



DISCHARGE PERMIT APPLICATION

**FORMER GIANT BLOOMFIELD
REFINERY
BLOOMFIELD, NEW MEXICO**

MAY 2020

Prepared for:

**WESTERN REFINING SOUTHWEST, INC.
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BLOOMFIELD, NEW MEXICO 87413**

Prepared by:

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of WSP**

DISCHARGE PERMIT APPLICATION

**FORMER GIANT BLOOMFIELD REFINERY
BLOOMFIELD, NEW MEXICO**

Project Number: 095820002

Prepared by:  _____ May 11, 2020
Stuart Hyde, LG _____
LTE Project Geologist Date

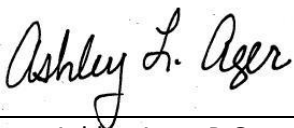
Reviewed by:  _____ May 11, 2020
Ashley Ager, P.G. _____
LTE Senior Geologist Date

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1.0 DISCHARGE PERMIT TYPE

Western Refining Southwest, Inc. (Western) proposes the potential discharge of water derived from wells at the inactive former Giant Bloomfield Refinery (GBR) in San Juan County, New Mexico. Monitoring and recovery wells were installed as part of site characterization activities and as a remedial action (groundwater recovery and treatment) to address groundwater contamination associated with historical releases of diesel fuel on the GBR property. For the purposes of this document, the “Site” is considered to be the lateral and vertical extents of contamination related to historical diesel-fuel releases originating from the GBR property. The “Facility” is considered the groundwater recovery and treatment system, as well as the existing water-discharge infrastructure, located on the GBR property.

Since 2015, no water has been discharged at the Facility. However, additional groundwater sampling is planned as part of additional characterization proposed for the Site per the *Stage 1 Abatement Plan* prepared by LT Environmental (LTE). Depending on the results of the additional sampling, the groundwater recovery and treatment system may be reactivated and require the discharge of treated effluent into the existing infiltration trenches located at the Site.

2.0 OPERATOR INFORMATION

The landowner, operator and legally responsible party is as follows:

Western Refining Southwest, Inc.
539 South Main Street, Room M-7081
Findlay, OH 45840
Phone: (419) 421-2338

Correspondence regarding this discharge plan should be directed to the local representative:

Gregory McCartney
Senior Environmental Professional
Marathon Petroleum Company LP
539 South Main Street, Room M-7081
Findlay, OH 45840
Phone: (419) 310-4888

3.0 LOCATION

The Facility is located on the northeast corner of United States Highway 64 and County Road 3500, approximately five 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).

4.0 LANDOWNER INFORMATION

The landowner, operator and legally responsible party is as follows:

Western Refining Southwest, Inc.
539 South Main Street, Room M-7081
Findlay, OH 45840
Phone: (419) 421-2338

5.0 FACILITY DESCRIPTION

The Facility consists of the former Giant Bloomfield Refinery storage tanks and equipment, as well as the remedial equipment installed for recovery, treatment, and discharge of groundwater from the Site (pumps, piping, and treatment system). The refinery operated from 1974 to 1982 and is presently inactive. A remediation system was installed in stages beginning in 1988 and has gradually been simplified over time. The remediation system was designed to treat groundwater affected by various releases during operation of the former refinery and periodic spills at the truck unloading facility. The remediation system consists of a series of groundwater monitoring wells, groundwater recovery wells, water treatment equipment, and treated-water infiltration trenches. During operation, the treatment system could process up to 5,000,000 gallons of water per year. Currently, the Facility and associated equipment is located within the GBR property boundary. The location of the current Facility equipment is shown on Figure 2.

6.0 STORED MATERIALS

The refinery is no longer in operation and there are no stored materials located at the Facility.

7.0 EFFLUENT SOURCES

The effluent will be derived from groundwater pumped from a series of recovery wells at the Site. Groundwater in several areas of the Site is impacted by petroleum hydrocarbons. However, the recovered water will be treated prior to discharge (see Section 8.0). Table 1 presents the analytical results of the influent and effluent water in 2015 prior to shut-down of the remediation system. Up to 420,000 gallons of water was previously treated and discharged per month.

8.0 WATER COLLECTION, TREATMENT, AND DISPOSAL

8.1 WATER COLLECTION

At the Facility, petroleum hydrocarbon-impacted groundwater and phase-separated hydrocarbons (PSH) may be pumped from the shallow aquifer through a series of recovery wells located within the formerly defined contaminant plume associated with the Site. Locations of previously used recovery wells are shown in Figure 2 and are identified by the acronym GRW (Giant Recovery Well), followed by a numerical designation. There may be solid filters in each recovery well enclosure to control deposition of solid contaminants in the system. Flow meters will be installed to monitor volumes of groundwater recovered.

8.2 WATER TREATMENT

Recovered water exhibiting dissolved phase contaminants and/or PSH above New Mexico Water Quality Control Commission (NMWQCC) regulatory standards require treatment to within applicable guidelines prior to discharge. A carbon adsorption process formerly was utilized for water treatment prior to discharge and is available for future use, if appropriate. This process removes contaminants from the groundwater by forcing it through tanks containing activated carbon treated to attract the contaminants. Figure 3 presents a simplified representation of the groundwater recovery and treatment system at the Site. Figure 4 details the carbon adsorption tank and associated piping used at the refinery.

8.2.1 Tank 102

Depending on the volume recovered, Tank 102 (capacity of 500 barrels, or 21,000 gallons) may be used as an intermediate storage tank for the water treatment system. The tank can store water before it is treated.

8.3 WATER DISCHARGE

Once treated, water can be discharged to an infiltration trench located within the Site boundary. Infiltration trenches consist of subsurface distribution systems placed within gravel packs. Water infiltrates into the surrounding strata and eventually makes its way to the shallow aquifer. Figure 5 illustrates a typical infiltration gallery. The return of treated water to the aquifer serves to recharge the aquifer.

9.0 PROPOSED MODIFICATION OF EXISTING COLLECTION, TREATMENT, AND DISPOSAL SYSTEMS

No modifications of the existing collection, treatment, and/or disposal systems are requested at this time. Following completion of a *Stage 1 Abatement Plan*, changes may be proposed in a *Stage 2 Abatement Plan*.

10.0 INSPECTION AND MAINTENANCE PLAN

When in operation, inspection and maintenance are an integral part of the remediation system. Inspection provides information critical to the safe and efficient operation of the system. Maintenance is key in the prevention of undesirable events and excessive downtime. Regular inspections are performed to assure safe and efficient operation. During operation, the system will be monitored on a regular basis during the work week. Observations will be recorded in a bound field logbook with the date, time, and person recording the information noted.

During operation, an inspection will be made weekly in the control building, at the storage tank, and each recovery well. All equipment will be inspected for leaks and malfunctions. The operator will be familiar with the location of underground lines and note any surface indication of underground leaks. Leaks of any size will be noted and repaired. Readings from all water meters will be observed and recorded in the logbook regularly, and comparisons to previous readings will be made. Abnormal meter readings can indicate problems within the system. On a semi-annual basis, the level of water and product is determined for each monitoring and recovery well. An electronic water/oil detection tape is used to determine levels. The data will be recorded in a logbook.

Maintenance of the Facility will include replacement of filters in well houses, lubrication of rotating equipment, air compressor oil changes, addition of nutrients as necessary, observations of unusual pump and motor noise, inspection of the carbon pre-filter, and repair of any equipment as required. Water volumes removed from each recovery well will be metered. Metered water volumes, as well as water levels, indicate the effectiveness of the well pump and controls. Efforts will be made to maintain consistent pumping rates.

An inspection and maintenance schedule and checklist will be provided with the *Stage 2 Abatement Plan*.

11.0 SPILLS AND RELEASE CONTINGENCY PLAN

In the event of an unplanned release of water or hydrocarbon at the Facility, the Western Project Manager should be notified and act as the response coordinator. If the Project Manager is not available, the next person noted in the following list of alternates should be notified.

INTERNAL EMERGENCY NOTIFICATIONS

- **24-hour Emergency Line:** 1-888-658-8006
- **Tommy D. Roberts – Facility Supervisor**
 - Mobile: 505-801-0421
 - Office: 505-632-4195
- **Frank Dooling - Operations**
 - Mobile: 505-634-6138
 - Office: 505-632-4142

EMERGENCY RESPONSE CONTRACTORS

- **EnviroTech Inc. / Emergency Spill Response Contractor**
 - 5796 U.S. Highway 64
 - Farmington, New Mexico 87401
 - 24 Hour Emergency Response: 1-800-362-1879
- **H2O Environmental / Emergency Spill Response Contractor**
 - 2634 S Airport Blvd #2
 - Chandler, Arizona 85286
 - 24 Hour Emergency Response: 480-855-5676

If it is determined that the release is 5 barrels or greater, the OCD will be notified and a written report submitted. Leaks occurring outside of tank containment berms should be contained or redirected so that they can be picked up by pumps or vacuum trucks and placed back in storage. In the event of a broken pipe, the leaking section should be isolated by closing necessary valves and shutting down pumps.

11.1 SPILL AND LEAK PREVENTION AND MONITORING

Leaks and spills are not likely; however, the potential does exist for these events. Tanks and piping are the most likely locations for leak and/or spills. Safeguards in place in the refinery include choice of construction materials, safety and shutdown devices, secondary containment, inspection and security.

11.1.1 Construction Materials

All piping is and will be constructed of PVC or other hydrocarbon and corrosion resistant plastic. Material choices for valves and controls include plastic, stainless steel, bronze and cast iron. All are suitable for water and hydrocarbon service. Storage Tank 102 is constructed of steel.

11.1.2 Safety and Shutdown Devices

All storage tanks are equipped with high- and low-level liquid sensors to detect breaches or overfills. Any treatment system installed may be equipped with an emergency shutoff.

11.1.3 Secondary Containment

Tank 102 has viable earthen secondary containment berms in place. The bermed area has a minimum liquid capacity of 1.5 times the total capacity of the tank contained within it. Berms are monitored and maintained to ensure effectiveness.

11.1.4 Inspection

During system operation, regular inspections will be performed during the work week. These inspections include looking for visual indications of leaks, checking tank levels, recording and comparing meter readings and checking the condition of pump seals and motors. Unusual conditions are noted in the logbook and reported to the Project Manager.

11.1.5 Security

The facility is entirely fenced with chain link or barbed wire. Gates are locked and access is limited to facility personnel and supervised visitors and contractors.

12.0 GEOLOGICAL/HYDROLOGICAL INFORMATION

The Facility and Site are located on weathered outcrops of Nacimiento Formation, which is comprised of shales, sandstones and siltstones of Cretaceous-Tertiary age. Immediately to the west of the Facility and on Western's property is a large unnamed arroyo, which is underlain by 30 to 60 feet of Quaternary alluvial sediments. Older Quaternary terrace deposits of cobbles and boulders are observed on the interfluvial ridges adjacent to the arroyo. These terrace deposits may have been utilized as fill on the refinery site. The San Juan River Valley is located south of the site and contains up to several hundred feet of alluvial fill.

The uppermost zone of ground water in the refinery area is unconfined to partially confined water table unit, which is hosted by the weathered, locally porous sandstones and shales of the Nacimiento Formation and arroyo alluvium. These units merge hydrologically with the San Juan River alluvium to the south. Figures 6 and 7 present generalized cross sections through the refinery site showing the relationship of the arroyo alluvium to bedrock. Major hydrogeologic features of the site are:

- An interconnected water table aquifer hosted by both valley and arroyo fill and the upper parts of the Nacimiento Formation;
- Ground water at a depth of 30 to 70 feet beneath the land surface;
- An upper water table surface generally conforming to topography, with ground water flow from north or northeast to south (towards the San Juan River) through the refinery area;
- Minor, local zones of perched ground water lying 5 to 10 feet above the water table.

Water levels and floating product thicknesses were measured in all wells at the Site during 2019. A record of these measurements is shown in Table 2. A groundwater contour map was prepared based on the static water levels of all the wells at the Site in November 2019 (Figure 8). This map is representative of static conditions of the aquifer because pumping currently is not being performed on wells at the Site. Where floating product was encountered, the product thickness has been multiplied by 0.8 and added to the measured water elevation. This calculation corrects for the difference in density between floating product and water.

12.1 BACKGROUND CONCENTRATIONS

As discussed in the *Stage 1 Abatement Plan* prepared for the Site (LTE, 2020), several constituents are present at the Site at concentrations exceeding NMWQCC standards. However, based on concentrations detected in wells hydrogeologically upgradient of the Site, elevated concentrations of several constituents are present due to the offsite migration of contaminants originating from the Lee Acres Landfill Superfund site. Specifically, chloride, chromium, iron, sulfate, and TDS concentrations are present in groundwater at and downgradient of the Lee Acres Landfill at concentrations above NMWQCC standards; however, these constituents were not considered during the remediation-selection process outlined in the *Record of Decision* for the Superfund site (EPA, 2004). In addition to these constituents, manganese (considered a COC for the Lee Acres Landfill Superfund site) also is found at concentrations above NMWQCC standards. These constituents have long been detected at the Site in upgradient wells GBR-32, GBR-48, GBR-49, and

GBR-50, located hydrogeologically upgradient of the source areas at the Site (identified on Figure 2) and downgradient of the Lee Acres Landfill Superfund site.

In June 2019, LTE performed a statistical analysis using ProUCL software (developed by the United States Environmental Protection Agency, or EPA) to develop “background” concentrations for the following constituents migrating onto the Site: chloride, chromium, iron, manganese, sulfate, and TDS. Table 3 presents the results of the statistical analysis and groundwater analytical results for these constituents detected between 2010 and 2018. Table 3 also presents the cleanup standards (or “remedial goals”) established for the Lee Acres Landfill Superfund site in their *Remedial Investigation Report* (BLM, 1992) and *Record of Decision* (EPA, 2004). Appendix B presents the assumptions and inputs used for the statistical analysis. Appendix B also includes a letter prepared by LTE summarizing our findings that was provided to the EPA for their five-year review of the Lee Acres Landfill Superfund site (conducted in 2019).

12.2 FLOODING POTENTIAL

The greatest threat to flooding of the Facility are the San Juan River (located less than one mile south of the site) and the unnamed arroyo located within the Site itself. History suggests flooding potential of the San Juan River is small. From 1904 until 1976, only 23 flood events (on individual streams, not concurrent on all streams) have been recorded. According to a study conducted by the New Mexico Floodplain Managers Association (2003), previous floods of the San Juan River resulted from general rainstorms, snowmelt augmented by rain, and from cloudburst storms. Rain floods usually occur during the months of September and October. This type of flood results from prolonged heavy rainfall over tributary areas and is characterized by high peak flows of moderate duration. Major floods (recurrence interval of 100 or more years) result from excessive snowmelt runoff generated in the watershed upstream from Bloomfield. Flood flows generated by snowmelt generally occur during the period from May through July. Snowmelt flooding is characterized by moderate peak flows, large volume and long duration, and marked diurnal fluctuation in flow. The refinery is elevated above the floodplain of the San Juan River, decreasing the chance of a river flood, such as the ones described above, from reaching the Facility.

The flooding potential of the arroyo is predicted to be low as well. Similar arroyos have been studied in detail near Farmington and are described as ephemeral in character, flowing only during periods of heavy rainfall (New Mexico Floodplain Managers Association, 2003). Furthermore, the arroyo’s influence on the Site and Facility has been decreased due to the construction of a new highway located between the arroyo and the refinery.

13.0 MONITORING AND REPORTING

When the Facility is in operation, influent/effluent and water samples will be collected on a monthly basis. Per the *Stage 1 Abatement Plan* (LTE, 2020) prepared for the Site, groundwater conditions also will be monitored through sampling of the existing Site monitoring wells. Based on the results of the Stage 1 sampling, a *Stage 2 Abatement Plan* and/or *Groundwater Monitoring Plan* will be prepared for the Site. At a minimum, appropriate wells will be gauged quarterly, with groundwater sampled for chemical analysis annually when the Facility is in operation. Constituents to be analyzed will be based on the results of the *Stage 1* and *Stage 2 Abatement Plans*.

A report of activities performed at the Facility will be prepared annually. The report will include an update of operations, analytical results, water levels, a potentiometric surface map, and discharge volume history. Reports and associated data will be retained by Western for a period of at least five years.

14.0 FACILITY CLOSURE AND POST CLOSURE PLAN

As described in Section 13.0 above, specific monitoring wells will be gauged quarterly, with groundwater sampled for chemical analysis annually when the Facility is in operation. Constituents to be analyzed will be based on the results of the *Stage 1* and *Stage 2 Abatement Plans*.

After completing abatement of groundwater contaminants originating from the Site to the standards proposed in the *Stage 2 Abatement Plan*, Western will cease active remedial actions and perform appropriate quarterly groundwater monitoring for at least two years (eight quarters) based on results at the time of proposed closure. During this period of monitoring, no maintenance activities are anticipated for the existing remediation system. Western will submit annual reports to the NMOCD documenting monitoring results. Once eight consecutive quarters with groundwater contaminants below applicable standards is documented, facility closure will be requested from the NMOCD that will include the following activities:

- Remove or plug all lines leading to and from groundwater recovery wells and injection lines so that a discharge can no longer occur at the Site.
- Remove all remediation system components from the Site, if applicable.
- Plug and abandon all monitoring wells associated with the Site.

Estimated costs for closure and post-closure activities are presented in Table 4.

15.0 PERMIT RENEWAL

The Facility discharge permit will expire five years after NMOCD approval and notification of this application. Western will prepare and submit an application for discharge permit renewal at least 120 days before the discharge permit expires. If the renewal application is submitted at least 120 day prior to expiration, then the existing discharge permit for the same activity shall not expire until the application for renewal has been approved or disapproved by NMOCD.

16.0 PERMIT MODIFICATIONS

In the case of Facility expansion, increase in discharge, and/or other significant modifications to the discharge of water, Western will notify NMOCD in writing for review and approval prior to implementing the modification. An application and a description of the requested modifications will be included in the written notice.

Modifications to abatement or monitoring plans prepared to address pre-existing contaminants associated with the Site (as of March 2020) also will be submitted to NMOCD in writing for review and approval. These modifications will not require an application and will not be subject to permit fees as described in Table 1 of 20.6.2.3114 NMAC. However, filing and/or review fees may be applied as presented in Table 2 of 20.6.2.3114 NMAC.

17.0 REFERENCES

New Mexico Floodplain Managers Association, 2003, A History of Floods and Flood Problems in New Mexico, LA Bond Associates, High Rolls, New Mexico, 144 p.

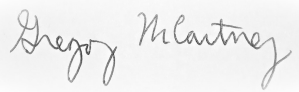
United States Bureau of Land Management (BLM). (1992). Remedial Investigation Report for the Lee Acres Landfill. Albuquerque: US Bureau of Land Management.

United States Environmental Protection Agency (EPA). (2004). Record of Decision for the Lee Acres Landfill Superfund Site, Farmington, New Mexico.

18.0 CERTIFICATION

WESTERN REFINING SOUTHWEST, INC.
GIANT BLOOMFIELD REFINERY
BLOOMFIELD, NEW MEXICO

I certify that the information provided in the application is true, accurate, and complete to the best of my knowledge, after reasonable inquiry.

Signature:  _____ May 11, 2020 _____
Gregory McCartney _____ Date _____
Senior Environmental Professional
gjmccartney@marathonpetroleum.com

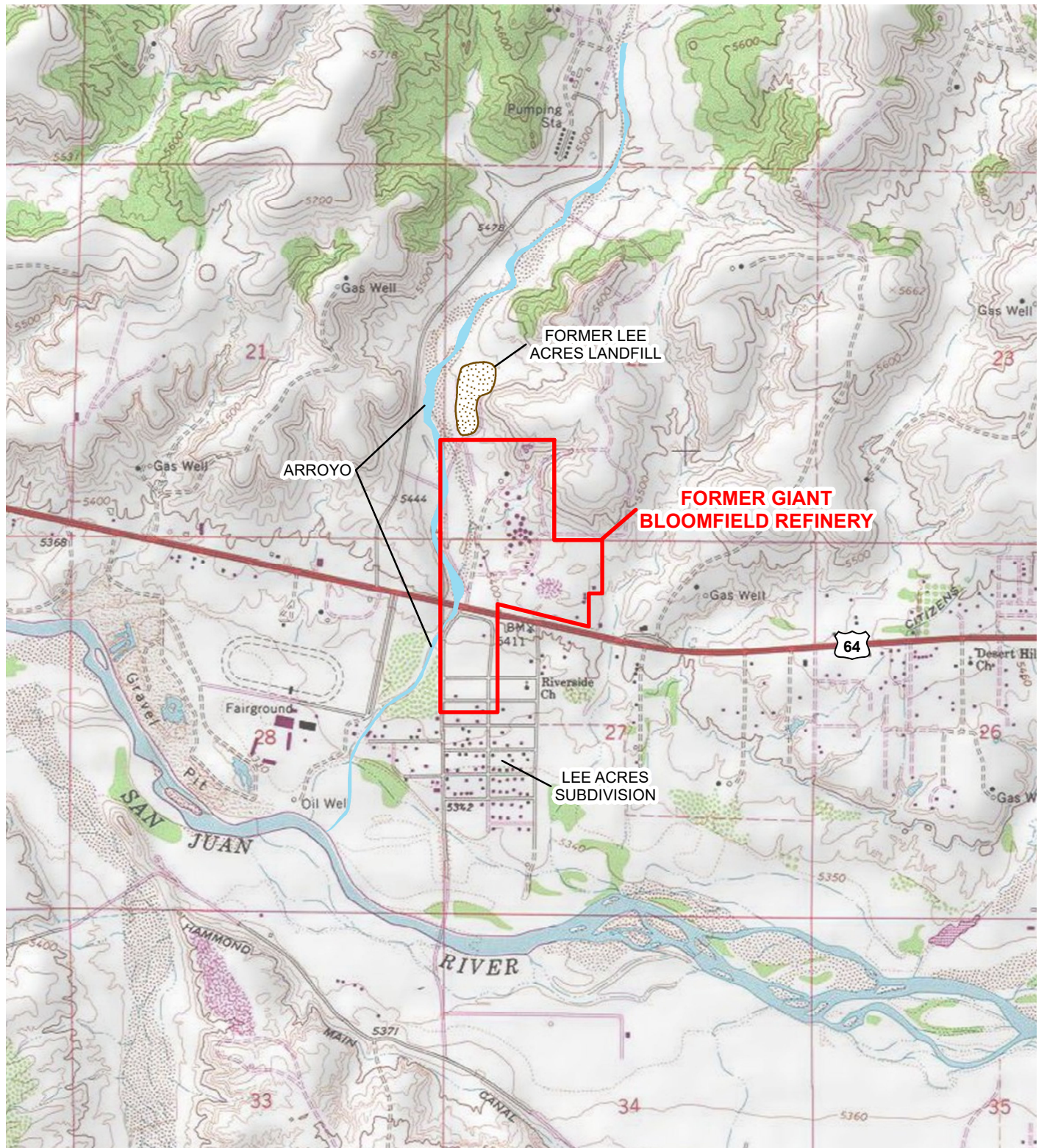


IMAGE COURTESY OF ESRI/USGS

LEGEND

- SITE LOCATION
- ARROYO
- FORMER LEE ACRES LANDFILL

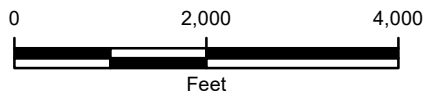
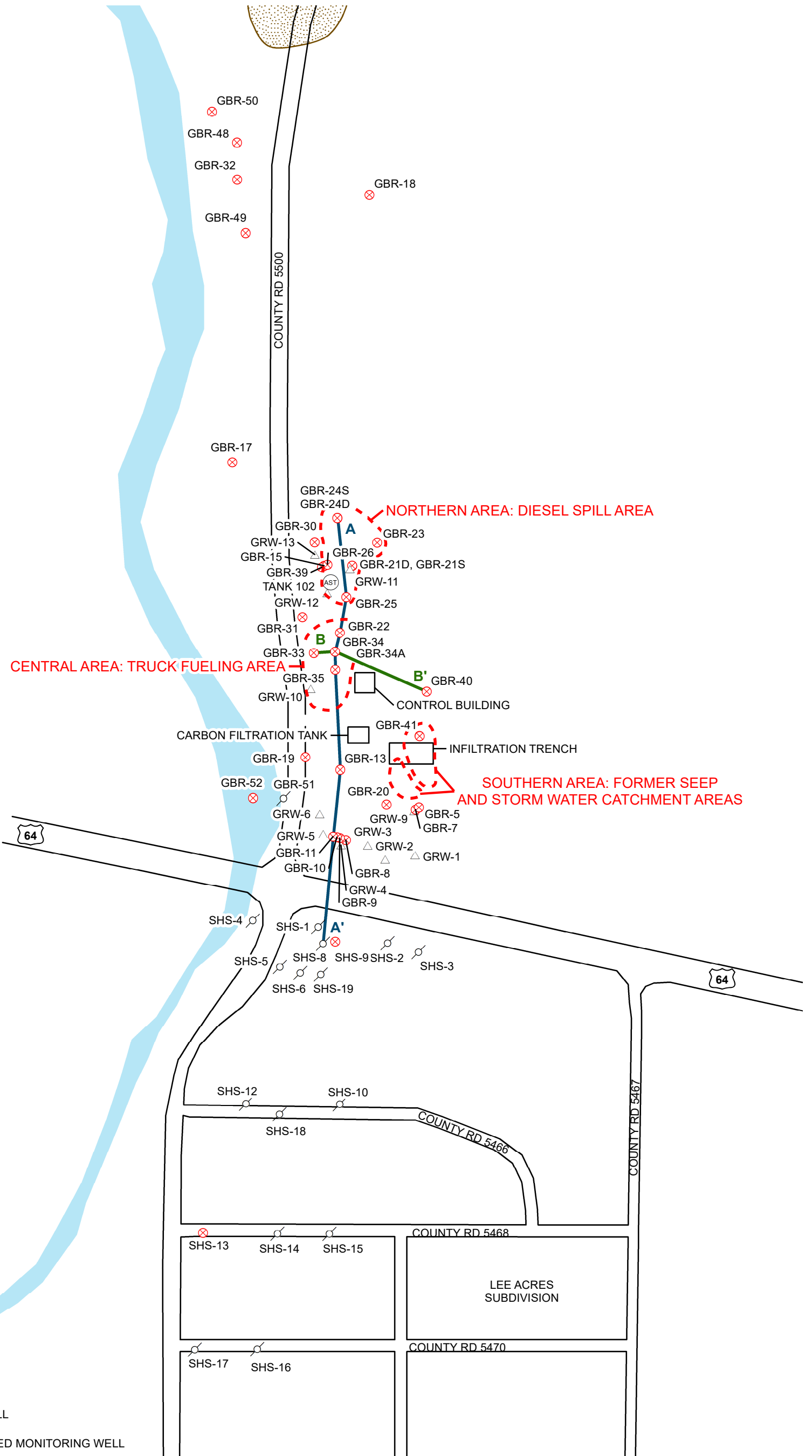


FIGURE 1
SITE LOCATION MAP
 FORMER GIANT BLOOMFIELD REFINERY
 SW SEC 22 & NW SEC 27 T29N R12W
 SAN JUAN COUNTY, NEW MEXICO
 WESTERN REFINING SOUTHWEST, INC.





LEGEND

- ⊗ MONITORING WELL
- △ INACTIVE RECOVERY WELL
- ⊘ PLUGGED AND ABANDONED MONITORING WELL
- (AST) ABOVEGROUND STORAGE TANK (AST)
- CROSS SECTION A-A'
- CROSS SECTION B-B'
- ARROYO
- FORMER LEE ACRES LANDFILL
- SOURCE AREA

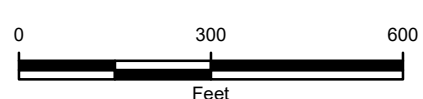


FIGURE 2
SITE MAP
 FORMER GIANT BLOOMFIELD REFINERY
 SW SEC 22 & NW SEC 27 T29N R12W
 SAN JUAN COUNTY, NEW MEXICO
 WESTERN REFINING SOUTHWEST, INC.



FIGURE 3
SIMPLIFIED REPRESENTATION OF THE
GROUNDWATER RECOVERY, TREATMENT,
AND DISCHARGE SYSTEM

FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

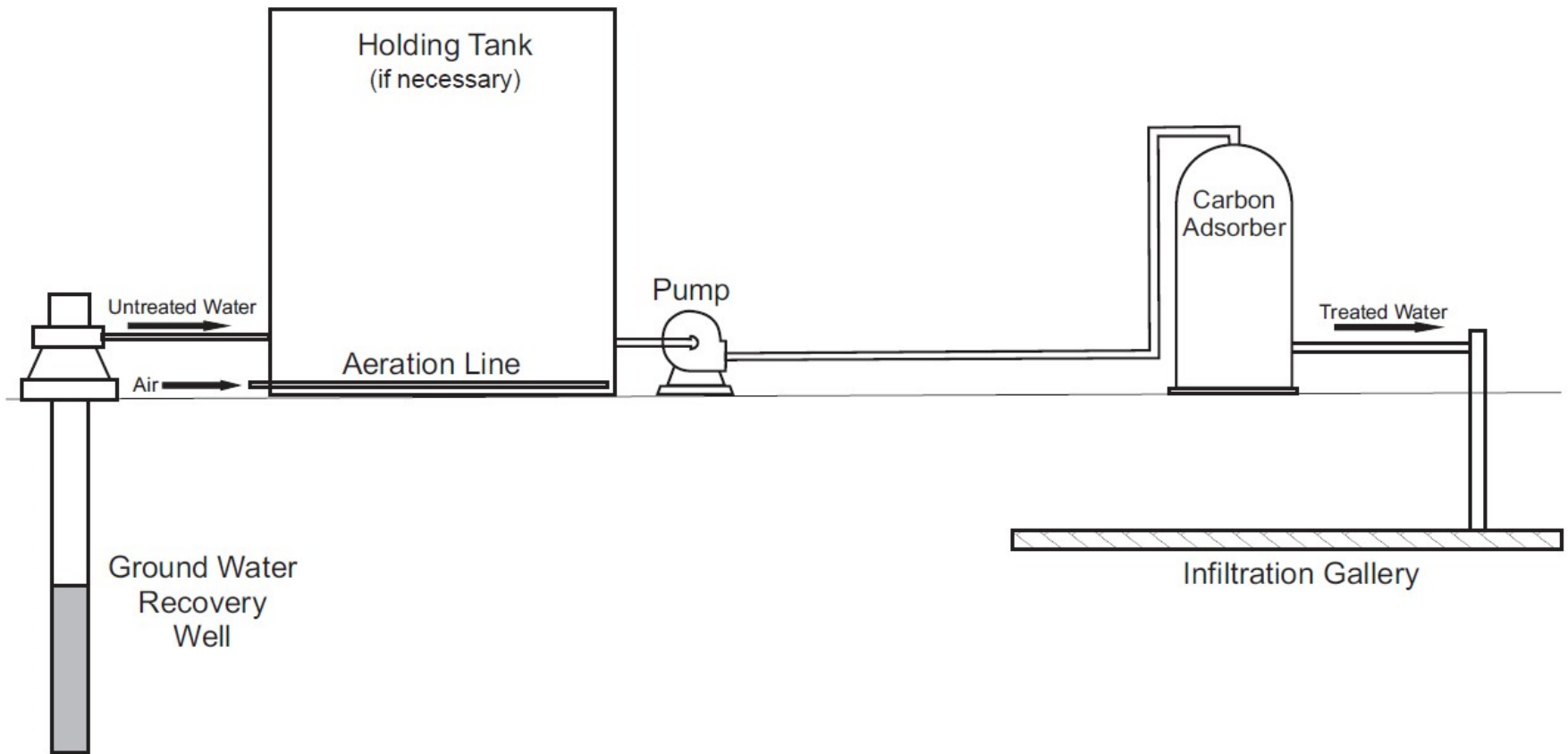


FIGURE 4
THE CARBON ADSORPTION SYSTEM
 FORMER GIANT BLOOMFIELD REFINERY
 SW SEC 22 & NW SEC 27 T29N R12W
 SAN JUAN COUNTY, NEW MEXICO
 WESTERN REFINING SOUTHWEST, INC.

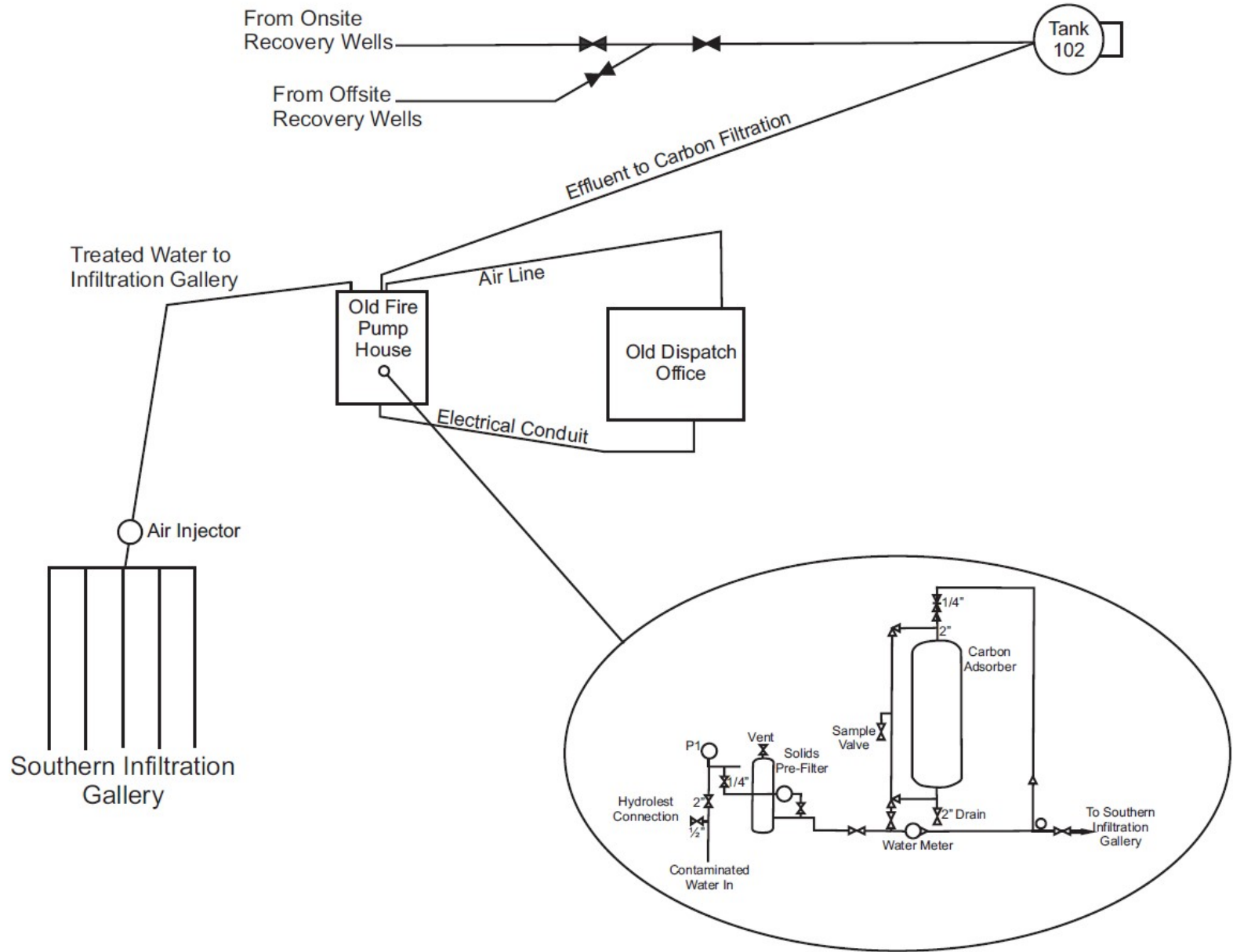
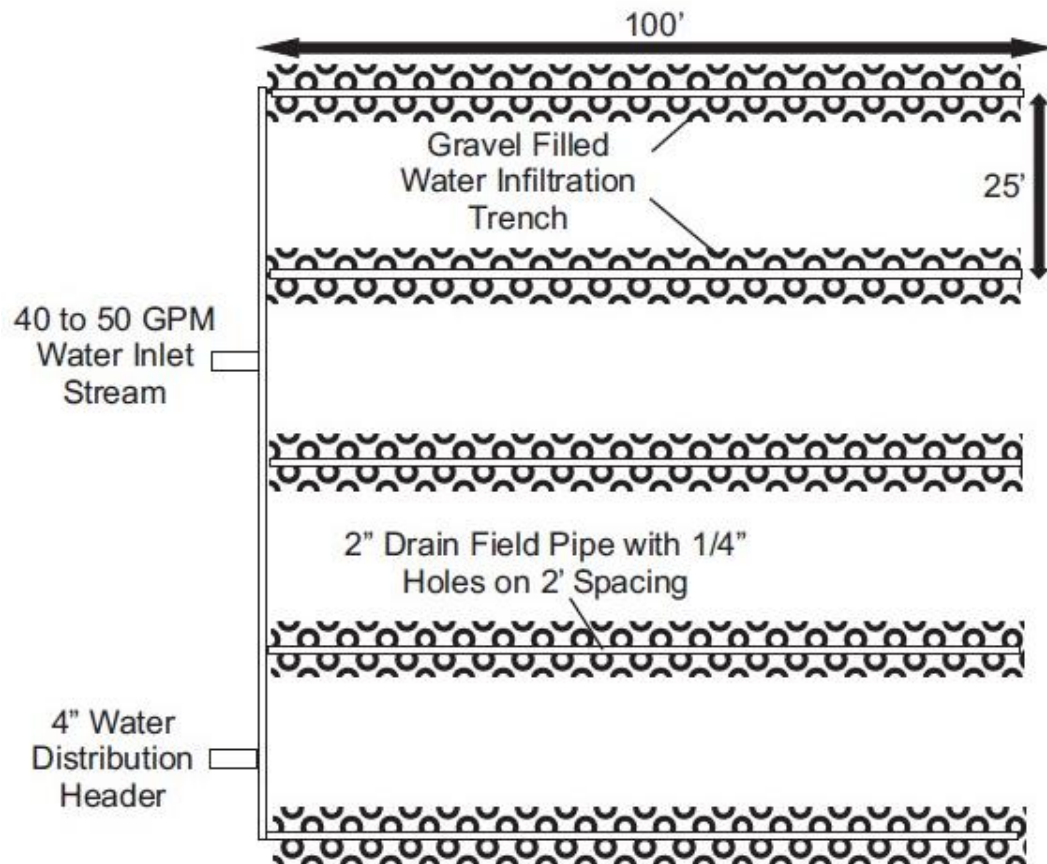


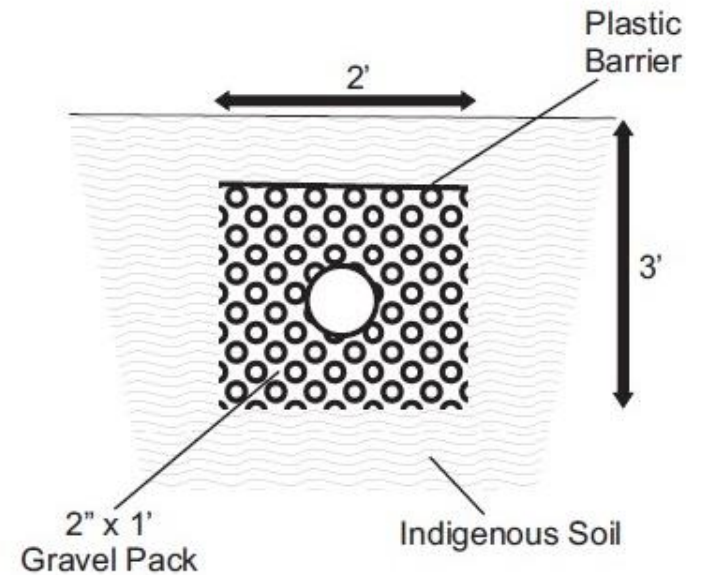
FIGURE 5
INFILTRATION TRENCH DESIGN AND
CONSTRUCTION SPECIFICATIONS
 FORMER GIANT BLOOMFIELD REFINERY
 SW SEC 22 & NW SEC 27 T29N R12W
 SAN JUAN COUNTY, NEW MEXICO
 WESTERN REFINING SOUTHWEST, INC.



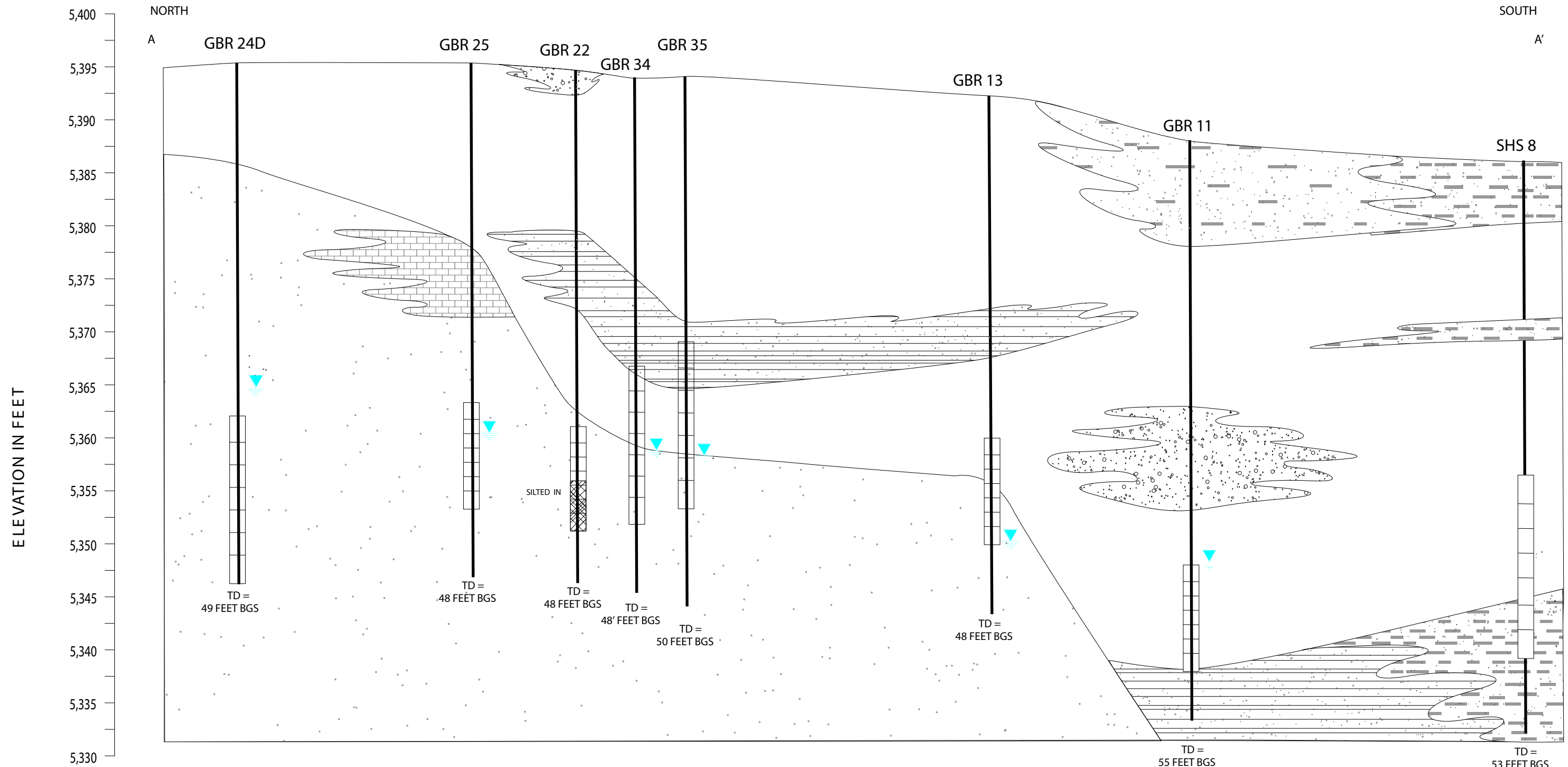
Trench Top View Cut Away
at the Infiltration Line Depth



Cross Section of a
Typical Infiltration Trench




2" infiltration lines are designed to handle approximately 10 gal/min each with a maximum length of 100'



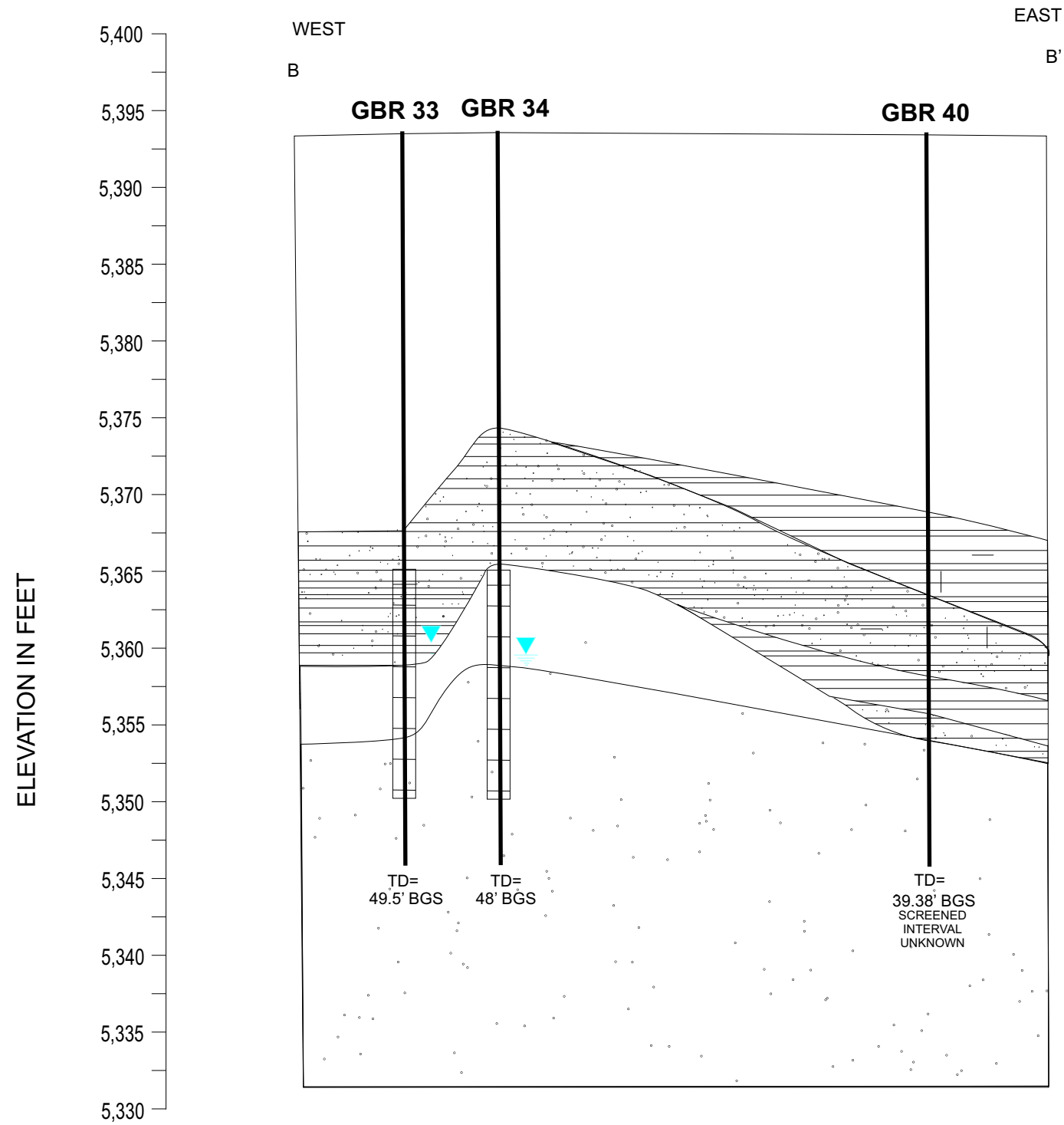
HORIZONTAL SCALE
1" = 10 FEET

VERTICAL SCALE
1" = 90 FEET

FIGURE 6
CROSS SECTION A-A'
 FORMER GIANT BLOOMFIELD REFINERY
 SWSW SEC 22 & WNW SEC 27 T29N R12W
 WESTERN REFINING SOUTHWEST, INC.



WR1009 1/16



LEGEND

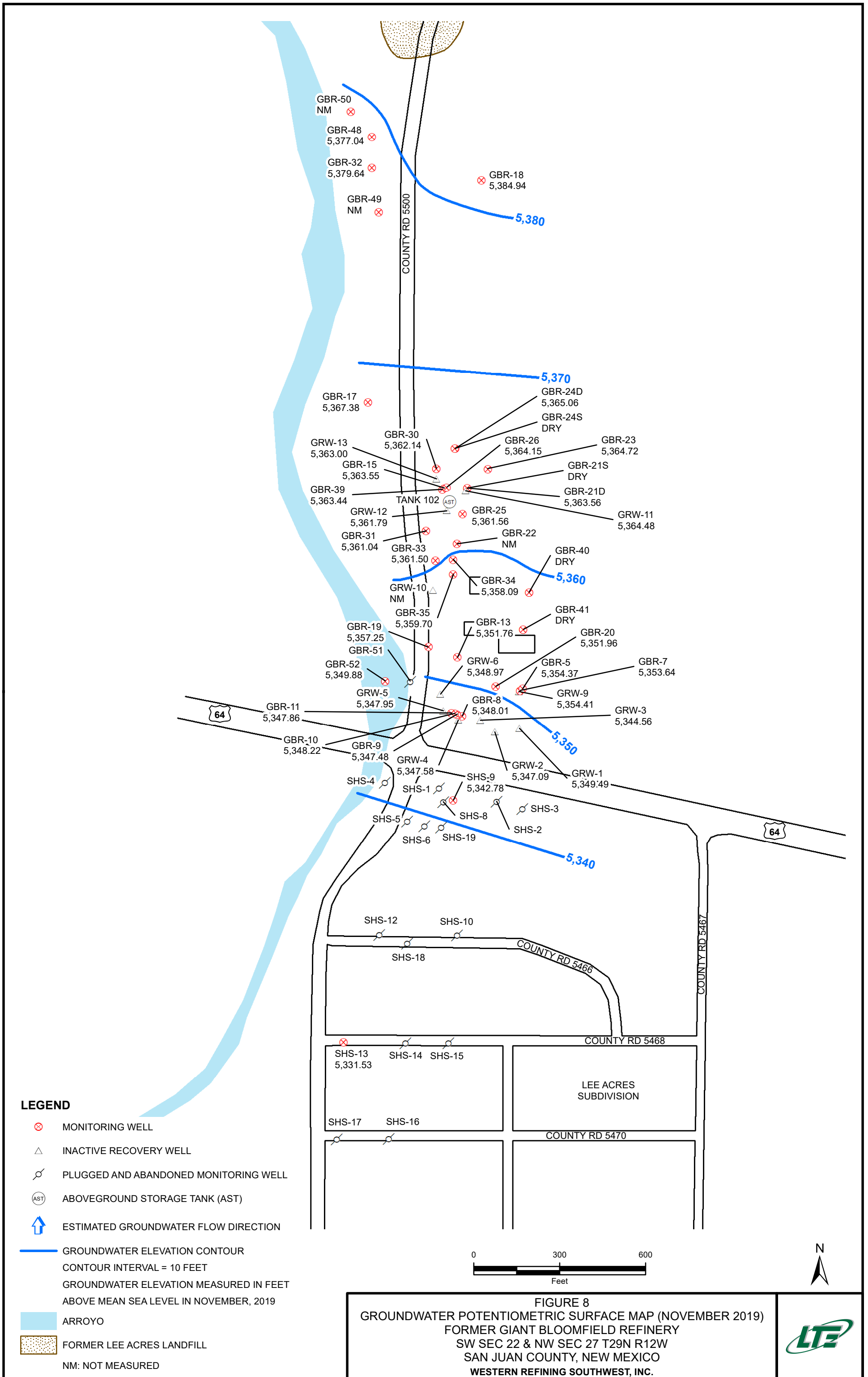
- CLAYEY SAND
- CLAY
- SAND
- NACIMIENTO SANDSTONE
- DRY
- BOREHOLE
- SCREENED INTERVAL
- BGS** BELOW GROUND SURFACE
- TD** TOTAL DEPTH IN FEET
- GROUNDWATER ELEVATION OCTOBER 2017

HORIZONTAL SCALE
1" = 10 FEET

VERTICAL SCALE
1" = 90 FEET

FIGURE 7
CROSS SECTION B-B'
 FORMER GIANT BLOOMFIELD REFINERY
 SWSW SEC 22 & WNW SEC 27 T29N R12W
 WESTERN REFINING SOUTHWEST, INC.





**TABLE 1
2015 INFUENT AND EFFLUENT ANALYTICAL RESULTS**

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

Analyte	NMWQCC Standard	Unit	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
			27-Jan	27-Jan	8-Apr	8-Apr	24-Jul	24-Jul	3-Aug	3-Aug
USEPA Method 8260B: Volatiles										
benzene	10	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
toluene	750	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
ethylbenzene	750	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
methyl tert-butyl ether (MTBE)	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trimethylbenzene	620	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trimethylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloroethane (EDC)	10	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromoethane (EDB)	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
naphthalene	NE	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1-methylnaphthalene	NE	µg/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2-methylnaphthalene	NE	µg/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
acetone	NE	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
bromobenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromodichloromethane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromoform	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromomethane	NE	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-butanone	NE	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
carbon disulfide	NE	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
carbon tetrachloride	10	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloroethane	NE	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
chloroform	100	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloromethane	NE	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-chlorotoluene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-chlorotoluene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-DCE	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-dichloropropene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromo-3-chloropropane	NE	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
dibromochloromethane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dibromomethane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-dichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dichlorodifluoromethane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethane	25	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethene	5	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloropropane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichloropropane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-dichloropropane	NE	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-dichloropropene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0



**TABLE 1
2015 INFUENT AND EFFLUENT ANALYTICAL RESULTS**

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

Analyte	NMWQCC Standard	Unit	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
			27-Jan	27-Jan	8-Apr	8-Apr	24-Jul	24-Jul	3-Aug	3-Aug
hexachlorobutadiene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-hexanone	NE	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
isopropylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-isopropyltoluene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-methyl-2-pentanone	NE	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
methylene chloride	100	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-butylbenzene	NE	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-propylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
sec-butylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
styrene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
tert-butylbenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-tetrachloroethane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-tetrachloroethane	10	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
tetrachloroethene (PCE)	20	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-DCE	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-dichloropropene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-trichloroethane	60	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-trichloroethane	10	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichloroethene (TCE)	100	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichlorofluoromethane	NE	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichloropropane	NE	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
vinyl chloride	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
xylenes, total	620	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5

Notes:

- BOLD** - indicates concentration exceeds the NMWQCC standard
- mg/L - milligrams per liter
- NE - not established
- NMWQCC - New Mexico Water Quality Control Commission
- NT - not tested
- µg/L - micrograms per liter
- USEPA - United States Environmental Protection Agency



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

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

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	March 2019				November 2019			
			Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)	Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)
GRW-1	5,394.30	73.35	43.33	-	-	5,350.97	44.81	-	-	5,349.49
GRW-2	5,391.28	61.00	44.98	-	-	5,346.30	44.19	-	-	5,347.09
GRW-3	5,388.77	58.30	43.83	-	-	5,344.94	44.21	-	-	5,344.56
GRW-4	5,390.02	60.00	42.19	-	-	5,347.83	42.44	-	-	5,347.58
GRW-5	5,390.56	68.30	42.28	-	-	5,348.28	42.61	-	-	5,347.95
GRW-6	5,390.81	53.80	41.45	-	-	5,349.36	41.84	-	-	5,348.97
GRW-9	5,395.70	54.40	41.10	-	-	5,354.60	41.29	-	-	5,354.41
GRW-10	5,395.02	66.02	36.15	-	-	5,358.87	NM - Well blocked at 5 feet			
GRW-11	5,397.85	64.00	33.18	-	-	5,364.67	33.37	-	-	5,364.48
GRW-12	5,397.24	48.00	35.42	-	-	5,361.82	35.45	-	-	5,361.79
GRW-13	5,396.90	61.30	34.51	-	-	5,362.39	33.90	-	-	5,363.00
GBR-5	5,395.07	47.08	41.41	-	-	5,353.66	40.70	-	-	5,354.37
GBR-7	5,395.85	51.65	41.91	41.74	0.17	5,354.08	42.35	42.18	0.17	5,353.64
GBR-8	5,390.50	50.90	42.30	-	-	5,348.20	42.49	-	-	5,348.01
GBR-9	5,389.92	67.22	42.25	-	-	5,347.67	42.44	-	-	5,347.48
GBR-10	5,390.57	47.56	42.34	-	-	5,348.23	42.35	-	-	5,348.22
GBR-11	5,389.43	51.87	41.29	-	-	5,348.14	41.57	-	-	5,347.86
GBR-13	5,393.04	45.47	40.98	-	-	5,352.06	41.28	-	-	5,351.76
GBR-15	5,397.99	58.42	34.25	-	-	5,363.74	34.44	-	-	5,363.55
GBR-17	5,402.69	43.20	34.68	-	-	5,368.01	35.31	-	-	5,367.38
GBR-18	5,421.68	47.85	37.29	-	-	5,384.39	37.74	-	-	5,383.94
GBR-19 (1)	5,393.83	46.23	-	-	-	-	-	-	-	-
GBR-20	5,393.47	54.57	41.21	-	-	5,352.26	41.51	-	-	5,351.96
GBR-21D	5,400.19	49.77	36.38	-	-	5,363.81	36.63	-	-	5,363.56
GBR-21S	5,400.65	49.77	Dry				Dry			
GBR-22	5,395.91	38.73	37.60	-	-	5,358.31	NM - Cap glued onto well casing			
GBR-23 (2)	5,403.72	39.45	37.54	-	-	-	39.00	-	-	5,364.72
GBR-24D	5,396.77	51.40	30.66	-	-	5,366.11	31.71	-	-	5,365.06
GBR-24S	5,396.08	37.05	33.38	-	-	5,362.70	Dry			
GBR-25	5,397.03	37.12	35.05	-	-	5,361.98	35.47	-	-	5,361.56
GBR-26	5,396.72	41.29	33.57	-	-	5,363.15	32.57	-	-	5,364.15
GBR-30	5,395.59	41.66	33.04	-	-	5,362.55	33.45	-	-	5,362.14
GBR-31	5,396.58	43.50	Dry				35.54	-	-	5,361.04
GBR-32	5,414.86	47.83	34.56	-	-	5,380.30	35.22	-	-	5,379.64
GBR-33	5,396.28	45.72	-	-	-	-	34.78	-	-	5,361.50
GBR-34	5,394.00	42.20	34.54	-	-	5,359.46	35.91	-	-	5,358.09
GBR-35	5,393.66	42.35	34.57	-	-	5,359.09	34.96	-	-	5,358.70
GBR-39	5,397.55	41.42	34.86	-	-	5,362.69	34.11	-	-	5,363.44
GBR-40	5,400.76	39.38	Dry				Dry			
GBR-41	5,396.35	34.28	34.29	-	-	5,362.06	Dry			
GBR-48	5,413.90	43.54	32.04	-	-	5,381.86	36.86	-	-	5,377.04
GBR-49	(3)	40.30	32.96	-	-	-	33.34	-	-	-
GBR-50	(3)	44.37	32.12	-	-	-	32.59	-	-	-
GBR-51	5,389.68	57.07	39.76	-	-	-	P&A	-	-	-
GBR-52	5,387.74	52.73	37.88	-	-	-	37.86	-	-	5,349.88



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

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

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	March 2019				November 2019			
			Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)	Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)
SHS-1	5,383.54	50.40	P&A	-	-	-	P&A	-	-	-
SHS-2	5,381.66	44.56	P&A	-	-	-	P&A	-	-	-
SHS-3 (4)	5,383.33	-	P&A	-	-	-	P&A	-	-	-
SHS-4	5,383.62	52.16	P&A	-	-	-	P&A	-	-	-
SHS-5	5,378.36	47.85	P&A	-	-	-	P&A	-	-	-
SHS-6	5,378.17	52.78	38.05	-	-	5,340.12	P&A	-	-	-
SHS-8	5,380.25	50.92	38.52	-	-	5,341.73	P&A	-	-	-
SHS-9	5,380.79	46.25	Dry				38.01	-	-	5,342.78
SHS-10	5,373.80	45.80	Dry				P&A	-	-	-
SHS-12	5,373.94	52.41	Dry				P&A	-	-	-
SHS-13	5,367.81	47.51	36.03	-	-	5,331.78	36.28	-	-	5,331.53
SHS-14	5,367.07	52.71	34.36	-	-	5,332.71	P&A	-	-	-
SHS-15 (5)	5,366.21	47.78	34.02	-	-	5,332.19	P&A	-	-	-
SHS-16	5,362.58	42.20	31.25	-	-	5,331.33	P&A	-	-	-
SHS-17	5,364.35	46.21	33.87	-	-	5,330.48	P&A	-	-	-
SHS-18	5,373.64	47.36	39.51	-	-	5,334.13	P&A	-	-	-
SHS-19	5,378.89	52.40	37.76	-	-	5,341.13	P&A	-	-	-

Notes:

BTOC - below top of casing

D - designates that the well screen is deep

GWEL - groundwater elevation

NM - not measured

P&A - plugged and abandoned

PSH - phase-separated hydrocarbon

S - designates that the well screen is shallow

(1) Well was paved over in June 2010

(2) Well hit by a vehicle May 2014

(3) Top-of-casing elevation is unknown

(4) Well is damaged by a tree root

(5) Well visibly broken/buried January 2016

- indicates no GWEL or PSH measured

When PSH is detected, the GWEL is corrected using an estimated density correction factor of 0.8



**TABLE 3
2010 to 2018 - ANNUAL COMPLIANCE GROUNDWATER LABORATORY ANALYTICAL RESULTS**

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

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals		manganese	USEPA Method SM2540C Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron		total dissolved solids	
NMWQCC Standard								250	600	0.05	1.0	0.2	1,000
GBR Background Threshold Values (1)								560	2,546	1.553	97.06	6.42	4,566
Regional Background Levels (Stone, et al. 1983) (2)								2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)								6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)								34,000	14,000	0.06	16	0.346	10,000
Units								mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Lee Acres Sampling, 1992 RI Report (5)													
Lee Acres Site 1, Subarea 2, OU 2 - Alluvial Aquifer								8.8 - 730	195 - 4,370	0.0108 - 0.124	0.118 - 1.71	0.0161 - 8.62	943 - 6,560
Lee Acres Site 1, Subarea 3, OU 2 - Southern Area - Alluvial Aquifer								19 - 2,110	830 - 2,610	0.0145 - 0.0406	0.148 - 23.9	0.0214 - 4.23	622 - 5,300
Lee Acres Site 2, Subarea 4 - Alluvial Aquifer								3.5 - 604	310 - 3,220	0.043 - 0.110	0.0749 - 64.1	0.0131 - 3.4	616 - 6,370
GBR Sampling, Upgradient Wells (6)													
GBR-32	5,414.86	45	25 - 40	2	Oct 2018	33.95	200	1,700	0.074	2.7	1.9	3,110	
					Dec 2017		290	1,600	0.13	2.3	1.2	3,210	
					Jan 2017		320	2,000	0.33	11	1.2	3,500	
					Aug 2015		370	2,000	0.02	0.26	0.56	3,830	
					Nov 2014		380	1,900	1.4	5.9	0.70	3,800	
					Jan 2013		400	2,200	0.098	1.2	0.40	4,320	
					Jan 2012		500	2,800	0.030	0.88	0.50	4,290	
					Jan 2011		420	2,300	0.13	NT	NT	4,010	
					Jan 2010		NT	NT	NT	NT	NT	NT	
					GBR-48	5,413.90	43.6	28.4 - 38.4	2	Oct 2018	35.62	300	1,800
Dec 2017		350	1,900	0.13						40	1.7	3,690	
Jan 2017		340	2,000	0.42						89	4.8	3,360	
Aug 2015		370	2,100	0.95						170	6.4	3,730	
Nov 2014		420	2,100	0.92						52	2.0	4,030	
Jan 2013		230	2,200	0.52						17	0.94	4,020	
Jan 2012		200	1,700	0.63						15	0.83	2,940	
Jan 2011		390	2,200	0.71						9.3	NT	3,510	
Jan 2010		NT	NT	NT						NT	NT	NT	
GBR-49	*	38.5	25.9 - 36.3	2						Oct 2018	32.06	180	1,800
					Dec 2017		150	1,300	0.018	0.44	0.30	2,720	
					Jan 2017		210	1,900	0.2	11	1.1	3,160	
					Aug 2015		180	1,500	0.38	7.1	0.54	2,840	
					Nov 2014		63	1,400	0.060	41	3.9	2,340	
					Jan 2013		240	1,600	0.041	4.6	1.3	3,290	
					Jan 2012		260	2,000	0.018	0.23	0.34	3,470	
					Jan 2011		310	2,000	0.48	NT	NT	3,390	
					Jan 2010		NT	NT	NT	NT	NT	NT	

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method 502.3/504: Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard							250	600	0.05	1.0	0.2	1,000	
GBR Background Threshold Values (1)							560	2,546	1.553	97.06	6.42	4,566	
Regional Background Levels (Stone, et al. 1983) (2)							2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA	
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600	
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							34,000	14,000	0.06	16	0.346	10,000	
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
GBR-50	*	42.5	26.91 - 37.26		Oct 2018	31.26	59	1,700	0.044	4.0	0.13	2,770	
					Dec 2017		54	1,500	0.16	5.8	0.32	2,590	
					Jan 2017		59	1,500	0.36	6.8	1.3	2,580	
					Aug 2015		44	1,700	0.073	2.2	0.19	2,760	
					Nov 2014		52	1,700	0.013	3.6	0.22	2,800	
					Jan 2013		49	1,600	<0.0060	1.3	0.12	2,830	
					Jan 2012		49	1,800	0.0069	0.72	0.041	2,730	
					Jan 2011		46	1,800	0.023	NT	NT	2,640	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR Sampling, Source-Area Wells													
GRW-3/GBR-29 or 43	5,388.77	58.3	34.5 - 50.2	6	Oct 2018	43.13	99	640	NT	18	0.80	2,190	
					Dec 2017		74	1,400	NT	54	1.9	2,920	
					Jan 2017		74	1,200	NT	150	2.9	2,730	
					Aug 2015		38	1,900	NT	0.89	0.69	3,320	
					Nov 2014		26	2,200	NT	0.86	0.44	3,680	
					Jan 2013		59	1,300	NT	2.8	0.54	2,620	
					Jan 2012		54	1,300	NT	2.8	0.67	2,660	
					Jan 2011		95	480	NT	NT	NT	1,810	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GRW-6/GBR-44	5,390.81	58.6	32.6 - 48.3	6	Oct 2018	40.89	100	1,300	NT	890	45	2,390	
					Dec 2017		120	1,200	NT	40	9.1	2,570	
					Jan 2017		89	1,500	NT	11	17	2,580	
					Aug 2015		88	1,400	NT	15	18	3,220	
					Nov 2014		86	1,600	NT	35	8.5	3,170	
					Jan 2013		100	1,500	NT	2.4	1.2	2,760	
					Apr 2012		80	1,900	NT	0.47	1.0	2,740	
					Jan 2011		110	1,400	NT	NT	NT	2,490	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR-17	5,402.69	51	31 - 51	2	Oct 2018	34.00	49	1,200	NT	100	3.0	2,180	
					Dec 2017		50	1,000	NT	9.3	0.25	2,110	
					Jan 2017		46	1,100	NT	15	0.35	1,890	
					Aug 2015		43	1,100	NT	3.6	<0.00200	1,960	
					Nov 2014		44	1,200	NT	3.7	0.13	1,980	
					Jan 2013		47	1,300	NT	1.2	0.045	2,700	
					Jan 2012		46	1,400	NT	3.9	0.15	2,150	
					Jan 2011		47	1,300	NT	NT	NT	2,140	
					Jan 2010		NT	NT	NT	NT	NT	NT	

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method 5M2540C Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard							250	600	0.05	1.0	0.2	1,000	
GBR Background Threshold Values (1)							560	2,546	1.553	97.06	6.42	4,566	
Regional Background Levels (Stone, et al. 1983) (2)							2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA	
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600	
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							34,000	14,000	0.06	16	0.346	10,000	
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
GBR-24D	5,396.77	46.3	33 - 43	2	Oct 2018	30.92	130	2,300	NT	9.1	1.8	3,780	
					Dec 2017		140	1,800	NT	11	1.8	3,560	
					Jan 2017		130	1,900	NT	14	1.8	3,390	
					Aug 2015		160	2,100	NT	11	1.8	3,380	
					Nov 2014		210	1,800	NT	12	1.7	3,410	
					Jan 2013		200	1,700	NT	3.6	1.8	3,430	
					Jan 2012		200	2,000	NT	2.4	1.7	3,320	
					Jan 2011		170	2,400	NT	NT	NT	3,410	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR-30	5,395.59	45	25 - 40	2	Oct 2018	32.31	250	1,500	NT	28	0.76	3,000	
					Dec 2017		220	1,300	NT	38	1.4	2,770	
					Jan 2017		220	1,400	NT	64	2.3	2,580	
					Aug 2015		310	1,600	NT	7.6	0.5	3,020	
					Nov 2014		270	1,400	NT	88	2.2	2,520	
					Jan 2013		310	1,500	NT	130	6.1	3,340	
					Jan 2012		390	1,700	NT	2.9	0.29	3,240	
					Jan 2011		320	1,600	NT	NT	NT	3,340	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR-31	5,396.58	45	24.6 - 39.6	2	Oct 2018	32.27	220	1,400	NT	13	3.1	2,660	
					Dec 2017		93	1,700	NT	21	4.2	2,940	
					Jan 2017		84	1,700	NT	1.9	0.18	2,970	
					Aug 2015		250	1,700	NT	2.4	0.45	3,170	
					Nov 2014		230	1,500	NT	12	1.6	3,100	
					Jan 2013		79	1,600	NT	15	0.77	2,720	
					Jan 2012		74	1,700	NT	3.8	0.27	2,760	
					Jan 2011		97	1,800	NT	NT	NT	2,740	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR-51	5,389.68	59.5	38.5 - 54.25	6	Oct 2018	NM	54	1,300	NT	0.059	<0.0020	2,330	
					Dec 2017		51	1,200	NT	0.080	<0.020	2,250	
					Jan 2017		45	990	NT	9.1	0.47	2,080	
					Aug 2015		54	1,600	NT	17	0.42	2,430	
					Nov 2014		54	1,400	NT	16	0.47	2,320	
					Jan 2013		56	1,500	NT	9.7	0.88	2,540	
					Jan 2012		53	1,600	NT	3.1	0.16	2,440	
					Jan 2011		53	1,600	NT	NT	NT	2,380	
					Jan 2010		NT	NT	NT	NT	NT	NT	

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals		USEPA Method 502.3: Dissolved Solids		
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard							250	600	0.05	1.0	0.2	1,000	
GBR Background Threshold Values (1)							560	2,546	1.553	97.06	6.42	4,566	
Regional Background Levels (Stone, et al. 1983) (2)							2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA	
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600	
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							34,000	14,000	0.06	16	0.346	10,000	
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
GBR-52	5,387.74	50.78	30.08 - 45.75	6	Oct 2018	NM	54	1,500	NT	0.12	0.0028	2,580	
							Dec 2017	54	1,500	NT	0.048	<0.0020	2,640
							Jan 2017	58	1,400	NT	18	0.46	2,540
							Aug 2015	65	1,400	NT	8.2	0.15	2,840
							Nov 2014	65	1,700	NT	12	0.25	2,540
							Jan 2013	63	1,700	NT	2.3	0.036	2,770
							Jan 2012	60	1,800	NT	2.2	0.032	2,720
							Jan 2011	62	1,900	NT	NT	NT	2,700
							Jan 2010	NT	NT	NT	NT	NT	NT
GBR Sampling, Downgradient Wells													
SHS-1	5,383.54	50.97	35.67 - 45.67	4	June 2017	P&A	100	1,300	NT	NT	NT	2,400	
					Jan 2011		NT	NT	NT	NT	NT		
SHS-2	5,381.66	41.28	30.98 - 40.98	4	June 2017	P&A	310	2,200	NT	NT	NT	4,100	
					Jan 2011		NT	NT	NT	NT	NT		
SHS-4	5,383.62	55	37 - 47	2	June 2017	P&A	59	1,600	NT	NT	NT	2,270	
SHS-5	5,378.36	53.33	37.62 - 48.0	4	June 2017	P&A	50	1,200	NT	NT	NT	2,030	
					Jan 2011		NT	NT	NT	NT	NT		
SHS-6	5,378.17	47.88	32.48 - 42.85	4	Jan 2018	37.85	NT	NT	NT	NT	NT	NT	
SHS-8	5,380.25	52.5	30.83 - 46.60	4	Oct 2018	38.25	130	890	NT	50	3.1	2,730	
Dec 2017						110	1,200	NT	10	3.6	2,730		
Jan 2017						100	720	NT	66	3.0	2,210		
Aug 2015						120	47	NT	8.6	0.41	1,300		
Nov 2014						110	350	NT	260	5.0	1,400		
Jan 2013						120	770	0.099	100	4.7	1,800		
Jan 2012						170	430	NT	15	2.3	2,040		
Jan 2011						150	150	0.0063	NT	NT	1,440		
Jan 2010						NT	NT	NT	NT	NT	NT		
SHS-9	5,380.79	49.88	34.46 - 44.46	4	Jan 2018	37.43	NT	NT	NT	NT	NT	NT	
SHS-13	5,367.81	47.4	27 - 42	4	Jan 2018	35.85	NT	NT	NT	NT	NT	NT	
SHS-14	5,367.07	54	28.70 - 48.70	4	Jan 2018	34.18	NT	NT	NT	NT	NT	NT	
SHS-15	5,366.21	47.8	27.40 - 42.40	4	Jan 2018	33.00	NT	NT	NT	NT	NT	NT	

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions	chloride	sulfate	USEPA Method 200.7: Total Metals	chromium	iron	manganese	USEPA Method 5M2540C Modified: Total Dissolved Solids	total dissolved solids
NMWQCC Standard								250	600		0.05	1.0	0.2		1,000
GBR Background Threshold Values (1)								560	2,546		1.553	97.06	6.42		4,566
Regional Background Levels (Stone, et al. 1983) (2)								2 - 34,000	1.9 - 14,000		0.001 - 0.06	0.01 - 16	0 - 2.6		NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)								6.4 - 404	420 - 2,120		0.0144 - 0.113	0 - 1.48	0.0161 - 0.423		760 - 3,600
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)								34,000	14,000		0.06	16	0.346		10,000
Units								mg/L	mg/L		mg/L	mg/L	mg/L		mg/L
SHS-16	5,362.58	42.6	22.2 - 37.2	4	Jan 2018	32.68	NT	NT		NT	NT	NT		NT	
SHS-17	5,364.35	46.21	35.67 - 45.67	4	Jan 2018	32.63	NT	NT		NT	NT	NT		NT	
SHS-18	5,373.64	47.36	37.36 - 47.36	4	Jan 2018	39.24	NT	NT		NT	NT	NT		NT	
SHS-19	5,378.89	52.4	32.40 - 52.40	4	Jan 2018	37.77	NT	NT		NT	NT	NT		NT	

Notes

- (1) Background Concentrations Proposed for the Giant Bloomfield Refinery Site. Based on Statistical Analysis Prepared by LT Environmental and Submitted to New Mexico Oil Conservation District in an Email Dated June 10, 2019.
- (2) Regional Background Concentrations Established in Document Titled *Hydrogeology and Water Resources of San Juan Basin, New Mexico*, Stone et al., dated 1983
- (3) "Background" Concentration Proposed in Lee Acres DRAFT *Remedial Investigation Report* Prepared for the US Bureau of Land Management (dated February 1992)
- (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) The Lee Acres *Remedial Investigation Report* Presents Analytical Data for Areas of the Site and Not Data for Individual Wells
- (6) Well Location Used for Statistical Analysis of Background Concentrations
- * Top-of-Casing Elevation is Unknown
- NM Not Measured
- P&A Plugged and Abandoned
- µg/L micrograms per liter
- BOLD** Indicates Concentration Exceeds the Greater Value of the NMWQCC Water-Quality Standards or Background Threshold Values Proposed for the Giant Bloomfield Refinery
- mg/L milligrams per liter
- NMWQCC New Mexico Water Quality Control Commission
- NT Not Tested
- USEPA United States Environmental Protection Agency

**TABLE 4
CLOSURE AND POST CLOSURE COST ESTIMATES**

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

QUARTERLY GROUNDWATER COMPLIANCE MONITORING					
LABOR COST	Senior Sci/Eng I	Project Sci/Eng II	Staff Sci/Eng II	CADD/ Designer	Admin/ Clerical
Task 1 - Office (2 Annual Reports)	8	60	16	16	4
Task 2 - Field (8 Sampling Events, 2 Personnel)	4	32	160		4
TOTAL HOURS	12	92	176	16	8
RATE (\$)	\$150.00	\$115.00	\$90.00	\$70.00	\$60.00
	\$1,800.00	\$10,580.00	\$15,840.00	\$1,120.00	\$480.00
				SUBTOTAL	\$29,820.00
OTHER DIRECT COSTS		QTY.	UNIT	RATE	UNIT TOTAL
Interface Probe		8	day	\$60.00	\$480.00
Temp/PH/Conductivity Meter		8	day	\$35.00	\$280.00
Field Vehicle		8	day	\$120.00	\$960.00
HDPE Disposable Bailers (20 each event)		160	ea.	\$7.00	\$1,120.00
Misc. Field Equipment		8	ea.	\$23.00	\$184.00
				SUBTOTAL	\$3,024.00
OTHER COSTS BILLED DIRECT TO WESTERN		QTY.	UNIT	RATE	UNIT TOTAL
Laboratory Analyses (VOCs, PAHs, 20 Wells each event)		160	ea.	\$270.00	\$43,200.00
				SUBTOTAL	\$43,200.00
				TOTAL	\$76,044.00

SYSTEM REMOVAL AND P&A OF WELLS					
LABOR COST	Senior Sci/Eng I	Project Sci/Eng II	Staff Sci/Eng II	CADD/ Designer	Admin/ Clerical
Task 1 - Follow Up and Documentation/State Engineer Coordination	2	20	10	10	2
Task 2 - Field		8	100		2
TOTAL HOURS	2	28	110	10	4
RATE (\$)	\$150.00	\$115.00	\$90.00	\$70.00	\$60.00
	\$300.00	\$3,220.00	\$9,900.00	\$700.00	\$240.00
				SUBTOTAL	\$14,360.00
OTHER DIRECT COSTS		QTY.	UNIT	RATE	UNIT TOTAL
Drilling Services, P&A of 47 Monitoring and Recovery Wells		1	ea.	\$45,000.00	\$45,000.00
Removal of Remediation System Infrastructure and Subsurface Piping		1	ea.	\$30,000.00	\$30,000.00
Field Vehicle		10	day	\$120.00	\$1,200.00
Misc. Field Equipment		10	ea.	\$23.00	\$230.00
				SUBTOTAL	\$76,430.00
				TOTAL	\$90,790.00

CLOSURE REPORTING AND NEGOTIATIONS					
LABOR COST	Senior Sci/Eng I	Project Sci/Eng II	Staff Sci/Eng II	CADD/ Designer	Admin/ Clerical
Task 1 - Closure Reporting and NMOCD Negotiations	8	76	28	16	3
TOTAL HOURS	8	76	28	16	3
RATE (\$)	\$150.00	\$115.00	\$90.00	\$70.00	\$60.00
	\$1,200.00	\$8,740.00	\$2,520.00	\$1,120.00	\$180.00
				SUBTOTAL	\$13,760.00
OTHER DIRECT COSTS		QTY.	UNIT	RATE	UNIT TOTAL
Field Vehicle		2	day	\$120.00	\$240.00
				SUBTOTAL	\$240.00
				TOTAL	\$14,000.00

SUBTOTAL	\$180,834.00
CONTINGENCY (10%)	\$18,083.40
TOTAL ESTIMATED COST	\$198,917.40





October 4, 2019

Nelly Smith, Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency – Region 6
1445 Ross Avenue, Suite 1200, Dallas, TX 75202

**RE: EPA-Requested Information
Giant Bloomfield Refinery GW-40 Site
Western Refining Southwest, Inc. (Marathon Petroleum Company, LP)
Bloomfield, New Mexico**

Dear Ms. Smith:

At the request of the United States Environmental Protection Agency (USEPA), in conjunction with the New Mexico Oil Conservation Division (NMOCD), LT Environmental has prepared the attached table (Table 1) to provide requested well information and analytical data for the former Giant Bloomfield Refinery, “GW-40” site (the “Site”). Specifically, the table provides well information that includes wellhead elevation, well depth, well-screen interval, well diameter, and depth to water measurements. The table also presents analytical results for select constituents requested by the USEPA, collected during annual sampling events between 2010 and 2018 (chloride, sulfate, chromium, iron, manganese, and total dissolved solids). In addition, the *2018 Annual Report* prepared for the Site is attached for your review. The report includes analytical results for the 2018 groundwater-sampling event, as well as figures presenting well locations, cross sections, and groundwater potentiometric surface maps with interpreted groundwater-flow directions. We understand that this information will be used as part of the upcoming five-year review for the upgradient Lee Acres Superfund Site.

Please contact us if you have questions regarding the attached information.

Sincerely,

LT ENVIRONMENTAL, INC.

Devin Hencmann
Project Geologist

Stuart Hyde, LG
Project Geologist

cc: Greg McCartney, Marathon Petroleum Company, LP
Carl Chavez, NMOCD



**TABLE 1
2010 to 2018 - ANNUAL COMPLIANCE GROUNDWATER LABORATORY ANALYTICAL RESULTS**

**FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.**

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method 512540C Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard								250	600	0.05	1.0	0.2	1,000
GBR Background Threshold Values (1)								560	2,546	1.553	97.06	6.42	4,566
Regional Background Levels (Stone, et al. 1983) (2)								2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)								6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)								34,000	14,000	0.06	16	0.346	10,000
Units								mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Lee Acres Sampling, 1992 RI Report (5)													
Lee Acres Site 1, Subarea 2, OU 2 - Alluvial Aquifer								8.8 - 730	195 - 4,370	0.0108 - 0.124	0.118 - 1.71	0.0161 - 8.62	943 - 6,560
Lee Acres Site 1, Subarea 3, OU 2 - Southern Area - Alluvial Aquifer								19 - 2,110	830 - 2,610	0.0145 - 0.0406	0.148 - 23.9	0.0214 - 4.23	622 - 5,300
Lee Acres Site 2, Subarea 4 - Alluvial Aquifer								3.5 - 604	310 - 3,220	0.043 - 0.110	0.0749 - 64.1	0.0131 - 3.4	616 - 6,370
GBR Sampling, Upgradient Wells (6)													
GBR-32	5,414.86	45	25 - 40	2	Oct 2018	33.95	200	1,700	0.074	2.7	1.9	3,110	
					Dec 2017		290	1,600	0.13	2.3	1.2	3,210	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		380	1,900	1.4	5.9	0.70	3,800	
					Jan 2013		400	2,200	0.098	1.2	0.40	4,320	
					Jan 2012		500	2,800	0.030	0.88	0.50	4,290	
					Jan 2011		420	2,300	0.13	NT	NT	4,010	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR-48	5,413.90	43.6	28.4 - 38.4	2	Oct 2018	35.62	300	1,800	0.036	18	0.49	3,580	
					Dec 2017		350	1,900	0.13	40	1.7	3,690	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		420	2,100	0.92	52	2.0	4,030	
					Jan 2013		230	2,200	0.52	17	0.94	4,020	
					Jan 2012		200	1,700	0.63	15	0.83	2,940	
					Jan 2011		390	2,200	0.71	9.3	NT	3,510	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR-49	*	38.5	25.9 - 36.3	2	Oct 2018	32.06	180	1,800	1.2	23	0.98	3,010	
					Dec 2017		150	1,300	0.018	0.44	0.30	2,720	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		63	1,400	0.060	41	3.9	2,340	
					Jan 2013		240	1,600	0.041	4.6	1.3	3,290	
					Jan 2012		260	2,000	0.018	0.23	0.34	3,470	
					Jan 2011		310	2,000	0.48	NT	NT	3,390	
					Jan 2010		NT	NT	NT	NT	NT	NT	

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method 801540C Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard							250	600	0.05	1.0	0.2	1,000	
GBR Background Threshold Values (1)							560	2,546	1.553	97.06	6.42	4,566	
Regional Background Levels (Stone, et al. 1983) (2)							2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA	
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600	
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							34,000	14,000	0.06	16	0.346	10,000	
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
GBR-50	*	42.5	26.91 - 37.26		Oct 2018	31.26	59	1,700	0.044	4.0	0.13	2,770	
					Dec 2017		54	1,500	0.16	5.8	0.32	2,590	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		52	1,700	0.013	3.6	0.22	2,800	
					Jan 2013		49	1,600	<0.0060	1.3	0.12	2,830	
					Jan 2012		49	1,800	0.0069	0.72	0.041	2,730	
					Jan 2011		46	1,800	0.023	NT	NT	2,640	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR Sampling, Source-Area Wells													
GRW-3/GBR-29 or 43	5,388.77	58.3	34.5 - 50.2	6	Oct 2018	43.13	99	640	NT	18	0.80	2,190	
					Dec 2017		74	1,400	NT	54	1.9	2,920	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Nov 2014		26	2,200	NT	0.86	0.44	3,680	
					Jan 2013		59	1,300	NT	2.8	0.54	2,620	
					Jan 2012		54	1,300	NT	2.8	0.67	2,660	
					Jan 2011		95	480	NT	NT	NT	1,810	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GRW-6/GBR-44	5,390.81	58.6	32.6 - 48.3	6	Oct 2018	40.89	100	1,300	NT	890	45	2,390	
					Dec 2017		120	1,200	NT	40	9.1	2,570	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		86	1,600	NT	35	8.5	3,170	
					Jan 2013		100	1,500	NT	2.4	1.2	2,760	
					Apr 2012		80	1,900	NT	0.47	1.0	2,740	
					Jan 2011		110	1,400	NT	NT	NT	2,490	
					Jan 2010		NT	NT	NT	NT	NT	NT	
GBR-17	5,402.69	51	31 - 51	2	Oct 2018	34.00	49	1,200	NT	100	3.0	2,180	
					Dec 2017		50	1,000	NT	9.3	0.25	2,110	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		44	1,200	NT	3.7	0.13	1,980	
					Jan 2013		47	1,300	NT	1.2	0.045	2,700	
					Jan 2012		46	1,400	NT	3.9	0.15	2,150	
					Jan 2011		47	1,300	NT	NT	NT	2,140	
					Jan 2010		NT	NT	NT	NT	NT	NT	

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method 502.540C Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard							250	600	0.05	1.0	0.2	1,000	
GBR Background Threshold Values (1)							560	2,546	1.553	97.06	6.42	4,566	
Regional Background Levels (Stone, et al. 1983) (2)							2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA	
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600	
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							34,000	14,000	0.06	16	0.346	10,000	
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
GBR-24D	5,396.77	46.3	33 - 43	2	Oct 2018	30.92	130	2,300	NT	9.1	1.8	3,780	
					Dec 2017		140	1,800	NT	11	1.8	3,560	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		210	1,800	NT	12	1.7	3,410	
					Jan 2013		200	1,700	NT	3.6	1.8	3,430	
					Jan 2012		200	2,000	NT	2.4	1.7	3,320	
					Jan 2011		170	2,400	NT	NT	NT	3,410	
Jan 2010		NT	NT	NT	NT	NT	NT						
GBR-30	5,395.59	45	25 - 40	2	Oct 2018	32.31	250	1,500	NT	28	0.76	3,000	
					Dec 2017		220	1,300	NT	38	1.4	2,770	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		270	1,400	NT	88	2.2	2,520	
					Jan 2013		310	1,500	NT	130	6.1	3,340	
					Jan 2012		390	1,700	NT	2.9	0.29	3,240	
					Jan 2011		320	1,600	NT	NT	NT	3,340	
Jan 2010		NT	NT	NT	NT	NT	NT						
GBR-31	5,396.58	45	24.6 - 39.6	2	Oct 2018	32.27	220	1,400	NT	13	3.1	2,660	
					Dec 2017		93	1,700	NT	21	4.2	2,940	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		230	1,500	NT	12	1.6	3,100	
					Jan 2013		79	1,600	NT	15	0.77	2,720	
					Jan 2012		74	1,700	NT	3.8	0.27	2,760	
					Jan 2011		97	1,800	NT	NT	NT	2,740	
Jan 2010		NT	NT	NT	NT	NT	NT						
GBR-51	5,389.68	59.5	38.5 - 54.25	6	Oct 2018	NM	54	1,300	NT	0.059	<0.0020	2,330	
					Dec 2017		51	1,200	NT	0.080	<0.020	2,250	
					Jan 2017		NT	NT	NT	NT	NT	NT	
					Aug 2015		NT	NT	NT	NT	NT	NT	
					Nov 2014		54	1,400	NT	16	0.47	2,320	
					Jan 2013		56	1,500	NT	9.7	0.88	2,540	
					Jan 2012		53	1,600	NT	3.1	0.16	2,440	
					Jan 2011		53	1,600	NT	NT	NT	2,380	
Jan 2010		NT	NT	NT	NT	NT	NT						

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method 502540C Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard							250	600	0.05	1.0	0.2	1,000	
GBR Background Threshold Values (1)							560	2,546	1.553	97.06	6.42	4,566	
Regional Background Levels (Stone, et al. 1983) (2)							2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA	
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600	
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							34,000	14,000	0.06	16	0.346	10,000	
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
GBR-52	5,387.74	50.78	30.08 - 45.75	6	Oct 2018	NM	54	1,500	NT	0.12	0.0028	2,580	
							Dec 2017	54	1,500	NT	0.048	<0.0020	2,640
							Jan 2017	NT	NT	NT	NT	NT	
							Aug 2015	NT	NT	NT	NT	NT	
							Nov 2014	65	1,700	NT	12	0.25	2,540
							Jan 2013	63	1,700	NT	2.3	0.036	2,770
							Jan 2012	60	1,800	NT	2.2	0.032	2,720
							Jan 2011	62	1,900	NT	NT	NT	2,700
Jan 2010	NT	NT	NT	NT	NT	NT							
GBR Sampling, Downgradient Wells													
SHS-1	5,383.54	50.97	35.67 - 45.67	4	June 2017	P&A	100	1,300	NT	NT	NT	2,400	
					Jan 2011	NT	NT	NT	NT	NT	NT		
SHS-2	5,381.66	41.28	30.98 - 40.98	4	June 2017	P&A	310	2,200	NT	NT	NT	4,100	
					Jan 2011	NT	NT	NT	NT	NT	NT		
SHS-4	5,383.62	55	37 - 47	2	June 2017	P&A	59	1,600	NT	NT	NT	2,270	
SHS-5	5,378.36	53.33	37.62 - 48.0	4	June 2017	P&A	50	1,200	NT	NT	NT	2,030	
					Jan 2011	NT	NT	NT	NT	NT	NT		
SHS-6	5,378.17	47.88	32.48 - 42.85	4	Jan 2018	37.85	NT	NT	NT	NT	NT	NT	
SHS-8	5,380.25	52.5	30.83 - 46.60	4	Oct 2018	38.25	130	890	NT	50	3.1	2,730	
Jan 2018					NT	NT	NT	NT	NT	NT			
Dec 2017					110	1,200	NT	10	3.6	2,730			
Jan 2017					NT	NT	NT	NT	NT	NT			
Aug 2015					NT	NT	NT	NT	NT	NT			
Nov 2014					110	350	NT	260	5.0	1,400			
Jan 2013					120	770	0.099	100	4.7	1,800			
Jan 2012					170	430	NT	15	2.3	2,040			
Jan 2011					150	150	0.0063	NT	NT	1,440			
SHS-8	Jan 2010	NT	NT	NT	NT	NT	NT						
SHS-9	5,380.79	49.88	34.46 - 44.46	4	Jan 2018	37.43	NT	NT	NT	NT	NT	NT	
SHS-13	5,367.81	47.4	27 - 42	4	Jan 2018	35.85	NT	NT	NT	NT	NT	NT	
SHS-14	5,367.07	54	28.70 - 48.70	4	Jan 2018	34.18	NT	NT	NT	NT	NT	NT	
SHS-15	5,366.21	47.8	27.40 - 42.40	4	Jan 2018	33.00	NT	NT	NT	NT	NT	NT	

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method 502.540C Modified: Total Dissolved Solids	
							chloride	sulfate	chromium	iron	manganese	total dissolved solids	
NMWQCC Standard								250	600	0.05	1.0	0.2	1,000
GBR Background Threshold Values (1)								560	2,546	1.553	97.06	6.42	4,566
Regional Background Levels (Stone, et al. 1983) (2)								2 - 34,000	1.9 - 14,000	0.001 - 0.06	0.01 - 16	0 - 2.6	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)								6.4 - 404	420 - 2,120	0.0144 - 0.113	0 - 1.48	0.0161 - 0.423	760 - 3,600
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)								34,000	14,000	0.06	16	0.346	10,000
Units								mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SHS-16	5,362.58	42.6	22.2 - 37.2	4	Jan 2018	32.68	NT	NT	NT	NT	NT	NT	
SHS-17	5,364.35	46.21	35.67 - 45.67	4	Jan 2018	32.63	NT	NT	NT	NT	NT	NT	
SHS-18	5,373.64	47.36	37.36 - 47.36	4	Jan 2018	39.24	NT	NT	NT	NT	NT	NT	
SHS-19	5,378.89	52.4	32.40 - 52.40	4	Jan 2018	37.77	NT	NT	NT	NT	NT	NT	

Notes

- (1) Background Concentrations Proposed for the Giant Bloomfield Refinery Site. Based on Statistical Analysis Prepared by LT Environmental and Submitted to New Mexico Oil Conservation District in an Email Dated June 10, 2019.
- (2) Regional Background Concentrations Established in Document Titled *Hydrogeology and Water Resources of San Juan Basin, New Mexico*, Stone et al., dated 1983
- (3) "Background" Concentration Proposed in Lee Acres DRAFT *Remedial Investigation Report* Prepared for the US Bureau of Land Management (dated February 1992)
- (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) The Lee Acres *Remedial Investigation Report* Presents Analytical Data for Areas of the Site and Not Data for Individual Wells
- (6) Well Location Used for Statistical Analysis of Background Concentrations
- * Top-of-Casing Elevation is Unknown
- NM Not Measured
- P&A Plugged and Abandoned
- µg/L micrograms per liter
- BOLD** Indicates Concentration Exceeds the Greater Value of the NMWQCC Water-Quality Standards or Background Threshold Values Proposed for the Giant Bloomfield Refinery
- mg/L milligrams per liter
- NMWQCC New Mexico Water Quality Control Commission
- NT Not Tested
- USEPA United States Environmental Protection Agency

**PROPOSED FACILITY-SPECIFIC BACKGROUND THRESHOLD VALUES FOR INORGANICS IN GROUNDWATER
FORMER GIANT BLOOMFIELD REFINERY
BLOOMFIELD, NEW MEXICO**

Analyte	Units	Number of Samples	Percent ND	Non-Detects	Detections	ND EM	Distribution	Min	Max	Mean	Std Deviation	Original Reported UTL	NDs replaced with PQL - Analyzed as Detections (per Agency's request)				Original Dataset with NDs (Statistic based on Gamma distribution for previously lognormal cases)				Proposed Background Threshold Values (BTVs)	Comments
												95%UTL 95% Coverage	CV	ND EM	Distribution	95%UTL 95% Coverage	CV	ND EM	Distribution	95%UTL 95% Coverage		
Chloride	mg/L	40	0	0	40	NA	Non-Parametric\Max	44	560	232.3	153.4	560									560	No Change. Dataset do not follow a discernible distribution, use Max value as UTL
Chromium	mg/L	32	3.125	1	31	ROS	Lognormal	0.006	1.4	0.318	0.379	4.46	1.19	PQL	Gamma-WH	1.59	0.145	KM	Gamma-WH	1.553	1.553	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 1.4 due to highly variable sample data, recommend using UTL based on Gamma distribution with WH approximation
Iron	mg/L	33	6	2	31	ROS	Lognormal	0.1	170	16.62	33.37	261.7	2.008	PQL	Gamma-HW	100.1	1168	KM	Gamma-HW	97.06	97.06	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 170 due to highly variable sample data, recommend using UTL based on Gamma distribution with HW approximation
Manganese	mg/L	24	0	0	24	NA	Lognormal	0.041	6.4	0.765	1.578	10.63					1.226	NA	Gamma-HW	6.42	6.42	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 6.4 due to highly variable sample data, recommend using UTL based on Gamma distribution with HW approximation
Sulfate	mg/L	40	0	0	40	NA	Normal	698	2800	1801	351.9	2546									2546	Low coefficient of variation, use UTL based on normal distribution
Total Dissolved Solids	mg/L	40	0	0	40	NA	Normal	1460	4320	3234	629	4566									4566	Low coefficient of variation, use UTL based on normal distribution

Notes:
CV - Coefficient of Variation
HW - Hawkins-Wixley approximation
KM - Kaplan-Meier method
NA - Not Applicable
ND - Non-detect
ND EM - Non-detect estimation method
ROS - Regression on order statistics
WH - Wilson-Hilferty approximation