) recovery well cycling sample
	1023	19.26	4.0	6.69	20.2	5060	0.4	161.6	44.0	↓ ↓	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
4/27/16	1025	MW-57	19.26	6.69	20.2	5060	0.4	161.6	44.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

* 1H15 this well was dry, 2H15 was Gauge only. If Sampled, will need tubing to be made.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#11-O
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CaDj

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	
4/26/16	1410	NA	22.16 *	0.0	22.20	NA	Yes	Yes	Yes	Yes		Weather: Sunny, 70's

* may reflect minimal water trapped in well sump/cap @ well bottom... *

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. 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						C) non-ded bladder pump; or
			2.5			Insufficient Water Column					*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-#11-O								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KwB-9
Event: Spring 2016 (Annual)
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	
4/26/16	1415	NM	NM	NM	NM	NA	Yes	# Issue	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			until further notice;					*Low-flow groundwater sample:*
			1.0			Removed b/c of no landowner access, 4/26/16					(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			UNABLE to Access per landowner (Jack Joy)					C) non-ded bladder pump; or
			2.5			(historical obstruction encountered at					*Standard groundwater sample:*
			3.0			15.11 ft TOC)					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-9								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
												If <0.03 feet of PSH present, remove PSH and sample groundwater

* No bladder pump installed IHIS due to limited water column.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12A
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

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

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1423	NA	20.94	0.0	25.03	24.9	Yes	Yes	Yes	Yes		Weather: Sunny, 50's
4/27/16	805	NA	21.01									

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	
4/27/16	810	21.11	0.5	7.06	17.5	3960	5.6	165.8	36.5	colorless / sl. cloudy	*Low-flow groundwater sample:*
	813	21.12	1.0	6.87	17.7	3960	4.5	172.9	20.1	↓	(A) peristaltic pump w/ ded tubing
	815	21.14	1.5	6.79	17.8	3970	4.2	175.8	6.7	colorless / clear	B) ded bladder pump
	817	21.15	2.0	6.75	17.9	3970	4.0	177.8	5.3		C) non-ded bladder pump; or
	820	21.15	2.5	6.73	18.1	3960	4.0	178.6	4.0		*Standard groundwater sample:*
	823	21.16	3.0	6.72	18.1	3960	3.9	179.4	3.6		D) bailer due to limited column; or
	825	21.16	3.5	6.71	18.2	3960	3.9	180.2	3.2		E) recovery well cycling sample
	827	21.17	4.0	6.70	18.2	3970	3.9	180.4	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
4/27/16	830	KWB-12A	21.17	6.70	18.2	3970	3.9	180.4	2.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

* Dedicated bladder pump installed 1H15.

+ EB - Rest - 05
+ Dup - Rest - 05
(both for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KwB-12B
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4in) 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	
4/26/16	1428	NA	20.80	0.0	39.39	35.2	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/27/16	850	NA	20.88									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	855	20.90	0.5	7.14	19.5	3690	4.3	121.8	4.7	Colorless / clear	*Low-flow groundwater sample:*
	857	20.90	1.0	6.94	19.5	3720	3.9	139.1	4.1		A) peristaltic pump w/ ded tubing
	900	20.90	1.5	6.89	19.5	3720	3.8	142.4	3.7		(B) ded bladder pump
	903	20.90	2.0	6.82	19.5	3750	3.8	147.8	3.2		C) non-ded bladder pump; or
	905	20.90	2.5	6.80	19.6	3750	3.7	149.9	3.8		*Standard groundwater sample:*
	907	20.90	3.0	6.77	19.6	3770	3.7	152.6	3.4		D) bailer due to limited column; or
	910	20.90	3.5	6.76	19.6	3780	3.6	154.7	3.1		E) recovery well cycling sample
	913	20.90	4.0	6.76	19.7	3770	3.6	155.7	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
4/27/16	915	KwB-12B	20.90	6.76	19.7	3770	3.6	155.7	2.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
4/27/16	935	EB-Rest-05	NA							same as above	same	same
4/27/16	800	Dup-Rest-05	20.90	6.76	19.7	3770	3.6	155.7	2.9	same as above	same	same

If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-2R
Event: Spring 2016 (Annual)
Area of Concern: Rest

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	
4/26/16	1458	NA	21.35	0.0	~~39.41~~	32.4	Yes	Yes	Yes	Yes		Weather: SUNNY, 80's
4/28/16	1655		21.27									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1700	21.55	0.5	7.00	24.5	3250	2.6	-185.1	>200	colorless / cloudy / odor	*Low-flow groundwater sample:*
	1703	21.59	1.0	6.90	24.2	3270	1.6	-184.7	32.4	colorless / clear / odor	(A) peristaltic pump w/ ded tubing
	1705	21.60	1.5	6.84	24.0	3270	1.4	-185.6	12.4		B) ded bladder pump
	1707	21.60	2.0	6.80	23.8	3280	1.3	-188.4	6.5		C) non-ded bladder pump; or
	1710	21.60	2.5	6.79	23.6	3280	1.2	-189.9	5.7		*Standard groundwater sample:*
	1713	21.60	3.0	6.78	23.4	3290	1.2	-191.9	5.5		D) bailer due to limited column; or
	1715	21.60	3.5	6.78	23.4	3290	1.2	-192.6	5.2		E) recovery well cycling sample
	1717	21.60	4.0	6.78	23.4	3290	1.2	-193.4	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1725	KWB-2R	21.60	6.78	23.4	3290	1.2	-193.4	5.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-58
Event: Spring 2016 (Annual)
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	
4/26/16	1505	NA	20.35	0.0	33.06	25.6	Yes	Yes	Yes	Yes		Weather: SUNNY, 80's
4/28/16	1750	NA	20.41									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1755	20.45	0.5	6.79	23.6	2340	2.5	-209.1	16.2	Colorless/clear/odor	*Low-flow groundwater sample:*
	1757	20.46	1.0	6.71	22.1	2380	1.0	-228.2	13.8		(A) peristaltic pump w/ ded tubing
	1800	20.46	1.5	6.71	21.8	2290	0.8	-235.9	9.9		B) ded bladder pump
	1803	20.46	2.0	6.70	21.5	2270	0.6	-243.2	7.4		C) non-ded bladder pump; or
	1805	20.46	2.5	6.70	21.3	2260	0.6	-250.9	7.0		*Standard groundwater sample:*
	1807	20.46	3.0	6.71	21.3	2260	0.6	-255.5	6.6		D) bailer due to limited column; or
	1810	20.46	3.5	6.71	21.2	2260	0.5	-259.1	6.1		E) recovery well cycling sample
	1813	20.46	4.0	6.70	21.2	2250	0.5	-261.1	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
4/28/16	1820	MW-58	20.46	6.70	21.2	2250	0.5	-261.1	5.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
												If <0.03 feet of PSH present, remove PSH and sample groundwater

*HMI installed dedicated bladder Pump 1H15 (Re-found and marked, Per ARCADIS 4.9.15)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-13
Event: Spring 2016 (Annual)
Area of Concern: Rest (Cross-Gradient) (2inj 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	
4/26/16	1441	NA	25.00	0.0	33.10	30.1	Yes	Yes	Yes	Yes		Weather: Sunny, 80's
4/28/16	1550	NA	24.95									

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	
4/28/16	1555	24.98	0.5	7.25	24.3	3660	4.0	43.3	71.4	Colorless / cloudy	*Low-flow groundwater sample:*
	1557	24.98	1.0	7.10	20.3	3770	3.2	52.8	>200		A) peristaltic pump w/ ded tubing
	1600	24.98	1.5	6.99	18.8	3850	3.2	60.9	>200		(B) ded bladder pump
	1603	24.98	2.0	6.92	18.5	3860	3.1	66.1	>200		C) non-ded bladder pump; or
	1605	24.98	2.5	6.89	18.5	3860	3.2	69.6	>200		*Standard groundwater sample:*
	1607	24.98	3.0	6.88	18.5	3870	3.2	71.6	>200		D) bailer due to limited column; or
	1610	24.98	3.5	6.85	18.5	3870	3.3	73.9	>200		E) recovery well cycling sample
	1613	24.98	4.0	6.83	18.5	3880	3.3	75.1	>200		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (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
4/28/16	1620	KWB-13	24.98	6.83	18.5	3880	3.3	75.1	>200	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Additional Safe Work Permit issued by Darlene Veenan (during sign-in at South Central Room 4-26-16 Banging

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-103
Event: Spring 2016 (Annual)
Area of Concern: Rest (4in j 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	
4/26/16	1212	NP	16.75	0.0	25.22	22.2	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/28/16	915	NP	16.80	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		
4/28/16	925	16.92	0.5	7.00	28.9	31,300	1.5	-273.0	4.8	colorless	clear	*Low-flow groundwater sample:*
	927	16.98	1.0	6.97	28.8	32,300	1.5	-287.7	4.4			(A) peristaltic pump w/ ded tubing
	930	17.04	1.5	6.95	28.7	32,600	1.5	-291.6	3.9			B) ded bladder pump
	932	17.08	2.0	6.93	28.7	33,000	1.4	-298.7	3.7			C) non-ded bladder pump; or
	935	17.12	2.5	6.92	28.8	33,100	1.4	-301.3	3.7			*Standard groundwater sample:*
	937	17.15	3.0	6.91	28.8	33,200	1.3	-302.1	3.5			D) bailer due to limited column; or
	940	17.18	3.5	6.91	28.8	33,200	1.3	-302.6	3.4			E) recovery well cycling sample
	942	17.21	4.0	6.91	28.8	33,200	1.3	-302.9	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	
4/28/16	945	MW-103	17.21	6.91	28.8	33,200	1.3	-302.9	3.4	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
									SM	VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~		~~HNO3~~	~~6010/6020 and/or 7470~~		
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~		~~HNO3~~	~~Field filtered 0.45-u~~		
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	12 bottles total
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

See SafeWork Permit note on MW-103

(Historical infrastructure has been removed from well area)

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

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-104
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4 in) stick up)

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	
4/26/16	1227	NP	15.90	0.0	21.97	19.0	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/28/16	1025	NP	15.94	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	
4/28/16	1030	16.08	0.5	7.12	23.0	1550	1.4	-338.2	5.3	colorless / clear	*Low-flow groundwater sample:*
	1032	16.14	1.0	7.11	22.8	1457	1.3	-340.0	5.3		(A) peristaltic pump w/ ded tubing
	1035	16.20	1.5	7.10	22.7	1422	1.3	-341.9	5.3		B) ded bladder pump
	1037	16.25	2.0	7.09	22.6	1409	1.3	-342.5	5.2		C) non-ded bladder pump; or
	1040	16.30	2.5	7.09	22.5	1406	1.2	-343.9	5.2		*Standard groundwater sample:*
	1042	16.33	3.0	7.08	22.3	1404	1.2	-344.5	5.1		D) bailer due to limited column; or
	1045	16.36	3.5	7.08	22.2	1403	1.2	-345.1	5.1		E) recovery well cycling sample
↓	1047	16.34	4.0	7.08	22.2	1401	1.2	-345.5	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
4/28/16	1050	MW-104	16.39	7.08	22.2	1401	1.2	-345.5	5.1	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1105	EB-Rest-02	NA							Same as above	Same	Same
↓	900	Dup-Rest-02	16.39	7.08	22.2	1401	1.2	-345.5	5.1	Same as above	Same	Same

12 bottles
12 bottles
12 bottles

If <0.03 feet of PSH present, remove PSH and sample groundwater

See Safe-Work Permit note on MW-103

Non-dedicated tube to stretch outside of berm

Navajo absorbent sock in well. Replaced after sampling

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-64 (Inside berm)
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4in; stickup)

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1233	NP	18.13	0.0	34.08	28.6	Yes	Yes	Yes	Yes	Navajo	Weather: 70s, windy
4/28/16	1130	NP	17.89	0.0							removed	

Well Purging Record

* Needed to stretch tube over berm

absorbent sock ~3 hrs before 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	
4/28/16	1140	18.08	0.5	7.12	30.9	2630	1.7	-297.0	6.4	colorless / clear / odor	*Low-flow groundwater sample:*
↓	1142	18.19	1.0	7.03	30.6	2650	1.6	-302.9	6.4	↓ ↓ ↓	(A) peristaltic pump w/ ded tubing
	1145	18.23	1.5	6.99	30.6	2660	1.6	-307.4	5.9		B) ded bladder pump
	1147	18.25	2.0	6.96	30.7	2670	1.5	-309.5	5.7		C) non-ded bladder pump; or
	1150	18.26	2.5	6.95	30.6	2680	1.5	-311.4	5.4		*Standard groundwater sample:*
	1152	18.27	3.0	6.95	30.5	2680	1.5	-312.4	5.2		D) bailer due to limited column; or
	1155	18.28	3.5	6.94	30.4	2680	1.5	-312.9	5.2		E) recovery well cycling sample
↓	1157	18.29	4.0	6.94	30.4	2680	1.5	-313.2	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
4/28/16	1200	MW-64	18.29	6.94	30.4	2680	1.5	-313.2	5.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	SM4500 (2 bottles)
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Non-dedicated tubc

Navajo absorbent sock removed by Navajo to facilitate sampling

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-65
Event: Spring 2016 (Annual)
Area of Concern: Rest (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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1140	NP	14.14	0.0	28.78	23.8	Yes	Yes	Yes	Yes	Navajo	Weather: Windy, 70s
4/28/16	1445	NP	14.12	0.0							removed	

Well Purging Record

absorbent sock in 3 hrs 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	
4/28/16	1455	14.13	0.5	6.91	27.7	2370	2.16	-190.6	13.1	colorless / clear / odor	Low-flow groundwater sample:
↓	1457	14.14	1.0	6.87	27.2	2380	2.4	-194.8	11.7	↓ ↓ ↓	(A) peristaltic pump w/ ded tubing
	1500	14.14	1.5	6.86	27.0	2380	2.3	-195.9	11.2		B) ded bladder pump
	1502	14.14	2.0	6.85	26.9	2380	2.1	-196.3	10.9		C) non-ded bladder pump; or
	1505	14.14	2.5	6.85	26.8	2380	2.0	-196.1	10.8		Standard groundwater sample:
	1507	14.14	3.0	6.85	26.7	2380	1.9	-196.2	10.1		D) bailer due to limited column; or
	1510	14.14	3.5	6.84	26.7	2380	1.9	-196.3	9.9		E) recovery well cycling sample
↓	1512	14.14	4.0	6.85	26.7	2380	1.9	-196.3	9.9	↓ ↓ ↓	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
4/28/16	1515	MW-65	14.14	6.85	26.7	2380	1.9	-196.3	9.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Active Recovery Well
(Sample by connecting to port discharge barb, when sampled)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[* measure to top of guide pipe]

Well: RW-5R
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Active RW; above grade vault 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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1305	14.87	14.89	0.02	NM b/c	24.0	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/28/16	1545				pumps/tubing/cables in well							

(Formerly 35.30)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/28/16	1550	NM	0.5	Active Recovery Well							*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	Grab sample collected following 4-Liter purge							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	
4/28/16	1600	RW-5R	NM	8.49	35.7	1128	1.7	-304.8	4.6	DRO	HCL	8015M	3
										~~GRO~~	~~HCL~~	~~8015M~~	
										VOC	HCL	8260	2
Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)											HNO3	6010/6020	1
Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)											HNO3	Field filtered 0.45-u	1
~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~											~~HNO3~~	~~6010/6020 and/or 7470~~	
~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~											~~HNO3~~	~~Field filtered 0.45-u~~	
Anions (Chloride,Fluoride,Sulfate)											Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	10 bottles

If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-102
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: SLH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1320	NP	13.65	0.0	26.45	21.3	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/28/16	1620	NP	13.63	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	
4/28/16	1625	13.66	0.5	6.93	26.2	2210	1.9	-296.1	9.1	colorless / clear	*Low-flow groundwater sample:*
	1627	13.66	1.0	6.88	25.8	2270	1.7	-305.3	9.1		(A) peristaltic pump w/ ded tubing
	1630	13.66	1.5	6.85	25.3	2300	1.6	-312.7	9.0		B) ded bladder pump
	1632	13.66	2.0	6.84	25.1	2300	1.5	-315.0	8.9		C) non-ded bladder pump; or
	1635	13.66	2.5	6.84	24.9	2310	1.5	-317.5	8.9		*Standard groundwater sample:*
	1637	13.66	3.0	6.83	24.9	2310	1.5	-318.5	8.7		D) bailer due to limited column; or
	1640	13.66	3.5	6.83	24.9	2310	1.5	-319.2	8.7		E) recovery well cycling sample
	1642	13.66	4.0	6.83	24.9	2310	1.5	-319.4	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: ESC Lab Sciences, Mt. Juliet, TN	
4/28/16	1645	MW-102	13.66	6.83	24.9	2310	1.5	-319.4	8.6	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	SM4500	1 (2 bottles)
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

[Active RW] in doghouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-4
Event: Spring 2016 (Annual)
Area of Concern: RCRA

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

* Gauged and sampled through labeled guide tube

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1327	NP	12.09	0.0	36.62	31.16	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/28/16	1800	NP	12.07	0.0								

Well Purging Record * Sampled via narrow-diam guide tube, preventing 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	
4/28/16	1810	NM*	0.5	7.18	27.1	2690	2.5	-236.9	10.8	colorless/clear/slight odor	Low-flow groundwater sample:
	1812		1.0	7.14	26.7	2730	2.6	-251.6	9.7		(A) peristaltic pump w/ ded tubing
	1815		1.5	7.11	26.7	2740	2.7	-262.7	9.4		B) ded bladder pump
	1817		2.0	7.10	26.1	2750	2.7	-266.5	9.4		C) non-ded bladder pump; or
	1820		2.5	7.09	26.0	2760	2.6	-270.1	9.1		Standard groundwater sample:
	1822		3.0	7.09	25.7	2760	2.6	-275.2	9.1		D) bailer due to limited column; or
	1825		3.5	7.08	25.5	2760	2.5	-278.7	9.0		E) recovery well cycling sample
	1827		4.0	7.08	25.4	2770	2.5	-280.2	9.0		F) irrigation well grab sample

Well Sampling Record * Gauged/Sampled inserting poly tube through narrow-diameter guide tube, prohibiting draw-down meas.

Date	Time	Sample I.D.	Depth to Water (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
4/28/16	1830	RW-4	NM*	7.08	25.6	2770	2.5	-280.2	9.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~ 10 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-6 [Active RW] in doghouse
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

* Gauged and sampled through labeled 1-inch guide tube (back-side) Initials: SCY

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1323	13.82	13.83	0.01	34.90	30.0	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/28/16	1715	13.80	13.81	0.01								

Well Purging Record * Narrow-diameter guide tube prevented 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	
4/28/16	1720	NM*	0.5	6.85	26.6	2480	2.4	-159.9	9.3	(c)olorless/(c)lear/sl. odor	Low-flow groundwater sample:
↓	1722	↓	1.0	6.79	26.1	2490	2.2	-167.4	7.1	↓ ↓ ↓	(A) peristaltic pump w/ ded tubing
	1725		1.5	6.77	26.0	2490	2.1	-172.5	5.7		B) ded bladder pump
	1727		2.0	6.75	25.9	2490	2.1	-176.3	4.9		C) non-ded bladder pump; or
	1730		2.5	6.73	25.7	2490	2.0	-181.7	4.5		Standard groundwater sample:
	1732		3.0	6.73	25.6	2480	2.0	-185.9	4.3		D) bailer due to limited column; or
	1735		3.5	6.73	25.6	2480	2.0	-186.6	4.3		E) recovery well cycling sample
↓	1737	↓	4.0	6.72	25.5	2480	2.0	-187.0	4.2	↓ ↓ ↓	F) irrigation well grab sample

Well Sampling Record **Sampled by inserting Poly tubing into narrow diameter (1-inch guide tube (low flow)

Date	Time	Sample I.D.	Depth to Water (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	
4/28/16	1740	RW-6	NM*	6.72	25.5	2480	2.0	-187.0	4.2	DRO	HCL	8015M	3
										~~GRO~~	~~HCL~~	~~8015M~~	
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	10 bottles

If <0.03 feet of PSH present, remove PSH and sample groundwater

* Position marked on fence w/ survey flagging, b/c surface dirt will obscure at-grade plate!!

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-99
Event: Spring 2016 (Annual)
Area of Concern: Rest

position marked on chain-link fence 4' North of fence (4in) at-grade

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH/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	
4/26/16	1405	NP	15.98	0.0	27.80	22.8	Yes	Yes	Yes	Yes		Weather: 70s, windy
4-29-16	820	NP	16.18	0.0	27.80	22.8						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	
4-29-16	825	16.26	0.5	6.88	20.1	2420	3.5	-283.6	28.1	Clear w/ black particles	*Low-flow groundwater sample:*
	828	16.28	1.0	6.86	20.1	2320	2.2	-301.4	22.4		(A) peristaltic pump w/ ded tubing
	830	16.29	1.5	6.86	20.1	2300	1.0	-305.8	19.7		B) ded bladder pump
	833	16.30	2.0	6.86	20.2	2290	0.9	-311.2	19.2		C) non-ded bladder pump; or
	835	16.30	2.5	6.85	20.2	2290	0.8	-314.8	18.6		*Standard groundwater sample:*
	838	16.30	3.0	6.85	20.3	2280	0.7	-316.1	18.4		D) bailer due to limited column; or
	840	16.30	3.5	6.84	20.4	2280	0.7	-316.9	18.7		E) recovery well cycling sample
↓	843	16.30	4.0	6.84	20.4	2280	0.6	-318.2	19.3	↓	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
4-29-16	845	MW-99	16.30	6.84	20.4	2280	0.6	-318.2	19.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet of PSH present, remove PSH and sample groundwater		

* Trip Blank - REST-04
4-29-16

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-66
Event: Spring 2016 (Annual)
Area of Concern: REST

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

Well Inspection Information

(4in; at-grade)

Date	Time	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
4/26/16	1415	NP	14.89	0.0	29.80	24.6	Yes	Yes	Yes	Yes		Weather: 70s, windy
4-29-16	915	NP	15.06	0.0								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	
4-29-16	920	15.21	0.5	7.17	20.2	1675	2.4	-218.7	48.1	SI- cloudy	*Low-flow groundwater sample:*
	923	15.27	1.0	7.01	20.0	1650	0.9	-222.8	28.7	↓	(A) peristaltic pump w/ ded tubing
	925	15.29	1.5	6.98	19.9	1642	0.5	-224.3	22.9	↓	B) ded bladder pump
	928	15.31	2.0	6.96	19.9	1639	0.4	-225.9	17.5	clear	C) non-ded bladder pump; or
	930	15.32	2.5	6.94	19.9	1636	0.4	-226.9	15.2		*Standard groundwater sample:*
	933	15.32	3.0	6.92	19.9	1627	0.4	-227.5	14.0		D) bailer due to limited column; or
	935	15.32	3.5	6.91	19.9	1623	0.4	-228.3	13.3		E) recovery well cycling sample
↓	938	15.32	4.0	6.90	19.9	1620	0.4	-228.9	13.7	↓	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	
4-29-16	940	MW-66	15.32	6.90	19.9	1620	0.4	-228.9	13.7	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓ (see above)	
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓ (see above)	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500 ✓	1
													13 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-28
Event: Spring 2016 (Annual)
Area of Concern: REST

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

Well Inspection Information (6in) Stickup through berm) No protective casing/pad unable to lock

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/28/16	1424	NP	20.24	0.0	34.55	30.2	Yes	Issue	Issue	Yes		Weather: 70s, windy
4.29.16	1000	NP	20.41	0.0	34.55	30.2						Sunny, windy, 70s

↳ 6" PVC (shattered at top w/ 0.65' 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	
4.29.16	1005	20.47	0.5	7.10	21.4	2910	2.4	-330.1	14.5	clear, odor, black tint	*Low-flow groundwater sample:*
	1008	20.52	1.0	6.93	21.0	2990	0.8	-352.8	8.0		(A) peristaltic pump w/ ded tubing
	1010	20.56	1.5	6.91	21.1	3000	0.5	-358.0	4.2		B) ded bladder pump
	1013	20.60	2.0	6.90	21.1	2990	0.4	-364.2	2.9		C) non-ded bladder pump; or
	1015	20.64	2.5	6.89	21.1	2980	0.4	-366.5	2.0		*Standard groundwater sample:*
	1018	20.67	3.0	6.89	21.2	2980	0.4	-369.1	1.7		D) bailer due to limited column; or
	1020	20.70	3.5	6.88	21.2	2960	0.4	-370.2	1.4		E) recovery well cycling sample
	1023	20.72	4.0	6.87	21.2	2960	0.4	-371.4	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	
4.29.16	1025	MW-28	20.72	6.87	21.2	2960	0.4	-371.4	1.2	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓ See above	
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓ See above	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500 ✓	1
													13 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-59
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: SCM / 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	
4/26/16	1435	NP	6.84	0.0	32.72	25.3	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/29/16	950	NA	6.96	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	
4/29/16	955	6.99	0.5	7.04	21.8	3266	2.9	-243.8	19.5	Clear	*Low-flow groundwater sample:*
	957	6.99	1.0	6.98	21.4	3190	2.5	-244.1	16.9		(A) peristaltic pump w/ ded tubing
	1000	6.99	1.5	6.95	21.2	3140	1.8	-243.4	8.2		B) ded bladder pump
	1002	6.99	2.0	6.94	21.2	3110	1.7	-243.1	7.4		C) non-ded bladder pump; or
	1005	6.99	2.5	6.93	21.3	3100	1.7	-243.0	6.8		*Standard groundwater sample:*
	1007	6.99	3.0	6.93	21.3	3100	1.6	-243.2	6.5		D) bailer due to limited column; or
	1010	6.99	3.5	6.93	21.3	3090	1.6	-243.5	6.1		E) recovery well cycling sample
↓	1012	6.99	4.0	6.93	21.3	3090	1.6	-243.7	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: ESC Lab Sciences, Mt. Juliet, TN	
4/29/16	1015	MW-59	6.99	6.93	21.3	3090	1.6	-243.7	5.9	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													12
												If <0.03 feet of PSH present, remove PSH and sample groundwater	

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

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-60
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4 inj stickup) Initials: SCH/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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1447	NP	8.17	0.0	37.78	26.7	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/29/16	800	NA	8.30	0.0								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	
4/29/16	805	8.47	0.5	6.86	19.1	3520	2.1	-200.3	8.2	Clear	*Low-flow groundwater sample:*
	807	8.53	1.0	6.88	19.2	3530	1.7	-238.6	7.5		(A) peristaltic pump w/ ded tubing
	810	8.58	1.5	6.89	19.2	3530	1.4	-257.6	6.9		B) ded bladder pump
	812	8.59	2.0	6.90	19.3	3540	1.2	-267.6	6.4		C) non-ded bladder pump; or
	815	8.60	2.5	6.92	19.3	3540	1.2	-269.3	6.1		*Standard groundwater sample:*
	817	8.60	3.0	6.93	19.3	3556	1.1	-270.5	5.7		D) bailer due to limited column; or
	820	8.60	3.5	6.93	19.3	3560	1.1	-272.3	5.4		E) recovery well cycling sample
	822	8.60	4.0	6.93	19.3	3560	1.1	-273.1	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: ESC Lab Sciences, Mt. Juliet, TN	
4/29/16	825	MW-60	8.60	6.93	19.3	3560	1.1	-273.1	5.4	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
										Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)	HNO3	6010/6020	1
										Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u	1
										Total Metals (Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470 ✓	See above
										Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u ✓	See above
										Anions (Chloride,Fluoride,Sulfate)	Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500✓	1
	910	EB-Rest-04	NA							Same as above	Same as above	Same	13 bottles
	1000	Dup-Rest-04	8.60	6.93	19.3	3560	1.1	-273.1	5.4	Same as above	Same as above	Same	

If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-107
Event: Spring 2016 (Annual)
Area of Concern: Rest (4 inj at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM / 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	
4/26/16	1505	NP	10.13	0.0	19.05	17.1	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/29/16	1040	NA	10.25	0.0								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	
4/29/16	1045	10.42	0.5	7.28	21.3	2080	1.9	-172.3	8.6	Clear	*Low-flow groundwater sample:*
	1047	10.50	1.0	7.18	21.2	2010	1.7	-190.9	7.4		(A) peristaltic pump w/ ded tubing
	1050	10.55	1.5	7.15	20.9	1997	1.5	-199.7	6.3		B) ded bladder pump
	1052	10.58	2.0	7.13	20.7	1976	1.4	-206.1	5.8		C) non-ded bladder pump; or
	1055	10.62	2.5	7.11	20.5	1971	1.3	-210.0	5.2		*Standard groundwater sample:*
	1057	10.64	3.0	7.10	20.5	1961	1.3	-213.4	4.9		D) bailer due to limited column; or
	1100	10.66	3.5	7.09	20.5	1958	1.3	-214.6	4.7		E) recovery well cycling sample
↓	1102	10.71	4.0	7.08	20.5	1958	1.2	-216.3	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	
4/29/16	1105	MW-107	10.71	7.08	20.5	1958	1.2	-216.3	4.5	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													12
												If <0.03 feet of PSH present, remove PSH and sample groundwater	

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-128
Event: Spring 2016 (Annual)
Area of Concern: Rest (2 inj at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCH/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	
4/26/16	1516	NP	12.92	0.0	35.35	25.4	Yes	Yes	Yes	Yes		Weather: 70s, windy
4.29.16	1100	NP	13.12	0.0	35.35	25.4						Sunny, windy, 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	
4.29.16	1105	13.15	0.5	7.12	21.4	2340	3.0	-204.9	25.8	sl. cloudy	*Low-flow groundwater sample:*
↑	1108	13.15	1.0	6.95	21.1	2350	1.0	-205.2	24.1	↓	(A) peristaltic pump w/ ded tubing
|	1110	13.15	1.5	6.90	21.2	2350	0.7	-206.0	16.5	Clear	B) ded bladder pump
|	1113	13.15	2.0	6.85	21.1	2350	0.5	-206.6	14.0	|	C) non-ded bladder pump; or
|	1115	13.15	2.5	6.83	21.1	2340	0.5	-206.8	12.9	|	*Standard groundwater sample:*
|	1118	13.15	3.0	6.81	21.0	2340	0.5	-207.0	10.1	|	D) bailer due to limited column; or
|	1120	13.15	3.5	6.80	21.0	2340	0.5	-207.1	9.8	|	E) recovery well cycling sample
↓	1123	13.15	4.0	6.80	21.0	2340	0.5	-206.9	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	
4.29.16	1125	MW-128	13.15	6.80	21.0	2340	0.5	-206.9	9.4	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													12 bot YES
												If <0.03 feet of PSH present, remove PSH and sample groundwater	

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-125
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in; stickup)

Initials: SCL/MDB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1525	NP	8.95	0.0	28.31	23.5	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/29/16	830	NP	9.15	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	
4/29/16	835	9.21	0.5	6.28	19.6	4420	2.1	144.7	24.0	Clear	*Low-flow groundwater sample:*
	837	9.21	1.0	6.31	19.5	4400	1.6	138.0	13.6		(A) peristaltic pump w/ ded tubing
	840	9.21	1.5	6.34	19.3	4380	1.4	129.0	10.3		B) ded bladder pump
	842	9.21	2.0	6.39	19.2	4350	1.2	124.5	9.7		C) non-ded bladder pump; or
	845	9.21	2.5	6.43	19.1	4370	1.2	120.4	5.4		*Standard groundwater sample:*
	847	9.21	3.0	6.46	19.1	4370	1.2	118.1	4.2		D) bailer due to limited column; or
	850	9.21	3.5	6.48	19.0	4360	1.3	116.1	3.6		E) recovery well cycling sample
	852	9.21	4.0	6.50	19.1	4400	1.3	115.7	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: ESC Lab Sciences, Mt. Juliet, TN
4/29/16	855	MW-125	9.21	6.50	19.1	4400	1.3	115.7	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			HNO_3	6010/6020 and/or 7470
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			HNO_3	Field filtered 0.45-u
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-116
Event: Spring 2016 (Annual)
Area of Concern: Rest Area flooded in past events...)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2in; stickup)

Initials: SLH/MOB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1545	NP	8.95	0.0	27.63	20.0	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/29/16	920		9.03									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/29/16	925	9.05	0.5	7.26	18.8	4590	3.3	122.3	77.8	SL Cloudy	*Low-flow groundwater sample:*
	927	9.05	1.0	7.09	18.7	4610	2.1	126.3	75.9		(A) peristaltic pump w/ ded tubing
	930	9.05	1.5	7.00	18.6	4630	1.4	130.3	73.8		B) ded bladder pump
	932	9.05	2.0	6.92	18.9	4660	1.0	134.5	64.5		C) non-ded bladder pump; or
	935	9.05	2.5	6.86	18.5	4670	1.0	138.5	68.7		*Standard groundwater sample:*
	937	9.05	3.0	6.82	18.4	4660	1.0	142.1	63.6		D) bailer due to limited column; or
	940	9.05	3.5	6.79	18.4	4650	1.0	145.0	6.4		E) recovery well cycling sample
	942	9.05	4.0	6.75	18.4	4650	1.0	145.8	64.9		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	
4/29/16	945	MW-116	9.05	6.75	18.4	4650	1.0	145.8	64.9	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													12
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

60ml 125

*N. side of dirt road) in line with last row of Pecan trees; position marked on fence with survey flagging (and labeled on fence-pole)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-46R
Event: Spring 2016 (Annual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM/MWD

Well Inspection Information

(2in; at-grade)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/16	1555	NP	5.28	0.0	19.36	14.1	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/29/16	1010	NP	5.26	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	
4/29/16	1015	5.28	0.5	7.18	21.3	3880	3.7	95.4	25.7	Clear	*Low-flow groundwater sample:*
	1017	5.28	1.0	6.98	21.1	3890	2.1	97.1	24.3		(A) peristaltic pump w/ ded tubing
	1020	5.28	1.5	6.86	21.0	3900	1.7	99.9	23.7		B) ded bladder pump
	1022	5.28	2.0	6.78	20.9	3910	1.5	103.6	22.1		C) non-ded bladder pump; or
	1025	5.28	2.5	6.75	20.8	3930	1.5	105.8	20.7		*Standard groundwater sample:*
	1027	5.28	3.0	6.73	20.7	3930	1.4	108.0	19.8		D) bailer due to limited column; or
	1030	5.28	3.5	6.72	20.7	3940	1.4	107.9	19.1		E) recovery well cycling sample
	1032	5.28	4.0	6.71	20.7	3960	1.4	107.8	18.3		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	
4/29/16	1035	MW-46R	5.28	6.71	20.7	3960	1.4	107.8	18.3	DRO	HCL	8015M	3
										~~GRO~~	~~HCL~~	~~8015M~~	
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													10 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

- BTB ATV in 1H15
- MDB ATV in 2H15
(S. Field Reject RO)

ATV everytime (S. Field Reject RO)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-115
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2in; stickup)

Initials: SCH gauging

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	
4/26/16	1604	NP	5.12	0.0	27.50	19.8	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/29/16	825	NP	5.49	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	
4/29/16	830	5.53	0.5	7.09	17.6	5173	3.1	-100.8	3.2	Clear	*Low-flow groundwater sample:*
	833	5.54	1.0	6.81	17.3	5270	2.6	-124.6	2.9	"	(A) peristaltic pump w/ ded tubing
	835	5.54	1.5	6.75	17.3	5298	1.5	-131.4	2.5	"	B) ded bladder pump
	838	5.54	2.0	6.73	17.2	5314	1.0	-135.2	2.2	"	C) non-ded bladder pump; or
	840	5.54	2.5	6.71	17.2	5321	0.8	-138.4	2.0	"	*Standard groundwater sample:*
	843	5.54	3.0	6.70	17.2	5326	0.7	-140.1	1.9	"	D) bailer due to limited column; or
	845	5.54	3.5	6.70	17.3	5329	0.7	-141.0	1.7	"	E) recovery well cycling sample
↓	848	5.54	4.0	6.69	17.3	5332	0.6	-141.3	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: ESC Lab Sciences, Mt. Juliet, TN	
4/29/16	850	MW-115	5.54	6.69	17.3	5332	0.6	-141.3	1.7	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	1
													13 bottles
												If <0.03 feet of PSH present, remove PSH and sample groundwater	

• BTB ATV in 1H15
• MDB ATV in 2H15
(S. Field Reject RO)

ATV everytime
Extreme wetlands grass vegetation across entire area

[Walked bridge of wood arrangal in 2H14, Needed to stretch tube ~25' across water-filled trench]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-114
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2in) stick up

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1617	NA	4.92	0.0	38.24	30.5	Yes	Yes	Yes	Yes		Weather: Sunny 70's
4/29/16	920	NA	4.97	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	
4/29/16	925	5.01	0.5	7.46	18.8	3715	2.6	61.7	18.1	Clear	*Low-flow groundwater sample:*
	928	5.01	1.0	6.82	18.8	3861	1.8	56.3	10.3	"	(A) peristaltic pump w/ ded tubing
	930	5.01	1.5	6.41	18.7	3894	1.5	43.8	9.1	"	B) ded bladder pump
	933	5.01	2.0	6.27	18.7	3906	1.2	39.4	8.6	"	C) non-ded bladder pump; or
	935	5.01	2.5	6.21	18.7	3911	0.9	36.3	8.1	"	*Standard groundwater sample:*
	938	5.01	3.0	6.19	18.7	3914	0.8	34.9	7.9	"	D) bailer due to limited column; or
	940	5.01	3.5	6.17	18.7	3916	0.7	33.7	7.8	"	E) recovery well cycling sample
↓	943	5.01	4.0	6.16	18.7	3917	0.7	33.5	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	
4/29/16	945	MW-114	5.01	6.16	18.7	3917	0.7	33.5	7.8	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	SM4500	12 bottles

If <0.03 feet of PSH present, remove PSH and sample groundwater

[Tool company locks Gate at 5:00 PM !!]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Ded. tube bagged and stored in vault]

Well: RW-#15C
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SLM

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1700	14.59	14.63	0.04	22.30	20.0	Yes	Yes	Yes	Yes		Weather: 70s, windy
				(double-checked)					(setup as recovery well in below-grade vault)			

(LNAPL has been present in historical events)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
		NM*	0.5								*Low-flow groundwater sample:*
		*Not	1.0						1		(A) peristaltic pump w/ ded tubing
		able to	1.5		NO SAMPLE;		LNAPL > 0.03				B) ded bladder pump
		monitor	2.0								C) non-ded bladder pump; or
		drawdown	2.5								*Standard groundwater sample:*
		due to	3.0								D) bailer due to limited column; or
		limited hole	3.5								E) recovery well cycling sample
		in flange	4.0								F) irrigation well grab sample
		(Not enough room for both tube and gauging probe)									

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (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-#15C								DRO	HCL	8015M	3
										~~GRO~~	~~HCL~~	~~8015M~~	
										VOC	HCL	8260	2
										Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)	HNO3	6010/6020	1
										Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u	1
										~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~	
										~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~	
										Anions (Chloride,Fluoride,Sulfate)	Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	10 bottles

If <0.03 feet of PSH present, remove PSH and sample groundwater

Tool company locks Gate @ 5:00 PM !!

* At-grade Completion destroyed, as in 2H14. Needs new pad and canister.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-48
Event: Spring 2016 (Annual)
Area of Concern: Rest (2in) 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	
4/26/16	1705	NP	16.95	0.0	32.00	26.9	Yes	Yes	* Issue	Yes		Weather: 70s, windy
4/27/16	1455	NP	16.92	0.0								

Well Purging Record

* Needs new pad/at-grade canister & plate installation !

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	1505	17.23	0.5	6.73	28.2	4010	1.5	-367.2	29.1	SL. cloudy, black tint,	*Low-flow groundwater sample:*
	1507	17.29	1.0	6.75	27.5	4310	1.5	-324.9	24.0	& odor	(A) peristaltic pump w/ ded tubing
	1510	17.32	1.5	6.76	27.3	4350	1.5	-329.2	21.9	clear, black tint	B) ded bladder pump
	1512	17.33	2.0	6.76	27.2	4390	1.5	-333.1	21.4	& odor	C) non-ded bladder pump; or
	1515	17.33	2.5	6.75	27.0	4410	1.5	-336.3	19.4		*Standard groundwater sample:*
	1517	17.33	3.0	6.75	26.9	4430	1.6	-338.6	17.1		D) bailer due to limited column; or
	1520	17.33	3.5	6.75	26.8	4430	1.6	-339.8	17.0		E) recovery well cycling sample
	1522	17.33	4.0	6.75	26.8	4430	1.6	-339.9	16.8		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	
4/27/16	1525	MW-48	17.33	6.75	26.8	4430	1.6	-339.9	16.8	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													12 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-130
Event: Spring 2016 (Annual)
Area of Concern: Rest (2in) 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	
4/26/16	1720	NP	19.04	0.0	45.00	37.4	Yes	Yes	Yes	Yes		Weather: 70s windy
4/27/16	1705	NP	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	
4/27/16	1710	19.08	0.5	7.08	25.7	3090	2.2	-35.4	49.3	sl. cloudy colorless	*Low-flow groundwater sample:*
	1712	19.08	1.0	7.05	25.6	3100	2.1	-32.4	44.7		(A) peristaltic pump w/ ded tubing
	1715	19.08	1.5	7.02	25.5	3110	2.1	-29.2	40.1		B) ded bladder pump
	1717	19.08	2.0	6.99	25.3	3110	2.0	-24.2	36.4		C) non-ded bladder pump; or
	1720	19.08	2.5	6.95	25.0	3100	1.8	-18.4	33.9	sl. cloudy - clear	*Standard groundwater sample:*
	1722	19.08	3.0	6.94	24.9	3100	1.8	-15.1	33.7		D) bailer due to limited column; or
	1725	19.08	3.5	6.92	25.0	3100	1.7	-13.3	31.9		E) recovery well cycling sample
↓	1727	19.08	4.0	6.92	24.9	3100	1.7	-13.0	30.5	↓	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	
4/27/16	1730	MW-130	19.08	6.92	24.9	3100	1.7	-13.0	30.5	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													12 bottles
												If <0.03 feet of PSH present, remove PSH and sample groundwater	

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-4
Event: Spring 2016 (Annual)
Area of Concern: Rest (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	
4/20/16	1728	22.89	23.03	0.14	41.75	31.7	Yes	Yes	Yes	Yes		Weather: 70s, windy

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. 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		LNAPL >	0.03	NO SAMPLE				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	3
										~~GRO~~	HCL	8015M	
										VOC	HCL	8260	2
								Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)			HNO3	6010/6020	1
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	SM4500	
													10 bottles
												If <0.03 feet of PSH present, remove PSH and sample groundwater	

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-19
Event: Spring 2016 (Annual)
Area of Concern: Rest

Equipped as recovery well in above-grade vault

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Gauge to top of 4-in galvanized pipe)

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1745	23.18	23.58	0.40	NM	NA	Yes	Yes	Yes	Yes		Weather: 70s, windy
					Pump/hoses cables installed in RW	10' off bottom as pumped						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. 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			LNAPL	> 0.03		NO SAMPLE		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	3
										~~GRO~~	~~HCL~~	~~8015M~~	
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

10 bottom TDS

*Driveway by bldg. A/C unit

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-52
Event: Spring 2016 (Annual)
Area of Concern: Rest (2in; 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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1755	NA	17.45	0.0	34.67	29.5	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/29/16	1025	NA	17.44									

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	
4/29/16	1030	17.47	0.5	7.44	20.6	2740	1.4	-227.8	7.5	colorless / clear	*Low-flow groundwater sample:*
	1033	17.48	1.0	7.25	20.4	2710	1.0	-227.7	5.0		(A) peristaltic pump w/ ded tubing
	1035	17.48	1.5	7.12	20.3	2680	0.7	-227.5	3.2		B) ded bladder pump
	1037	17.48	2.0	7.07	20.2	2660	0.7	-228.2	2.8		C) non-ded bladder pump; or
	1040	17.48	2.5	7.00	20.2	2650	0.6	-229.6	2.8		*Standard groundwater sample:*
	1043	17.48	3.0	7.03	20.2	2640	0.6	-229.5	3.1		D) bailer due to limited column; or
	1045	17.48	3.5	7.04	20.1	2650	0.5	-230.0	2.6		E) recovery well cycling sample
	1047	17.48	4.0	7.03	20.1	2650	0.5	-230.6	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: ESC Lab Sciences, Mt. Juliet, TN	
4/29/16	1050	MW-52	17.48	7.03	20.1	2650	0.5	-230.6	2.2	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u	1
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	6010/6020 and/or 7470 ✓ See above	
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO3	Field filtered 0.45-u ✓ See above	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500 ✓	1
													13 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

* E. side of blue building

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-109
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2in jat-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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1805	NA	16.01	0.0	29.48	25.5	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/29/16	940	NA	15.59									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/29/16	945	15.75	0.5	6.92	22.5	3690	1.3	-298.9	22.1	Dark tint/clear/odor	*Low-flow groundwater sample:*
	947	15.82	1.0	6.90	22.1	3750	0.8	-309.7	9.4		(A) peristaltic pump w/ ded tubing
	950	15.87	1.5	6.89	21.9	3760	0.6	-319.0	6.0		B) ded bladder pump
	953	15.90	2.0	6.91	21.8	3740	0.6	-322.7	4.5		C) non-ded bladder pump; or
	955	15.91	2.5	6.90	21.8	3670	0.6	-324.0	4.1		*Standard groundwater sample:*
	957	15.91	3.0	6.89	21.8	3530	0.7	-323.6	3.8		D) bailer due to limited column; or
	1000	15.92	3.5	6.90	21.7	3490	0.7	-322.2	4.2		E) recovery well cycling sample
	1003	15.92	4.0	6.90	21.7	3450	0.7	-321.1	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	
4/29/16	1005	MW-109	15.92	6.90	21.7	3450	0.7	-321.1	3.9	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~		~~HNO_3~~	~~HNO_3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~		~~HNO_3~~	~~HNO_3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	SM4500	12 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-110 * west side driveway at blue bldg.
Event: Spring 2016 (Annual)
Area of Concern: Rest (2 inj 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	
4/26/16	1610	NA	13.68	0.0	29.75	24.7	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/29/16	850	NA	13.62									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/29/16	855	13.76	0.5	7.29	21.2	2060	1.6	-214.4	137	colorless / cloudy / odor	*Low-flow groundwater sample:*
	857	13.82	1.0	7.15	21.3	2050	0.9	-223.8	97.3		(A) peristaltic pump w/ ded tubing
	900	13.87	1.5	7.11	21.4	2030	0.8	-230.0	66.7		B) ded bladder pump
	903	13.90	2.0	7.06	21.5	2000	0.7	-230.8	37.4		C) non-ded bladder pump; or
	905	13.92	2.5	7.33	21.5	2000	0.7	-232.0	23.2	colorless/clear / odor	*Standard groundwater sample:*
	907	13.93	3.0	7.25	21.6	1994	0.6	-229.6	17.5		D) bailer due to limited column; or
	910	13.94	3.5	7.20	21.7	1992	0.6	-214.5	12.4		E) recovery well cycling sample
	913	13.95	4.0	7.01	21.7	1994	0.5	-207.5	9.8		F) irrigation well grab sample
	915	13.96	4.5	7.00	21.8	1991	0.5	-204.7	8.8		
	917	13.97	5.0	7.03	21.8	1992	0.5	-201.7	8.4		

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: ESC Lab Sciences, Mt. Juliet, TN	
4/29/16	920	MW-110	13.97	7.03	21.8	1992	0.5	-201.7	8.4	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u	1
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~	
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										~~Cyanide~~	~~NaOH~~	~~SM4500~~	
													12 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

(E-W alley, just NW of Hotel Artesia)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: UG-2
Event: Spring 2016 (Annual)
Area of Concern: Rest (up gradient) (4 inj 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	
4/26/16	1825	NP	17.35	0.0	29.28	24.3	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/27/16	810	NP	17.35									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/16	815	17.43	0.5	6.55	22.4	2580	3.7	164.4	4.7	no color / clear	*Low-flow groundwater sample:*
	817	17.43	1.0	6.73	22.6	2560	3.6	160.4	4.2		(A) peristaltic pump w/ ded tubing
	820	17.44	1.5	6.83	22.7	2530	3.7	156.7	3.9		B) ded bladder pump
	822	17.44	2.0	6.87	22.7	2520	3.8	155.1	3.8		C) non-ded bladder pump; or
	825	17.45	2.5	6.91	22.9	2520	3.9	153.6	3.7		*Standard groundwater sample:*
	827	17.45	3.0	6.96	22.9	2500	3.8	152.3	3.7		D) bailer due to limited column; or
	830	17.45	3.5	6.96	23.0	2500	3.8	152.2	3.6		E) recovery well cycling sample
	832	17.45	4.0	6.97	23.1	2510	3.9	152.1	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	
4/27/16	835	UG-2	17.45	6.97	23.1	2510	3.9	152.1	3.6	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓	See above
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓	See above
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500 ✓	1
													13 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

[HMI installed dedicated bladder pump 1H15]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-3R
Event: Spring 2016 (Annual)
Area of Concern: Rest (upgradient) (4 ing at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCY

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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1835	NP	24.51	0.0	38.58	35.6	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/27/16	1110	NP	24.50	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	
4/27/16	1115	24.51	0.5	7.44	24.2	2430	5.3	106.0	43.9	colorless / clear	*Low-flow groundwater sample:*
	1117	24.52	1.0	7.30	23.5	2440	5.7	119.1	57.1	to sl. cloudy	A) peristaltic pump w/ ded tubing
	1120	24.52	1.5	7.24	23.4	2440	5.8	125.4	65.3		(B) ded bladder pump
	1122	24.53	2.0	7.14	23.0	2420	5.7	140.2	84.1		C) non-ded bladder pump; or
	1125	24.53	2.5	7.11	23.1	2420	5.9	144.9	89.1		*Standard groundwater sample:*
	1127	24.53	3.0	7.09	23.1	2420	5.8	147.4	94.3		D) bailer due to limited column; or
	1130	24.53	3.5	7.08	23.0	2410	5.9	149.1	91.7		E) recovery well cycling sample
↓	1132	24.53	4.0	7.08	23.0	2410	5.8	150.4	90.2	↓ ↓	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	
4/27/16	1135	UG-3R	24.53	7.08	23.0	2410	5.8	150.4	96.2	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓	see above
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓	see above
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500 ✓	1
													13 bottles
												If <0.03 feet of PSH present, remove PSH and sample groundwater	

+ Trip Blank - RIST-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-1
Event: Spring 2016 (Annual)
Area of Concern: Rest (upgradient) (4 inj 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	
4/26/16	1850	NP	12.87	0.0	24.08	19.1	Yes	Yes	Yes	Yes		Weather: 70s windy
4/27/16	900	NP	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	
4/27/16	905	12.86	0.5	7.32	23.8	3260	4.7	142.3	3.8	colorless / clear	*Low-flow groundwater sample:*
	907	12.86	1.0	7.24	23.6	3230	4.8	148	3.5		(A) peristaltic pump w/ ded tubing
	910	12.86	1.5	7.18	23.4	3250	4.8	151.4	3.3		B) ded bladder pump
	912	12.86	2.0	7.14	23.3	3260	4.8	153.6	3.2		C) non-ded bladder pump; or
	915	12.86	2.5	7.13	23.3	3260	4.8	154.7	2.9		*Standard groundwater sample:*
	917	12.86	3.0	7.12	23.3	3260	4.8	156.0	2.9		D) bailer due to limited column; or
	920	12.86	3.5	7.11	23.2	3270	4.8	157.1	2.8		E) recovery well cycling sample
↓	922	12.86	4.0	7.11	23.2	3270	4.7	157.4	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	
4/27/16	925	UG-1	12.86	7.11	23.2	3270	4.7	157.4	2.8	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓ See above	
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓ See above	
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500 ✓	1
													13 bottles
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-4
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Screen: 19.5 - 39.5 ft-bgs) (2in; 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	
4/26/16	1910	NP	18.65	0.0	39.24	34.5	Yes	Yes	Yes	Yes		Weather: 70s, windy
4/27/16	950	NP	18.62	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	
4/27/16	1000	18.82	0.5	7.03	25.5	3760	3.6	129.5	10.4	colorless / clear	*Low-flow groundwater sample:*
	1002	18.83	1.0	6.97	25.1	3830	3.7	136.4	9.7		(A) peristaltic pump w/ ded tubing
	1005	18.84	1.5	6.92	24.6	3870	3.7	143.1	9.3		B) ded bladder pump
	1007	18.85	2.0	6.91	24.4	3880	3.7	145.4	8.9		C) non-ded bladder pump; or
	1010	18.86	2.5	6.90	24.3	3890	3.7	147.9	8.5		*Standard groundwater sample:*
	1012	18.86	3.0	6.89	24.3	3890	3.8	150.4	8.5		D) bailer due to limited column; or
	1015	18.87	3.5	6.88	24.3	3890	3.9	151.5	8.4		E) recovery well cycling sample
↓	1017	18.87	4.0	6.88	24.1	3890	3.9	152.0	8.4	↓ ↓	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	
4/27/16	1020	UG-4	18.87	6.88	24.1	3890	3.9	152.0	8.4	DRO	HCL	8015M	3
										GRO	HCL	8015M	2
										VOC	HCL	8260	2
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020	1
							Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u	1
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓	See above
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓	See above
								Anions (Chloride,Fluoride,Sulfate)			Neat	300	1
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences	1
										TDS	Neat	2540C	1
										Cyanide	NaOH	SM4500 ✓	1
													13 bott 1eS
										If <0.03 feet of PSH present, remove PSH and sample groundwater			

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-101
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4in) stickup) Initials: TAB/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	
4/26/16	1240	NA	12.23	0.0	26.85	23.5	yes	yes	yes	yes		Weather: PTC/cloudy windy
4/28/16	800	NA	12.30	0.0								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	
4/28/16	805	12.36	0.5	6.56	20.4	1905	2.2	-41.7	24.2	clear, colorless	*Low-flow groundwater sample:*
↓	807	12.36	1.0	6.61	20.5	1912	1.8	-55.6	16.5	↓	(A) peristaltic pump w/ ded tubing
	810	12.36	1.5	6.64	20.6	1919	1.6	-65.4	11.9		B) ded bladder pump
	812	12.36	2.0	6.64	20.6	1923	1.5	-73.1	10.2		C) non-ded bladder pump; or
	815	12.36	2.5	6.65	20.6	1925	1.6	-78.8	9.5		*Standard groundwater sample:*
	817	12.36	3.0	6.68	20.6	1930	1.6	-84.4	9.1		D) bailer due to limited column; or
	820	12.36	3.5	6.68	20.6	1932	1.6	-85.7	8.6		E) recovery well cycling sample
↓	822	12.36	4.0	6.69	20.7	1935	1.7	-87.6	8.4	↓	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
4/28/16	825	MW-101	12.36	6.69	20.7	1935	1.7	-87.6	8.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-105
Event: Spring 2016 (Annual)
Area of Concern: Rest (4in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: TAB/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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1250	NA	8.11	0.0	17.20	14.2	yes	yes	yes	yes		Weather: 01/cloudy 78°
4/28/16	1700	NA	8.04	0.0								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	
4/28/16	1705	8.05	0.5	6.79	22.7	1758	2.1	-368.9	22.4	clear, black tint; odor	*Low-flow groundwater sample:*
	1707	8.05	1.0	6.82	21.8	1702	1.3	-374.7	16.7		(A) peristaltic pump w/ ded tubing
	1710	8.05	1.5	6.84	21.9	1676	1.1	-376.2	14.8		B) ded bladder pump
	1712	8.05	2.0	6.84	22.0	1659	1.2	-376.7	13.9		C) non-ded bladder pump; or
	1715	8.05	2.5	6.84	22.0	1643	1.2	-377.5	11.1		*Standard groundwater sample:*
	1717	8.05	3.0	6.83	22.0	1633	1.1	-377.8	10.2		D) bailer due to limited column; or
	1720	8.05	3.5	6.83	22.1	1629	1.1	-376.5	9.5		E) recovery well cycling sample
	1722	8.05	4.0	6.83	22.1	1627	1.0	-376.1	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1725	MW-105	8.05	6.83	22.1	1627	1.0	-376.1	9.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			HNO_3	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Gauge & Sample through labeled 1-in guide-pipe inside doghouse.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-2
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Do not address the old RW-2 corrugated plastic stickup, large-diam. Initials: TAB / 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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1500	N/A	10.76	0.0	36.13	31.1	YES	YES	YES	YES		Weather: PC/cloudy 70s
4.28.16	1715	NA	10.76	0.0								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	
4.28.16	1720	NM *	0.5	6.88	24.0	5110	2.8	-379.5	62.0	Cloudy, black tint,	*Low-flow groundwater sample:*
↓	1723	↓	1.0	6.82	23.0	5150	2.0	-382.4	67.0	odor	(A) peristaltic pump w/ ded tubing
	1725		1.5	6.80	22.9	5170	1.3	-385.1	48.6	↓	B) ded bladder pump
	1728		2.0	6.79	22.8	5180	0.8	-387.0	32.5		C) non-ded bladder pump; or
	1730		2.5	6.79	22.8	5190	0.7	-389.6	21.8	clear w/ yellow	*Standard groundwater sample:*
	1733		3.0	6.78	22.7	5200	0.7	-391.4	20.4	tint, odor	D) bailer due to limited column; or
	1735		3.5	6.78	22.6	5200	0.7	-392.9	19.7	↓ ↓	E) recovery well cycling sample
↓	1738	↓	4.0	6.78	22.5	5210	0.7	-394.2	19.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record * Drawdown not monitored during low-flow sampling due to narrow-diam (1-inch) guide-pipe.

Date	Time	Sample I.D.	Depth to Water (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
4.28.16	1740	RW-2	NM *	6.78	22.5	5210	0.7	-394.2	19.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO_3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-61
Event: Spring 2016 (Annual)
Area of Concern: Rest (4in) at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RB/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	
4/26/16	1310	NA	9.21	0.0	29.35	19.30	yes	yes	yes	yes	Badly	Weather: PT/C/Sud 78
4/28/16	1755	NA	9.15	0.0							broken pad	Clear 76'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	
4/28/16	1800	9.35	0.5	6.90	24.4	2780	1.9	-351.1	12.5	Clear colorless	*Low-flow groundwater sample:*
↓	1802	9.51	1.0	6.84	24.5	2740	1.3	-358.8	10.3	↓	(A) peristaltic pump w/ ded tubing
	1805	9.60	1.5	6.82	24.4	2750	1.1	-361.3	9.8		B) ded bladder pump
	1807	9.72	2.0	6.82	24.5	2750	0.9	-360.2	8.8		C) non-ded bladder pump; or
	1810	9.76	2.5	6.81	24.5	2760	0.9	-360.5	7.3	reduce purge rate	*Standard groundwater sample:*
	1815	9.82	3.0	6.80	24.5	2760	0.8	-361.4	6.7	to 0.1 L/min	D) bailer due to limited column; or
	1820	9.86	3.5	6.80	24.4	2770	0.8	-362.8	6.2	↓	E) recovery well cycling sample
↓	1825	9.90	4.0	6.79	24.4	2770	0.8	-363.1	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: ESC Lab Sciences, Mt. Juliet, TN
4/28/16	1830	MW-61	9.90	6.79	24.4	2770	0.8	-363.1	5.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO3	Field filtered 0.45-u
								~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~6010/6020 and/or 7470~~
								~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~			~~HNO3~~	~~Field filtered 0.45-u~~
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	SM4500
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-62
Event: Spring 2016 (Annual)
Area of Concern: Rest (4-in) At-grade

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB/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: Cap	Casing	Well Secured	Label	Other	Comments
4/26/16	1310	NA	10.85	0.0	29.50	21.3	yes	yes	yes	yes		Weather: Pt/Cloudy/90s
4-28-16	1620	NA	10.81	0.0	29.50	21.3						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	
4-28-16	1625	11.06	0.5	6.90	25.0	4590	2.8	-375.4	5.2	Clear	*Low-flow groundwater sample:*
↓	1628	11.15	1.0	6.87	24.6	4600	1.6	-379.2	4.0	↓	(A) peristaltic pump w/ ded tubing
	1630	11.23	1.5	6.84	24.2	4620	1.2	-381.4	3.6		B) ded bladder pump
	1633	11.30	2.0	6.82	24.1	4630	0.9	-382.6	3.1		C) non-ded bladder pump; or
	1635	11.35	2.5	6.69	24.0	4630	0.8	-385.1	2.8		*Standard groundwater sample:*
	1638	11.39	3.0	6.61	23.9	4640	0.7	-386.3	2.2		D) bailer due to limited column; or
	1640	11.43	3.5	6.57	23.8	4640	0.7	-386.7	1.9		E) recovery well cycling sample
	1643	11.47	4.0	6.54	23.8	4640	0.7	-387.2	1.7		F) irrigation well grab sample
↓	1645	11.50	4.5	6.52	23.8	4640	0.7	-386.9	1.4	↓	

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: ESC Lab Sciences, Mt. Juliet, TN
4-28-16	1650	MW-62	11.50	6.52	23.8	4640	0.7	-386.9	1.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)	HNO3	6010/6020
										Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-93
Event: Spring 2016 (Annual)
Area of Concern: Rest (4in) at-grade)

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	
4/26/16	1330	NA	6.50	0.0	20.23	15.9	yes	yes	yes	yes		Weather: Clear 60's 70's
4/28/16	800	NA	6.49	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	
4/28/16	805	6.65	0.5	6.56	20.2	3510	2.3	-285.4	8.1	Clear w/ black	*Low-flow groundwater sample:*
|	807	6.72	1.0	6.45	20.3	3520	1.7	-290.7	7.8	particles and odor	(A) peristaltic pump w/ ded tubing
|	810	6.78	1.5	6.56	20.4	3540	1.4	-291.8	6.4	Black tint	B) ded bladder pump
|	812	6.82	2.0	6.58	20.4	3590	1.1	-296.6	7.1	|	C) non-ded bladder pump; or
|	815	6.86	2.5	6.59	20.4	3600	1.0	-298.4	7.6	|	*Standard groundwater sample:*
|	817	6.90	3.0	6.59	20.4	3620	1.0	-303.7	8.7	|	D) bailer due to limited column; or
|	820	6.94	3.5	6.59	20.4	3630	0.9	-305.4	9.8	|	E) recovery well cycling sample
√	827	6.99	4.0	6.59	20.3	3640	0.9	-310.7	10.4	↓	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
4/28/16	825	MW-93	6.99	6.59	20.3	3640	0.9	-310.7	10.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)	HNO_3	6010/6020
										Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~Total Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet of PSH present, remove PSH and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-43
Event: Spring 2016 (Annual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(6in; stickup) Initials: TAB / 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	
4/26/16	~~1400~~ 1400	NA	7.54	0.0	19.67	16.5	yes	yes	yes	yes		Weather: Clear 80's
4/28/16	1530	NA	7.60	0.0	19.67	16.5						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	
4.28.16	1535	7.64	0.5	7.30	23.9	6240	2.8	-388.1	10.2	clear w/ yellow	*Low-flow groundwater sample:*
	1538	7.64	1.0	7.11	23.8	6480	1.2	-398.2	8.0	tint, gaseous	(A) peristaltic pump w/ ded tubing
	1540	7.64	1.5	7.02	23.7	6540	0.9	-404.0	6.2		B) ded bladder pump
	1543	7.64	2.0	6.91	23.6	6560	0.8	-405.0	5.1		C) non-ded bladder pump; or
	1545	7.64	2.5	6.84	23.6	6580	0.8	-408.0	4.6		*Standard groundwater sample:*
	1548	7.64	3.0	6.79	23.5	6590	0.7	-410.0	4.1		D) bailer due to limited column; or
	1550	7.64	3.5	6.77	23.4	6590	0.7	-411.0	4.0		E) recovery well cycling sample
↓	1553	7.64	4.0	6.76	23.4	6590	0.6	-412.0	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: ESC Lab Sciences, Mt. Juliet, TN
4.28.16	1555	MW-43	7.64	6.76	23.4	6590	0.6	-412.0	3.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
						Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se) and/or Cations (Ca,K,Na)					HNO_3	6010/6020
								Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)			HNO_3	Field filtered 0.45-u
								Total Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	6010/6020 and/or 7470 ✓
								Dissolved Metals (Hg,Ni,V,B,Cd,Co,U)			HNO_3	Field filtered 0.45-u ✓
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Cyanide	NaOH	SM4500 ✓
												If <0.03 feet of PSH present, remove PSH and sample groundwater