



March 8, 2022

New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Subject: 2021 Annual Report
Former Giant Bloomfield Refinery
NMOCD Discharge Permit Number: GW-40
Western Refining Southwest, LLC
San Juan County, New Mexico

To Whom it May Concern:

WSP USA Inc. (WSP), on behalf of Western Refining Southwest, LLC (Western, an affiliate of Marathon Petroleum Company LP), has prepared this report detailing activities completed from January 2021 through December 2021 at the former Giant Bloomfield Refinery (Site), Discharge Permit number GW-40, in San Juan County, New Mexico.

SITE DESCRIPTION AND HISTORY

The Giant Bloomfield Refinery Site is a former refinery currently owned by Western. It is located on the northeast corner of United States Highway 64 and County Road 3500, approximately 5 miles west of Bloomfield, New Mexico, in the southwest quarter of Section 22 and the northwest quarter of Section 27, Township 29 North, Range 12 West in San Juan County, New Mexico (Figure 1). The former refinery, under ownership of Giant Industries (Giant), produced leaded and unleaded gasoline, diesel, kerosene, and other refined petroleum products from 1974 to 1982 and has been inactive since closure in 1982.

In April 1985, a breach in a lagoon dike on the former Lee Acres Landfill property (located north-adjacent to the Site), which had been retaining liquids in the lagoons, released liquid wastes into an arroyo west of the Site. The arroyo drains south toward the Lee Acres Subdivision (located south-adjacent to the Site), where the New Mexico Oil Conservation Division (NMOCD) and the New Mexico Environment Department (NMED) identified impacted groundwater in domestic water wells in 1986. In response, the NMOCD required Giant to investigate petroleum hydrocarbon impacts to groundwater downgradient of the refinery. NMED also conducted a separate investigation to identify potential impacts from the landfill. The investigations identified two separate plumes of impacted groundwater that commingled across the Site and flowed downgradient into the Lee Acres Subdivision. Groundwater contaminants detected in the refinery plume included phase-separated hydrocarbon (PSH) and dissolved-phase petroleum hydrocarbons. Groundwater contaminants associated with the Lee Acres Landfill included total dissolved solids (TDS), chloride, sulfate, metals, and volatile organic compounds (VOCs).

Detailed information regarding Site history, historical remediation efforts, and historical groundwater monitoring results are presented in WSP's *Stage 2 Abatement Plan* dated May 18, 2021. The *WSP Stage 2 Abatement Plan* has not yet been approved by the NMOCD. Pursuant to Discharge Permit GW-40 (dated January 6, 2021), this report details interim Site activities performed in 2021. A summary of field activities not presented in WSP's *Stage 2 Abatement Plan* (dated May 18, 2021) are presented below.

2021 GROUNDWATER MONITORING ACTIVITIES

During 2021, no groundwater was recovered from on-Site wells, treated, and/or discharged into the infiltration gallery; however, WSP has continued to conduct groundwater monitoring and PSH recovery activities from all viable on-Site wells Site until the NMOCD approves WSP's *Stage 2 Abatement Plan*.



GROUNDWATER GAUGING

Gauging events were conducted by WSP in January, August, and October of 2021 using a Keck oil-water interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with distilled water before each measurement. Depth-to-water and depth-to-PSH measurements were used to calculate groundwater elevations at the Site to determine direction and gradient of flow. Attached Table 1 presents well construction information for all on-Site monitoring wells. Measurements and calculated groundwater elevations above mean sea level (amsl) for each sampling event are presented in Table 2. Plots of static groundwater elevation and PSH versus time are presented in Graphs 1 and 2 for wells containing PSH (GBR-7 and GBR-22). Groundwater potentiometric surface maps and inferred groundwater flow directions for each event are also shown in Figures 2 through 4. Inferred groundwater flow at the Site is to the south.

OCTOBER 2021 UPGRADIENT BLM SPLIT SAMPLING AND RESULTS

WSP was present and collected split groundwater samples during a Bureau of Land Management (BLM) groundwater sampling event conducted in October 2021. Specifically, as part of their effort to assess residual manganese concentrations related to the Lee Acres Landfill Superfund site, the BLM collected groundwater samples from several Site wells located hydrologically downgradient of the Lee Acres Landfill. WSP was present during the sampling event and collected split samples from the following wells: GBR-17, GBR-32, GBR-48, and GBR-50. Samples were collected using low-flow purging and sampling methods. Specifically, groundwater was purged using a stainless-steel, impellor-driven submersible pump connected to a low-flow controller. Following well purging, groundwater samples were placed directly into laboratory-provided vials and labeled with the date and time of collection, well designation, project name, sample collector's name, and parameters to be analyzed. They were immediately sealed with zero headspace and packed on ice to preserve samples.

Samples were submitted to Hall Environmental Analysis Laboratory for analysis of VOCs by Environmental Protection Agency (EPA) Method 8260B, total and dissolved metals by EPA Method 6010B, anions by EPA Method 300.0, sulfide by Method SM 4500S2-H, dissolved organic carbon by Method SM 5310B, and TDS by Method SM 2540C. Analytical results, including Site historical results, are summarized on Tables 3, 4, and 5, with laboratory reports attached as Enclosure A.

Because only upgradient wells GBR-17, GBR-32, GBR-48, and GBR-50 were sampled, iso-concentration maps were not developed for the constituents of concern for this sampling event. Once the *Stage 2 Abatement Plan* is approved, iso-concentration maps will be developed for the Site constituents of concern.

WSP appreciates the opportunity to provide this report to you. If you have any questions or comments regarding this report, do not hesitate to contact Stuart Hyde at (970) 385-1096 or at stuart.hyde@wsp.com, or Kateri Luka or at kaluka@marathonpetroleum.com.

Kind regards,

Stuart Hyde, L.G.
Senior Geologist

Daniel Moir, P.G.
Sr. Lead Consultant, Geologist

cc: Kateri Luka, Marathon Petroleum Company LP

Attachments:

- Figure 1: Site Location Map
- Figure 2: Groundwater Potentiometric Surface Map (January 2021)
- Figure 3: Groundwater Potentiometric Surface Map (August 2021)
- Figure 4: Groundwater Potentiometric Surface Map (October 2021)



Table 1: Well Construction Information

Table 2: Groundwater Elevations and Thickness of Phase-Separated Hydrocarbons

Table 3: Groundwater Analytical Results – Volatile Organic Compounds

Table 4: Groundwater Analytical Results – Metals

Table 5: Groundwater Analytical Results – General Chemistry Parameters

Graph 1: GBR-7 Groundwater Elevations vs PSH

Graph 2: GBR-22 Groundwater Elevations vs PSH

Enclosure A: Laboratory Analytical Reports

FIGURES

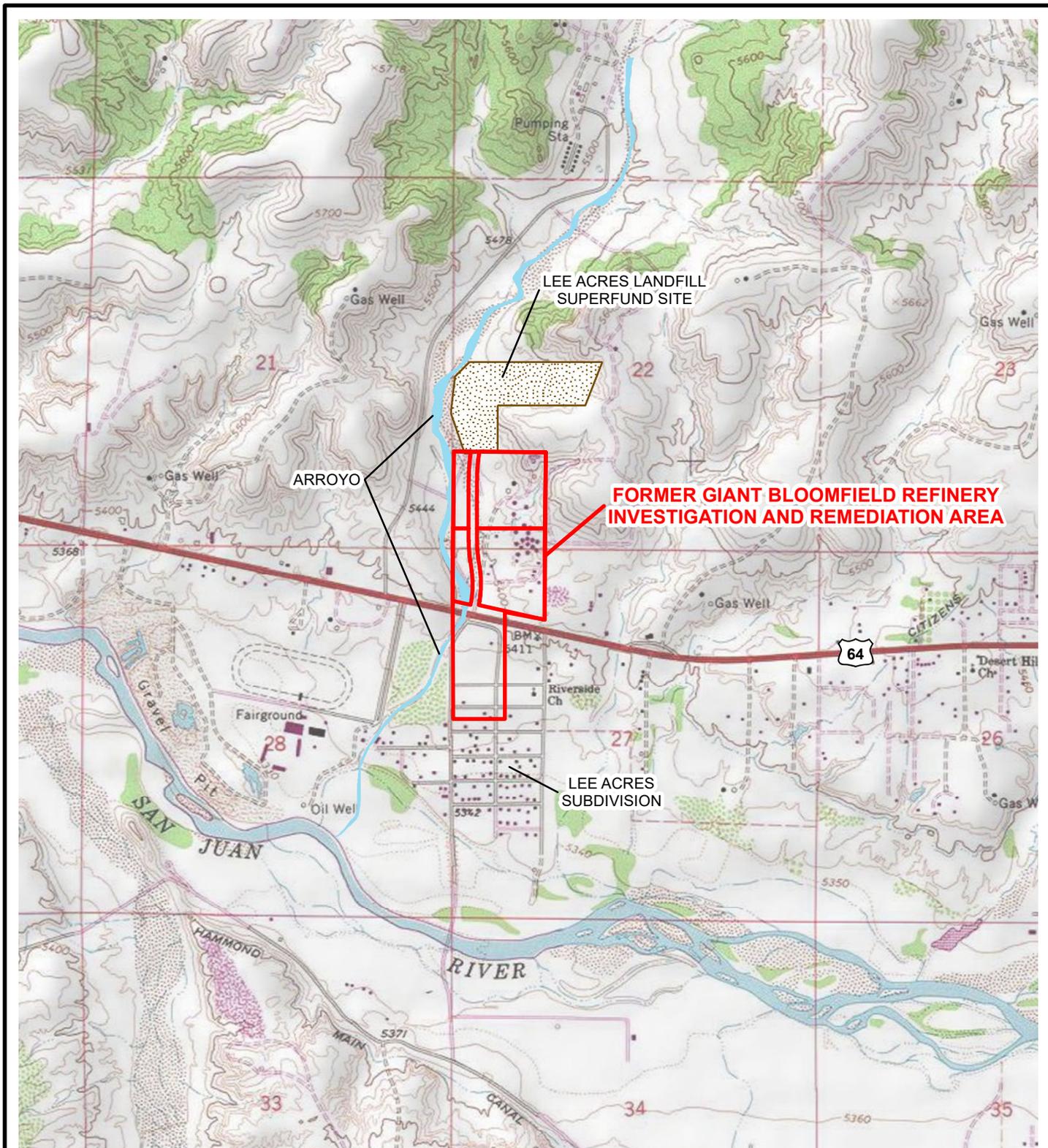


IMAGE COURTESY OF ESRI/USGS

LEGEND

-  FORMER GIANT BLOOMFIELD REFINERY PROPERTY BOUNDARY
-  ARROYO
-  FORMER LEE ACRES LANDFILL

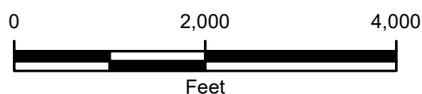
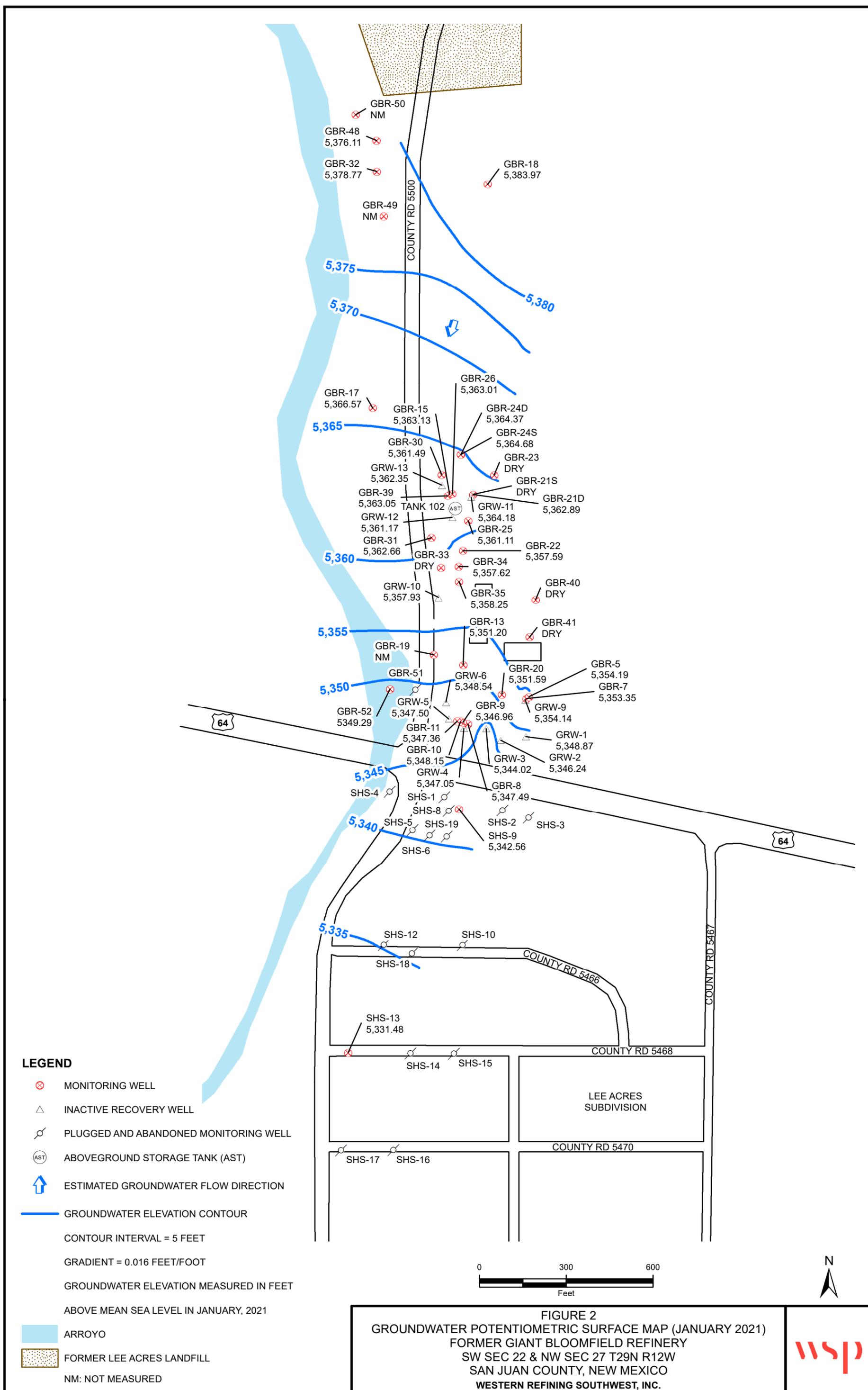
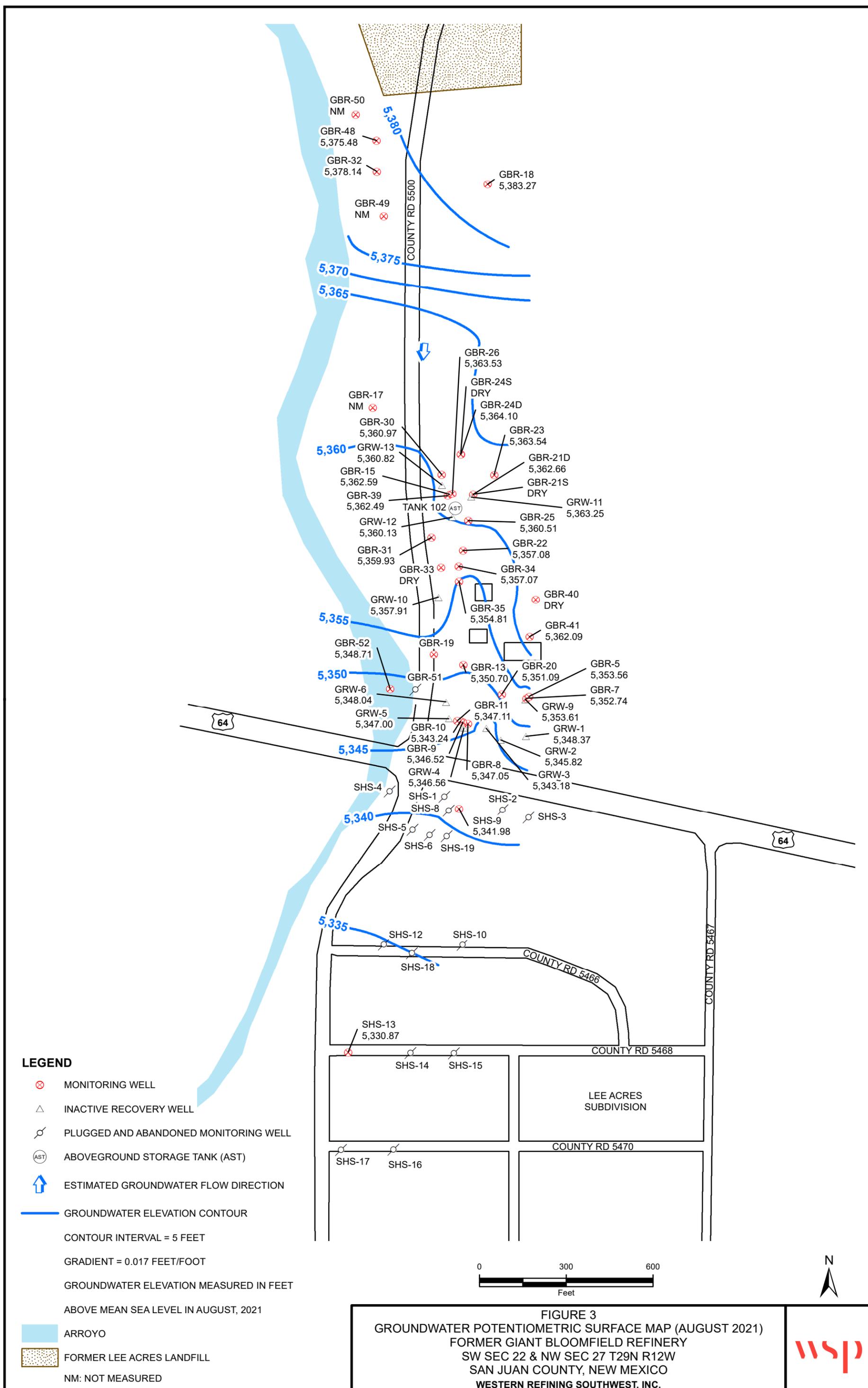


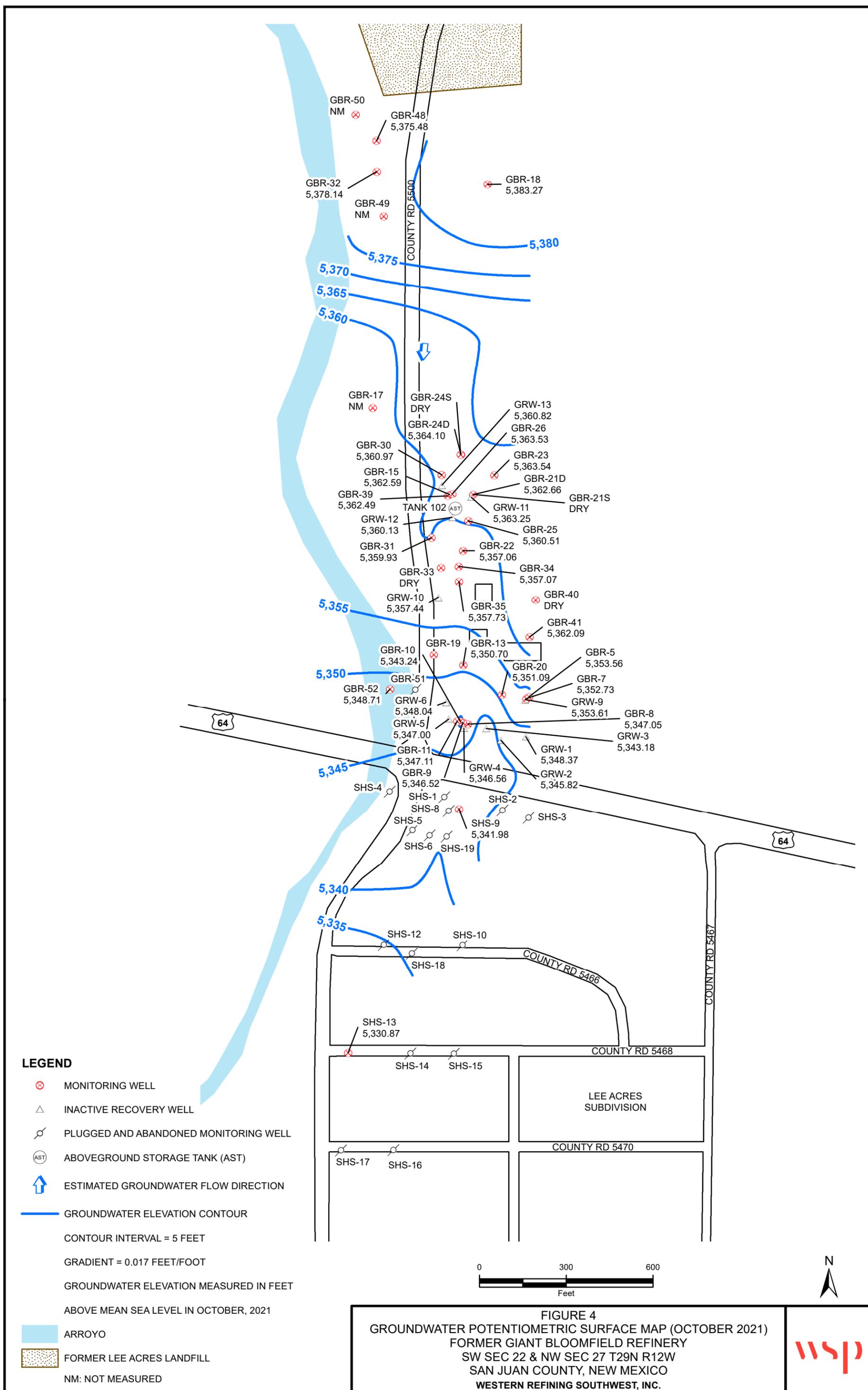
FIGURE 1
SITE LOCATION MAP
 FORMER GIANT BLOOMFIELD REFINERY
 SW SEC 22 & NW SEC 27 T29N R12W
 SAN JUAN COUNTY, NEW MEXICO
 WESTERN REFINING SOUTHWEST, LLC



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TABLES

TABLE 1
WELL CONSTRUCTION INFORMATION
FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	Screened Interval (feet BTOC)	Screen Placement (lithology)	Well Diameter (inches)
GRW-1 / GBR-38	5,394.30	72.59	27 - 67	sand/sandstone	6
GRW-2 / GBR-42	5,391.28	66.11	37 - 52	sand	6
GRW-3 / GBR-29	5,388.77	60.90	25 - 65	sand/sandstone	6
GRW-4 / GBR-43	5,390.02	66.30	35 - 50	sand	6
GRW-5 / GBR-37	5,390.56	75.44	26 - 66	sand/sandstone	6
GRW-6 / GBR-44	5,390.81	63.11	33 - 48	sand	6
GRW-9 / GBR-6	5,395.70	54.90	20 - 60	sand/sandstone	6
GRW-10 / GBR-36	5,395.02	66.02	25 - 65	sand/clay/gravel	6
GRW-11 / GBR-27	5,397.85	55.60	22 - 62	sand/shale/sandstone	5
GRW-12 / GBR-28	5,397.24	51.76	24 - 64	sand/clay/sandstone	6
GRW-13 / GBR-14	5,396.90	70.86	20 - 60	sand/gravel	6
GBR-5*	5,395.07	46.88	32 - 52	sandstone	2
GBR-7	5,395.85	50.56	32 - 42	sand	2
GBR-8	5,390.50	49.26	38 - 53	sand	2
GBR-9	5,389.92	67.28	50 - 60	silt/shale	2
GBR-10	5,390.57	47.50	29 - 39	sand	2
GBR-11	5,389.43	51.20	40 - 50	sand	2
GBR-13*	5,393.04	45.40	32 - 42	sandstone	2
GBR-15	5,397.99	58.33	45 - 55	clay	2
GBR-17	5,402.69	50.25	31 - 51	sand	2
GBR-18*	5,421.68	47.87	35 - 45	siltstone/sandstone	2
GBR-20*	5,393.47	44.60	27 - 37	sandstone	2
GBR-21D*	5,400.19	48.64	33 - 38	shale	2
GBR-21S*	5,400.65	34.85	17 - 32	shale	2
GBR-22*	5,395.91	45.85	32 - 42	sandstone	2
GBR-23 (1)*	5,403.72	41.75	24 - 34	sandstone	2
GBR-24D*	5,396.77	51.44	33 - 43	sandstone	2
GBR-24S*	5,396.08	33.50	23 - 33	sandstone	2
GBR-25*	5,397.03	50.27	33 - 43	sandstone	2
GBR-26	5,396.72	42.54	25 - 35	sand	2
GBR-30	5,395.59	41.44	25 - 40	sand/clay	2
GBR-31	5,396.58	43.50	25 - 40	clay/gravel	2
GBR-32*	5,414.86	47.90	25 - 40	sandstone	2
GBR-33	5,396.28	45.77	27 - 43	clay/sand	2
GBR-34	5,394.00	46.70	27 - 43	sand/sandstone	2
GBR-35	5,393.66	41.62	25 - 41	sand/sandstone	2
GBR-39	5,397.55	41.39	25 - 35	sand	2
GBR-40	5,400.76	39.40	26 - 36	sand	2
GBR-41	5,396.35	34.34	22 - 32	sand	2
GBR-48	5,413.90	43.76	28 - 38	sand/gravel	2
GBR-49	(2)	40.26	26 - 36	sand	2
GBR-50	(2)	40.63	27 - 37	sand	2
GBR-52 / GRW-8	5,387.74	54.59	30 - 45	sand	6
SHS-9	5,380.79	46.27	35 - 45	clay	4
SHS-13	5,367.81	47.51	27 - 42	sand	4
Wells Plugged and Abandoned or Damaged					
GBR-19 (3)	5,393.83	46.23	-	-	-
GBR-51 / GRW -7	5,389.68	57.07	-	-	-
SHS-1	5,383.54	50.40	-	-	-
SHS-2	5,381.66	44.56	-	-	-
SHS-3	5,383.33	-	-	-	-
SHS-4	5,383.62	52.16	-	-	-
SHS-5	5,378.36	47.85	-	-	-
SHS-6	5,378.17	52.78	-	-	-
SHS-8	5,380.25	50.92	-	-	-
SHS-10	5,373.80	45.80	-	-	-
SHS-12	5,373.94	52.41	-	-	-
SHS-14	5,367.07	52.71	-	-	-
SHS-15	5,366.21	47.78	-	-	-
SHS-16	5,362.58	42.20	-	-	-
SHS-17	5,364.35	46.21	-	-	-
SHS-18	5,373.64	47.36	-	-	-
SHS-19	5,378.89	52.40	-	-	-

Notes:

(1) Well hit by a vehicle May 2014

(2) Top-of-casing elevation is unknown

(3) Well was paved over in June 2010

* - asterisk indicates that the well is screened withing the bedrock aquifer, no asterisk indicates that a well is screened in the alluvial aquifer

BTOC - below top of casing

D - designates that the well screen is deep

P&A - plugged and abandoned

S - designates that the well screen is shallow

GBR-1, GBR-2, GBR-3, GBR-4, GBR-12, GBR-16, GBR-45, GBR-46, and GBR-47 not completed as wells

**TABLE 2
GROUNDWATER ELEVATIONS AND THICKNESS OF PHASE-SEPARATED HYDROCARBONS**

**FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO**

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	January 2021				August 2021				October 2021			
			Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet amsl)	Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet amsl)	Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet amsl)
GRW-1 / GBR-38	5,394.30	72.59	45.43	-	-	5,348.87	45.93	--	--	5348.37	45.93	-	-	5,348.37
GRW-2 / GBR-42	5,391.28	66.11	45.04	-	-	5,346.24	45.46	--	--	5345.82	45.46	-	-	5,345.82
GRW-3 / GBR-29	5,388.77	60.90	44.75	-	-	5,344.02	45.59	--	--	5343.18	45.59	-	-	5,343.18
GRW-4 / GBR-43	5,390.02	66.30	42.97	-	-	5,347.05	43.46	--	--	5346.56	43.46	-	-	5,346.56
GRW-5 / GBR-37	5,390.56	75.44	43.06	-	-	5,347.50	43.56	--	--	5347.00	43.56	-	-	5,347.00
GRW-6 / GBR-44	5,390.81	63.11	42.27	-	-	5,348.54	42.77	--	--	5348.04	42.77	-	-	5,348.04
GRW-9 / GBR-6	5,395.70	54.90	41.56	-	-	5,354.14	42.09	--	--	5353.61	42.09	-	-	5,353.61
GRW-10 / GBR-36	5,395.02	66.02	37.09	-	-	5,357.93	37.11	--	--	5357.91	37.58	-	-	5,357.44
GRW-11 / GBR-27	5,397.85	55.60	33.67	-	-	5,364.18	34.60	--	--	5363.25	34.60	-	-	5,363.25
GRW-12 / GBR-28	5,397.24	51.76	36.07	-	-	5,361.17	37.11	--	--	5360.13	37.11	-	-	5,360.13
GRW-13 / GBR-14	5,396.90	70.86	34.55	-	-	5,362.35	36.08	--	--	5360.82	36.08	-	-	5,360.82
GBR-5	5,395.07	46.88	40.88	-	-	5,354.19	41.51	--	--	5353.56	41.51	-	-	5,353.56
GBR-7	5,395.85	50.56	42.59	42.48	0.11	5,353.35	43.12	43.13	0.01	5,352.74	43.13	43.12	0.01	5,352.73
GBR-8	5,390.50	49.26	43.01	-	-	5,347.49	43.45	--	--	5347.05	43.45	-	-	5,347.05
GBR-9	5,389.92	67.28	42.96	-	-	5,346.96	43.40	--	--	5346.52	43.40	-	-	5,346.52
GBR-10	5,390.57	47.50	42.42	-	-	5,348.15	47.33	--	--	5343.24	47.33	-	-	5,343.24
GBR-11	5,389.43	51.20	42.07	-	-	5,347.36	42.32	--	--	5347.11	42.32	-	-	5,347.11
GBR-13	5,393.04	45.40	41.84	-	-	5,351.20	42.34	--	--	5350.70	42.34	-	-	5,350.70
GBR-15	5,397.99	58.33	34.86	-	-	5,363.13	35.40	--	--	5362.59	35.40	-	-	5,362.59
GBR-17	5,402.69	50.25	36.12	-	-	5,366.57	Obstructed				Obstructed			
GBR-18	5,421.68	47.87	37.71	-	-	5,383.97	38.41	--	--	5383.27	38.41	-	-	5,383.27
GBR-20	5,393.47	44.60	41.88	-	-	5,351.59	42.38	--	--	5351.09	42.38	-	-	5,351.09
GBR-21D	5,400.19	48.64	37.30	-	-	5,362.89	37.53	--	--	5362.66	37.53	-	-	5,362.66
GBR-21S	5,400.65	34.85	Dry				Dry				Dry			
GBR-22	5,395.91	45.85	38.40	38.30	0.10	5,357.59	38.85	38.87	0.02	5,357.08	38.87	38.85	0.02	5,357.06
GBR-23	5,403.72	41.75	Dry				40.18	--	--	5363.54	40.18	-	-	5,363.54
GBR-24D	5,396.77	51.44	32.40	-	-	5,364.37	32.67	--	--	5364.10	32.67	-	-	5,364.10
GBR-24S	5,396.08	33.50	31.40	-	-	5,364.68	Dry				Dry			
GBR-25	5,397.03	50.27	35.92	-	-	5,361.11	36.52	--	--	5360.51	36.52	-	-	5,360.51
GBR-26	5,396.72	42.54	33.71	-	-	5,363.01	33.19	--	--	5363.53	33.19	-	-	5,363.53
GBR-30	5,395.59	41.44	34.10	-	-	5,361.49	34.62	--	--	5360.97	34.62	-	-	5,360.97
GBR-31	5,396.58	43.50	33.92	-	-	5,362.66	36.65	--	--	5359.93	36.65	-	-	5,359.93
GBR-32	5,414.86	47.90	36.09	-	-	5,378.77	36.72	--	--	5378.14	36.72	-	-	5,378.14
GBR-33	5,396.28	45.77	Dry				Dry				Dry			
GBR-34	5,394.00	46.70	36.38	-	-	5,357.62	36.93	--	--	5357.07	36.93	-	-	5,357.07
GBR-35	5,393.66	41.62	35.41	-	-	5,358.25	38.85	--	--	5354.81	35.93	-	-	5,357.73
GBR-39	5,397.55	41.39	34.50	-	-	5,363.05	35.06	--	--	5362.49	35.06	-	-	5,362.49
GBR-40	5,400.76	39.40	Dry				Dry				Dry			
GBR-41	5,396.35	34.34	Dry				34.26	--	--	5362.09	34.26	-	-	5,362.09
GBR-48	5,413.90	43.76	37.79	-	-	5,376.11	38.42	--	--	5375.48	38.42	-	-	5,375.48
GBR-49	(1)	40.26	Obstructed				34.85	--	--	-	34.85	-	-	-
GBR-50	(1)	40.63	33.50	-	-	-	34.13	--	--	-	34.13	-	-	-
GBR-52 / GRW-8	5,387.74	54.59	38.45	-	-	5,349.29	39.03	--	--	5348.71	39.03	-	-	5,348.71
SHS-9	5,380.79	46.27	38.23	-	-	5,342.56	38.81	--	--	5341.98	38.81	-	-	5,341.98
SHS-13	5,367.81	47.51	36.33	-	-	5,331.48	36.94	--	--	5330.87	36.94	-	-	5,330.87

Notes:

- amsl - above mean sea level
- BTOC - below top of casing
- D - designates that the well screen is deep
- GWEL - groundwater elevation
- PSH - phase-separated hydrocarbon
- S - designates that the well screen is shallow

TABLE 3
GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS

FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO

Table with columns: Well ID, Sample Date, and 28 chemical compounds (benzene, toluene, ethylbenzene, m-xylenes, total, p-methyl tert-butyl ether (MTBE), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-dichloroethane (EDC), 1,2-dibromoethane (EDB), vinylhalane, 1-methylvinylhalane, 2-methylvinylhalane, acetone, bromobenzene, bromodichloromethane, bromoform, bromomethane, 2-bromobenzene, carbon disulfide, carbon tetrachloride, chlorobenzene, chloroethane, chloroform, chloromethane, 2-chloroethane, 1,4-dichlorobenzene, cis-1,2-dichlorobenzene, cis-1,3-dichlorobenzene, 1,2-dibromochloroethane, dibromochloroethane, dibromomethane, 1,2-dibromobenzene). Rows include various monitoring wells (GRW-1 to GRW-13, GBR-5 to GBR-13) with data points for different dates (e.g., Jun-88, Mar-21, Sep-89, Feb-21) and values in µg/L.

TABLE 3
GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS

FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO

Table with columns for Well ID, Sample Date, and various chemical compounds (benzene, toluene, ethylbenzene, etc.) with corresponding concentration values in µg/L.

Notes:
(1) - EPA Regional Screening Level for tap water using hazard quotient of 1.0 (non-carcinogens) and cancer risk of 1 in 100,000 exposed persons (carcinogens)
(2) - "Background" Concentration Proposed in Lee Acres DRAFT Remedial Investigation Report Prepared for the US Bureau of Land Management (dated February 1992)
(3) - Regional Background Concentrations Established in Document Titled Hydrogeology and Water Resources of San Juan Basin, New Mexico, Stone et al., dated 1983
(4) - Contaminant Concentrations Established as the "Remedial Goals" or "Background" Concentrations for the Lee Acres Superfund Site. Based on the Lee Acres DRAFT Remedial Investigation Report and Record of Decision (dated May 2004).
(5) - Background Threshold Value Established for the Former Giant Bloomfield Refinery
* - asterisk indicates that the well is screened within the bedrock aquifer, no asterisk indicates that a well is screened in the alluvial aquifer
--- - not tested
µg/L - micrograms per liter
mg/L - milligrams per liter
NE - not established
NMWQCC - New Mexico Water Quality Control Commission
PSH - phase separated hydrocarbons
USEPA - United States Environmental Protection Agency
BOLD - bold and highlighted cells indicates concentration exceeds the NMWQCC standard, where NMWQCC are not established, concentrations compared to EPA regional screening levels

TABLE 5
GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS

FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO

Table with columns: Well ID, Sample Date, and 28 chemical compounds (1,2-dichloroethane, 1,4-dichlorobenzene, etc.). Rows include various wells (GBR-32*, GBR-33, GBR-34, GBR-35, GBR-39, GBR-40, GBR-41, GBR-48, GBR-49, GBR-50, GBR-52/GRW-8, SHS-9, SHS-13) and their respective analytical results over time.

Notes:
(1) - EPA Regional Screening Level for tap water using hazard quotient of 1.0 (non-carcinogens) and cancer risk of 1 in 100,000 exposed persons (carcinogens)
(2) - "Background" Concentration Proposed in Lee Acres DRAFT Remedial Investigation Report Prepared for the US Bureau of Land Management (dated February 1992)
(3) - Regional Background Concentrations Established in Document Titled Hydrogeology and Water Resources of San Juan Basin, New Mexico, Stone et al., dated 1983
(4) - Contaminant Concentrations Established as the "Remedial Goals" or "Background" Concentrations for the Lee Acres Superfund Site, Based on the Lee Acres DRAFT Remedial Investigation Report and Record of Decision (dated May 2004).
(5) - Background Threshold Value Established for the Former Giant Bloomfield Refinery
* - asterisk indicates that the well is screened within the bedrock aquifer, no asterisk indicates that a well is screened in the alluvial aquifer
--- - not tested
µg/L - micrograms per liter
mg/L - milligrams per liter
NE - not established
NMWQCC - New Mexico Water Quality Control Commission
PSH - phase separated hydrocarbons
USEPA - United States Environmental Protection Agency
BOLD - bold and highlighted cells indicates concentration exceeds the NMWQCC standard, where NMWQCC are not established, concentrations compared to EPA regional screening levels

TABLE 4
GROUNDWATER ANALYTICAL RESULTS - METALS
FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO

Well ID	Sample Date	Total Metals	arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	mercury	nickel	selenium	silver	thallium	Dissolved Metals	arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	nickel	selenium	silver	thallium
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
NMWQCC Standard		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.002	0.2	0.05	0.05	0.002		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.2	0.05	0.05	0.002	
EPA Regional Screening Level (1)		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.000626	0.392	0.0998	0.0941	0.0002		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.392	0.0998	0.0941	0.0002	
Lee Acres Alluvial Aquifer Background Concentration (2)		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	nd	0.008 - 0.0095	0.0273 - 0.0309	NE		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	0.008 - 0.0095	0.0273 - 0.0309	NE	
Lee Acres Regional Background Concentration (3)		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	NE	0.002 - 0.04	NE	NE		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	0.002 - 0.04	NE	NE	
Lee Acres RI/ROD Remedial Goals (4)		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.002	0.20	0.010	0.05	NE		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.20	0.010	0.05	NE	
GBR Background Concentrations (5)		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE	NE		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE	
GRW-1/GBR-38	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Mar-21	0.0020	0.014	<0.0010	<0.00050	<0.0060	0.86	0.0011	2.9	<0.00020	0.012	0.0024	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GRW-2/GBR-42	Sep-89	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.023	0.066	<0.0010	<0.00050	0.018	22	<0.00050	3.3	<0.00020	0.26	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	---
GRW-3/GBR-29	Jun-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-05	---	---	---	---	---	---	---	---	---	---	6.8	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	---	0.89	---	0.69	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
GRW-4/GBR-43	Nov-19	---	---	---	---	---	2.3	---	1.4	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Feb-21	0.0013	0.21	<0.0010	<0.00050	<0.0060	3.8	<0.00050	1.8	<0.00020	0.0074	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GRW-5/GBR-37	Sep-89	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.0028	0.024	<0.0010	<0.00050	0.013	3.3	0.00098	4.4	<0.00020	0.016	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GRW-6/GBR-44	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-05	---	---	---	---	---	---	---	---	---	---	1.80	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	15	---	18	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Nov-19	---	---	---	---	---	8.0	---	5.9	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
GRW-9/GBR-6	Feb-21	<0.0010	0.025	<0.0010	<0.00050	<0.0060	1.6	<0.00050	2.1	<0.00020	0.0058	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
	Nov-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
GRW-10/GBR-36	Dec-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	<0.0010	0.034	<0.0010	<0.00050	<0.0060	1.9	<0.00050	0.53	<0.00020	0.0027	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GRW-11/GBR-27	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	<0.0010	0.017	<0.0010	<0.00050	<0.0060	1.8	0.0015	1.0	<0.00020	0.00	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GRW-12/GBR-28	Jun-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	May-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.014	0.087	<0.0010	<0.00050	<0.0060	14	0.0012	0.47	<0.00020	0.0070	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GRW-13/GBR-14	Nov-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	<0.0010	0.0082	<0.0010	<0.00050	<0.0060	0.32	0.00059	1.1	<0.00020	0.015	0.017	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GBR-5*	Jun-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.0043	0.012	<0.0010	<0.00050	0.054	4.5	0.0063	4.4	<0.00020	0.0049	0.0026	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GBR-7	Nov-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Not Sampled, PSH)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
GBR-8	Oct-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.062	0.35	<0.0010	<0.00050	<0.0060	52	0.038	3.6	<0.00020	0.018	0.0027	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
GBR-9	Nov-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Aug-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.0026	0.018	<0.0010	<0.00050	<0.0060	1.6	0.00063	0.43	<0.00020	0.016	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	

TABLE 4
GROUNDWATER ANALYTICAL RESULTS - METALS
FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO

Well ID	Sample Date	Total Metals														Dissolved Metals											
		arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	mercury	nickel	selenium	silver	thallium	arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	nickel	selenium	silver	thallium	
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
NMWQCC Standard		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.002	0.2	0.05	0.05	0.002		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.05	0.05		
EPA Regional Screening Level (1)		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.000626	0.392	0.0998	0.0941	0.0002		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.392	0.0998	0.0941	0.0002
Lee Acres Alluvial Aquifer Background Concentration (2)		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	nd	0.008 - 0.0095	0.0273 - 0.0309	NE		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	0.008 - 0.0095	0.0273 - 0.0309	NE
Lee Acres Regional Background Concentration (3)		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	NE	0.002 - 0.04	NE	NE		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	0.002 - 0.04	NE	NE
Lee Acres RI/ROD Remedial Goals (4)		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.002	0.20	0.010	0.05	NE		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.20	0.010	0.05	NE
GBR Background Concentrations (5)		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE	NE		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE
GBR-10	Nov-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Obstructed)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-11	Jun-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-13*	Feb-21	0.0015	0.15	<0.0010	<0.00050	<0.0060	44	0.0018	0.93	<0.00020	0.0061	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
	Jun-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-15	Dec-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.0018	0.042	<0.0010	<0.00050	<0.0060	3.1	0.0048	4.7	<0.00020	0.011	<0.0050	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
GBR-17	Oct-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	<0.0010	0.014	<0.0010	<0.00050	<0.0060	0.59	0.00067	0.48	<0.00020	0.0030	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
GBR-18*	Jun-86	0.01	nd	nd	nd	nd	nd	nd	nd	nd	0.10	---	nd	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-05	---	---	---	---	---	---	---	---	---	4.4	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	3.60	---	<0.0020	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Nov-19	---	---	---	---	---	120	---	3.80	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
Jan-21	<0.0010	0.014	<0.0010	<0.00050	0.011	0.79	0.00064	0.014	<0.00020	0.0056	0.0030	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
Apr-21	<0.0010	0.011	<0.0010	<0.00050	0.003	<0.050	<0.00050	0.015	<0.00020	0.0014	0.0038	<0.00050	<0.00025		<0.0010	---	<0.0010	<0.00050	0.002	<0.020	<0.00050	<0.0020	<0.0010	0.0032	<0.0050	<0.00050	
Oct-21	---	---	---	---	---	0.21	---	---	---	---	---	---	---		<0.020	0.0089 J	<0.0030	<0.0020	<0.0060	<0.020	<0.020	0.005 J	<0.010	<0.050	0.0098	<0.050	
GBR-18*	Jun-86	---	nd	nd	nd	nd	nd	nd	nd	---	nd	---	nd	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jul-94	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Mar-21	<0.0050	0.040	<0.0050	<0.0025	0.013	68	0.031	0.25	<0.00020	0.020	<0.0050	<0.0025	<0.0012		---	---	---	---	---	---	---	---	---	---	---	---
GBR-20*	Jun-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.0026	0.23	<0.0010	<0.00050	<0.0060	22	0.0034	0.53	<0.00020	0.0073	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	
GBR-21S*	Jan-21 (Dry)	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
GBR-21D*	May-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	<0.0010	0.27	<0.0010	<0.00050	<0.0060	0.97	0.0022	0.33	<0.00020	0.014	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	
GBR-22*	May-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Not Sampled, PSH)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-23*	Jan-21 (Dry or Obstructed)	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---
GBR-24S*	Nov-86	nd	0.10	nd	nd	nd	nd	nd	43	---	0.60	---	nd	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Obstructed)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-24D*	Nov-86	nd	0.10	nd	nd	nd	nd	nd	43	---	0.60	---	nd	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-05	---	---	---	---	---	---	---	---	---	9.2	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	11	---	1.8	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	
Feb-21	<0.0010	0.016	<0.0010	<0.00050	<0.0060	0.46	0.0010	0.9	<0.00020	0.0037	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	

**TABLE 4
GROUNDWATER ANALYTICAL RESULTS - METALS
FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO**

Well ID	Sample Date	Total Metals														Dissolved Metals											
		arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	mercury	nickel	selenium	silver	thallium	arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	nickel	selenium	silver	thallium	
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
NMWQCC Standard		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.002	0.2	0.05	0.05	0.002		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.05	0.05		
EPA Regional Screening Level (1)		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.000626	0.392	0.0998	0.0941	0.0002		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.392	0.0998	0.0941	0.0002
Lee Acres Alluvial Aquifer Background Concentration (2)		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	nd	0.008 - 0.0095	0.0273 - 0.0309	NE		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	0.008 - 0.0095	0.0273 - 0.0309	NE
Lee Acres Regional Background Concentration (3)		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	NE	0.002 - 0.04	NE	NE		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	0.002 - 0.04	NE	NE
Lee Acres RI/ROD Remedial Goals (4)		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.002	0.20	0.010	0.05	NE		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.20	0.010	0.05	NE
GBR Background Concentrations (5)		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE	NE		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE
GBR-25*	May-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.014	0.48	<0.0010	<0.00050	<0.0060	26	0.028	2.7	<0.00020	0.0075	0.0031	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
GBR-26	Oct-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (No Recovery)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-30	Dec-86	nd	nd	nd	0.19	nd	nd	nd	2.2	---	nd	---	nd	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	7.6	---	0.50	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-31	Nov-19	---	---	---	---	---	43	---	4.2	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.0051	0.33	0.0010	<0.00050	0.014	23	0.015	0.75	<0.00020	0.027	0.013	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
	Nov-86	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-32*	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	---	---	---	---	---	2.4	---	0.45	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Nov-19	---	---	---	---	---	15	---	2.7	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21	<0.0010	0.057	<0.0010	<0.00050	<0.0060	2.1	0.0056	0.23	<0.00020	0.0056	0.0063	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-05	---	---	---	---	---	---	---	---	---	9.00	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-33	Jan 2010	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	<0.0050	0.011	<0.0020	<0.0020	0.020	0.26	<0.00050	0.56	<0.00020	0.30	0.020	<0.0050	<0.00050		---	---	---	---	---	---	---	---	---	---	---	---
	Nov-19	<0.0010	0.034	<0.010	<0.010	0.10	3.6	0.0012	2.10	<0.00020	0.07	0.0029	<0.025	<0.00050		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21	0.0013	0.028	<0.0010	<0.00050	0.33	8.30	0.0011	1.1	<0.00020	0.061	0.0044	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
	Apr-21	0.0013	0.054	<0.0010	<0.00050	0.13	6.00	0.0025	2.0	<0.00020	0.059	0.0025	<0.00050	<0.00025		<0.0010	0.012	<0.0010	<0.0050	<0.0010	<0.020	<0.00050	1.4	0.034	0.0014	<0.0050	<0.00050
	Oct-21	---	---	---	---	---	1.30	---	---	---	---	---	---	---		<0.020	0.0085 J	<0.0030	<0.0020	<0.0060	<0.020	<0.020	0.74	0.026	<0.050	0.0110	<0.050
GBR-34	Sep-89	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Dry or Obstructed)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-35	Aug-15	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	0.023	1.80	<0.0010	<0.00050	<0.0060	20	0.0064	2.1	<0.00020	0.015	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
GBR-39	Feb-21	0.012	2.7	<0.0010	0.0023	<0.0060	26	0.032	1.8	<0.00020	0.015	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---
	Feb-21	<0.0010	0.091	<0.0010	<0.00050	0.043	6.9	0.0022	0.19	<0.00020	0.030	<0.0010	<0.00050	0.00045		---	---	---	---	---	---	---	---	---	---	---	---
GBR-40	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Dry)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-41	Jun-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Dry)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
GBR-48	Nov-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Dec-05	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
	Aug-15	<0.050	0.67	0.011	<0.0020	0.95	170	0.11	6.40	0.00046	0.28	0.089	<0.0050	0.0023		---	---	---	---	---	---	---	---	---	---	---	---
	Nov-19	0.0076	0.31	0.0038	<0.0020	0.23	48	0.031	1.80	<0.00020	0.10	0.018	<0.0050	0.0005		---	---	---	---	---	---	---	---	---	---	---	---
Jan-21	0.0050	0.20	0.00200	<0.00050	0.050	29	0.016	0.67	<0.00020	0.068	0.02	<0.00050	0.00038		---												

TABLE 4
GROUNDWATER ANALYTICAL RESULTS - METALS
FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO

Well ID	Sample Date	Total Metals	arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	mercury	nickel	selenium	silver	thallium	Dissolved Metals	arsenic	barium	beryllium	cadmium	chromium (total)	iron	lead	manganese	nickel	selenium	silver	thallium
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
NMWQCC Standard		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.002	0.2	0.05	0.05	0.002		0.1	2	0.004	0.005	0.05	1	0.015	0.2	0.2	0.05	0.05	0.002	
EPA Regional Screening Level (1)		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.000626	0.392	0.0998	0.0941	0.0002		0.000517	3.77	0.0246	0.0092	22.5	14	0.015	0.434	0.392	0.0998	0.0941	0.0002	
Lee Acres Alluvial Aquifer Background Concentration (2)		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	nd	0.008 - 0.0095	0.0273 - 0.0309	NE		nd	nd	nd	nd	0.0144 - 0.113	nd - 1.48	nd	0.0161 - 0.423	nd	0.008 - 0.0095	0.0273 - 0.0309	NE	
Lee Acres Regional Background Concentration (3)		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	NE	0.002 - 0.04	NE	NE		NE	0 - 3.4	NE	0.001 - 0.018	0.001 - 0.060	0.010 - 16	0 - 0.055	0 - 2.6	NE	0.002 - 0.04	NE	NE	
Lee Acres RI/ROD Remedial Goals (4)		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.002	0.20	0.010	0.05	NE		0.05	1.0	NE	0.010	0.113	16	0.050	0.346	0.20	0.010	0.05	NE	
GBR Background Concentrations (5)		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE	NE		NE	NE	NE	NE	1.29	97.8	NE	5.28	NE	NE	NE	NE	
GBR-49	Nov-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Dec-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Dec-05	---	---	---	---	---	---	---	---	---	---	<20	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Aug-15	0.0057	0.058	<0.0020	<0.0020	0.38	7.1	0.0038	0.54	<0.00020	0.11	0.0069	<0.0050	<0.00050		---	---	---	---	---	---	---	---	---	---	---	---	
	Nov-19	<0.0010	0.021	<0.0020	<0.0020	0.10	1.4	0.00083	0.87	<0.00020	0.12	0.0011	0.0063	<0.00050		---	---	---	---	---	---	---	---	---	---	---	---	
Jan-21 (Obstructed)	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	
GBR-50	Nov-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Dec-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Dec-05	---	---	---	---	---	---	---	---	---	---	10	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Aug-15	<0.0050	0.024	<0.0020	<0.0020	0.073	2.2	0.0013	0.19	<0.00020	0.04	0.0089	<0.0050	<0.00050		---	---	---	---	---	---	---	---	---	---	---	---	
	Nov-19	<0.0010	0.018	<0.0020	<0.0020	0.039	2.2	0.0010	0.14	<0.00020	0.06	0.0083	0.0079	<0.00050		---	---	---	---	---	---	---	---	---	---	---	---	
Jan-21	<0.0010	0.012	<0.0010	<0.00050	0.035	2.5	0.0068	0.16	<0.00020	0.013	0.010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---		
Apr-21	<0.0010	0.009	<0.0010	<0.00050	0.002	0.06	<0.00050	0.02	<0.00020	0.001	0.011	<0.00050	<0.00025		<0.0010	0.001	<0.0010	<0.00050	0.001	<0.020	<0.00050	0.01	<0.0010	0.011	<0.0050	<0.00050		
Oct-21	---	---	---	---	---	0.59	---	---	---	---	---	---	---		<0.020	0.0088 J	<0.0030	<0.0020	0.009	0.220	<0.020	0.06	0.05	<0.050	0.013	<0.050		
GBR-52/GRW-8	Nov-88	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-95	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-00	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-05	---	---	---	---	---	---	---	---	---	---	2.0	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-10	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Aug-15	---	---	---	---	---	8.20	---	0.15	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Nov-19	---	---	---	---	---	1.40	---	0.026	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---		
Jan-21	<0.0010	0.016	<0.0010	<0.00050	<0.0060	0.32	<0.00050	0.0094	<0.00020	<0.0010	0.0052	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---		
SHS-9	Aug-15	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	
	Jan-21	<0.0010	0.62	<0.0010	<0.00050	<0.0060	1.4	0.0032	0.22	<0.00020	0.011	<0.0010	<0.00050	<0.00025		---	---	---	---	---	---	---	---	---	---	---	---	
SHS-13	Jan-21	0.0018	0.083	<0.0010	<0.00050	<0.0060	0.26	<0.00050	3.7	<0.00020	0.010	<0.0010	<0.00050	<0.0025		---	---	---	---	---	---	---	---	---	---	---	---	

Notes:
(1) - EPA Regional Screening Level for tap water using hazard quotient of 1.0 (non-carcinogens) and cancer risk of 1 in 100,000 exposed persons (carcinogens)
(2) - "Background" Concentration Proposed in Lee Acres DRAFT Remedial Investigation Report Prepared for the US Bureau of Land Management (dated February 1992)
(3) - Regional Background Concentrations Established in Document Titled *Hydrogeology and Water Resources of San Juan Basin, New Mexico*, Stone et al., dated 1983
(4) - Contaminant Concentrations Established as the "Remedial Goals" or "Background" Concentrations for the Lee Acres Superfund Site. Based on the Lee Acres DRAFT Remedial Investigation Report and Record of Decision (dated May 2004).
(5) - Background Threshold Value Established for the Former Giant Bloomfield Refinery
* - asterisk indicates that the well is screened withing the bedrock aquifer, no asterisk indicates that a well is screened in the alluvial aquifer
--- not tested
mg/L - milligrams per liter
NE - not established
NMWQCC - New Mexico Water Quality Control Commission
PSH - phase separated hydrocarbons
USEPA - United States Environmental Protection Agency
J - Analyte detected below quantitation limits
BOLD - bold and highlighted cells indicates concentration exceeds the greater of GBR background concentrations or NMWQCC standards; where NMWQCC standards are not established, concentrations compared to EPA regional screening levels

**TABLE 5
GROUNDWATER ANALYTICAL RESULTS - GENERAL CHEMISTRY PARAMETERS**

**FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO**

Well ID	Sample Date	chloride	fluoride	nitrate + nitrite as N	nitrate (as NO ₃)	nitrite (as NO ₂)	sodium	sulfate	sulfide	total dissolved solids	dissolved organic carbon
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NMWQCC Standard		250	1.6	NE	10.0	1.0	NE	600	NE	1,000	NE
EPA Regional Screening Level (1)		NE	0.799	NE	32	2.0	NE	NE	NE	NE	NE
Lee Acres Alluvial Aquifer Background Concentration (2)		6.4 - 404	NE	1.2 - 4.9	NE	NE	NE	420 - 2,120	NE	760 - 3,600	NE
Lee Acres Regional Background Concentration (3)		2 - 34,000	NE	0.10 - 1,640	NE	NE	NE	1.9 - 14,000	NE	NE	NE
Lee Acres RI/ROD Remedial Goals (4)		34,000	NE	10	NE	NE	NE	14,000	NE	10,000	NE
GBR Background Concentrations (5)		560	NE	NE	NE	NE	NE	2,800	NE	4,599	NE
GRW-1/GBR-38	Jun-88	---	---	---	---	---	---	---	---	---	---
	Mar-21	40	0.85	<0.50	---	---	---	2,100	---	3,540	---
GRW-2/GBR-42	Sep-89	---	---	---	---	---	---	---	---	---	---
	Feb-21	100	0.59	<0.50	<0.50	<0.50	---	660	---	1,880	---
GRW-3/GBR-29	Jun-86	---	---	---	---	---	---	---	---	---	---
	Jun-88	---	---	---	---	---	---	---	---	---	---
	Jan-00	148	---	---	---	---	---	145	---	1,540	---
	Jan-05	36	---	---	---	---	---	2,000	---	3,300	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	38	0.95	<0.10	---	---	---	1,900	---	3,320	---
	Nov-19	100	<0.50	<0.50	---	---	---	450	---	1,990	---
Feb-21	110	1.0	<0.50	---	---	---	440	---	1,860	---	
GRW-4/GBR-43	Sep-89	---	---	---	---	---	---	---	---	---	---
	Feb-21	120	1.10	<0.50	---	---	---	1,300	---	2,790	---
GRW-5/GBR-37	Jun-88	---	---	---	---	---	---	---	---	---	---
	Feb-21	91	1.0	<0.50	---	---	2,790	1,500	2,790	2,790	2,790
GRW-6/GBR-44	Jun-88	---	---	---	---	---	---	---	---	---	---
	Jan-00	162	---	---	---	---	---	395	---	1,680	---
	Jan-05	96	---	---	---	---	---	440	---	1,600	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	88	0.55	<1.0	---	---	---	1,400	---	3,220	---
	Nov-19	94	0.60	<0.50	---	---	---	1,200	---	2,470	---
Feb-21	97	0.93	<0.50	---	---	---	1,500	---	2,570	---	
GRW-9/GBR-6	Nov-86	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---
	Feb-21	59	<0.50	<0.50	---	---	---	1,900	---	3,260	---
GRW-10/GBR-36	Jun-88	---	---	---	---	---	---	---	---	---	---
	Feb-21	51	1.1	<0.50	---	---	---	2,200	---	3,460	---
GRW-11/GBR-27	Jun-86	---	---	---	---	---	---	---	---	---	---
	Feb-21	29	1.3	<0.50	---	---	---	2,400	---	3,880	---
GRW-12/GBR-28	May-86	---	---	---	---	---	---	---	---	---	---
	Jun-88	---	---	---	---	---	---	---	---	---	---
	Feb-21	230	0.74	<0.50	---	---	---	500	---	1,880	---
GRW-13/GBR-14	Nov-86	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---
	Jan-00	264	---	---	---	---	---	1,640	---	510	---
	Feb-21	220	0.85	1.3	---	---	---	1,900	---	3,340	---
GBR-5*	Jun-86	---	---	---	---	---	---	---	---	---	---
	Feb-21	89	<0.50	<0.50	---	---	---	1,700	---	3,290	---
GBR-7	Nov-86	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Not Sampled, PSH)	---	---	---	---	---	---	---	---	---	---
GBR-8	Oct-86	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---
	Aug-15	86	---	---	---	---	---	---	---	---	---
	Feb-21	100	0.59	<0.50	---	---	---	1,300	---	2,430	---
GBR-9	Nov-86	---	---	---	---	---	---	---	---	---	---
	Aug-88	---	---	---	---	---	---	---	---	---	---
	Feb-21	110	0.88	<0.50	---	---	---	1,200	---	2,520	---
GBR-10	Nov-86	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Obstructed)	---	---	---	---	---	---	---	---	---	---
GBR-11	Jun-86	---	---	---	---	---	---	---	---	---	---
	Aug-15	95	---	---	---	---	---	---	---	---	---
	Feb-21	110	<0.50	<0.50	---	---	---	960	---	1,890	---
GBR-13*	Jun-86	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---
	Feb-21	110	1.1	<0.50	---	---	---	1,200	---	2,380	---
GBR-15	Oct-86	---	---	---	---	---	---	---	---	---	---
	Dec-88	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---
	Jan-00	313	---	---	---	---	---	1,210	---	2,910	---
	Feb-21	92	0.94	<0.10	---	---	---	2,000	---	3,460	---

**TABLE 5
GROUNDWATER ANALYTICAL RESULTS - GENERAL CHEMISTRY PARAMETERS**

**FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO**

Well ID	Sample Date	chloride	fluoride	nitrate + nitrite as N	nitrate (as NO ₃)	nitrite (as NO ₂)	sodium	sulfate	sulfide	total dissolved solids	dissolved organic carbon
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NMWQCC Standard		250	1.6	NE	10.0	1.0	NE	600	NE	1,000	NE
EPA Regional Screening Level (1)		NE	0.799	NE	32	2.0	NE	NE	NE	NE	NE
Lee Acres Alluvial Aquifer Background Concentration (2)		6.4 - 404	NE	1.2 - 4.9	NE	NE	NE	420 - 2,120	NE	760 - 3,600	NE
Lee Acres Regional Background Concentration (3)		2 - 34,000	NE	0.10 - 1,640	NE	NE	NE	1.9 - 14,000	NE	NE	NE
Lee Acres RI/ROD Remedial Goals (4)		34,000	NE	10	NE	NE	NE	14,000	NE	10,000	NE
GBR Background Concentrations (5)		560	NE	NE	NE	NE	NE	2,800	NE	4,599	NE
GBR-17	Jun-86	1,005	---	---	---	---	---	1,202	---	4,355	---
	Dec-88	370	---	---	---	---	---	2,270	---	3,996	---
	Jan-95	---	---	---	---	---	---	---	---	---	---
	Dec-00	4.0	---	---	---	---	---	1,060	---	1,930	---
	Dec-05	48	---	---	---	---	---	1,000	---	2,200	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	43	0.68	5.8	---	---	---	1,100	---	1,960	---
	Nov-19	55	<0.50	5.2	---	---	---	1,200	---	2,150	---
	Jan-21	52	0.57	5.5	---	---	---	1,300	---	2,220	---
GBR-18*	Jun-86	262	---	---	---	---	---	3,141	---	4,935	---
	Jul-94	---	---	---	---	---	---	---	---	---	---
	Mar-21	43	<0.50	1.8	---	---	---	190	---	5,100	---
GBR-20*	Jun-86	---	---	---	---	---	---	---	---	---	---
	Aug-15	96	---	---	---	---	---	---	---	---	---
	Feb-21	89	0.66	<0.50	---	---	---	250	---	1,850	---
GBR-21S*	Jan-21 (Dry)	---	---	---	---	---	---	---	---	---	
GBR-21D*	May-88	---	---	---	---	---	---	---	---	---	---
	Aug-15	330	---	---	---	---	---	---	---	---	---
	Feb-21	310	0.66	<0.50	---	---	---	780	---	2,220	---
GBR-22*	May-86	---	---	---	---	---	---	---	---	---	---
	Aug-15	470	---	---	---	---	---	---	---	---	---
	Jan-21 (Not Sampled, PSH)	---	---	---	---	---	---	---	---	---	---
GBR-23*	Jan-21 (Dry or Obstructed)	---	---	---	---	---	---	---	---	---	
GBR-24S*	Nov-86	618	---	---	---	---	---	943	---	2,826	---
	Jan-21 (Obstructed)	---	---	---	---	---	---	---	---	---	---
GBR-24D*	Nov-86	618	---	---	---	---	---	943	---	2,826	---
	Jun-88	630	---	---	---	---	---	1,640	---	3,487	---
	Jan-95	---	---	---	---	---	---	---	---	---	---
	Jan-00	610	---	---	---	---	---	1,380	---	3,550	---
	Jan-05	310	---	---	---	---	---	1,900	---	3,400	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	160	0.96	0.23	---	---	---	2,100	---	3,380	---
	Nov-19	170	0.58	<1.0	---	---	---	2,100	---	3,420	---
GBR-25*	Feb-21	200	0.52	<0.10	---	---	---	2,100	---	3,360	---
	May-86	---	---	---	---	---	---	---	---	---	---
	Aug-15	520	---	---	---	---	---	---	---	---	---
GBR-26	Feb-21	390	0.77	<0.50	---	---	---	660	---	2,480	---
	Oct-86	---	---	---	---	---	---	---	---	---	---
	Aug-15	170	---	---	---	---	---	---	---	---	---
GBR-30	Jan-21 (No Recovery)	---	---	---	---	---	---	---	---	---	---
	Dec-86	133	---	---	---	---	---	389	---	1,308	---
GBR-31	Jun-88	370	---	---	---	---	---	2,270	---	3,996	---
	Jan-95	---	---	---	---	---	---	---	---	---	---
	Jan-00	310	---	---	---	---	---	1,460	---	3,140	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	310	0.59	5.2	---	---	---	1,600	---	3,020	---
	Nov-19	280	<0.50	1.4	---	---	---	1,700	---	3,040	---
	Feb-21	220	0.42	0.95	---	---	---	1,900	---	3,150	---
	Nov-86	---	---	---	---	---	---	---	---	---	---
GBR-31	Jun-88	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---
	Jan-00	181	---	---	---	---	---	1,560	---	3,030	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	250	0.63	2.6	---	---	---	1,700	---	3,170	---
	Nov-19	290	<0.50	<0.50	---	---	---	1,600	---	3,220	---
	Jan-21	85	0.54	7.1	---	---	---	1,600	---	2,770	---

**TABLE 5
GROUNDWATER ANALYTICAL RESULTS - GENERAL CHEMISTRY PARAMETERS**

**FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO**

Well ID	Sample Date	chloride	fluoride	nitrate + nitrite as N	nitrate (as NO ₃)	nitrite (as NO ₂)	sodium	sulfate	sulfide	total dissolved solids	dissolved organic carbon
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NMWQCC Standard		250	1.6	NE	10.0	1.0	NE	600	NE	1,000	NE
EPA Regional Screening Level (1)		NE	0.799	NE	32	2.0	NE	NE	NE	NE	NE
Lee Acres Alluvial Aquifer Background Concentration (2)		6.4 - 404	NE	1.2 - 4.9	NE	NE	NE	420 - 2,120	NE	760 - 3,600	NE
Lee Acres Regional Background Concentration (3)		2 - 34,000	NE	0.10 - 1,640	NE	NE	NE	1.9 - 14,000	NE	NE	NE
Lee Acres RI/ROD Remedial Goals (4)		34,000	NE	10	NE	NE	NE	14,000	NE	10,000	NE
GBR Background Concentrations (5)		560	NE	NE	NE	NE	NE	2,800	NE	4,599	NE
GBR-32*	Aug-88	588	---	---	---	---	---	1,830	---	4,400	---
	Jan-95	569	---	---	---	---	---	1,770	---	3,830	---
	Dec-00	735	---	---	---	---	---	2,190	---	4,840	---
	Dec-05	520	---	---	---	---	---	1,700	---	4,400	---
	Jan 2010	---	---	---	---	---	---	---	---	---	---
	Aug-15	370	0.49	3.1	---	---	---	2,000	---	3,830	---
	Nov-19	190	<0.50	<1.0	---	---	---	1,700	---	3,200	---
	Jan-21	170	0.37	<1.0	---	---	---	1,900	---	3,230	---
	Apr-21	160	<0.50	1.6	1.6	<0.50	---	1,800	<0.050	3,240	2
Oct-21	170	0.24	3.7	3.7	<0.10	450	2,400	<0.050	3,430	1.0 J	
GBR-33	Sep-89	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Dry or Obstructed)	---	---	---	---	---	---	---	---	---	---
GBR-34	Aug-15	280	---	---	---	---	---	---	---	---	---
	Feb-21	270	0.86	<0.50	---	---	---	49	---	1,440	---
GBR-35	Feb-21	250	0.92	<0.50	---	---	---	10	---	1,230	---
GBR-39	Feb-21	160	0.54	<0.50	---	---	---	1,000	---	1,860	---
GBR-40	Jun-88	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Dry)	---	---	---	---	---	---	---	---	---	---
GBR-41	Jun-88	---	---	---	---	---	---	---	---	---	---
	Jan-21 (Dry)	---	---	---	---	---	---	---	---	---	---
GBR-48	Nov-88	1,300	4.7	8.0	---	---	---	1,900	---	5,900	---
	Jan-95	708	---	---	---	---	---	1,940	---	4,740	---
	Dec-00	1,200	---	---	---	---	---	1,990	---	5,340	---
	Dec-05	420	---	---	---	---	---	1,300	---	3,400	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	370	0.45	7.3	---	---	---	2,100	---	3,730	---
	Nov-19	270	<0.50	1.9	---	---	---	2,000	---	3,450	---
	Jan-21	290	0.39	2.1	---	---	---	2,100	---	3,720	---
	Apr-21	290	<0.50	2.8	2.8	<0.50	---	1,700	<0.050	3,410	1.6
Oct-21	290	0	3.2	3.2	<0.10	600	2,600	<0.050	3,430	2.0	
GBR-49	Nov-88	790	3.6	5.1	---	---	---	1,800	---	---	---
	Jan-95	225	---	---	---	---	---	1,530	---	3,100	---
	Dec-00	426	---	---	---	---	---	1,910	---	3,800	---
	Dec-05	530	---	---	---	---	---	1,900	---	4,900	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	180	0.62	<0.10	---	---	---	1,500	---	2,840	---
	Nov-19	97	<0.50	<1.0	---	---	---	1,500	---	2,710	---
Jan-21 (Obstructed)	---	---	---	---	---	---	---	---	---	---	
GBR-50	Nov-88	110	2.3	1.8	---	---	---	1,300	---	---	---
	Jan-95	39	---	---	---	---	---	1,940	---	2,690	---
	Dec-00	4.0	---	---	---	---	---	1,540	---	2,580	---
	Dec-05	51	---	---	---	---	---	1,300	---	2,700	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	44	0.83	5.0	---	---	---	1,700	---	2,760	---
	Nov-19	69	<0.50	6.9	---	---	---	1,700	---	2,910	---
	Jan-21	60	0.56	2.4	---	---	---	2,100	---	3,100	---
	Apr-21	68	0.17	8.9	8.9	<0.10	---	1,800	<0.050	3,100	<1.0
Oct-21	70	0	9.6	9.6	<0.10	370	2,400	<0.050	3,220	3.1	
GBR-52/GRW-8	Nov-88	---	---	---	---	---	---	---	---	---	---
	Jan-95	---	---	---	---	---	---	---	---	---	---
	Jan-00	96	---	---	---	---	---	1,500	---	2,700	---
	Jan-05	67	---	---	---	---	---	1,700	---	2,800	---
	Jan-10	---	---	---	---	---	---	---	---	---	---
	Aug-15	65	0.71	5.7	---	---	---	1,400	---	2,840	---
	Nov-19	60	<0.50	6.9	---	---	---	1,500	---	2,600	---
Jan-21	56	0.64	7.9	---	---	---	1,600	---	2,590	---	

**TABLE 5
GROUNDWATER ANALYTICAL RESULTS - GENERAL CHEMISTRY PARAMETERS**

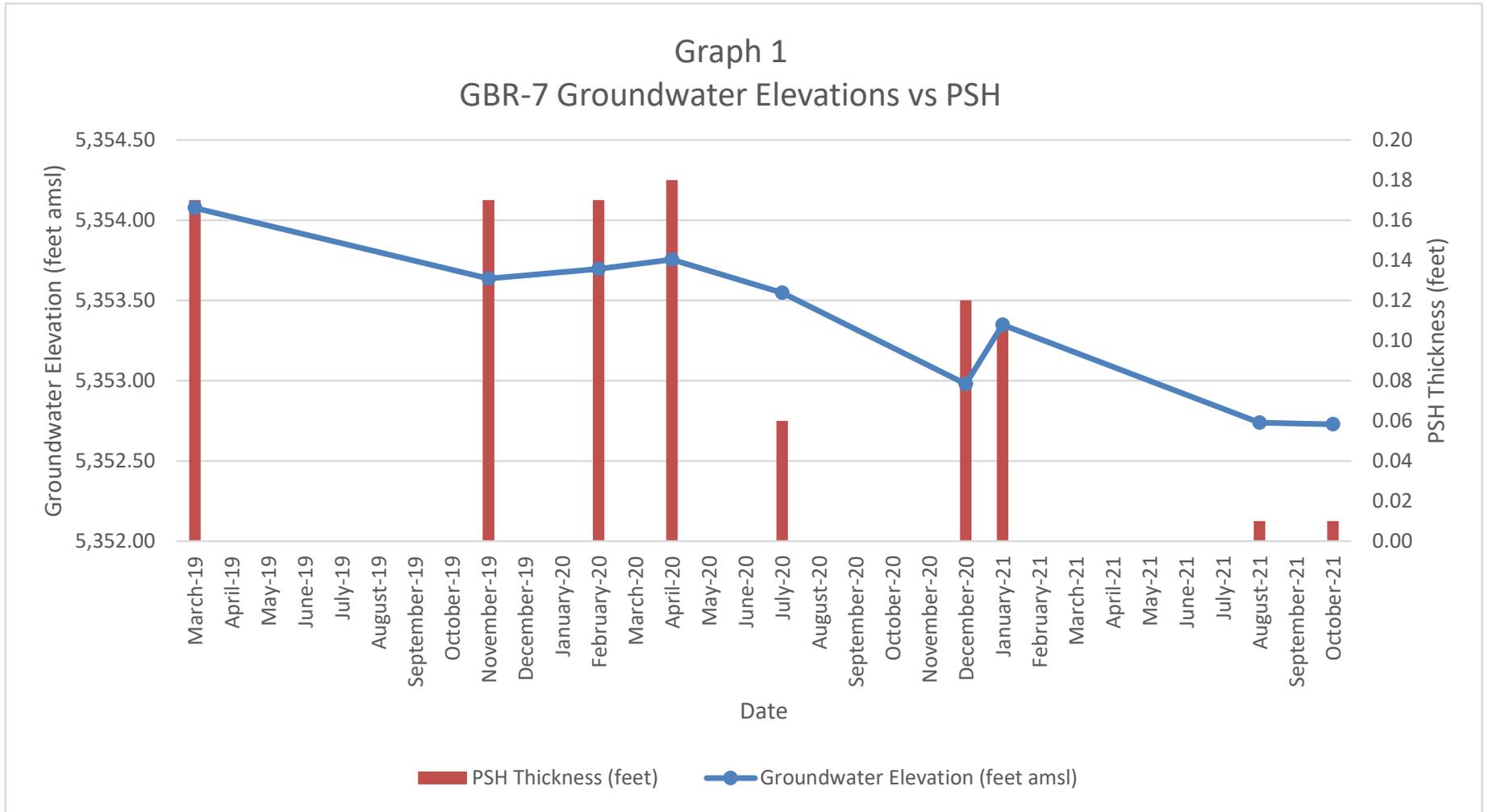
**FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, LLC
SAN JUAN COUNTY, NEW MEXICO**

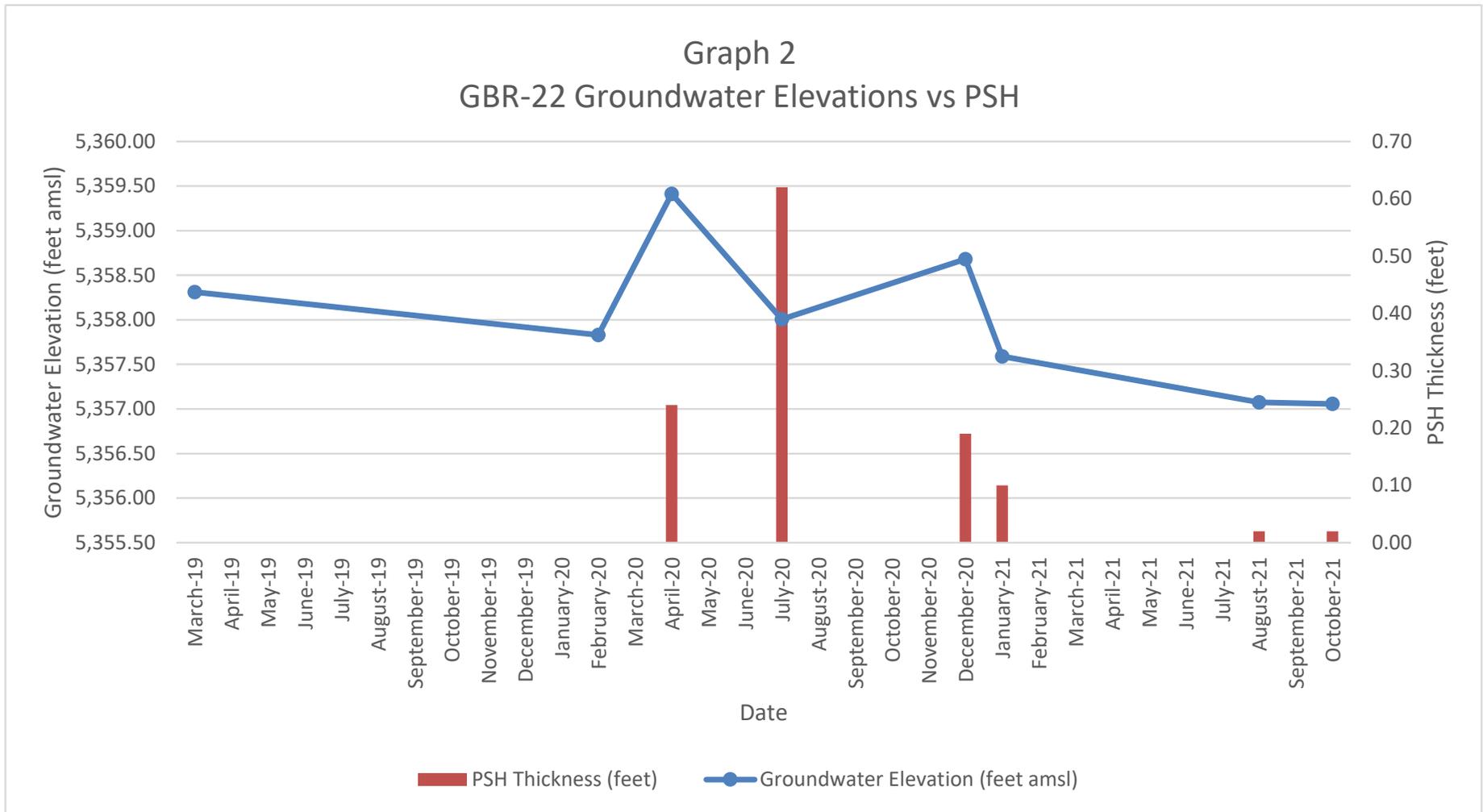
Well ID	Sample Date	chloride	fluoride	nitrate + nitrite as N	nitrate (as NO ₃)	nitrite (as NO ₂)	sodium	sulfate	sulfide	total dissolved solids	dissolved organic carbon
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NMWQCC Standard		250	1.6	NE	10.0	1.0	NE	600	NE	1,000	NE
EPA Regional Screening Level (1)		NE	0.799	NE	32	2.0	NE	NE	NE	NE	NE
Lee Acres Alluvial Aquifer Background Concentration (2)		6.4 - 404	NE	1.2 - 4.9	NE	NE	NE	420 - 2,120	NE	760 - 3,600	NE
Lee Acres Regional Background Concentration (3)		2 - 34,000	NE	0.10 - 1,640	NE	NE	NE	1.9 - 14,000	NE	NE	NE
Lee Acres RI/ROD Remedial Goals (4)		34,000	NE	10	NE	NE	NE	14,000	NE	10,000	NE
GBR Background Concentrations (5)		560	NE	NE	NE	NE	NE	2,800	NE	4,599	NE
SHS-9	Aug-15	96	---	---	---	---	---	---	---	---	---
	Jan-21	130	0.74	<1.0	---	---	---	26	---	1,540	---
SHS-13	Jan-21	330	0.65	1.6	---	---	---	360	---	1,690	---

Notes:

- (1) - EPA Regional Screening Level for tap water using hazard quotient of 1.0 (non-carcinogens) and cancer risk of 1 in 100,000 exposed persons (carcinogens)
 - (2) - "Background" Concentration Proposed in Lee Acres DRAFT Remedial Investigation Report Prepared for the US Bureau of Land Management (dated February 1992)
 - (3) - Regional Background Concentrations Established in Document Titled *Hydrogeology and Water Resources of San Juan Basin, New Mexico*, Stone et al., dated 1983
 - (4) - Contaminant Concentrations Established as the "Remedial Goals" or "Background" Concentrations for the Lee Acres Superfund Site. Based on the Lee Acres DRAFT Remedial Investigation Report and Record of Decision (dated May 2004).
 - (5) - Background Threshold Value Established for the Former Giant Bloomfield Refinery
- * - asterisk indicates that the well is screened within the bedrock aquifer, no asterisk indicates that a well is screened in the alluvial aquifer
 --- - not tested
 mg/L - milligrams per liter
 NE - not established
 NMWQCC - New Mexico Water Quality Control Commission
 PSH - phase separated hydrocarbons
 USEPA - United States Environmental Protection Agency
BOLD - bold and highlighted cells indicates concentration exceeds the greater of GBR background concentrations or NMWQCC standards; where NMWQCC standards are not established, concentrations compared to EPA regional screening levels
 J - Analyte detected below quantitation limits

GRAPHS





ENCLOSURE A – LABORATORY ANALYTICAL REPORTS



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

December 16, 2021

Kateri Luka

Western Refining Southwest, Inc.

#50 CR 4990

Bloomfield, NM 87413

TEL: (505) 632-4135

FAX (505) 632-3911

RE: Giant Bloomfield Refinery

OrderNo.: 2110335

Dear Kateri Luka:

Hall Environmental Analysis Laboratory received 8 sample(s) on 10/6/2021 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued October 29, 2021.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-17

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 10:05:00 AM

Lab ID: 2110335-001

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM 4500S2-H: SULFIDE							Analyst: PAC
Sulfide	ND	0.0500		mg/L	1	10/11/2021 6:41:00 PM	R82474
SM 5310B: DOC							Analyst: SMS
Organic Carbon, Dissolved	0.94	1.0	J	mg/L	1	10/12/2021 4:23:28 AM	R81969
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS
Total Dissolved Solids	2300	40.0	*D	mg/L	1	10/13/2021 11:06:00 AM	63150
EPA METHOD 6010B: DISSOLVED METALS							Analyst: JLF
Arsenic	ND	0.020		mg/L	1	10/19/2021 6:57:47 PM	B82212
Barium	0.0089	0.020	J	mg/L	1	10/19/2021 6:57:47 PM	B82212
Beryllium	ND	0.0030		mg/L	1	11/10/2021 1:50:16 PM	A82772
Cadmium	ND	0.0020		mg/L	1	10/19/2021 6:57:47 PM	B82212
Chromium	ND	0.0060		mg/L	1	10/19/2021 6:57:47 PM	B82212
Iron	ND	0.020		mg/L	1	10/19/2021 6:57:47 PM	B82212
Lead	ND	0.020		mg/L	1	10/19/2021 6:57:47 PM	B82212
Manganese	0.00050	0.0020	J	mg/L	1	10/19/2021 6:57:47 PM	B82212
Nickel	ND	0.010		mg/L	1	11/10/2021 1:50:16 PM	A82772
Selenium	ND	0.050		mg/L	1	11/16/2021 4:32:24 PM	R82894
Silver	0.0098	0.0050		mg/L	1	10/19/2021 6:57:47 PM	B82212
Sodium	230	5.0		mg/L	5	10/19/2021 7:00:56 PM	B82212
Thallium	ND	0.050		mg/L	1	11/10/2021 1:50:16 PM	A82772
Zinc	0.014	0.020	J	mg/L	1	10/19/2021 6:57:47 PM	B82212
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Iron	0.21	0.050		mg/L	1	10/13/2021 6:17:54 PM	63130
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Benzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Toluene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Ethylbenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Naphthalene	ND	2.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1-Methylnaphthalene	ND	4.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
2-Methylnaphthalene	ND	4.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Acetone	ND	10		µg/L	1	10/13/2021 2:50:00 PM	A82008
Bromobenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Bromodichloromethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix interference	

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-17

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 10:05:00 AM

Lab ID: 2110335-001

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Bromoform	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Bromomethane	ND	3.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
2-Butanone	ND	10		µg/L	1	10/13/2021 2:50:00 PM	A82008
Carbon disulfide	ND	10		µg/L	1	10/13/2021 2:50:00 PM	A82008
Carbon Tetrachloride	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Chlorobenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Chloroethane	ND	2.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Chloroform	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Chloromethane	ND	3.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
2-Chlorotoluene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
4-Chlorotoluene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
cis-1,2-DCE	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Dibromochloromethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Dibromomethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,1-Dichloroethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,1-Dichloroethene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2-Dichloropropane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,3-Dichloropropane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
2,2-Dichloropropane	ND	2.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,1-Dichloropropene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Hexachlorobutadiene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
2-Hexanone	ND	10		µg/L	1	10/13/2021 2:50:00 PM	A82008
Isopropylbenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
4-Isopropyltoluene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
4-Methyl-2-pentanone	ND	10		µg/L	1	10/13/2021 2:50:00 PM	A82008
Methylene Chloride	ND	3.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
n-Butylbenzene	ND	3.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
n-Propylbenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
sec-Butylbenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Styrene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
tert-Butylbenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/13/2021 2:50:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-17

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 10:05:00 AM

Lab ID: 2110335-001

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
trans-1,2-DCE	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Trichlorofluoromethane	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Vinyl chloride	ND	1.0		µg/L	1	10/13/2021 2:50:00 PM	A82008
Xylenes, Total	ND	1.5		µg/L	1	10/13/2021 2:50:00 PM	A82008
Surr: 1,2-Dichloroethane-d4	91.7	70-130		%Rec	1	10/13/2021 2:50:00 PM	A82008
Surr: 4-Bromofluorobenzene	96.6	70-130		%Rec	1	10/13/2021 2:50:00 PM	A82008
Surr: Dibromofluoromethane	94.9	70-130		%Rec	1	10/13/2021 2:50:00 PM	A82008
Surr: Toluene-d8	96.3	70-130		%Rec	1	10/13/2021 2:50:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-32

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 11:50:00 AM

Lab ID: 2110335-002

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM 4500S2-H: SULFIDE							Analyst: PAC
Sulfide	ND	0.0500		mg/L	1	10/11/2021 6:41:00 PM	R82474
SM 5310B: DOC							Analyst: SMS
Organic Carbon, Dissolved	1.0	1.0	J	mg/L	1	10/12/2021 4:39:32 AM	R81969
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS
Total Dissolved Solids	3430	20.0	*	mg/L	1	10/13/2021 11:06:00 AM	63150
EPA METHOD 6010B: DISSOLVED METALS							Analyst: JLF
Arsenic	ND	0.020		mg/L	1	10/19/2021 7:03:53 PM	B82212
Barium	0.0085	0.020	J	mg/L	1	10/19/2021 7:03:53 PM	B82212
Beryllium	ND	0.0030		mg/L	1	11/10/2021 1:53:38 PM	A82772
Cadmium	ND	0.0020		mg/L	1	10/19/2021 7:03:53 PM	B82212
Chromium	ND	0.0060		mg/L	1	10/19/2021 7:03:53 PM	B82212
Iron	ND	0.020		mg/L	1	10/19/2021 7:03:53 PM	B82212
Lead	ND	0.020		mg/L	1	10/19/2021 7:03:53 PM	B82212
Manganese	0.74	0.0020		mg/L	1	10/19/2021 7:03:53 PM	B82212
Nickel	0.026	0.010		mg/L	1	11/10/2021 1:53:38 PM	A82772
Selenium	ND	0.050		mg/L	1	11/15/2021 6:46:13 PM	A82855
Silver	0.011	0.0050		mg/L	1	10/19/2021 7:03:53 PM	B82212
Sodium	450	10		mg/L	10	10/19/2021 7:07:04 PM	B82212
Thallium	ND	0.050		mg/L	1	11/10/2021 1:53:38 PM	A82772
Zinc	0.021	0.020		mg/L	1	10/19/2021 7:03:53 PM	B82212
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Iron	1.3	0.25		mg/L	5	10/13/2021 7:48:17 PM	63130
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Benzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Toluene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Ethylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Methyl tert-butyl ether (MTBE)	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2,4-Trimethylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,3,5-Trimethylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2-Dichloroethane (EDC)	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2-Dibromoethane (EDB)	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Naphthalene	ND	2.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1-Methylnaphthalene	ND	4.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
2-Methylnaphthalene	ND	4.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Acetone	ND	10	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Bromobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Bromodichloromethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-32

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 11:50:00 AM

Lab ID: 2110335-002

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Bromoform	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Bromomethane	ND	3.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
2-Butanone	ND	10	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Carbon disulfide	ND	10	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Carbon Tetrachloride	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Chlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Chloroethane	ND	2.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Chloroform	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Chloromethane	ND	3.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
2-Chlorotoluene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
4-Chlorotoluene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
cis-1,2-DCE	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
cis-1,3-Dichloropropene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2-Dibromo-3-chloropropane	ND	2.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Dibromochloromethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Dibromomethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2-Dichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,3-Dichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,4-Dichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Dichlorodifluoromethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,1-Dichloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,1-Dichloroethene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2-Dichloropropane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,3-Dichloropropane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
2,2-Dichloropropane	ND	2.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,1-Dichloropropene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Hexachlorobutadiene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
2-Hexanone	ND	10	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Isopropylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
4-Isopropyltoluene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
4-Methyl-2-pentanone	ND	10	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Methylene Chloride	ND	3.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
n-Butylbenzene	ND	3.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
n-Propylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
sec-Butylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Styrene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
tert-Butylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,1,1,2-Tetrachloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,1,2,2-Tetrachloroethane	ND	2.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-32

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 11:50:00 AM

Lab ID: 2110335-002

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Tetrachloroethene (PCE)	1.0	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
trans-1,2-DCE	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
trans-1,3-Dichloropropene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2,3-Trichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2,4-Trichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,1,1-Trichloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,1,2-Trichloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Trichloroethene (TCE)	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Trichlorofluoromethane	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
1,2,3-Trichloropropane	ND	2.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Vinyl chloride	ND	1.0	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Xylenes, Total	ND	1.5	P	µg/L	1	10/13/2021 4:00:00 PM	A82008
Surr: 1,2-Dichloroethane-d4	91.6	70-130	P	%Rec	1	10/13/2021 4:00:00 PM	A82008
Surr: 4-Bromofluorobenzene	96.3	70-130	P	%Rec	1	10/13/2021 4:00:00 PM	A82008
Surr: Dibromofluoromethane	93.0	70-130	P	%Rec	1	10/13/2021 4:00:00 PM	A82008
Surr: Toluene-d8	95.7	70-130	P	%Rec	1	10/13/2021 4:00:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order **2110335**

Date Reported: **12/16/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-50

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 12:50:00 PM

Lab ID: 2110335-003

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM 4500S2-H: SULFIDE							Analyst: PAC
Sulfide	ND	0.0500		mg/L	1	10/11/2021 6:42:00 PM	R82474
SM 5310B: DOC							Analyst: SMS
Organic Carbon, Dissolved	3.1	1.0		mg/L	1	10/12/2021 4:55:44 AM	R81969
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS
Total Dissolved Solids	3220	20.0	*	mg/L	1	10/13/2021 11:06:00 AM	63150
EPA METHOD 6010B: DISSOLVED METALS							Analyst: JLF
Arsenic	ND	0.020		mg/L	1	10/19/2021 7:09:54 PM	B82212
Barium	0.0088	0.020	J	mg/L	1	10/19/2021 7:09:54 PM	B82212
Beryllium	ND	0.0030		mg/L	1	11/10/2021 1:57:11 PM	A82772
Cadmium	ND	0.0020		mg/L	1	10/19/2021 7:09:54 PM	B82212
Chromium	0.0085	0.0060		mg/L	1	10/19/2021 7:09:54 PM	B82212
Iron	0.22	0.020		mg/L	1	10/19/2021 7:09:54 PM	B82212
Lead	ND	0.020		mg/L	1	10/19/2021 7:09:54 PM	B82212
Manganese	0.062	0.0020		mg/L	1	10/19/2021 7:09:54 PM	B82212
Nickel	0.054	0.010		mg/L	1	11/10/2021 1:57:11 PM	A82772
Selenium	ND	0.050		mg/L	1	11/15/2021 6:48:53 PM	A82855
Silver	0.013	0.0050		mg/L	1	10/19/2021 7:09:54 PM	B82212
Sodium	370	10		mg/L	10	10/25/2021 3:50:13 PM	A82346
Thallium	ND	0.050		mg/L	1	11/10/2021 1:57:11 PM	A82772
Zinc	0.022	0.020		mg/L	1	10/19/2021 7:09:54 PM	B82212
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Iron	0.59	0.050		mg/L	1	10/13/2021 6:24:20 PM	63130
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Benzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Toluene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Ethylbenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Naphthalene	ND	2.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1-Methylnaphthalene	ND	4.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
2-Methylnaphthalene	ND	4.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Acetone	ND	10		µg/L	1	10/13/2021 4:23:00 PM	A82008
Bromobenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Bromodichloromethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-50

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 12:50:00 PM

Lab ID: 2110335-003

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Bromoform	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Bromomethane	ND	3.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
2-Butanone	ND	10		µg/L	1	10/13/2021 4:23:00 PM	A82008
Carbon disulfide	ND	10		µg/L	1	10/13/2021 4:23:00 PM	A82008
Carbon Tetrachloride	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Chlorobenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Chloroethane	ND	2.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Chloroform	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Chloromethane	ND	3.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
2-Chlorotoluene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
4-Chlorotoluene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
cis-1,2-DCE	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Dibromochloromethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Dibromomethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,1-Dichloroethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,1-Dichloroethene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2-Dichloropropane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,3-Dichloropropane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
2,2-Dichloropropane	ND	2.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,1-Dichloropropene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Hexachlorobutadiene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
2-Hexanone	ND	10		µg/L	1	10/13/2021 4:23:00 PM	A82008
Isopropylbenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
4-Isopropyltoluene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
4-Methyl-2-pentanone	ND	10		µg/L	1	10/13/2021 4:23:00 PM	A82008
Methylene Chloride	ND	3.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
n-Butylbenzene	ND	3.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
n-Propylbenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
sec-Butylbenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Styrene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
tert-Butylbenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/13/2021 4:23:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-50

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 12:50:00 PM

Lab ID: 2110335-003

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
trans-1,2-DCE	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Trichlorofluoromethane	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Vinyl chloride	ND	1.0		µg/L	1	10/13/2021 4:23:00 PM	A82008
Xylenes, Total	ND	1.5		µg/L	1	10/13/2021 4:23:00 PM	A82008
Surr: 1,2-Dichloroethane-d4	92.6	70-130		%Rec	1	10/13/2021 4:23:00 PM	A82008
Surr: 4-Bromofluorobenzene	93.6	70-130		%Rec	1	10/13/2021 4:23:00 PM	A82008
Surr: Dibromofluoromethane	93.8	70-130		%Rec	1	10/13/2021 4:23:00 PM	A82008
Surr: Toluene-d8	96.1	70-130		%Rec	1	10/13/2021 4:23:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-48

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 1:45:00 PM

Lab ID: 2110335-004

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM 4500S2-H: SULFIDE							Analyst: PAC
Sulfide	ND	0.0500		mg/L	1	10/11/2021 6:42:00 PM	R82474
SM 5310B: DOC							Analyst: SMS
Organic Carbon, Dissolved	2.0	1.0		mg/L	1	10/12/2021 5:11:49 AM	R81969
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS
Total Dissolved Solids	3430	200	*D	mg/L	1	10/13/2021 11:06:00 AM	63150
EPA METHOD 6010B: DISSOLVED METALS							Analyst: JLF
Arsenic	ND	0.020		mg/L	1	10/19/2021 7:23:43 PM	B82212
Barium	0.011	0.020	J	mg/L	1	10/19/2021 7:23:43 PM	B82212
Beryllium	ND	0.0030		mg/L	1	11/10/2021 2:00:58 PM	A82772
Cadmium	ND	0.0020		mg/L	1	10/19/2021 7:23:43 PM	B82212
Chromium	ND	0.0060		mg/L	1	10/19/2021 7:23:43 PM	B82212
Iron	0.34	0.020		mg/L	1	10/19/2021 7:23:43 PM	B82212
Lead	ND	0.020		mg/L	1	10/19/2021 7:23:43 PM	B82212
Manganese	0.0047	0.0020		mg/L	1	10/19/2021 7:23:43 PM	B82212
Nickel	0.029	0.010		mg/L	1	11/10/2021 2:00:58 PM	A82772
Selenium	ND	0.050		mg/L	1	11/15/2021 6:51:20 PM	A82855
Silver	0.0091	0.0050		mg/L	1	11/15/2021 6:51:20 PM	A82855
Sodium	600	10		mg/L	10	10/25/2021 3:53:06 PM	A82346
Thallium	ND	0.050		mg/L	1	11/10/2021 2:00:58 PM	A82772
Zinc	0.011	0.020	J	mg/L	1	10/19/2021 7:23:43 PM	B82212
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: JLF
Iron	260	25		mg/L	500	10/13/2021 7:51:23 PM	63130
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Benzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Toluene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Ethylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Methyl tert-butyl ether (MTBE)	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2,4-Trimethylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,3,5-Trimethylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2-Dichloroethane (EDC)	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2-Dibromoethane (EDB)	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Naphthalene	ND	2.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1-Methylnaphthalene	ND	4.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
2-Methylnaphthalene	ND	4.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Acetone	ND	10	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Bromobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Bromodichloromethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-48

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 1:45:00 PM

Lab ID: 2110335-004

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Bromoform	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Bromomethane	ND	3.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
2-Butanone	ND	10	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Carbon disulfide	ND	10	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Carbon Tetrachloride	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Chlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Chloroethane	ND	2.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Chloroform	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Chloromethane	ND	3.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
2-Chlorotoluene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
4-Chlorotoluene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
cis-1,2-DCE	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
cis-1,3-Dichloropropene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2-Dibromo-3-chloropropane	ND	2.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Dibromochloromethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Dibromomethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2-Dichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,3-Dichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,4-Dichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Dichlorodifluoromethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,1-Dichloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,1-Dichloroethene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2-Dichloropropane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,3-Dichloropropane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
2,2-Dichloropropane	ND	2.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,1-Dichloropropene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Hexachlorobutadiene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
2-Hexanone	ND	10	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Isopropylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
4-Isopropyltoluene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
4-Methyl-2-pentanone	ND	10	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Methylene Chloride	ND	3.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
n-Butylbenzene	ND	3.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
n-Propylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
sec-Butylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Styrene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
tert-Butylbenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,1,1,2-Tetrachloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,1,2,2-Tetrachloroethane	ND	2.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-48

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 1:45:00 PM

Lab ID: 2110335-004

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: CCM
Tetrachloroethene (PCE)	1.0	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
trans-1,2-DCE	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
trans-1,3-Dichloropropene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2,3-Trichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2,4-Trichlorobenzene	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,1,1-Trichloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,1,2-Trichloroethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Trichloroethene (TCE)	0.44	1.0	JP	µg/L	1	10/13/2021 4:46:00 PM	A82008
Trichlorofluoromethane	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
1,2,3-Trichloropropane	ND	2.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Vinyl chloride	ND	1.0	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Xylenes, Total	ND	1.5	P	µg/L	1	10/13/2021 4:46:00 PM	A82008
Surr: 1,2-Dichloroethane-d4	92.7	70-130	P	%Rec	1	10/13/2021 4:46:00 PM	A82008
Surr: 4-Bromofluorobenzene	93.6	70-130	P	%Rec	1	10/13/2021 4:46:00 PM	A82008
Surr: Dibromofluoromethane	91.0	70-130	P	%Rec	1	10/13/2021 4:46:00 PM	A82008
Surr: Toluene-d8	96.1	70-130	P	%Rec	1	10/13/2021 4:46:00 PM	A82008

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-17-Diss

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 10:05:00 AM

Lab ID: 2110335-005

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LRN
Fluoride	0.49	0.10		mg/L	1	10/6/2021 8:18:41 PM	R81855
Chloride	58	10		mg/L	20	10/6/2021 8:31:33 PM	R81855
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/6/2021 8:18:41 PM	R81855
Bromide	0.26	0.10		mg/L	1	10/6/2021 8:18:41 PM	R81855
Nitrogen, Nitrate (As N)	6.6	2.0		mg/L	20	10/6/2021 8:31:33 PM	R81855
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/6/2021 8:31:33 PM	R81855
Sulfate	1600	10	E*	mg/L	20	10/6/2021 8:31:33 PM	R81855

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix interference	

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-32-Diss

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 11:50:00 AM

Lab ID: 2110335-006

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LRN
Fluoride	0.24	0.10		mg/L	1	10/6/2021 8:44:27 PM	R81855
Chloride	170	10		mg/L	20	10/6/2021 8:57:20 PM	R81855
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/6/2021 8:44:27 PM	R81855
Bromide	0.61	0.10		mg/L	1	10/6/2021 8:44:27 PM	R81855
Nitrogen, Nitrate (As N)	3.7	0.10		mg/L	1	10/6/2021 8:44:27 PM	R81855
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/6/2021 8:57:20 PM	R81855
Sulfate	2400	10	E*	mg/L	20	10/6/2021 8:57:20 PM	R81855

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix interference	

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-50-Diss

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 12:50:00 PM

Lab ID: 2110335-007

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LRN
Fluoride	0.30	0.10		mg/L	1	10/6/2021 9:10:13 PM	R81855
Chloride	70	10		mg/L	20	10/6/2021 9:23:04 PM	R81855
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/6/2021 9:10:13 PM	R81855
Bromide	0.34	0.10		mg/L	1	10/6/2021 9:10:13 PM	R81855
Nitrogen, Nitrate (As N)	9.6	2.0		mg/L	20	10/6/2021 9:23:04 PM	R81855
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/6/2021 9:23:04 PM	R81855
Sulfate	2400	10	E*	mg/L	20	10/6/2021 9:23:04 PM	R81855

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix interference	

Analytical Report

Lab Order 2110335

Date Reported: 12/16/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.

Client Sample ID: GBR-48-Diss

Project: Giant Bloomfield Refinery

Collection Date: 10/5/2021 1:45:00 PM

Lab ID: 2110335-008

Matrix: GROUNDWA

Received Date: 10/6/2021 8:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LRN
Fluoride	0.21	0.10		mg/L	1	10/6/2021 10:01:44 PM	R81855
Chloride	290	10	*	mg/L	20	10/6/2021 10:40:22 PM	R81855
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/6/2021 10:01:44 PM	R81855
Bromide	1.0	0.10		mg/L	1	10/6/2021 10:01:44 PM	R81855
Nitrogen, Nitrate (As N)	3.2	0.10		mg/L	1	10/6/2021 10:01:44 PM	R81855
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/6/2021 10:40:22 PM	R81855
Sulfate	2600	10	E*	mg/L	20	10/6/2021 10:40:22 PM	R81855

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	RL Reporting Limit
	S % Recovery outside of range due to dilution or matrix interference	



ANALYTICAL REPORT

October 12, 2021

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Hall Environmental Analysis Laboratory

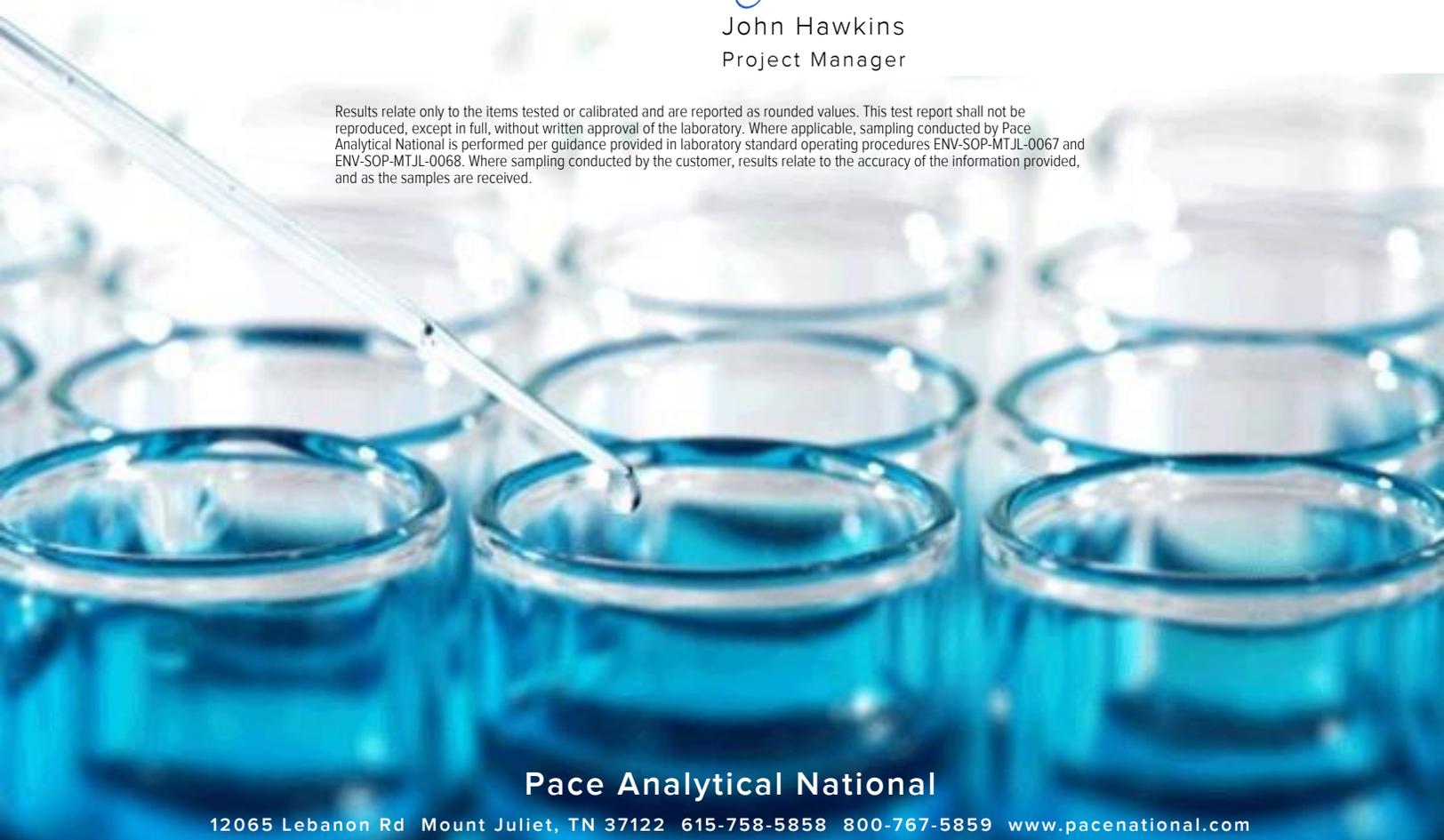
Sample Delivery Group: L1415694
 Samples Received: 10/08/2021
 Project Number:
 Description:

Report To: Andy Freeman
 4901 Hawkins NE
 Albuquerque, NM 87109

Entire Report Reviewed By:

John Hawkins
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

Cp: Cover Page	1	
Tc: Table of Contents	2	
Ss: Sample Summary	3	
Cn: Case Narrative	4	
Sr: Sample Results	5	
2110335-001F GBR-17 L1415694-01	5	
2110335-002F GBR-32 L1415694-02	6	
2110335-003F GBR-50 L1415694-03	7	
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Qc: Quality Control Summary	9	
Wet Chemistry by Method 4500S2 D-2011	9	
Gl: Glossary of Terms	10	
Al: Accreditations & Locations	11	
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2110335-001F GBR-17 L1415694-01 WW

Collected by
Collected date/time
Received date/time
10/05/21 10:05
10/08/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500S2 D-2011	WG1755124	1	10/11/21 18:41	10/11/21 18:41	BMD	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

2110335-002F GBR-32 L1415694-02 WW

Collected by
Collected date/time
Received date/time
10/05/21 11:50
10/08/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500S2 D-2011	WG1755124	1	10/11/21 18:41	10/11/21 18:41	BMD	Mt. Juliet, TN

4 Cn

5 Sr

2110335-003F GBR-50 L1415694-03 WW

Collected by
Collected date/time
Received date/time
10/05/21 12:50
10/08/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500S2 D-2011	WG1755124	1	10/11/21 18:42	10/11/21 18:42	BMD	Mt. Juliet, TN

6 Qc

7 Gl

8 Al

2110335-004F GBR-48 L1415694-04 WW

Collected by
Collected date/time
Received date/time
10/05/21 13:45
10/08/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500S2 D-2011	WG1755124	1	10/11/21 18:42	10/11/21 18:42	BMD	Mt. Juliet, TN

9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc

Collected date/time: 10/05/21 10:05

L1415694

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	10/11/2021 18:41	WG1755124

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Collected date/time: 10/05/21 11:50

L1415694

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	10/11/2021 18:41	WG1755124

- ¹Cp
- ²Tc
- ³Ss
- ⁴Cn
- ⁵Sr
- ⁶Qc
- ⁷Gl
- ⁸Al
- ⁹Sc

Collected date/time: 10/05/21 12:50

L1415694

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	10/11/2021 18:42	WG1755124

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Collected date/time: 10/05/21 13:45

L1415694

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	10/11/2021 18:42	WG1755124

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Wet Chemistry by Method 4500S2 D-2011

[L1415694-01,02,03,04](#)

Method Blank (MB)

(MB) R3714994-1 10/11/21 18:35

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Sulfide	U		0.0250	0.0500

1 Cp

2 Tc

3 Ss

L1414553-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1414553-09 10/11/21 18:38 • (DUP) R3714994-4 10/11/21 18:38

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Sulfide	ND	ND	1	0.000		20

4 Cn

5 Sr

Laboratory Control Sample (LCS)

(LCS) R3714994-2 10/11/21 18:35

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Sulfide	0.500	0.516	103	85.0-115	

6 Qc

7 Gl

L1414553-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414553-10 10/11/21 18:39 • (MS) R3714994-5 10/11/21 18:39 • (MSD) R3714994-6 10/11/21 18:39

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Sulfide	0.500	ND	0.457	0.465	91.4	93.0	1	80.0-120			1.74	20

8 Al

9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

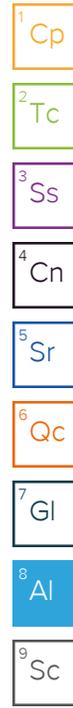
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

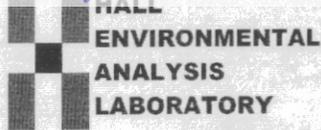
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Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975
 FAX: 505-345-4107
 Website: clients.hallenvironmental.com

1236

SUB CONTRACTOR: **Pace TN** COMPANY: **PACE TN** PHONE: **(800) 767-5859** FAX: **(615) 758-5859**
 ADDRESS: **12065 Lebanon Rd** ACCOUNT #: _____ EMAIL: _____
 CITY, STATE, ZIP: **Mt. Juliet, TN 37122**

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2110335-001F	GBR-17	500PLNAOH ZnAc	Groundw ater	10/5/2021 10:05:00 AM	1	Sulfide <i>712</i> <i>L1415694-01</i>
2	2110335-002F	GBR-32	500PLNAOH ZnAc	Groundw ater	10/5/2021 11:50:00 AM	1	Sulfide <i>712</i> <i>02</i>
3	2110335-003F	GBR-50	500PLNAOH ZnAc	Groundw ater	10/5/2021 12:50:00 PM	1	Sulfide <i>712</i> <i>03</i>
4	2110335-004F	GBR-48	500PLNAOH ZnAc	Groundw ater	10/5/2021 1:45:00 PM	1	Sulfide <i>712</i> <i>04</i>

Sample Receipt Checklist

COC Seal Present/Intact: Y N If Applicable
 COC Signed/Accurate: Y N VOA Zero Headspace: Y N
 Bottles arrive intact: Y N Pres. Correct/Check: Y N
 Correct bottles used: Y N
 Sufficient volume sent: Y N
 RAD Screen <0.5 mR/hr: Y N

5300 4295 6787

SPECIAL INSTRUCTIONS / COMMENTS:

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By: <i>SA</i>	Date: 10/6/2021	Time: 3:58 PM	Received By: <i>[Signature]</i>	Date: <i>10/8/21</i>	Time: <i>11:20</i>	REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARD COPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE FOR LAB USE ONLY Temp of samples <i>370 = 3°C</i> Attempt to Cool? _____ Comments: _____
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
TAT: Standard <input checked="" type="checkbox"/> RUSH <input type="checkbox"/> Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>						

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R81855	RunNo: 81855								
Prep Date:	Analysis Date: 10/6/2021	SeqNo: 2896013			Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P)	ND	0.50								
Sulfate	ND	0.50								

Sample ID: LCS	SampType: ics	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R81855	RunNo: 81855								
Prep Date:	Analysis Date: 10/6/2021	SeqNo: 2896014			Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Fluoride	0.52	0.10	0.5000	0	104	90	110			
Chloride	4.9	0.50	5.000	0	98.2	90	110			
Nitrogen, Nitrite (As N)	1.0	0.10	1.000	0	99.7	90	110			
Bromide	2.5	0.10	2.500	0	101	90	110			
Nitrogen, Nitrate (As N)	2.6	0.10	2.500	0	104	90	110			
Phosphorus, Orthophosphate (As P)	4.7	0.50	5.000	0	93.6	90	110			
Sulfate	10	0.50	10.00	0	102	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID: 100ng 8260 lcs	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES								
Client ID: LCSW	Batch ID: A82008	RunNo: 82008								
Prep Date:	Analysis Date: 10/13/2021	SeqNo: 2903970	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	93.3	70	130			
Toluene	19	1.0	20.00	0	96.8	70	130			
Chlorobenzene	20	1.0	20.00	0	98.9	70	130			
1,1-Dichloroethene	17	1.0	20.00	0	87.4	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	88.0	70	130			
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.9	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		97.2	70	130			
Surr: Dibromofluoromethane	9.2		10.00		92.4	70	130			
Surr: Toluene-d8	9.6		10.00		96.3	70	130			

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES								
Client ID: PBW	Batch ID: A82008	RunNo: 82008								
Prep Date:	Analysis Date: 10/13/2021	SeqNo: 2903971	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

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- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: A82008	RunNo: 82008
Prep Date:	Analysis Date: 10/13/2021	SeqNo: 2903971 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES								
Client ID: PBW	Batch ID: A82008	RunNo: 82008								
Prep Date:	Analysis Date: 10/13/2021	SeqNo: 2903971	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.3		10.00		93.4	70	130			
Surr: 4-Bromofluorobenzene	9.5		10.00		94.7	70	130			
Surr: Dibromofluoromethane	9.3		10.00		93.5	70	130			
Surr: Toluene-d8	9.8		10.00		98.0	70	130			

Sample ID: 2110335-001ams	SampType: MS	TestCode: EPA Method 8260B: VOLATILES								
Client ID: GBR-17	Batch ID: A82008	RunNo: 82008								
Prep Date:	Analysis Date: 10/13/2021	SeqNo: 2903973	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	91.3	70	130			
Toluene	20	1.0	20.00	0	97.6	70	130			
Chlorobenzene	20	1.0	20.00	0	99.0	70	130			
1,1-Dichloroethene	17	1.0	20.00	0	84.1	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	87.4	70	130			
Surr: 1,2-Dichloroethane-d4	9.2		10.00		92.0	70	130			
Surr: 4-Bromofluorobenzene	9.5		10.00		94.8	70	130			
Surr: Dibromofluoromethane	9.4		10.00		94.1	70	130			
Surr: Toluene-d8	9.8		10.00		97.7	70	130			

Sample ID: 2110335-001amsd	SampType: MSD	TestCode: EPA Method 8260B: VOLATILES								
Client ID: GBR-17	Batch ID: A82008	RunNo: 82008								
Prep Date:	Analysis Date: 10/13/2021	SeqNo: 2904877	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	90.1	70	130	1.30	20	
Toluene	19	1.0	20.00	0	95.2	70	130	2.51	20	
Chlorobenzene	19	1.0	20.00	0	97.5	70	130	1.52	20	
1,1-Dichloroethene	16	1.0	20.00	0	81.9	70	130	2.65	20	
Trichloroethene (TCE)	17	1.0	20.00	0	84.2	70	130	3.67	20	
Surr: 1,2-Dichloroethane-d4	9.2		10.00		92.5	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.7		10.00		96.9	70	130	0	0	
Surr: Dibromofluoromethane	9.3		10.00		93.3	70	130	0	0	
Surr: Toluene-d8	9.8		10.00		98.1	70	130	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
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- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID: MB-B	SampType: MBLK	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: PBW	Batch ID: B82212	RunNo: 82212								
Prep Date:	Analysis Date: 10/19/2021	SeqNo: 2913390	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.020								
Barium	ND	0.020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Iron	ND	0.020								
Lead	ND	0.020								
Manganese	ND	0.0020								
Silver	ND	0.0050								
Sodium	ND	1.0								
Zinc	ND	0.020								

Sample ID: LCS-B	SampType: LCS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCSW	Batch ID: B82212	RunNo: 82212								
Prep Date:	Analysis Date: 10/19/2021	SeqNo: 2913392	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.49	0.020	0.5000	0	97.3	80	120			
Barium	0.50	0.020	0.5000	0	99.9	80	120			
Cadmium	0.51	0.0020	0.5000	0	103	80	120			
Chromium	0.50	0.0060	0.5000	0	99.8	80	120			
Iron	0.51	0.020	0.5000	0	102	80	120			
Lead	0.51	0.020	0.5000	0	102	80	120			
Manganese	0.50	0.0020	0.5000	0	99.3	80	120			
Silver	0.098	0.0050	0.1000	0	98.5	80	120			
Sodium	52	1.0	50.00	0	104	80	120			
Zinc	0.50	0.020	0.5000	0	99.1	80	120			

Sample ID: MB-A	SampType: MBLK	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: PBW	Batch ID: A82346	RunNo: 82346								
Prep Date:	Analysis Date: 10/25/2021	SeqNo: 2920384	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID: LCS-A	SampType: LCS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCSW	Batch ID: A82346	RunNo: 82346								
Prep Date:	Analysis Date: 10/25/2021	SeqNo: 2920386	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	49	1.0	50.00	0	98.7	80	120			

Qualifiers:

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- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID: MB-A	SampType: MBLK	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: PBW	Batch ID: A82772	RunNo: 82772								
Prep Date:	Analysis Date: 11/10/2021	SeqNo: 2938644	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	ND	0.0030								
Nickel	ND	0.010								
Thallium	ND	0.050								

Sample ID: LCS-A	SampType: LCS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCSW	Batch ID: A82772	RunNo: 82772								
Prep Date:	Analysis Date: 11/10/2021	SeqNo: 2938646	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.47	0.0030	0.5000	0	94.0	80	120			
Nickel	0.41	0.010	0.5000	0	82.8	80	120			
Thallium	0.45	0.050	0.5000	0	90.5	80	120			

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: PBW	Batch ID: A82855	RunNo: 82855								
Prep Date:	Analysis Date: 11/15/2021	SeqNo: 2941877	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	ND	0.050								
Silver	ND	0.0050								

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCSW	Batch ID: A82855	RunNo: 82855								
Prep Date:	Analysis Date: 11/15/2021	SeqNo: 2941879	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	0.44	0.050	0.5000	0	88.9	80	120			
Silver	0.093	0.0050	0.1000	0	92.6	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
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- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID: MB-63130	SampType: MBLK	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: PBW	Batch ID: 63130	RunNo: 82038								
Prep Date: 10/7/2021	Analysis Date: 10/13/2021	SeqNo: 2905334	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.050								

Sample ID: LCS-63130	SampType: LCS	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: LCSW	Batch ID: 63130	RunNo: 82038								
Prep Date: 10/7/2021	Analysis Date: 10/13/2021	SeqNo: 2905336	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.50	0.050	0.5000	0	100	80	120			

Qualifiers:

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- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refinery

Sample ID: MB-doc	SampType: MBLK	TestCode: SM 5310B: DOC								
Client ID: PBW	Batch ID: R81969	RunNo: 81969								
Prep Date:	Analysis Date: 10/12/2021	SeqNo: 2902099	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	ND	1.0								

Sample ID: LCS-doc	SampType: LCS	TestCode: SM 5310B: DOC								
Client ID: LCSW	Batch ID: R81969	RunNo: 81969								
Prep Date:	Analysis Date: 10/12/2021	SeqNo: 2902102	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	4.7	1.0	4.850	0	96.8	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2110335

16-Dec-21

Client: Western Refining Southwest, Inc.

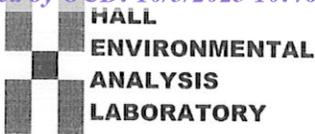
Project: Giant Bloomfield Refinery

Sample ID: MB-63150	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids								
Client ID: PBW	Batch ID: 63150	RunNo: 81996								
Prep Date: 10/11/2021	Analysis Date: 10/13/2021	SeqNo: 2903607	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: LCS-63150	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids								
Client ID: LCSW	Batch ID: 63150	RunNo: 81996								
Prep Date: 10/11/2021	Analysis Date: 10/13/2021	SeqNo: 2903608	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
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- S % Recovery outside of range due to dilution or matrix interference
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southwest, Inc. Work Order Number: 2110335 RcptNo: 1

Received By: Juan Rojas 10/6/2021 8:40:00 AM

Juan Rojas

Completed By: Sean Livingston 10/6/2021 3:40:19 PM

Sean Livingston

Reviewed By: *JN 10/6/21*

Chain of Custody

- 1. Is Chain of Custody complete? Yes No Not Present
- 2. How was the sample delivered? Courier

Log In

- 3. Was an attempt made to cool the samples? Yes No NA
- 4. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 5. Sample(s) in proper container(s)? Yes No
- 6. Sufficient sample volume for indicated test(s)? Yes No
- 7. Are samples (except VOA and ONG) properly preserved? Yes No
- 8. Was preservative added to bottles? Yes No NA
- 9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes No NA
- 10. Were any sample containers received broken? Yes No
- 11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes No
- 12. Are matrices correctly identified on Chain of Custody? Yes No
- 13. Is it clear what analyses were requested? Yes No
- 14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes No

of preserved bottles checked for pH: 8-4
 (<2 or >12 unless noted)
 Adjusted? NO
 Checked by: TMC 10/7/21

Special Handling (if applicable)

- 15. Was client notified of all discrepancies with this order? Yes No NA

KPG 10/06/21 HPP UNPRES Taken Back - KPG 10/06/21

Person Notified:	_____	Date:	_____
By Whom:	_____	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	_____		
Client Instructions:	_____		

16. Additional remarks: *Filtered from 001C, 004C, 002C, 003C into 005A,*

17. Cooler Information *008A, 006A, 007A. KPG 10/06/21*

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.5	Good				

Chain-of-Custody Record

Client: Western Marathon
Kateri Luka
 Mailing Address: 2350 E. 223rd Street
Carson, CA 90810
 Phone #: 714-713-1218

email or Fax#: KAlukac.marathon.petroleum
 QA/QC Package:
 Standard Level 4 (Full Validation)
 Accreditation: Az Compliance
 NELAC Other
 EDD (Type)

Turn-Around Time:
 Standard Rush
 Project Name: Giant Bloomfield Refinery
 Project #: _____

Project Manager:
Stuart Hyde
 Sampler: Josh Adams
 On Ice: Yes No
 # of Coolers: _____
 Cooler Temp (including CF): 4.6-0.1-4.5 (°C)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
10-5-21	1005	GW	GBR-17	various	various	2110335
	1150		GBR-32			002/06
	1250		GBR-50			003/07
	1345		GBR-48			004/08

Relinquished by: Josh Adams Date: 10/5/21 Time: 1507
 Relinquished by: Stuart Hyde Date: 10/5/21 Time: 1811

Received by: WAS Date: 10/5/21 Time: 1507
 Received by: Carver Date: 10/6/21 Time: 8:40



HALL ENVIRONMENTAL ANALYSIS LABORATORY
 www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Metals (dissolved) by ICP	Iron un.f. by ICP-MS 50058	Ferrous Iron	Ferric Iron	Anions dissolved + bro	Sulfide + DS, TP
							X			X	X	X	X	X	X
							X			X	X	X	X	X	X
							X			X	X	X	X	X	X

Remarks:
 See attachment
 CC: Stuart.hyde@wsp.com
~~Report will be sent w/ required analysis~~

District I
 1625 N. French Dr., Hobbs, NM 88240
 Phone:(575) 393-6161 Fax:(575) 393-0720

District II
 811 S. First St., Artesia, NM 88210
 Phone:(575) 748-1283 Fax:(575) 748-9720

District III
 1000 Rio Brazos Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV
 1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 271818

CONDITIONS

Operator: Western Refining Southwest LLC 539 South Main Street Findlay, OH 45840	OGRID: 267595
	Action Number: 271818
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
lbarr	None	10/3/2023