ARCADIS

REVIEWED
By Mike Buchanan at 2:41 pm, Jun 12, 2024

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Date: March 27, 2024
Our Ref: 30167857.300
Subject: 2023 Annual Groundwater Report
Former Brickland Refinery Site
Sunland Park, New Mexico
Huntsman International LLC
Case No. AP-01

Review of the 2023 Annual Groundwater Report for the Former Brickland Refinery Site: Content Satisfactory
1. Continue LNAPL removal, if present, at MW-10 by bailing or pumping at quarterly intervals
2. Continue to monitor BTEX at MW-3S, MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, MW-10, MW-11, and MW-17
3. Continue evaluations as planned for the relationship between river stages, elevated water level measurements, and seasonal increases in concentrations of benzene.
4. Submit the 2024 Annual Groundwater report by April 1, 2025.

Dear Mr. Buchanan:

On behalf of Huntsman International LLC (Huntsman), Arcadis U.S., Inc. is submitting an electronic copy of the above-referenced report. As agreed upon on February 11, 2009, this report is being submitted on or before April 1 for the previous year.

If you have any questions regarding the enclosed report, please contact the undersigned at 225-802-8261 or Mr. Scott Wagaman with the Huntsman facility at 281-719-3038.

Sincerely,
Arcadis U.S., Inc.

Timothy D. Ratchford, P.G. (LA/TX)
Associate Vice President/Regulatory Compliance Specialist

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CC. Scott Wagaman – Huntsman (electronic)

ARCADIS

HUNTSMAN

Enriching lives through innovation

2023 Annual Groundwater Monitoring Report

Former Brickland Refinery

Sunland Park, New Mexico

March 27, 2024

2023 Annual Groundwater Monitoring Report

Former Brickland Refinery
Sunland Park, New Mexico

March 27, 2024

Prepared By:
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Contents

Tables

Figures

Appendices

Executive Summary

This 2023 Annual Groundwater Monitoring Report documents the results of four groundwater monitoring events conducted at the former Brickland Refinery in Sunland Park, New Mexico (site). The 2023 quarterly groundwater monitoring events were conducted in March (March 7-8), June (June 6-7), September (September 5-7), and November (November 20-21). This report contains summaries of groundwater elevation and analytical data from the 2023 groundwater monitoring events and historical records.

This monitoring program was conducted in accordance with the Groundwater Monitoring Plan included as Section 3.5 of the Stage 2 Abatement Plan approved by Mr. Bill Olson of the New Mexico Oil Conservation Division (NMOCD) in a letter dated December 17, 1998, and revised in 2006. A request was sent to NMOCD in a letter dated November 7, 2014, to modify the existing sampling performed at the site. The request was approved by Mr. Glenn von Gonten in correspondence dated April 24, 2015, and the Addendum to Abatement Plan AP-001 for the former Brickland Refinery was submitted to NMOCD on June 3, 2015. The modification to the plan requires quarterly sampling for designated wells.

In accordance with the Stage 2 Abatement Plan, quarterly sampling events include water-level and -product thickness measurements in all monitoring wells and analysis of benzene for all sampled wells. In email correspondence dated November 15, 2023, the Oil Conservation Division approved the removal of polycyclic aromatic hydrocarbons (PAHs) from the Abatement Plan as a monitoring parameter for Monitoring Well MW-8. Therefore, analysis of groundwater for PAHs was eliminated before the November event and only conducted during the March, June, and September events.

During the 2023 monitoring events, the following samples were collected:

- Five off-site well samples (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S).
- Five on-site well samples (MW-5, MW-8, MW-10, MW-11, and MW-17).

The laboratory-reported benzene concentrations for samples collected from MW-5 (March, June, and September 2023 monitoring events) and MW-8 (June 2023 monitoring event) were above the New Mexico Water Quality Control Commission (NMWQCC) standard of 10 micrograms per liter (µg/L).

The laboratory-reported total PAHs were below the NMWQCC standard of 30 µg/L for all samples collected at MW-8 during the March, June, and September 2023 monitoring events.

A good-faith effort was made to obtain the water-level measurements for the Rio Grande from the U.S. International Boundary and Water Commission, but the data could not be obtained. The relationship between high river stages, water-level elevations in site monitoring wells, and detections of benzene and PAHs was not evaluated due to this data gap.

The hydraulic gradient beneath the former Brickland Refinery varies slightly across the site in response to river stages. In March, June, September, and November 2023, the gradient was approximately 0.0019, 0.0006, 0.001, and 0.0017 foot per foot, respectively. The groundwater flow direction was generally to the southeast, parallel to the river.

During the March, June, September, and November 2023 sampling events, no measurable amount of light non-aqueous phase liquid (LNAPL) was observed in MW-10 or in any of the other monitoring wells.

Based on the results of ongoing monitoring, the following actions are recommended:

- Continue LNAPL removal, if present, at Monitoring Well MW-10 by bailing or pumping at quarterly intervals.
- Continue groundwater monitoring of benzene at Monitoring Wells MW-3S, MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, MW-10, MW-11, and MW-17.
- Continue evaluations of the relationship between river stages, elevated water-level measurements, and seasonal increases in concentrations of benzene at Monitoring Wells MW-5 and MW-8.

1 Introduction

1.1 Background

The former Brickland Refinery (site) is located in Sunland Park, New Mexico, and consists of approximately 33 acres situated along the west bank of the Rio Grande (Figure 1). Huntsman International LLC (Huntsman) currently owns the site. From 1933 to 1958, the site was operated by previous owners as a petroleum refinery, producing both gasoline and jet fuel. The site was closed and the plant dismantled by the previous owners in 1958. Between 1964 and 1989, the site was leased by the previous owners to various parties to service trucks, conduct automobile salvage operations, graze livestock, and store used bricks.

Petroleum hydrocarbons have been reported in soil and groundwater at the site since the sampling program was initiated in December 1993. The distribution of petroleum hydrocarbons was investigated, and these investigations provided the basis for the Stage 2 Abatement Plan approved by Mr. Bill Olson of the New Mexico Oil Conservation Division (NMOCD) on December 17, 1998. The Stage 2 Abatement Plan provides the methods for abating contamination of groundwater and soil in compliance with New Mexico Water Quality Control Commission (NMWQCC) regulations on prevention and abatement of water pollution (20 New Mexico Administrative Code 6.2, Subpart IV) and NMOCD requirements to protect public health and the environment with respect to wastes from the refinement of crude oil (Section 70 2 12.8 [22] New Mexico Statute Annotated 1978).

The sampling protocol was modified in 2006, and modifications were implemented during the June 2006 monitoring event. A request to further modify sampling performed at the site was sent to NMOCD in a letter dated November 7, 2014. The request was approved by Mr. Glenn von Gonten in correspondence dated April 24, 2015, and the Addendum to Abatement Plan AP-001 for the former Brickland Refinery was submitted to NMOCD on June 3, 2015. The revised protocol is in general accordance with applicable NMOCD, New Mexico Environment Department, and U.S. Environmental Protection Agency (USEPA) regulations, procedures, and guidelines.

Huntsman maintained a stand-alone light non-aqueous phase liquid (LNAPL) recovery system at the site (at MW-10) as part of the Stage 2 Abatement Plan. The system was installed in December 1998 and shut down in June 2008 because no free-phase product was removed from MW-10 in 2006, 2007, or 2008.

The current groundwater monitoring program conducted as part of Abatement Plan AP-001 includes:

- Collection of water levels and groundwater samples on a quarterly basis at the locations of five off-site monitoring wells (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S) and five on-site wells (MW-5, MW-8, MW-10, MW-11, and MW-17).
- Analysis of groundwater for benzene at all monitoring well locations.
- Monitoring for LNAPL at all monitoring wells.
- Extraction of LNAPL at Recovery Well MW-10 (when present).
- Submittal of an annual groundwater monitoring report.

In email correspondence dated November 15, 2023, the Oil Conservation Division approved the removal of polycyclic aromatic hydrocarbons (PAHs) from the Abatement Plan as a monitoring parameter for Monitoring

Well MW-8. Therefore, analysis of groundwater for PAHs was eliminated before the November event and only conducted during the March, June, and September events in 2023.

The site layout and monitoring well locations are shown on Figure 2.

1.2 Scope of Services

Arcadis performed quarterly groundwater monitoring at the site in March, June, September, and November 2023. Table 1 provides a summary of the groundwater sampling methods, purging methods, and laboratory analyses that were performed during the quarterly sampling events. The following activities were included during quarterly monitoring, as required by the Groundwater Monitoring Plan and 2015 Addendum to Stage 2 Abatement Plan as approved by NMOCD:

- Depth-to-groundwater measurements were recorded for five on-site monitoring wells and five off-site monitoring wells. Historical groundwater elevations for the monitoring wells are provided in Table 2, and groundwater elevation contour maps for the 2023 monitoring events are depicted on Figures 3, 4, 5, and 6.
- Groundwater sampling was conducted in March, June, September, and November 2023 at each of the five off-site monitoring wells (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S) and five on-site wells (MW-5, MW-8, MW-10, MW-11, and MW-17).
- Analytical testing for the samples included benzene for all wells sampled (using USEPA Test Method 8260C) during the March, June, September, and November 2023 events and PAHs for MW-8 (using USEPA Test Method 8270D) during the March, June, and September 2023 events. The analytical results for benzene and PAHs are shown in Tables 3 and 4, respectively.
- Ten monitoring wells were monitored for the presence of LNAPL, and a summary of the LNAPL thicknesses is graphed on Figure 7 and also included in Table 5.

Extraction system operations and maintenance reports were not prepared because the extraction system was shut down in June 2008 due to an absence of LNAPL in Recovery Well MW-10.

2 Groundwater Elevation, Hydraulic Gradient, and Flow Direction

The hydraulic gradient beneath the former Brickland Refinery varies slightly across the site. This variability is in part a response to river-stage fluctuations. In March, June, September, and November 2023, the gradient was approximately 0.0019, 0.0006, 0.001, and 0.0017 foot per foot, respectively. The groundwater flow direction was generally to the southeast, parallel to the river.

Historical groundwater elevations for the monitoring wells are provided in Table 2. Water levels are not listed for the well points because the well points were specifically designed to detect LNAPL at a discrete depth and the screened intervals do not correlate with the monitoring well screens. Groundwater elevation contour maps for the March, June, September, and November 2023 monitoring events are depicted on Figures 3, 4, 5, and 6, respectively.

Groundwater levels in the monitoring wells are influenced by the stage of the Rio Grande, which borders the site. Due to observed seasonal fluctuations in the river, water levels in the monitoring wells may vary as much as

2 feet over the course of a year. Monitoring of groundwater elevations since June 2003 indicates a consistent pattern of higher water elevations in the wells and the river during summer sampling events and lower water elevations during winter sampling events.

3 LNAPL Product Thickness and Removal

3.1 LNAPL Product Thickness

The occurrence of LNAPL in MW-10 was tested with an oil/water interface meter. The potential occurrence of LNAPL in other monitoring wells was evaluated visually during gauging of water levels with an electronic water-level meter. Measurable thicknesses of LNAPL were not found in any wells during the four 2023 monitoring events. Recent and historical measurements dating back to June 2003 are graphed on Figure 7 and listed in Table 5. LNAPL thickness maps were not prepared for this report because none of the wells contained measurable amounts of LNAPL during the four events.

3.2 LNAPL Removal

Historically, approximately 235 gallons of LNAPL have been removed from MW-10 since December 1998, when the product recovery system was installed. LNAPL yields were no longer recovered in measurable amounts during 2006 and 2007, and the recovery system was shut down/disconnected in June 2008. Subsequently, no LNAPL was removed from MW-10 in 2008, 2009, 2010, or 2011. In 2012, manual LNAPL removal was initiated for MW-10 in response to a measurable thickness present in MW-10 as of December 2011. During the March, June, September, and December 2023 sampling events, no product thickness was observed in MW-10.

4 Sample Collection and Laboratory Analytical Testing Procedures

4.1 Decontamination for Fluid-Level Measurements

The interface probe was decontaminated prior to each use and between each well to prevent the introduction of external contamination or artifacts into a well. A wash and double-rinse decontamination procedure was used. The procedure consisted of washing the probe with Liquinox, a mild, non-phosphate detergent, and then rinsing twice with water.

4.2 Calibration of Multi-Probe Water Analyzer

The multi-probe analyzer was calibrated by Geotech for each sampling event prior to use at the site. Each calibration was carried out in accordance with the equipment manufacturer's procedures and recommendations.

4.3 Well Purging and Field Parameter Measurements

The monitoring wells were purged using low-flow/low-stress techniques prior to sampling. Low-flow purging involves removing small volumes of groundwater at very low pumping rates until certain field parameters have stabilized. Field parameter measurements were recorded while each well was purged through the multi-probe flow cell. The groundwater temperature, pH, specific conductance, dissolved oxygen, oxidation reduction (redox) potential, and turbidity were documented on the Groundwater Sampling Logs provided in Appendix A. Purging of each well was continued until three consecutive readings for three field parameters (dissolved oxygen, redox potential, and turbidity) stabilized within 10 percent of one another. When stabilization was achieved, well purging was discontinued and the well was sampled. The total volume of water purged prior to sample collection was recorded on the Groundwater Sampling Log for each well. The purged water was containerized for disposal.

Approximately 1 to 2 gallons of water were removed from each well prior to sampling. Field data collected during the purging of each well are provided in Appendix A. Groundwater odor, color, and other physically apparent characteristics were documented. Monitoring well integrity was also documented (see the Daily Field Reports provided in Appendix A).

During the March, June, September, and November 2023 sampling events, all wells sampled were purged with peristaltic pumps. All tubing used with the peristaltic pumps was dedicated and/or replaced at each well. A combined total ranging from approximately 10 to 20 gallons of water was purged from the sampled monitoring wells during each of the four monitoring events. Rhino Environmental Services is handling the collection of purged water from these monitoring events for subsequent nonhazardous disposal at an approved facility.

4.4 Groundwater Sample Collection

Samples were collected for laboratory analysis in the order of volatility of the analytical parameters (benzene first and PAHs second). All samples were labeled with the sampling location, date, time, and testing requirements on self-adhering labels provided by the laboratory.

4.4.1 Benzene

The groundwater samples were analyzed by USEPA Method 8260C for benzene in the March, June, September, and November 2023 monitoring events. Three 40-milliliter (mL) unpreserved glass vials were used as sample containers for volatile organic compounds. Water was collected from the well via tubing directly into the glass vial until a convex meniscus formed above the lip of the bottle. Once capped, the vial was checked for air bubbles (headspace) by turning it upside down, tapping the cap of the inverted bottle, and visually inspecting the bottle contents. No bubbles were observed in the vials shipped to the laboratory.

4.4.2 Polycyclic Aromatic Hydrocarbons

Samples collected from Monitoring Well MW-8 in the March, June, and September 2023 monitoring events were analyzed by USEPA Method 8270D for the presence of PAHs. Three 40-mL glass vials with no preservative were used as sample containers for PAHs. Water was collected from the well via tubing placed directly into the sample container until filled to the neck.

4.5 Field Quality Assurance/Quality Control (QA/QC)

The field QA/QC program includes collection of field blanks, equipment blanks, and duplicate samples. The water samples collected during the monitoring events were placed in ice-filled coolers immediately after collection and shipped to ALS Environmental in Houston, Texas, for analysis. In each event, chain of-custody forms documenting sample identification numbers, the required analysis for each sample, collection times, and delivery times to the laboratories were completed for each set of samples. Copies of chain-of-custody forms are provided in Appendix B. Descriptions of the QA/QC samples and evaluation of QA/QC results for 2023 are presented below.

4.5.1 Field Blanks

Field blanks were used to determine potential absorption of volatile organics from ambient air into the water samples. The blanks for volatile organics were collected by filling three 40-mL glass vials with distilled water at the time of sampling. Field blanks were analyzed for benzene and/or PAHs during the March, June, September, and November 2023 sampling events. None of the constituents were detected in the field blanks collected during the four sampling events.

4.5.2 Equipment Blanks

Equipment blanks were collected on non-dedicated or new sampling equipment. During the March, June, September, and November 2023 sampling events, equipment blanks were collected for the Teflon® dipper and the water-level indicator. Immediately following decontamination, equipment blanks were collected by pouring distilled water over the equipment and then filling three 40-mL glass vials with water from the equipment. Equipment blanks were analyzed for benzene and/or PAHs during the March, June, September, and November 2023 sampling events. None of the constituents were detected in the equipment blanks collected during the four sampling events.

4.5.3 Duplicate Samples

Two duplicate samples were collected during each of the four 2023 monitoring events. During the March, June, September, and November sampling events, duplicate samples were collected from Monitoring Wells MW-3D (benzene) and MW-8 (PAHs during March, June, and September; benzene during November). For the March, June, September, and November 2023 sampling events, the non-detect analytical result for benzene in the duplicate sample was consistent with the non-detect original result in MW-3D. The duplicate sample results for total PAHs and benzene were similar to the original MW-8 results.

5 Groundwater Analytical Results

5.1 Benzene

According to the Stage 2 Abatement Plan, benzene concentrations are measured quarterly during the March, June, September, and November sampling events. Benzene was reported in concentrations above the NMWQCC standard of 10 micrograms per liter (µg/L) in samples collected from Monitoring Well MW-5 in the March, June,

and September 2023 events and from Monitoring Well MW-8 in the June 2023 event. Laboratory results for benzene analyses are shown in Table 3, and copies of the laboratory reports are provided in Appendix B.

5.2 Polycyclic Aromatic Hydrocarbons

Samples collected from MW-8 were analyzed for PAHs in March, June, and September 2023. Concentrations were reported below the NMWQCC standard of 30 µg/L for total PAHs during all three events. PAHs were removed from the Abatement Plan as a monitoring parameter for Monitoring Well MW-8 before the November event. Concentrations of PAHs have not been detected above the corresponding NMWQCC standard at Monitoring Well MW-8 since June 2016. Laboratory results for PAH analyses are shown in Table 4, and copies of the laboratory reports are provided in Appendix B.

5.3 Trend Analyses and Seasonal Concentration Increases

Graphs showing trends for detected concentrations of benzene and PAHs are provided as Figures 8 and 9, respectively. Measurements for stages in the Rio Grande from the U.S. International Boundary and Water Commission (IBWC) could not be obtained from the IBWC to evaluate the relationship between high river stages, water-level elevations in site monitoring wells, and detections of benzene and PAHs. Therefore, these hydrographs are not provided for comparison and should be noted as a data gap.

6 Remediation Performance

6.1 Bioremediation Pilot Testing

Absorbent socks were used during 2011 and the first half of 2012 as a pilot test to evaluate bioremediation by enhancing natural attenuation. The absorbent socks use a patented calcium peroxide (45 to 70 percent composition) and calcium hydroxide (10 to 20 percent composition) solid granular material to react with water to release oxygen slowly, which stimulates aerobic biodegradation of groundwater contaminants. During the June 2012 sampling event, the “O-Sox” were removed from MW-5 and MW-8 and have not been replaced. Based upon these conditions, it appears that the absorbent socks used for pilot testing have addressed conditions at MW-5 and MW-8.

6.2 Product Recovery

During the March, June, September, and November 2023 sampling events, no measurable amount of LNAPL was observed in MW-10 or in any of the other monitoring wells.

7 Conclusions

Overall, the reported concentrations in groundwater appear to be stable or decreasing. During the 2023 reporting period, benzene concentrations from two wells (MW-5 and MW-8) exceeded NMWQCC standards. PAHs at MW-8 were reported below NMWQCC standards. Review of laboratory results shows general consistency

through time in benzene concentrations in MW-5 and MW-8. This stable/decreasing trend will be verified with future sampling events.

A good-faith effort was made to obtain the water-level measurements for the Rio Grande from the IBWC, but the data was not released in time for this report. The relationship between high river stages, water-level elevations in site monitoring wells, and detections of benzene and PAHs was not evaluated due to this data gap.

During the March, June, September, and November 2023 sampling events, no measurable amount of LNAPL was observed in Monitoring Well MW-10 or in any of the other monitoring wells.

8 Recommendations

Based upon data collected during the 2023 sampling program, the following recommendations are proposed for the remediation system and monitoring operations at the former Brickland Refinery:

- Continue LNAPL removal, if present, at Monitoring Well MW-10 by bailing or pumping at quarterly intervals.
- Continue groundwater monitoring of benzene at Monitoring Wells MW-3S, MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, MW-10, MW-11, and MW-17.
- Continue evaluations of the relationship between river stages, elevated water-level measurements, and seasonal increases in concentrations of benzene at Monitoring Wells MW-5 and MW-8.

Tables

Table 1
Water Sampling and Purging Methods
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well Number	Sample Date	Purge Method	Sampling Method	Purge Volume	Laboratory Analytes
MW-3S	3/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/6/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/5/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/20/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-3D	3/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/6/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/5/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/20/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-5	3/8/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/21/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-6S	3/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/6/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/5/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/20/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-6D	3/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/6/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/20/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-8	3/8/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene, PAH
	6/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene, PAH
	9/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene, PAH
	11/21/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene

Table 1
Water Sampling and Purging Methods
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well Number	Sample Date	Purge Method	Sampling Method	Purge Volume	Laboratory Analytes
MW-9S	3/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/6/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/5/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/20/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-10	3/8/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/21/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-11	3/8/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/21/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
MW-17	3/8/2023	Low-Flow Purge	Peristaltic Pump	Approximately 1 gallon	Benzene
	6/6/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	9/7/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene
	11/21/2023	Low-Flow Purge	Peristaltic Pump	Approximately 2 gallons	Benzene

Total volume purged during quarterly monitoring event in March 2023:	10 gallons
Total volume purged during quarterly monitoring event in June 2023:	20 gallons
Total volume purged during quarterly monitoring event in September 2023:	20 gallons
Total volume purged during quarterly monitoring event in November 2023:	20 gallons
Total volume purged during all 2023 quarterly monitoring events:	70 gallons

Abbreviation:
PAH - Polycyclic aromatic hydrocarbon.

Table 2
Monitoring Well Groundwater Elevations
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well ID	TOC[1]	6/18/2003	12/16/2003	6/16/2004	12/16/2004	6/15/2005	12/14/2005	6/13/2006	12/14/2006	6/13/2007	12/11/2007	6/25/2008	1/7/2009	6/30/2009	12/9/2009	6/21/2010
MW-1	Plugged 7/15	3725.55	3723.69	3725.56	3723.6	3726.5	3724.01	3725.89	3724.29	3726.74	3724.57	3726.88	3724.4	3726.94	3724.20	3726.79
MW-2	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-3S	3732.20	3724.65	3722.69	3724.61	3722.71	3725.56	3723.1	3725.02	3723.34	3725.82	3723.49	3725.99	3723.53	3725.98	3723.24	3725.88
MW-3D	3732.19	3724.57	3722.61	3724.62	3722.64	3725.49	3723.04	3724.96	3723 29	3725.78	3723.57	3725.96	3723.5	3725.92	3723.68	3725.83
MW-4	Plugged 7/15	3724.87	3722.88	3724.76	3722.96	3725.75	3723.37	3725.21	3723.62	3726.06	3723.77	3726.26	3723.82	3726.22	3723.52	3726.41
MW-5	3731.64	3724.91	3722.85	3724.83	3722.98	3725.68	3723.38	3725.15	3723.65	3726.02	3723.84	3726.14	3723.85	3726.21	3723.51	3726.13
MW-6S	3733.28	3724.4	3722.38	3724.4	3722.45	3725.21	3722.9	3724.76	3722.99	3725.53	3723.13	3725.7	3723.29	3725.68	3722.99	3725.70
MW-6D	3733.83	3724.36	3722.33	3724.38	3722.41	3725.22	3722.86	3724.74	3722.98	3725.58	3723.28	3725.76	3723.25	3725.69	3722.95	3725.62
MW-7	Plugged 7/15	3724.76	3722.69	3724.75	3722.82	3725.53	3723.24	3725.06	3723.45	3725.92	3723.78	3726.05	3723.64	3726.39	3723.42	3725.99
MW-8	3731.15	3724.67	3722.63	3724.62	3722.84	3725.28	3723.25	3724.91	3723.46	3725.53	3723.67	3725.79	3723.62	3725.78	3723.39	3725.53
MW-9S	3734.42	3724.04	3722.02	3723.97	3722.18	3724.85	3722.65	3724.39	3722.89	3725.4	3723.17	3725.41	3723.17	3725.41	3722.88	3725.35
MW-9D	Plugged 7/05	Dry	Dry	Dry	Dry	Dry	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05
MW-10	3734.53	3725.67	3722.31	3724.41	3722.56	3725.24	3723.11	3724.53	3723.29	3725.83	3723.54	3732.54	3723.47	3725.82	3723.22	3725.73
MW-11	3733.39	3724.51	3721.17	3724.42	3722.74	3725.24	3723.21	3724.65	3723.43	3725.77	3723.62	3725.74	3723.53	3725.76	3723.30	3725.69
MW-12	Plugged 7/15	3725.93	3724.09	3725.9	3723.86	3726.74	3724.4	3726.24	3724.66	3727.1	3724.8	3726.95	3724.79	3727.28	3724.49	3727.08
MW-13	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-14	Plugged 7/15	3725.3	3722.79	3724.81	3722.88	3725.67	3723.3	3725.17	3723.55	3726.03	3723.82	3726.13	3723.77	3726.14	3723.45	3726.06
MW-15	Plugged 7/15	3724.35	3722.38	3724.28	3722.58	3725.16	3723.04	3724.69	3723.42	3725.75	3723.57	3725.73	3723.58	3725.74	3723.26	3725.62
MW-16	Plugged 7/15	3724.17	3722.14	3724.13	3722.34	3725	3722.78	3724.48	3723.05	3725.53	3723.29	3725.51	3723.28	3725.51	3722.99	3725.43
MW-17	3733.87	3724.67	3722.61	3724.67	3722.71	3725.53	3723.15	3725.06	3723.33	3725.93	3723.63	3726	3723.63	3726.02	3723.28	3726.02

Well ID	12/7/2010	6/28/2011	12/13/2011	6/19/2012	12/11/2012	6/11/2013	12/3/2013	6/9/2014	12/9/2014	6/8/2015	9/14/2015	12/2/2015	3/8/2016	6/6/2016	9/12/2016	12/13/2016
MW-1	3724.08	3726.27	3723.93	3725.83	3724.01	3725.80	3724.07	3726.26	3723.96	3726.46	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-2	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-3S	3723.15	3725.35	3723.05	3724.86	3723.03	3724.68	3723.08	3725.27	3722.84	3725.70	3725.16	3722.57	3722.45	3724.81	3723.79	3722.32
MW-3D	3723.07	3725.37	3722.93	3724.96	3722.91	3724.81	3723.28	3725.37	3722.74	3725.62	3725.27	3722.48	3722.35	3724.75	3723.63	3722.24
MW-4	3723.41	3725.51	3723.26	3725.11	3723.20	3724.73	3723.34	3725.35	3723.05	3725.72	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-5	3723.54	3725.50*	3722.13*	3724.91*	3723.27	3724.66	3723.37	3725.22	3723.14	3725.60	3725.40	3722.79	3722.75	3724.95	3724.23	3722.57
MW-6S	3722.83	3725.11	3722.69	3724.70	3722.71	3724.50	3722.61	3725.07	3722.50	3725.32	3725.03	3722.35	3722.24	3724.60	3723.55	3722.15
MW-6D	3722.85	3725.06	3722.76	3724.67	3722.70	3724.54	3722.59	3725.19	3722.46	3725.39	3724.99	3722.26	3722.22	3724.53	3723.40	3722.09
MW-7	3723.26	3725.43	3723.04	3724.99	3723.08	3724.73	3723.06	3725.39	3722.93	3725.70	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-8	3723.22	3725.25*	3721.89*	3724.76*	3723.05	3723.87	3723.04	3724.46	3722.89	3724.76	3725.24	3722.59	3722.59	3724.62	3724.12	3722.44
MW-9S	3723.23	3725.16	3722.32	3724.33	3722.49	3723.98	3722.38	3724.68	3722.32	3724.92	3724.74	3722.14	3722.00	3724.26	3723.42	3721.99
MW-9D	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05
MW-10	3722.91	3724.87*	3722.21*	3724.34	3722.55	3724.56	3722.79	3724.88	3722.72	3725.01	3725.08	3722.36	3722.23	3724.52	3724.15	3722.25
MW-11	3723.17	3724.95	3722.94	3724.64	3722.98	3723.80	3722.95	3724.48	3722.78	3724.69	3725.08	3722.54	3722.53	3724.56	3724.02	3722.42
MW-12	3724.52	3726.70	3724.79	3726.21	3724.33	3726.00	3724.30	3726.54	3724.14	3726.73	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-13	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-14	3723.58	3725.49	3723.44	3725.09	3724.84	3724.70	3724.16	3725.31	3723.01	3725.66	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-15	3723.26	3724.99	3723.15	3724.63	3722.81	3724.19	3722.74	3724.83	3722.60	3725.06	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-16	3722.78	3724.87	3724.76	3724.64	3724.71	3724.12	**	3724.73	3722.70	3724.99	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-17	3723.17	3725.40	3723.02	3724.95	3723.05	3724.80	3722.91	3725.44	3722.77	3725.69	3725.28	3722.56	3722.48	3724.86	3723.78	3722.41

Notes:
[1] - Wells resurveyed on March 24, 2022.
*Oxygen-releasing compound sleeves/socks (O-Sox) were utilized to enhance natural attenuation. Water elevations may be artificially lowered due to displacement caused by the O-Sox.
**Roots on probe.
Measurements are reported in feet mean sea level.
Dry - Monitoring point was dry.
Plugged - Plugged and abandoned as of specified date.

Abbreviation:
TOC - Top of casing.

ARCADIS

Table 2
Monitoring Well Groundwater Elevations
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well ID	TOC[(1)]	3/7/2017	6/6/2017	9/26/2017	12/5/2017	3/6/2018	6/26/2018	9/20/2018	12/11/2018	3/5/2019	6/4/2019	9/18/2019	12/10/2019	3/17/2020	6/1/2020	9/21/2020	12/18/2020	3/8/2021	6/1/2021	9/8/2021	12/8/2021	3/8/2022	6/13/2022	9/6/2022	12/6/2022	3/7/2023	6/6/2023	9/5/2023	11/20/2023
MW-1	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-2	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-3S	3732.20	3722.24	3724.65	3724.50	3721.87	3721.80	3724.61	3724.08	3721.85	3721.65	3721.63	3724.57	3722.24	3723.95	3724.37	3723.82	3722.08	3722.00	3721.79	3722.80	3722.48	3724.37	3726.19	3724.14	3723.91	3723.89	3726.12	3726.39	3724.15
MW-3D	3732.19	3722.14	3724.60	3724.43	3721.81	3721.71	3724.59	3724.01	3721.75	3721.72	3721.58	3724.32	3722.18	3724.00	3724.23	3723.63	3722.04	3721.95	3721.71	3722.75	3722.40	3724.33	3726.17	3724.08	3723.87	3723.83	3726.06	3726.33	3724.09
MW-4	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-5	3731.64	3722.49	3724.89	3724.72	3721.10	3722.11	3724.70	3724.25	3722.29	3722.14	3721.80	3724.62	3722.73	3723.57	3724.40	3724.01	3722.39	3722.29	3722.05	3723.13	3722.78	3724.33	3725.76	3724.25	3723.92	3723.89	3726.05	3726.32	3724.19
MW-6S	3733.28	3722.00	3724.41	3724.25	3721.60	3721.57	3724.38	3723.81	3721.69	3721.57	3721.54	3724.15	3722.05	Damaged	Damaged	Damaged	Damaged	Damaged	Damaged	3722.22	3722.29	3725.19	3726.07	3723.98	3723.80	3723.80	3726.34	3726.17	3724.00
MW-6D	3733.83	3721.98	3724.34	3724.20	3721.53	3721.51	3724.39	3723.80	3721.64	3721.52	3721.49	3724.10	3721.96	3723.75	3723.94	3723.40	3721.77	3721.72	3721.54	3722.62	3721.89	3725.31	3727.04	3724.90	3724.74	3724.72	3726.52	3727.09	3724.89
MW-7	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-8	3731.15	3722.31	3724.59	3724.40	3721.97	3721.90	3724.39	3723.52	3722.04	3721.84	3721.77	3724.37	3722.39	3723.08	3724.12	3723.90	3722.16	3722.08	3721.81	3722.48	3722.61	3724.26	3725.27	3724.18	3723.79	3723.76	3725.81	3726.04	3724.02
MW-9S	3734.42	3721.91	3724.01	3724.01	3721.45	3721.47	3724.00	3723.56	3721.60	3721.51	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	3720.54	3719.98	3724.40	3725.55	3723.88	3723.64	3723.58	3725.53	3725.81	3723.70
MW-9D	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05	Plugged 7/05
MW-10	3734.53	3722.22	3724.32	3724.40	3721.90	3721.82	3724.48	3723.95	3721.96	3721.84	3721.74	3724.26	3722.23	3723.62	3723.93	3723.60	3721.95	3721.93	3721.74	3722.99	3722.58	3724.33	3725.84	3724.03	3723.78	3723.76	3725.80	3726.04	3723.90
MW-11	3733.39	3722.28	3724.39	3724.38	3721.98	3721.84	3724.32	3723.98	3721.99	3721.80	3721.78	3724.24	3722.27	3722.97	3724.05	3723.72	3722.07	3721.97	3721.80	3722.95	3722.60	3724.09	3725.31	3724.11	3723.84	3723.79	3725.72	3725.98	3724.03
MW-12	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-13	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99	Plugged 6/99
MW-14	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-16	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15	Plugged 7/15
MW-17	3733.87	3722.30	3724.64	3724.49	3721.86	3721.83	3724.66	3724.10	3721.96	3721.82	3721.80	3724.39	3722.28	3723.98	3724.26	3723.70	3722.09	3722.48	3721.79	3722.88	3722.58	3724.22	3725.96	3723.91	3723.71	3723.76	3725.85	3726.07	3723.89

Notes:

(1) - Wells resurveyed on March 24, 2022.
*Oxygen-releasing compound sleeves/socks (O-Sox) were utilized to enhance natural attenuation. Water elevations may be artificially lowered due to displacement caused by the O-Sox.
**Roots on probe.
Measurements are reported in feet mean sea level.
Dry - Monitoring point was
Plugged - Plugged and abandoned as of specified date.

Abbreviation:

TOC - Top of casing.

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-3S	6/19/2003	ND
	12/17/2003	ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/24/2008	<1
	1/8/2009	<1
	7/1/2009	<1
	12/10/2009	<1
	6/23/2010	<0.20
	12/7/2010	<0.20
	6/29/2011	<1
	12/14/2011	<1
	6/19/2012	<0.20
	12/11/2012	<0.20
	6/12/2013	<1
	12/4/2013	<5
	6/9/2014	<0.60
	12/10/2014	<1
	6/10/2015	<1
	9/14/2015	<1
	12/2/2015	<1
	3/7/2016	<1
	6/6/2016	<1
	9/13/2016	<1
	12/14/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/10/2019	<1
	3/17/2020	<1
	6/1/2020	<1
	9/21/2020	<1
	12/18/2020	<1
	3/8/2021	<1
	6/1/2021	<1
	9/8/2021	<1
	12/8/2021	<1
	3/8/2022	<1
	6/13/2022	<1
	9/6/2022	<1
	12/6/2022	<1
	3/7/2023	<1
	6/6/2023	<1
	9/5/2023	<1
	11/20/2023	<1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-3D[1]	6/19/2003	ND
	12/17/2003	ND; ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/24/2008	<1
	1/8/2009	<1
	7/1/2009	<1
	12/10/2009	<1
	6/23/2010	<0.20
	12/7/2010	<1
	6/29/2011	<1
	12/14/2011	<1
	6/19/2012	<0.20
	12/11/2012	<0.20
	6/12/2013	<1
	12/4/2013	<5
	6/9/2014	<0.60
	12/10/2014	<1
	6/10/2015	<1
	9/14/2015	<1
	12/2/2015	<1
	3/7/2016	<1
	6/6/2016	<1
	9/13/2016	<1
	12/14/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/10/2019	<1
	3/17/2020	<1
	6/1/2020	<1; <1
	9/21/2020	<1; <1
	12/18/2020	<1; <1
	3/8/2021	<1; <1
	6/1/2021	<1; <1
	9/8/2021	<1; <1
	12/8/2021	<1; <1
	3/8/2022	<1; <1
	6/13/2022	<1; <1
	9/6/2022	<1; <1
	12/6/2022	<1; <1
	3/7/2023	<1; <1
	6/6/2023	<1; <1
	9/5/2023	<1; <1
	11/20/2023	<1; <1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-5[1]	6/21/2010	**2,200**
	6/30/2011	**870**
	12/13/2011	**2,000**
	7/20/2012	**400**
	12/13/2012	**1,100; 910**
	6/13/2013	**1,200**
	12/4/2013	**140**
	6/10/2014	**420**
	12/10/2014	**580**
	6/9/2015	**1,900**
	9/15/2015	**73**
	12/3/2015	**450**
	3/8/2016	**460**
	6/7/2016	**1,200**
	9/13/2016	**400**
	12/14/2016	**510**
	3/8/2017	**230**
	6/7/2017	**920**
	9/27/2017	**3,500**
	12/6/2017	**1,600**
	3/7/2018	**120**
	6/27/2018	**2,300**
	9/21/2018	**1,500**
	12/12/2018	**120**
	3/6/2019	**990**
	6/5/2019	**1,200**
	9/19/2019	**910**
	12/11/2019	**1,900**
	3/18/2020	**1,700**
	6/2/2020	**1,000**
	9/22/2020	**750**
	12/18/2020	**959**
	3/8/2021	**370**
	6/1/2021	**150**
	9/9/2021	**300**
	12/9/2021	**470**
	3/9/2022	**250**
	6/14/2022	**49**
	9/6/2022	**230**
	12/7/2022	**300**
	3/8/2023	**120**
	6/7/2023	**26**
	9/7/2023	**76**
	11/21/2023	<1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-6S[1]	6/19/2003	ND
	12/17/2003	ND
	6/16/2004	ND; ND
	12/16/2004	ND; ND
	6/15/2005	0.8
	12/16/2005	ND
	6/15/2006	ND; ND
	12/14/2006	**11**; 6.1
	6/14/2007	ND; ND
	12/17/2007	ND; ND
	6/25/2008	<1
	1/8/2009	<1
	7/1/2009	1.7; 1.8
	12/11/2009	<10,000; <10,000
	6/24/2010	<1; <1
	12/8/2010	<0.20
	6/29/2011	0.61J; <1
	12/16/2011	<1; <1
	6/21/2012	<1; <1
	12/12/2012	<0.20
	6/12/2013	<1; <1
	12/4/2013	<10; <10
	6/10/2014	<0.60; <0.60
	12/9/2014	<1
	6/10/2015	<1; <1
	9/15/2015	<1
	12/3/2015	<1
	3/7/2016	<1
	6/6/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/8/2017	<1
	6/7/2017	<1
	9/27/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/10/2019	<1
	3/17/2020	[2]
	6/1/2020	[2]
	9/21/2020	[2]
	12/18/2020	[2]
	3/8/2021	[2]
	6/1/2021	[2]
	9/8/2021	1.7
	12/8/2021	<1
	3/8/2022	<1
	6/13/2022	<1
	9/6/2022	<1
	12/6/2022	<1
	3/7/2023	<1
	6/6/2023	<1
	9/5/2023	<1
	11/20/2023	<1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-6D[1]	6/19/2003	ND
	12/17/2003	ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/25/2008	<1
	1/8/2009	<1
	7/1/2009	<1
	12/11/2009	<1
	6/24/2010	<0.20
	12/8/2010	<1
	6/29/2011	<1
	12/16/2011	<1
	6/21/2012	<0.20
	12/12/2012	<0.20
	6/12/2013	<1
	12/4/2013	<5
	6/10/2014	<0.60
	12/9/2014	<1; <1
	6/10/2015	<1
	9/15/2015	<1
	12/3/2015	<1
	3/8/2016	<1
	6/7/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/8/2017	<1
	6/7/2017	<1
	9/27/2017	<1
	12/5/2017	<1; <1
	3/6/2018	<1; <1
	6/26/2018	<1; <1
	9/20/2018	<1; <1
	12/11/2018	<1; <1
	3/5/2019	<1; <1
	6/4/2019	<1; <1
	9/18/2019	<1; <1
	12/10/2019	<1; <1
	3/17/2020	<1; <1
	6/1/2020	<1
	9/21/2020	<1
	12/18/2020	<1
	3/8/2021	<1
	6/1/2021	<1
	9/8/2021	<1
	12/8/2021	<1
	3/8/2022	<1
	6/13/2022	<1
	9/6/2022	<1
	12/6/2022	<1
	3/7/2023	<1
	6/6/2023	<1
	9/7/2023	<1
	11/20/2023	<1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-8[1]	6/22/2010	**6,800**
	6/30/2011	**460**
	12/14/2011	**9,900**
	7/20/2012	**2,700**
	12/13/2012	**5,500**
	6/13/2013	**4,700**
	12/4/2013	**270**
	6/10/2014	**3,300**
	12/10/2014	**1,600**
	6/9/2015	**5,100**
	9/16/2015	**2,400**
	12/4/2015	**970**
	3/8/2016	**1,300**
	6/7/2016	**5,000**
	9/13/2016	**3,800**
	12/14/2016	**1,100**
	3/8/2017	**150**
	6/7/2017	**2,400; 2,400**
	9/27/2017	**3,800**
	12/6/2017	**1,900**
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	**630**
	12/12/2018	<1
	3/6/2019	<1
	6/5/2019	<1
	9/19/2019	**190**
	12/11/2019	<1
	3/18/2020	<1
	6/2/2020	**630**
	9/22/2020	**720**
	12/18/2020	**136**
	3/8/2021	**550**
	6/1/2021	**220**
	9/9/2021	**1,500**
	12/9/2021	**41**
	3/9/2022	<1
	6/14/2022	**54**
	9/6/2022	**230**
	12/7/2022	1.2
	3/8/2023	2.3
	6/7/2023	**300**
	9/7/2023	<1
	11/21/2023	1.4; 1.0
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-9S[1]	6/19/2003	ND; ND
	12/17/2003	ND
	6/16/2004	ND
	12/16/2004	ND
	6/15/2005	ND
	12/16/2005	ND
	6/15/2006	ND
	12/14/2006	ND
	6/14/2007	ND
	12/17/2007	ND
	6/24/2008	<1
	1/8/2009	<1
	7/2/2009	<1
	12/10/2009	<1
	6/23/2010	<0.20
	12/8/2010	<0.20
	6/29/2011	<1
	12/15/2011	<1
	6/21/2012	<0.20
	12/12/2012	<0.20
	6/12/2013	<1
	12/4/2013	<25
	6/9/2014	<0.60
	12/9/2014	<1
	6/10/2015	<1
	9/15/2015	<1
	12/3/2015	<1
	3/8/2016	<1
	6/7/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/6/2018	<1
	6/26/2018	<1
	9/20/2018	<1
	12/11/2018	<1
	3/5/2019	<1
	6/5/2019[2]	NS
	9/19/2019[2]	NS
	12/11/2019[2]	NS
	3/17/2020	[2]
	6/1/2020	[2]
	9/21/2020	[2]
	12/18/2020	[2]
	3/8/2021	[2]
	6/1/2021	[2]
	9/8/2021	<1
	12/8/2021	<1
	3/8/2022	<1
	6/13/2022	<1
	9/6/2022	<1
	12/6/2022	<1
	3/7/2023	<1
	6/6/2023	<1
	9/5/2023	<1
	11/20/2023	<1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-10	6/24/2010	<0.20
	6/30/2011	<1
	12/14/2011	**30**
	7/20/2012	**12**
	12/13/2012	**15**
	6/13/2013	2.8
	12/5/2013	<25
	6/11/2014	<0.60
	12/11/2014	<1
	6/8/2015	**23**
	9/16/2015	<1
	12/4/2015	<1
	3/8/2016	<1
	6/7/2016	4.6
	9/13/2016	1.6
	12/14/2016	<1
	3/8/2017	1.1
	6/7/2017	2.1
	9/27/2017	1.5
	12/6/2017	<1
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	<1
	12/12/2018	<1
	3/6/2019	<1
	6/5/2019	<1
	9/19/2019	<1
	12/11/2019	<1
	3/18/2020	<1
	6/2/2020	<1
	9/22/2020	<1
	12/18/2020	0.65J
	3/8/2021	<5
	6/1/2021	<1
	9/9/2021	<1
	12/9/2021	<1
	3/9/2022	<1
	6/14/2022	<1
	9/6/2022	<1
	12/6/2022	<1
	3/8/2023	<1
	6/7/2023	<1
	9/7/2023	<1
	11/21/2023	<1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-11	6/22/2010	<0.20
	6/28/2011	4.7
	12/15/2011	NS
	6/19/2012	NS
	12/12/2012	NS
	6/11/2013	<1
	12/3/2013	<25
	6/9/2014	<0.60
	12/11/2014	<1
	6/9/2015	1.3
	9/14/2015	<1
	12/2/2015	<1
	3/7/2016	2.5
	6/6/2016	<1
	9/12/2016	<1
	12/13/2016	<1
	3/7/2017	<1
	6/6/2017	<1
	9/26/2017	<1
	12/5/2017	<1
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	<1
	12/12/2018	<1
	3/6/2019	<1
	6/5/2019	<1
	9/19/2019	<1
	12/11/2019	<1
	3/18/2020	<1
	6/2/2020	<1
	9/22/2020	<1
	12/18/2020	<1
	3/8/2021	<5
	6/1/2021	<1
	9/9/2021	<1
	12/9/2021	<1
	3/9/2022	<1
	6/14/2022	<1
	9/6/2022	<1
	12/7/2022	<1
	3/8/2023	<1
	6/7/2023	<1
	9/7/2023	<1
	11/21/2023	<1
NMWQCC Standard (µg/L)		**10**

Table 3
Benzene Concentrations in Monitoring Wells
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well	Date	Benzene (µg/L)
MW-17[(1)]	6/22/2010	<0.20
	6/28/2011	<1
	12/15/2011	NS
	6/19/2012	NS
	12/12/2012	NS
	6/11/2013	6.8
	12/4/2013	<25
	6/9/2014	<0.60
	12/10/2014	<1
	6/9/2015	<1
	9/14/2015	<1; <1
	12/2/2015	<1; <1
	3/7/2016	<1; <1
	6/6/2016	<1; <1
	9/12/2016	2.7; 2.5
	12/13/2016	<1; <1
	3/7/2017	1.3; <1
	6/6/2017	<1; <1
	9/26/2017	<1; <1
	12/5/2017	<1
	3/7/2018	<1
	6/27/2018	<1
	9/21/2018	<1
	12/12/2018	<1
	3/6/2019	<1
	6/4/2019	<1
	9/18/2019	<1
	12/11/2019	<1
	3/17/2020	<1
	6/1/2020	<1
	9/21/2020	<1
	12/18/2020	<1
	3/8/2021	<1
	6/1/2021	<1
	9/9/2021	2.3
	12/9/2021	<1
	3/9/2022	<1
	6/14/2022	<1
	9/6/2022	<1
	12/6/2022	<1
	3/8/2023	<1
	6/6/2023	<1
	9/7/2023	<1
	11/21/2023	<1
NMWQCC Standard (µg/L)		**10**

Notes:

[(1)]Monitoring Wells MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, and MW-17 and respective duplicate samples are reported in the same cell and separated by a semicolon.

[(2)]Well damaged/destroyed and could not be sampled.

Results are reported in micrograms per liter (µg/L).

BOLD - Concentrations in bold type indicate levels exceed NMWQCC standards.

J - Analyte detected below quantitation limit.

Abbreviations:

ND - Not detected.

NS - Not sampled.

NMWQCC - New Mexico Water Quality Control Commission.

µg/L - micrograms per liter

ARCADIS

Table 4
Total Polycyclic Aromatic Hydrocarbon Concentrations in Monitoring Well MW-8
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Total PAH Concentration											
Well ID	**12/8/1993**	**3/25/1994**	**7/12/1994**	**9/28/1994**	**12/13/1994**	**3/28/1995**	**6/21/1995**	**9/1/1995**	**6/21/1996**	**6/26/1997**	**6/25/1998**
MW-8	--	**250**	**93**	**366**	**236**	**180**	--	**140**	--	--	--

Total PAH Concentration											
Well ID	**6/3/1999**	**6/14/2000**	**7/27/2001**	**6/27/2002**	**6/19/2003**	**6/16/2004**	**6/15/2005**	**6/14/2006**	**6/14/2007**	**6/25/2008**	**7/2/2009**
MW-8	--	--	--	--	--	--	--	--	--	--	--

Total PAH Concentration											
Well ID	**7/21/2010**	**6/28/2011**	**6/19/2012**	**6/11/2013**	**6/9/2014**	**6/9/2015**	**9/16/2015**	**12/4/2015**	**3/8/2016**	**6/7/2016**	**9/13/2016**
MW-8	2.21	<0.20	--	**43.33**	3.279	1.67; 0.86	9.723; 10.742	9.203; 8.707	1.26; 1.63	**32.62; 30.139**	5.286; 6.543

Total PAH Concentration											
Well ID	**12/14/2016**	**3/8/2017**	**6/7/2017**	**9/27/2017**	**12/6/2017**	**3/7/2018**	**6/27/2018**	**9/21/2018**	**12/12/2018**	**3/6/2019**	**6/5/2019**
MW-8	4.857; 5.335	4.251; 4.184	20.251; 16.463	3.211; 3.208	3.654; 5.934	1.565; 1.369	8.195; 7.655	2.741; 2.27	4.269; 3.882	4.257; 2.73	9.529; 6.184

Total PAH Concentration											
Well ID	**9/19/2019**	**12/11/2019**	**3/18/2020**	**6/1/2020**	**9/22/2020**	**12/18/2020**	**3/8/2021**	**6/1/2021**	**9/9/2021**	**12/9/2021**	**3/9/2022**
MW-8	2.141; 1.452	1.353; 0.896	5.806; 8.092	0.193; 0.909	4.004; 7.017	2.907; 1.652	5.266; 9.532	0.494; 0.297	1.493; 1.804	0.993; 1.011	0.673; 0.116

Total PAH Concentration							
Well ID	**6/14/2022**	**9/6/2022**	**12/7/2022**	**3/8/2023**	**6/7/2023**	**9/7/2023**	**11/21/2023**
MW-8	0.351; 0.196	0.219; 0.450	0.509; 0.576	0.422; 0.190	1.747; 2.047	1.575; 1.790	--

2023 Quarterly Data Detail

March 2023 Data Detail			
Well	**Acenaphthene**	**Acenaphthylene**	**Naphthalene**
MW-8	0.155; 0.190	0.267; <0.101	<0.100; <0.101

June 2023 Data Detail			
Well	**Acenaphthene**	**Acenaphthylene**	**Naphthalene**
MW-8	0.822; 0.777	<0.105; <0.104	1.48; 1.27

September 2023 Data Detail			
Well	**Acenaphthene**	**Acenaphthylene**	**Naphthalene**
MW-8	0.803; 0.951	0.248; 0.264	0.524; 0.575

November 2023 Data Detail			
Well	**Acenaphthene**	**Acenaphthylene**	**Naphthalene**
MW-8	--	--	--

Notes:
Results are reported in micrograms per liter (µg/L).
Total PAH concentration is the sum of the low-level PAH concentrations listed in the data detail section. Non-detects were not included.
Duplicate result reported following the semicolon.
-- Not sampled.
BOLD - Concentrations in bold type indicate levels exceed the New Mexico Water Quality Control Commission standard for PAH concentrations (30 µg/L).

Abbreviations:
PAH - Polycyclic aromatic hydrocarbon.

Table 5
LNAPL Thickness Measurements
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well ID	Jun-03	Dec-03	Jun-04	Dec-04	Jun-05	Dec-05	Jun-06	Dec-06	Jun-07	Dec-07	Jun-08	Jan-09	Jul-09	Dec-09	Jun-10	Dec-10	Jun-11	Dec-11	Jun-12	Dec-12	Jun-13	Dec-13	Jun-14	Dec-14	Jun-15	Sep-15	Dec-15	Mar-16	Jun-16	Sep-16	Dec-16
MW-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A
MW-2	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-3S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-3D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A
MW-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-6S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-6D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A
MW-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-9S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-10	0.00	**0.13**	**0.08**	**0.05**	**0.10**	0.00	Trace	Trace	0.00	Trace	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.20**	**0.11**	**0.04**	**0.04**	Sheen	Sheen	0.00	**0.42**	0.00	0.00	0.00	0.00	0.00	0.00
MW-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A
MW-13	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A
MW-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A
MW-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NM[1]	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A
MW-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Trace	0.00	0.00	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Dry	0.00	Dry	0.00	Dry	Dry	Dry	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Trace	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-14	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Trace	0.00	0.00	0.00	0.00	0.00	**0.02**	0.00	Tar	Tar	**0.33**	Tar	0.00	Tar/Dry	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-25	Dry	Dry	Dry	Dry	Dry	Dry	**0.70**	**0.52**	**0.54**	**0.52**	**0.45**	**0.08**	**0.07**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-26S	**0.35**	**0.60**	**0.63**	**0.66**	**0.66**	**0.52**	**0.58**	**0.47**	**0.48**	**0.35**	**0.73**	**0.38**	**0.25**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-26D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-27S	**0.01**	0.00	0.00	0.00	0.00	0.00	Trace	**0.02**	0.00	Trace	0.00	**0.01**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-27D	**0.12**	**0.26**	**0.06**	**0.11**	0.00	**0.04**	0.00	**0.04**	0.00	**0.03**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Dry	0.00	Dry	0.00	0.00	0.00	0.00	NM	NM	NM	NM	NM	0.00	NM[2]	NM[2]	NM[2]	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-32	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Trace	Dry	Dry	NM	NM	NM	NM	NM	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Trace	0.00	0.00	Sheen	0.00	P&A	P&A	P&A	P&A	P&A	P&A	P&A

Notes:

[1]Roots on probe.

[2]Cap could not be removed.

Measurements are reported in feet.

BOLD - Measurable amount of LNAPL observed.

Dry - Monitoring point was dry.

Sheen - Thin layer of LNAPL or oxidation observed; too thin to measure. See field notes for details.

Tar - Thickness measurement not obtainable because of presence of thick, tar-like substance in well point.

Trace - Traces of LNAPL observed; too thin to measure.

Abbreviations:

LNAPL - Light Non-Aqueous Phase Liquid.

NM - Not measured.

P&A - Plugged and abandoned.

Table 5
LNAPL Thickness Measurements
2023 Annual Groundwater Monitoring Report
Former Brickland Refinery
Huntsman International LLC
Sunland Park, New Mexico

Well ID	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Nov-23
MW-1	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-2	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-3S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-3D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-4	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-5	0.00	0.00	0.00	Heavy sheen	**0.05**	Heavy sheen	Sheen	Heavy sheen	**0.01**	**0.19**	**0.02**	0.00	0.00	0.00	Heavy sheen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sheen	Heavy sheen	0.00	0.00	0.00	Slight sheen
MW-6S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Damaged	Damaged	Damaged	Damaged	Damaged	Damaged	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-6D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-7	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-8	0.00	0.00	0.00	0.00	0.00	Sheen	0.00	Light sheen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-9S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	Destroyed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-10	0.00	0.00	Light sheen	Light sheen	0.00	Sheen	0.00	Light sheen	0.00	0.00	Slight sheen	0.00	0.00	0.00	Slight sheen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-12	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-13	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-14	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-15	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-16	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
MW-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-1	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-2	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-3	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-7	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-14	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-25	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-26S	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-26D	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-27S	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-27D	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-30	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-31	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-32	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A
WP-33	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A	P&A

Notes:

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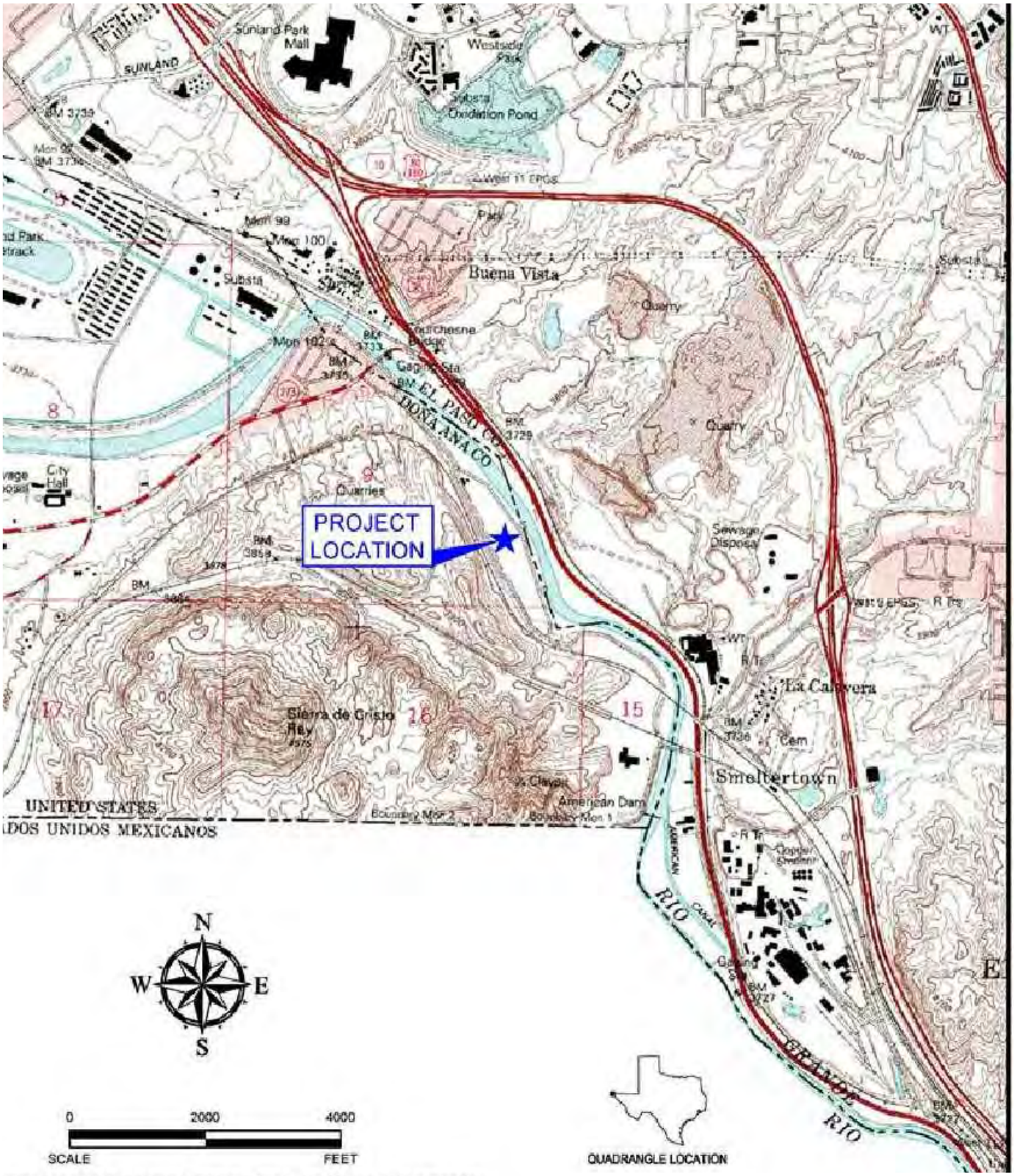
P&A - Plugged and abandoned.

Figures



SOURCE: U.S.G.S. 7.5' QUADRANGLE, SMELTERTOWN, TX, 1994 (o31106G5).

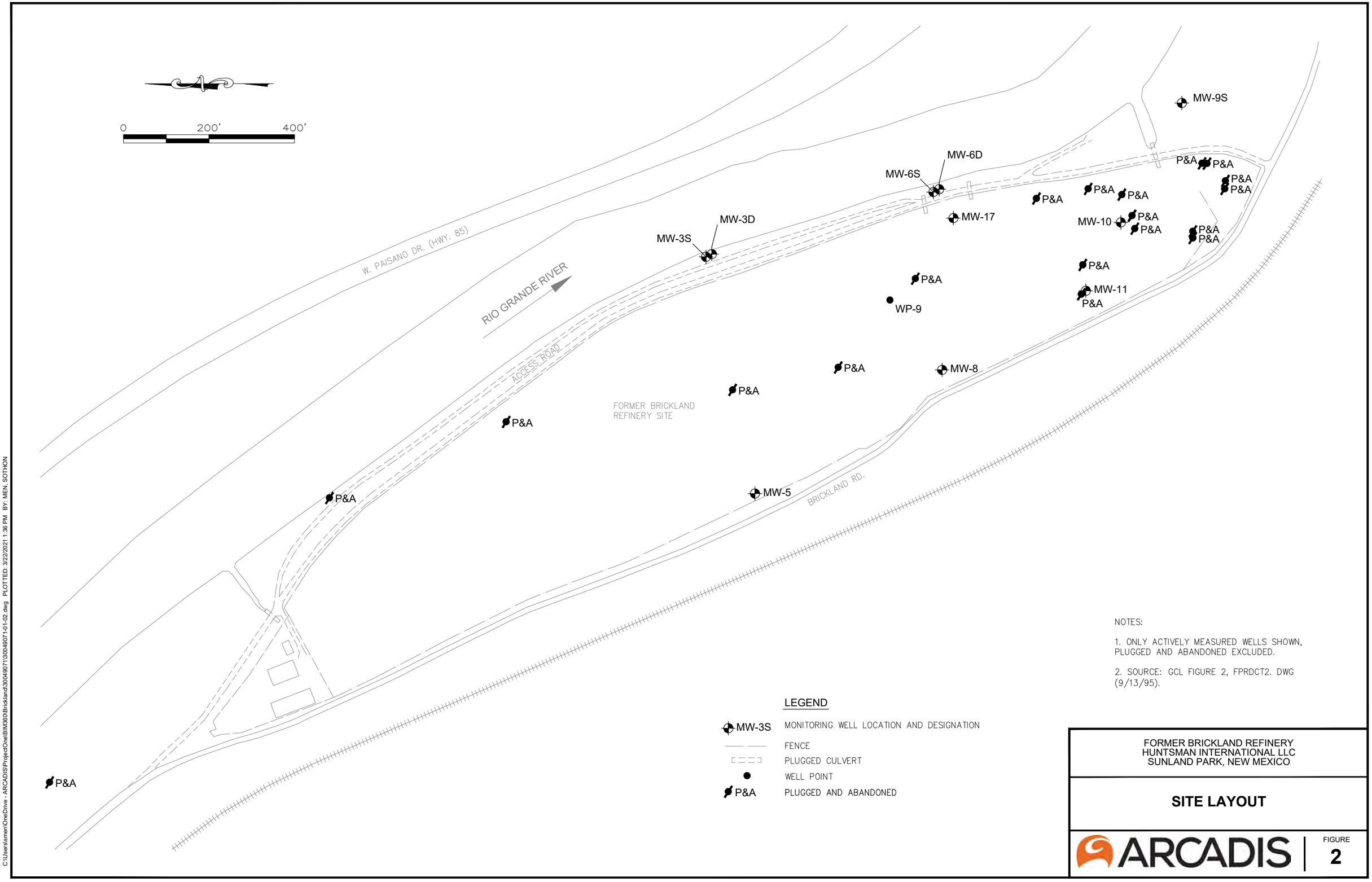
FORMER BRICKLAND REFINERY
HUNTSMAN INTERNATIONAL LLC
SUNLAND PARK, NEW MEXICO

SITE LOCATION MAP

ARCADIS

FIGURE
1

DRAWN BY: S. MEN CHECKED BY: TDR PROJECT MANAGER: DRE
C:\Users\smen\OneDrive - ARCADIS\Project\One\BIM360\Brickland\30049071\30049071-01-01.dwg PLOTTED: 3/22/2021 1:34 PM BY: MEN, SOTHON



LEGEND

MW-3S	MONITORING WELL LOCATION AND DESIGNATION
	FENCE
	PLUGGED CULVERT
	WELL POINT
P&A	PLUGGED AND ABANDONED

NOTES:

1. ONLY ACTIVELY MEASURED WELLS SHOWN, PLUGGED AND ABANDONED EXCLUDED.

2. SOURCE: GCL FIGURE 2, FPRDCT2. DWG (9/13/95).

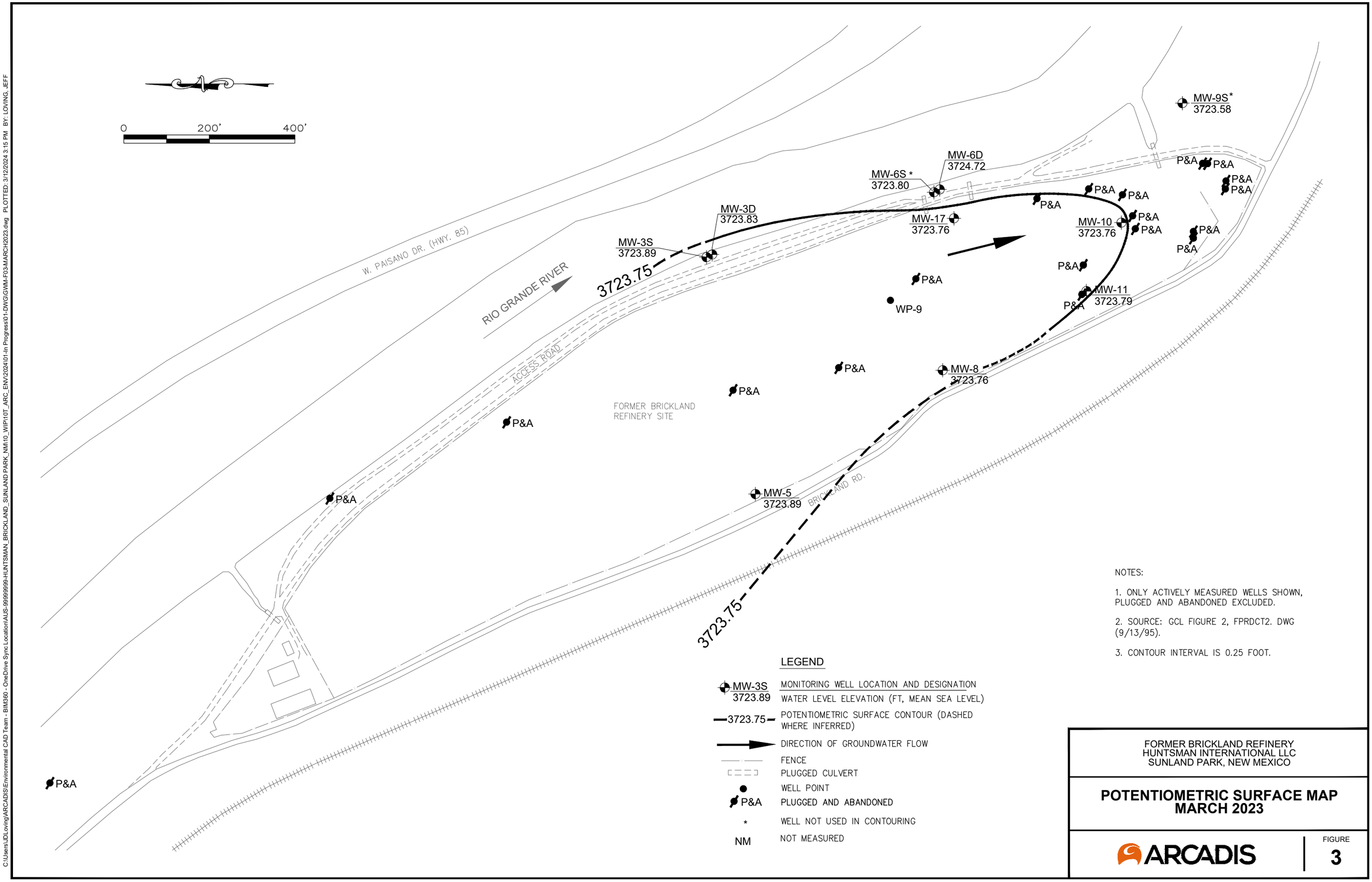
FORMER BRICKLAND REFINERY
HUNTSMAN INTERNATIONAL LLC
SUNLAND PARK, NEW MEXICO

SITE LAYOUT

ARCADIS

FIGURE
2

DRAWN BY: S. MEN CHECKED BY: TDR PROJECT MANAGER: DRE
C:\Users\smen\OneDrive - ARCADIS\Project One\BIM360\Brickland\30049071\30049071-01-02.dwg PLOTTED: 3/22/2021 1:38 PM BY: MEN, SOTHON



NOTES:

1. ONLY ACTIVELY MEASURED WELLS SHOWN, PLUGGED AND ABANDONED EXCLUDED.

2. SOURCE: GCL FIGURE 2, FPRDCT2. DWG (9/13/95).

3. CONTOUR INTERVAL IS 0.25 FOOT.

LEGEND

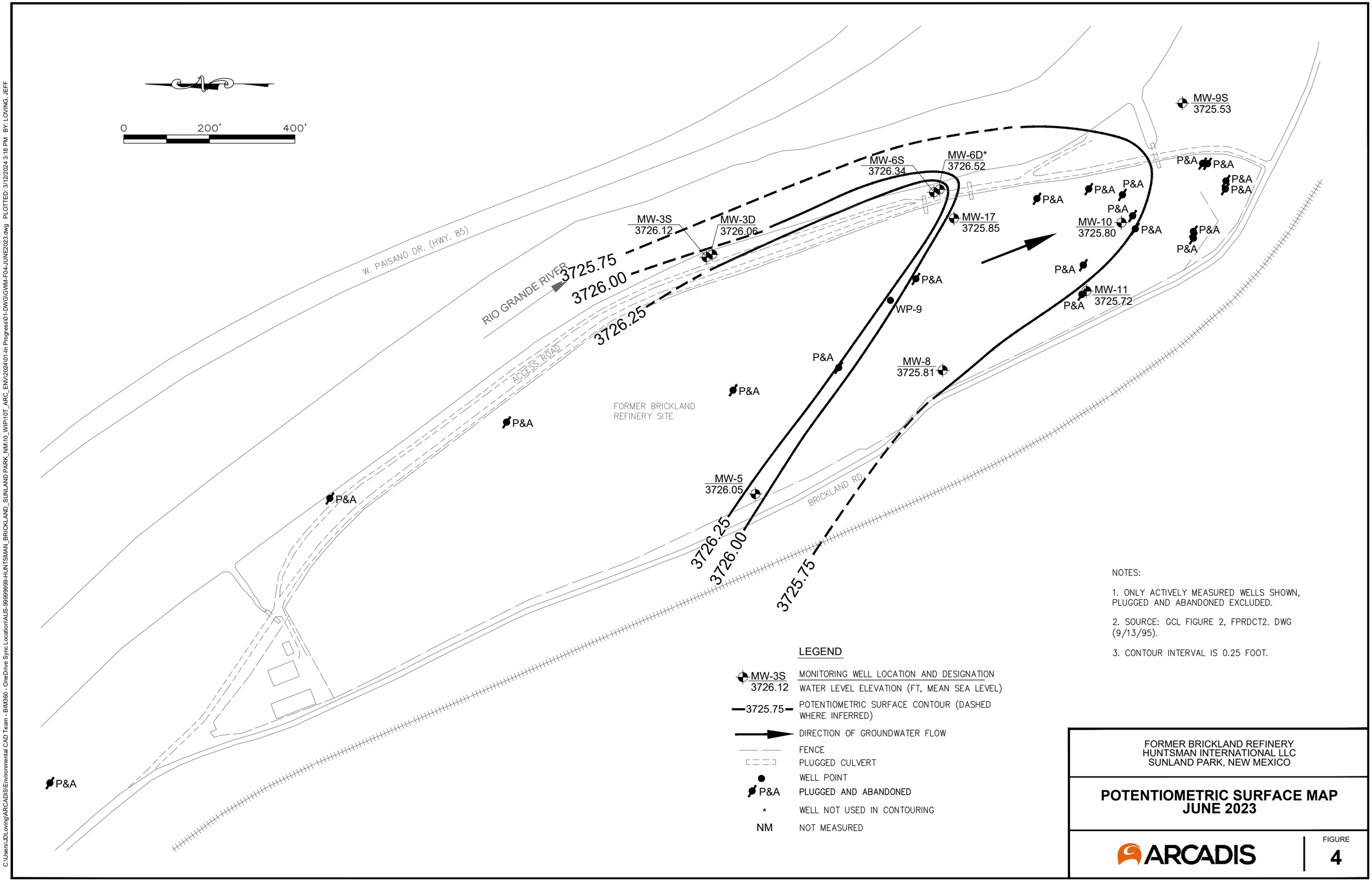
MW-3S 3723.89	MONITORING WELL LOCATION AND DESIGNATION; WATER LEVEL ELEVATION (FT, MEAN SEA LEVEL)
3723.75	POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
	DIRECTION OF GROUNDWATER FLOW
	FENCE
	PLUGGED CULVERT
	WELL POINT
P&A	PLUGGED AND ABANDONED
*	WELL NOT USED IN CONTOURING
NM	NOT MEASURED

FORMER BRICKLAND REFINERY
HUNTSMAN INTERNATIONAL LLC
SUNLAND PARK, NEW MEXICO

POTENTIOMETRIC SURFACE MAP MARCH 2023

ARCADIS

FIGURE 3



LEGEND

MW-3S 3726.12	MONITORING WELL LOCATION AND DESIGNATION WATER LEVEL ELEVATION (FT, MEAN SEA LEVEL)
3725.75	POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
	DIRECTION OF GROUNDWATER FLOW
	FENCE
	PLUGGED CULVERT
	WELL POINT
P&A	PLUGGED AND ABANDONED
*	WELL NOT USED IN CONTOURING
NM	NOT MEASURED

NOTES:

1. ONLY ACTIVELY MEASURED WELLS SHOWN, PLUGGED AND ABANDONED EXCLUDED.
2. SOURCE: GCL FIGURE 2, FPRDCT2. DWG (9/13/95).
3. CONTOUR INTERVAL IS 0.25 FOOT.

FORMER BRICKLAND REFINERY
HUNTSMAN INTERNATIONAL LLC
SUNLAND PARK, NEW MEXICO

POTENTIOMETRIC SURFACE MAP JUNE 2023

ARCADIS

FIGURE 4

0 200' 400'

3726.00

3726.25

MW-6S
3726.17

MW-6D*
3727.09

MW-9S
3725.81

MW-3S
3726.39

MW-3D
3726.33

MW-17
3726.07

MW-10
3726.04

MW-11
3725.98

MW-8
3726.04

MW-5
3726.32

WP-9

P&A

W. PAISANO DR. (HWY. 85)

RIO GRANDE RIVER

ACCESS ROAD

FORMER BRICKLAND
REFINERY SITE

BRICKLAND RD.

LEGEND

MW-3S 3726.39	MONITORING WELL LOCATION AND DESIGNATION WATER LEVEL ELEVATION (FT, MEAN SEA LEVEL)
3726.00	POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
	DIRECTION OF GROUNDWATER FLOW
	FENCE
	PLUGGED CULVERT
	WELL POINT
P&A	PLUGGED AND ABANDONED
*	WELL NOT USED IN CONTOURING

NOTES:

1. ONLY ACTIVELY MEASURED WELLS SHOWN, PLUGGED AND ABANDONED EXCLUDED.

2. SOURCE: GCL FIGURE 2, FPRDCT2. DWG (9/13/95).

3. CONTOUR INTERVAL IS 0.25 FOOT.

FORMER BRICKLAND REFINERY
HUNTSMAN INTERNATIONAL LLC
SUNLAND PARK, NEW MEXICO

POTENTIOMETRIC SURFACE MAP SEPTEMBER 2023

ARCADIS

FIGURE
5

0 200' 400'

W. PAISANO DR. (HWY. 85)

RIO GRANDE RIVER

ACCESS ROAD

FORMER BRICKLAND REFINERY SITE

BRICKLAND RD.

MW-9S 3723.70

MW-6D* 3724.89

MW-6S 3724.00

MW-3D 3724.09

MW-3S 3724.15

MW-17* 3723.89

MW-10 3723.90

MW-11 3724.03

MW-8 3724.02

MW-5 3724.19

WP-9

3723.75

3724.00

P&A

LEGEND

MW-3S 3724.15	MONITORING WELL LOCATION AND DESIGNATION; WATER LEVEL ELEVATION (FT, MEAN SEA LEVEL)
3723.75	POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
	DIRECTION OF GROUNDWATER FLOW
	FENCE
	PLUGGED CULVERT
	WELL POINT
P&A	PLUGGED AND ABANDONED
*	WELL NOT USED IN CONTOURING

NOTES:

1. ONLY ACTIVELY MEASURED WELLS SHOWN, PLUGGED AND ABANDONED EXCLUDED.
2. SOURCE: GCL FIGURE 2, FPRDCT2. DWG (9/13/95).
3. CONTOUR INTERVAL IS 0.25 FOOT.

FORMER BRICKLAND REFINERY
HUNTSMAN INTERNATIONAL LLC
SUNLAND PARK, NEW MEXICO

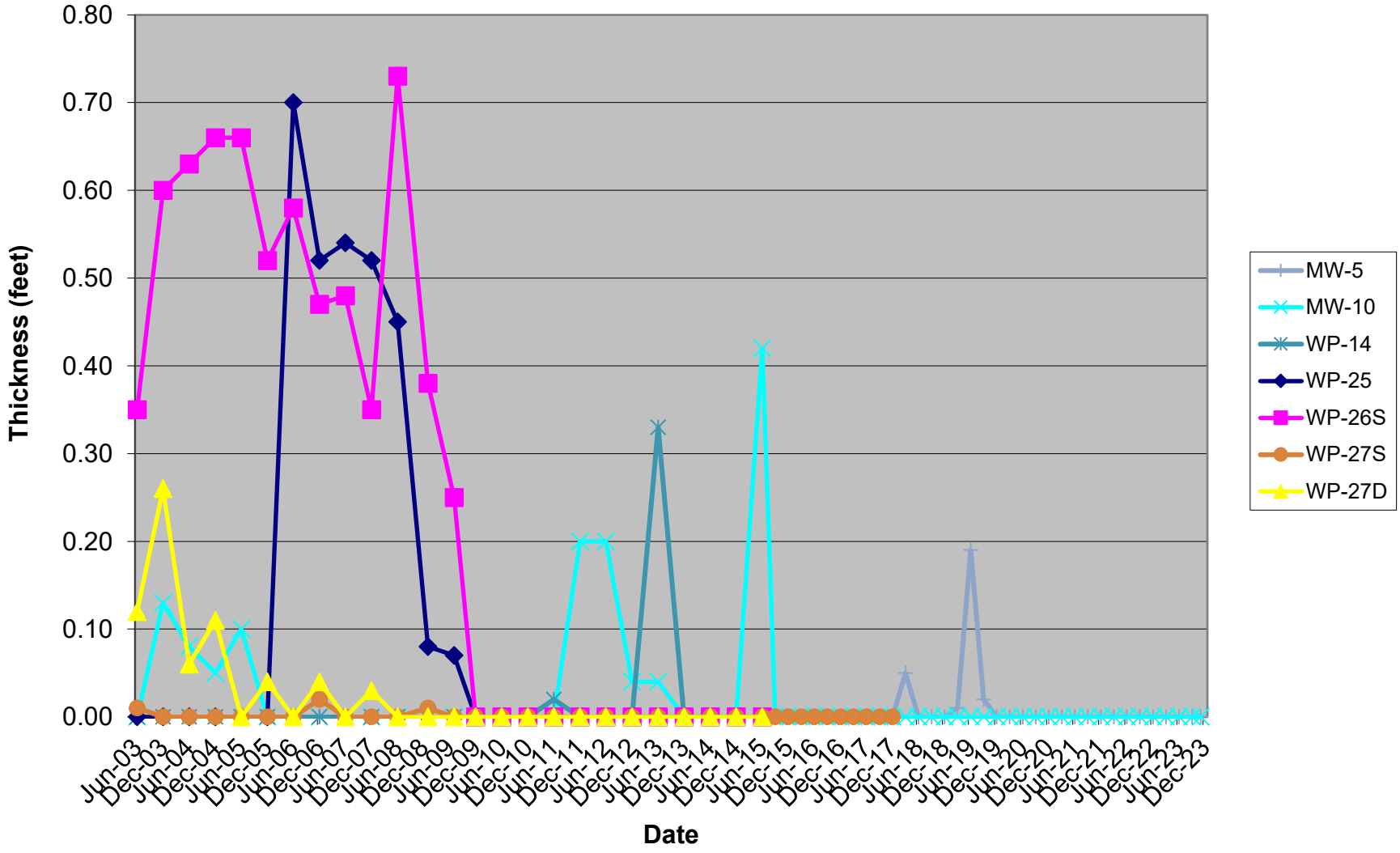
POTENTIOMETRIC SURFACE MAP NOVEMBER 2023

ARCADIS

FIGURE 6

ARCADIS

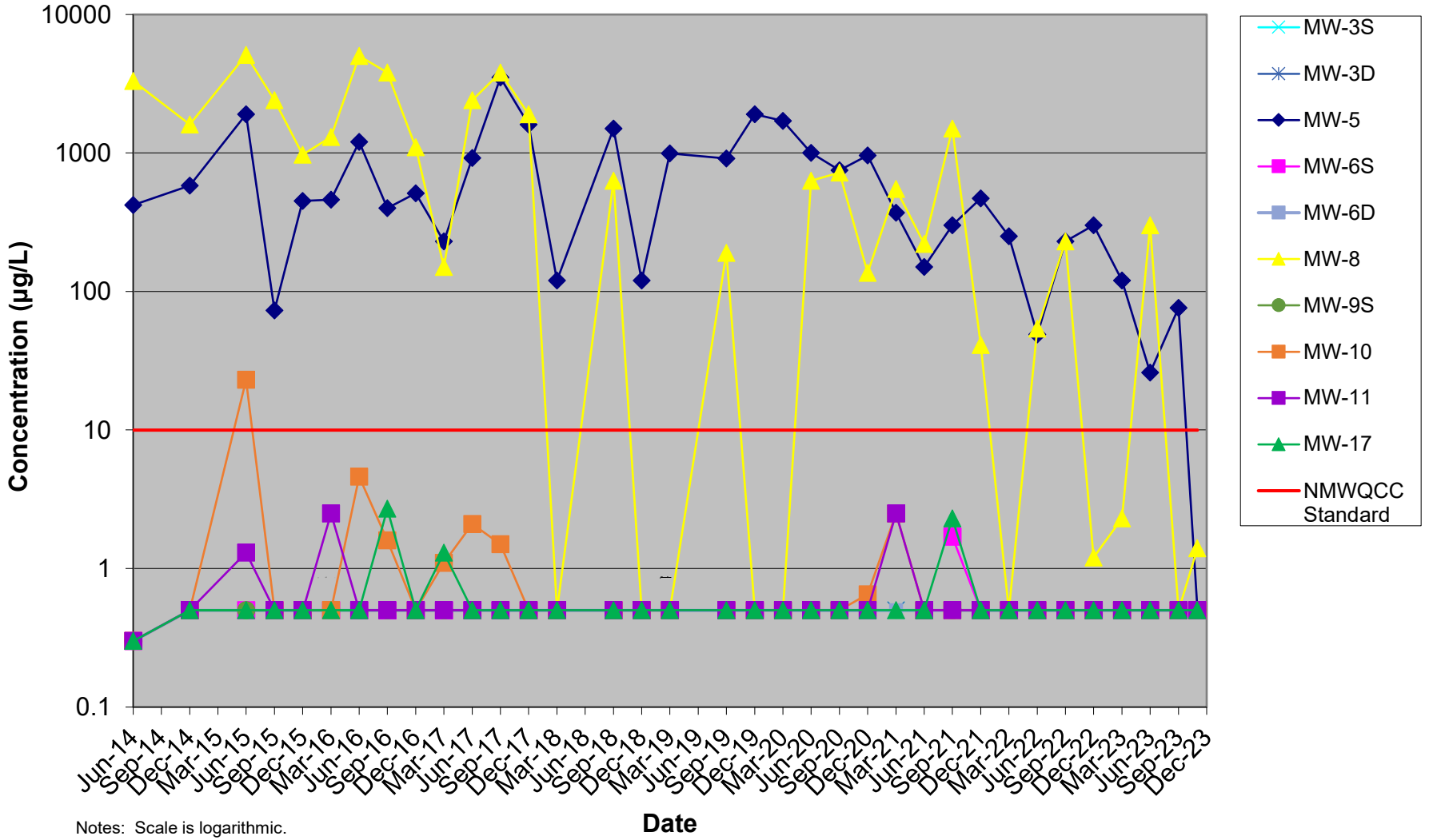
Figure 7 - Historical LNAPL Thickness



Note: WP-14, WP-25, WP-26S, WP-27S, and WP-27D were plugged and abandoned in June 2015.

ARCADIS

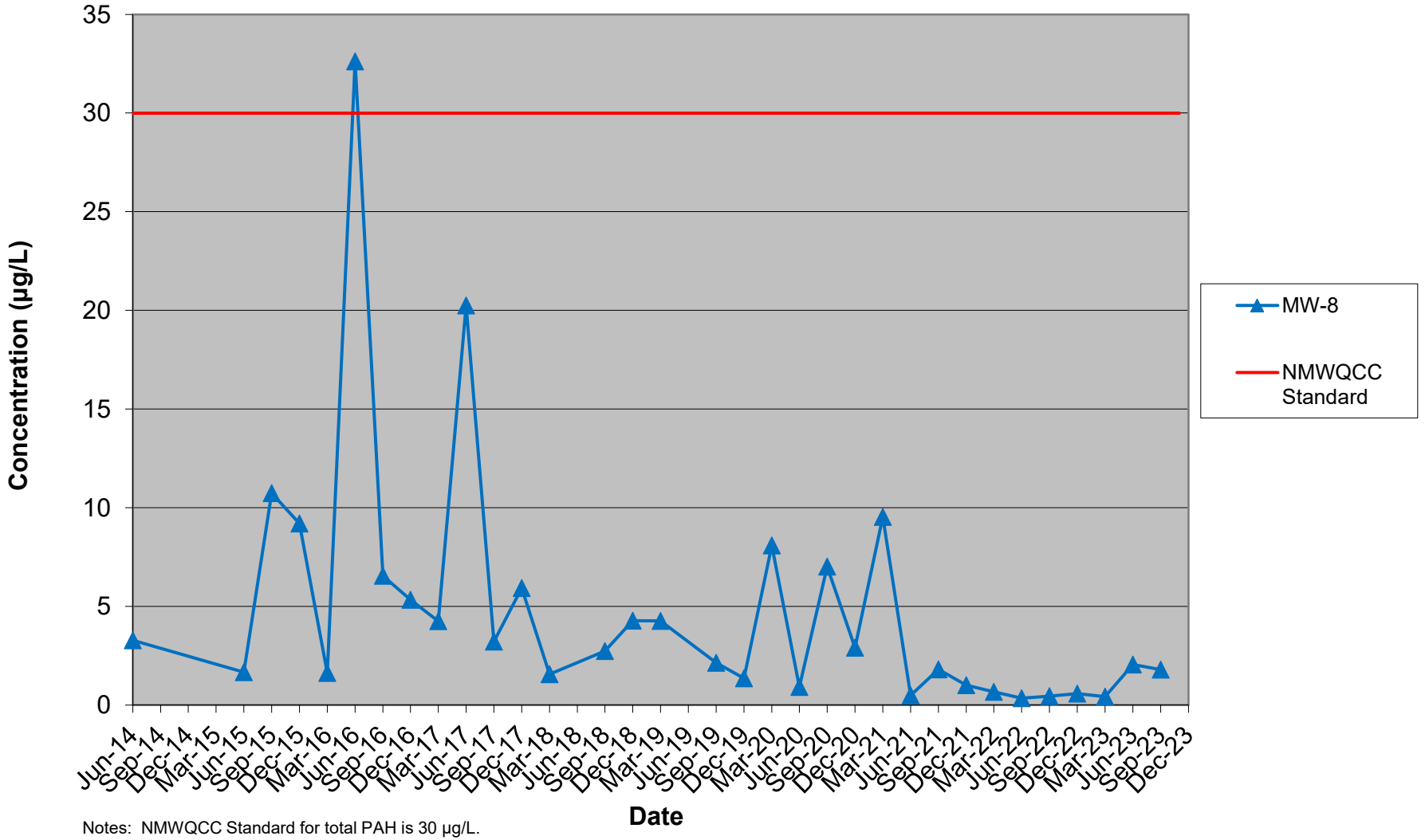
Figure 8 - Quarterly Benzene Concentrations in Monitoring Wells (2014–2023)



Notes: Scale is logarithmic.
NMWQCC Standard for benzene is 10 µg/L.
Non-detects are graphed at half the reporting limit.

ARCADIS

Figure 9 - Quarterly Total PAH Concentrations in Monitoring Well MW-8 (2014–2023)



Notes: NMWQCC Standard for total PAH is 30 µg/L.
The higher detection between the parent and duplicate samples is graphed.
PAH sampling terminated in November 2023 at MW-8.

Appendix A

Field Data

ARCADIS Design & Consultancy for natural and built assets

DAILY LOG

Project Name and No. Huntsman Brickland Refinery - PN-30167857

Site Location Sunland Park, NM

Prepared by D. Solon

Date/Time	Description of Activities
3-7-23 0715	ARRived on site / H&S Tailgate meeting
0730 - 0900	Gauged all wells / PID Readings
0950	Pumped + sampled MW-3S
1025	Pumped & Sampled MW-3D / Field Blank / Field Dup
1110	Pumped & Sampled MW-6S
1150	Pumped & Sampled MW-6D
1235	Pumped & Sampled MW-9S / Equipment Blank
1300	Pumped Purge water / Packaged PID for Return / Secured
to	site
1410	shipped PID / Return to office
1500	Completed Daily Reporting

ARCADIS Design & Consultancy for natural and built assets

DAILY LOG

Project Name and No. Huntsman Brickland Refinery - PN-30167857

Site Location Sunland Park, NM

Prepared by D. Solon

Date/Time	Description of Activities
3.8.23 0730	Arrived on site / H&S Tailgate meeting
0830	Pumped and Sampled MW-17
0915	Pumped and Sampled MW-5
1000	Pumped and Sampled MW-8 / Field Dup / Field Blank / Equipment Blank (PAH + Benzene)
1055	~~Pumped~~ and Sampled MW-11
1140	Pumped and Sampled MW-10
1245	Secured site / Dumped purge water / Perimeter check of fence + gates
1315	Packaged samples / Return to office
1500	Delivered samples to Fed EX

Control Number: TSM- 5285051

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Huntsman GW Sampling			**Project Location:** Sunland Park, nm
Date: 3-7-23	**Time:** 0715	**Conducted by:** D. Solon	**Signature/Title:** DM Solon / Fieldsup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: Gauge allwells / GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [ ] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*): _____
- [ ] Permits (*specify type or #*): _____
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*): _____
- [ ] H&S Standard (*specify number*): _____
- [ ] H&S checklist (*specify type*): _____
- [ ] Activity specific hazard analysis:

Activity: _____

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental	X	Gravity		Mechanical		Motion	
Personal Safety		Pressure		Radiation		Sound	

Controls required to be used:

PPE Required (If not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [ ] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*): _____
- [ ] Life Vest (*specify type*): _____
- [ ] Protective Suit (*specify type*):
- [ ] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

SSE Employee*	Printed Name/Signature/Company	Sign In Time	Sign Out Time
	Doug Solon / DM Solon / ARCADIS	0715	

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager

*Short Service Employee (SSE) working for Arcadis <1 year.

Control Number: TSM- 5285051

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx – dd/mm/year

ARCADIS for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Huntsman			**Project Location:** Sun L And, NM
Date: 3-8-23	**Time:** 0730	**Conducted by:** D-Solon	**Signature/Title:** DM Solon / Field Sup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [ ] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*): _____
- [ ] Permits (*specify type or #*): _____
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*): _____
- [ ] H&S Standard (*specify number*): _____
- [ ] H&S checklist (*specify type*): _____
- [ ] Activity specific hazard analysis:

Activity: _____

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental	X	Gravity		Mechanical		Motion	
Personal Safety		Pressure		Radiation		Sound	

Controls required to be used:

PPE Required (If not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [ ] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*): _____
- [ ] Life Vest (*specify type*): _____
- [ ] Protective Suit (*specify type*):
- [ ] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

SSE Employee*

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

	Printed Name/Signature/Company	Sign In Time	Sign Out Time
	Doug Solon / DMSolon / ARCADIS	0730	

*Short Service Employee (SSE) working for Arcadis <1 year.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

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All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager

ARCADIS
Achieve Water Environment Buildings

WELL GAUGING LOG

Site Name: Huntsman
Project Number: 30122717
Date & Time: 03/07/23 0720

Gauging Equations (before purging) LNAPL Only

water column height = (well depth in feet) - (initial depth to water in feet)

product layer thickness = (initial depth to water in feet) - (depth to product in feet)

Well Gauging Information

Well ID	Total Depth (feet bgs)	Depth to Product (feet bgs)	Depth to Water (feet bgs)	Water Column Height (feet bgs)	Product Layer Thickness (feet bgs)	Product Removed (gallons)	Comments
MW-35			8.31				PID - 0.0 ppm
MW-30			8.36				PID - 0.0
MW-65			9.48				PID - 0.0
MW-60			9.11				PID - 0.0
MW-95			10.84				PID - 0.1
MW-17			10.11				PID - 0.1
MW-5			7.75				PID - 401.4
MW-8			7.39				PID - 2.9
MW-11			9.60				PID - 0.1
MW-10			10.77				PID - 7.3

Equipment and Decon Procedures

Gauging Equipment

Decon Procedures

file stamp

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-35
Date	3/7/2023	Sampled By	Doug Solon		
Sampling Time	~~60°F~~ 0950	Recorded By	Ana Gutierrez		
Weather	60°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH (4-INCH)		
Sounded Depth (ft bmp)	8.28		
Depth to Water (ft bmp)	8.28	Purge Time	Start 9:15 Finish 9:55

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or ~~mS/cm~~)[1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
9:25 ~~9:20~~	250		16.7	7.21	3.138	-5.7	2.30	1.46	8.33
~~9:30~~	↓		17.1	7.08	3.147	-18.2	1.29	2.38	8.42
~~9:35~~			17.1	7.14	3.155	107.8	2.64	2.99	8.48
~~9:40~~			17.7	7.13	3.120	104.1	1.41	2.95	8.50
9:45			17.4	7.11	3.137	98.7	1.31	3.05	8.59
9:50	↓		17.9	7.08	8.91	91.2	1.01	2.76	8.61

Collected Sample Condition — Color: Clear — Odor: none — Appearance: Clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0 ppm

Comments: MW-38

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-3D
Date	3/7/2023	Sampled By	Doug Solon		
Sampling Time	10:25	Recorded By	Aud Gutierrez		
Weather	60°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)	8.30		
Depth to Water (ft bmp)	8.30	Purge Time	Start 10:00 Finish 10:35

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
10:05	250		18.9	5.95	13.58	-77.0	0.69	4.78	8.32
10:10	↓		19.0	5.31	13.64	91.2	0.48	3.88	8.32
10:15			18.7	6.08	13.90	21.5	0.45	2.94	8.32
10:20			18.8	7.05	14.05	-6.1	0.44	3.10	8.32
10:25	↓		19.0	6.88	14.20	-2.6	0.38	2.62	8.32

Collected Sample Condition — Color: Clear — Odor: none — Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0 ppm

Comments: MW-3D Field Dup - FD030723

Field Blank - FB030723 (10:30)

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-65
Date	3/7/2023	Sampled By	Doug Solon		
Sampling Time	11:10	Recorded By	And Gutierrez		
Weather	60°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH (4-INCH)		
Sounded Depth (ft bmp)	9.43		
Depth to Water (ft bmp)	9.43	Purge Time	Start 10:45 Finish 11:15

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
10:50	250		18.6	7.14	11.33	61.3	1.02	45.3	9.52
10:55	↓		18.9	7.14	11.30	58.3	0.62	32.2	9.53
11:00			18.8	7.14	11.41	53.8	0.53	27.6	9.53
11:05			19.2	7.18	11.43	31.2	0.51	31.3	9.53
11:10	↓		19.0	7.17	11.49	23.2	0.50	29.4	9.53

Collected Sample Condition — Color: Clear — Odor: none — Appearance: Clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0 ppm

Comments: MW-65

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-6D
Date	3/7/2023	Sampled By	Doug Solon		
Sampling Time	11:50	Recorded By	Ana Gutierrez		
Weather	65°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH (4-INCH)		
Sounded Depth (ft bmp)	9.07		
Depth to Water (ft bmp)	9.07	Purge Time	Start 11:20 Finish 11:55

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or (mS/cm)) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
11:25	250		20.1	7.15	4.647	1.0	1.10	21.5	9.10
11:30	↓		20.2	7.16	4.653	-19.6	0.69	6.43	9.10
11:35			20.1	7.14	4.611	-27.3	0.55	4.41	9.10
11:40			20.3	7.16	4.599	-51.7	0.42	6.75	9.10
11:45			20.2	7.06	4.595	-57.9	0.34	4.43	9.10
11:50	↓		20.1	7.15	4.600	-59.0	0.29	5.03	9.10

Collected Sample Condition — Color: Clear — Odor: none — Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0 ppm

Comments: MW-6D

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-95
Date	3/7/2023	Sampled By	Doug Solon		
Sampling Time	12:35	Recorded By	Ana Gutierrez		
Weather	65°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC		
Casing Diameter	2-INCH/4-INCH				
Sounded Depth (ft bmp)	10.80				
Depth to Water (ft bmp)	10.80	Purge Time	Start 12:05	Finish	12:40

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
12:10	250		17.8	6.5	14.95	-4.1	1.81	11.00	10.81
12:15	↓		17.6	6.5	14.95	-18.8	1.01	6.30	10.82
12:20			17.4	6.85	14.90	-40.3	0.46	5.17	10.82
12:25			17.6	6.75	14.89	-45.1	0.30	6.76	10.82
12:30			17.5	6.68	14.92	-43.2	0.24	5.90	10.82
12:35	↓		17.7	6.64	14.91	-45.3	0.22	3.66	10.82

Collected Sample Condition — Color: Clear — Odor: none — Appearance: Clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.1 ppm

Comments: Equipment Blank EB030723 (12:40)

MW-95

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-17
Date	3.8.23	Sampled By	DS		
Sampling Time	0830	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	10.18	Purge Time	Start 0800 Finish 0835

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0805	250ml/m		18.7	6.99	12.020	97.3	45.1	4.95	10.20
0810			19.2	6.89	12.200	60.6	10.9	3.77	10.20
0815			19.1	6.89	12.290	34.3	6.9	3.20	10.20
0820			19.1	6.90	12.330	31.2	5.9	2.06	10.20
0825			19.2	6.90	12.330	46.3	5.0	2.11	10.20
0830			19.3	6.91	12.350	55.0	4.6	1.34	10.20

Collected Sample Condition — Color: clear — Odor: none — Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.1 ppm

Comments: MW-17

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30122717 | Site Location: SUNLAND PARK, NM | Well ID: MW-5

Date: 3-8-23 | Sampled By: DS

Sampling Time: 0915 | Recorded By: DS

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 7.77 | Purge Time | Start: 0845 | Finish: 0920

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)[1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0850	250 ml/m		17.6	6.61	16.40	-99.4	27.0	4.40	7.91
0855	↓		17.6	6.56	16.49	-110.3	6.9	4.52	8.11
0900			17.6	6.55	16.55	-140.2	5.2	3.58	8.30
0905			17.6	6.54	16.63	-161.9	0.34	2.79	8.48
0910			17.6	6.55	16.64	-170.0	0.30	2.55	8.61
0915	↓		17.6	6.55	16.72	-176.9	0.28	2.94	8.77

Collected Sample Condition | Color: Slight Tint | Odor: Hydro Carbon odor | Appearance: sl tint

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 401.4 ppm

Comments: MW-5

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-8
Date	3/8/23	Sampled By	DS		
Sampling Time	10:00	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.37	Purge Time	Start 9:30 Finish 10:15

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)[1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
9:35	250		18.6	7.03	5.50	-109.5	0.56	1.58	7.80
9:40			18.6	7.13	5.52	-111.7	0.34	1.16	7.98
9:45			18.7	7.10	5.51	-113.2	0.27	1.22	8.20
9:50			18.6	7.12	5.50	-114.0	0.23	1.19	8.40
9:55			18.7	7.13	5.47	-115.1	0.21	1.12	8.62
10:00	↓		18.7	7.13	5.46	-115.3	0.19	1.17	8.80

Collected Sample Condition

Color: ~~clear~~ slight tint Odor: ~~none~~ Hydro Odor Appearance: ~~clear~~ slight tint

Parameter	Container	No.	Preservative
Benzene, PAH	40ml/VOA	# 21	Raw

PID Reading: 2.9 ppm

Comments:

MW-8 (PAH, Benzene)
FD 030823 (PAH) Field Dup
FB 030823 (PAH, Benzene) Field Blank - 10:05
EB 030823 (PAH, Benzene) Equipment Blank - 10:10

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-11
Date	3.8.23	Sampled By	DS		
Sampling Time	10:55	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	9.55	Purge Time	Start 10:25 Finish ~~10:30~~ 11:00

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
10:30	250		20.4	7.12	11.55	-84.2	0.70	1.05	9.82
10:35	↓		20.4	7.44	10.32	-109.9	0.34	1.03	10.18
10:40			20.4	7.46	10.19	-140.8	0.27	0.98	10.42
10:45			20.4	7.45	10.18	-178.9	0.23	0.98	10.68
10:50			20.4	7.46	10.15	-178.5	0.20	1.00	10.85
10:55	↓		20.5	7.46	10.19	-146.6	0.19	1.05	11.02

Collected Sample Condition — Color: clear — Odor: Organic — Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.1 ppm

Comments: MW-11

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-10
Date	3.8.23	Sampled By	DS		
Sampling Time	11:40	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	10.75	Purge Time	Start 11:10 Finish 11:45

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
11:15	250		21.0	7.23	11.08	-221.4	0.34	1.23	11.22
11:20	↓		21.1	7.23	11.08	-200.4	0.22	1.10	11.37
11:25			21.1	7.24	11.07	-18.13	0.18	1.23	11.45
11:30			21.2	7.22	11.06	-4.1	0.15	2.16	11.50
11:35			21.4	7.22	11.05	-2.1	0.15	1.26	11.50
11:40	↓		21.4	7.22	11.04	-0.9	0.15	1.15	11.51

Collected Sample Condition: Color Clear Odor Hydro odor Appearance Slight Sheen

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 7.3 ppm

Comments: MW-10

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
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Middletown, PA +1 717 944 5541
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Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 292573

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30122717 Task 250	Project Name	30122717 Brickland Refinery 1Q23	A	8260_LL_W (8260 Benzene (*Unpreserved*)-7 day HT
Work Order		Project Number	30122717 Task 250	B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-3S	3-7-23	0950	W	8	3	X										
2	MW-3D	3-7-23	1025	W	8	3	X										
3	MW-6S	3-7-23	1110	W	8	3	X										
4	MW-6D	3-7-23	1150	W	8	3	X										
5	MW-9S	3-7-23	1235	W	8	3	X										
6	FB030723	3-7-23	1030	W	8	3	X										
7	FD030723	3-7-23	—	W	8	3	X										
8	EB030723	3-7-23	1240	W	8	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon DM Solon

Shipment Method: FED EX

Required Turnaround Time: (Check Box) ☐ Other _____ ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: DM Solon	Date: 3-8-23	Time: 1300	Received by:	Notes: [AGM Brickland NM]	
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☒ Level II Std QC ☐ Level III Std QC/Raw Data ☐ Level IV SW846/CLP ☐ Other _____ ☐ TRRP Checklist ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 292572

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30122717 Task 250	Project Name	30122717 Brickland Refinery 1Q23	A	8260_LL_W (8260 Benzene (*Unpreserved*)-7 day HT
Work Order		Project Number	30122717 Task 250	B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi		

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-17	3-8-23	0830	W	8	3	X										
2	MW-5	3-8-23	0915	W	8	3	X										
3	MW-8	3-8-23	1000	W	8	~~3~~ 6	X	X									
4	FD030823	3-8-23	—	W	8	3		X									
5	FB030823	3-8-23	1005	W	8	6	X	X									
6	EB030823	3-8-23	1010	W	8	6	X	X									
7	MW-11	3-8-23	1055	W	8	3	X										
8	MW-10	3-8-23	1140	W	8	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon Doug Solon

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Doug Solon	3-8-23	1305	
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: [AGM Brickland NM]

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
☒ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SVM&EQLP
☐ Other _____
☐ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ARCADIS Design & Consultancy for natural and built assets

DAILY LOG

Project Name and No. Huntsman Buckland Refinery - 30167857

Site Location Jonland Park, NM

Prepared by D. Solon

Date/Time	Description of Activities
6-6-23 0705	Arrived onsite / H&S Tailgate meeting
0715 - 0855	Gauged all wells / PID readings
0935 ~~0935~~	Pumped & Sampled MW-3S
-1010	Pumped & Sampled MW-3D / Field Blank / Field Dup
-1055	Pumped & Sampled MW-6S
-1130	Pumped & Sampled MW-6D
-1215	Pumped & Sampled MW-9S / EB - Equipment Blank
-1310	Pumped & Sampled MW-17
-1400	Dumped Purge Water / Secured Site
-1415	Returned to office / completed daily Report

ARCADIS Design & Consultancy for natural and built assets

DAILY LOG

Project Name and No. Huntsman Burkland Refinery

Site Location Burkland Park, NM

Prepared by D. Solon

Date/Time	Description of Activities
6-7-23 0753	Arrived onsite / H&S Tailgate meeting
-0855	Pumped and Sampled MW-5
-0940	Pumped and Sampled MW-8 / Field Dup / Field Blank / Equipment Blank (PAH, Benzene)
-1045	Pumped and Sampled MW-11
-1130	Pumped and Sampled MW-10
-1200	Pumped Purge Water / Perimeter inspection - Fence Line & Gates
-1300	Packaged samples plus equipment
-1300	Delivered Samples to FEDEX
-1400	Returned to office - completed Daily Report / completed review of Field notes.

Control Number: TSM- 5285051

TSM + project number plus date as follows: xxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Huntsman			**Project Location:** Sunland Park, NM
Date: 6-6-23	**Time:** 0705	**Conducted by:** D Solon	**Signature/Title:** DMyhan / Field Sup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: Gauge wells / GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [X] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*): _____
- [ ] Permits (*specify type or #*): _____
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*): _____
- [X] H&S Standard (*specify number*): _____
- [ ] H&S checklist (*specify type*): _____
- [ ] Activity specific hazard analysis:

Activity: _____

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental		Gravity		Mechanical		Motion	
Personal Safety	X	Pressure		Radiation		Sound	

Controls required to be used:

PPE Required (If not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [ ] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*): _____
- [ ] Life Vest (*specify type*): _____
- [ ] Protective Suit (*specify type*):
- [ ] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

SSE Employee*	Printed Name/Signature/Company	Sign In Time	Sign Out Time
	Doug Solon / DMyhan / ARCADIS	0705	
	Ana Gutierrez / AGutierrez / Arcadis	0705	

*Short Service Employee (SSE) working for Arcadis <1 year.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager

Control Number: TSM- 5285051

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Huntsman			**Project Location:** Sunland Park, NM
Date: 6.7.23	**Time:** 805	**Conducted by:** D. Solon	**Signature/Title:** Dm Solon / Field Sup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [ ] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*):
- [ ] Permits (*specify type or #*):
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*):
- [ ] H&S Standard (*specify number*):
- [ ] H&S checklist (*specify type*):
- [ ] Activity specific hazard analysis:

Activity:

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental	X	Gravity		Mechanical		Motion	
Personal Safety		Pressure		Radiation	X	Sound	

Controls required to be used:

PPE Required (If not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [ ] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*):
- [ ] Life Vest (*specify type*):
- [ ] Protective Suit (*specify type*):
- [ ] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

SSE Employee*	Printed Name/Signature/Company	Sign In Time	Sign Out Time
	Doug Solon / DmSolon / ARCADIS	0805	
	Ana Gutierrez / AGutierrez / ARCADIS	0805	

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

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If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

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In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager

*Short Service Employee (SSE) working for Arcadis <1 year.

ARCADIS
Design for Water Infrastructure Building

WELL GAUGING LOG

Site Name: Huntsman
Project Number: 30122717
Date & Time: 6-6-23 0710

Gauging Equations (before purging) LNAPL Only

water column height = (well depth in feet) - (initial depth to water in feet)

product layer thickness = (initial depth to water in feet) - (depth to product in feet)

Well Gauging Information

Well ID	Total Depth (feet bgs)	Depth to Product (feet bgs)	Depth to Water (feet bgs)	Water Column Height (feet bgs)	Product Layer Thickness (feet bgs)	Product Removed (gallons)	Comments
MW-3S			6.08				PID - 0.0 PPM
MW-3D			6.13				PID - 0.0
MW-6S			6.94				PID - 0.0
MW-6D			7.31				PID - 0.0
MW-9S			8.87				PID - 0.0
MW-17			8.02				PID - 0.0
MW-5			5.59				PID - 67.2
MW-8			5.34				PID - 0.9
MW-11			7.67				PID - 0.0
MW-10			8.73				PID - 2.4

Equipment and Decon Procedures

Gauging Equipment

Decon Procedures

file stamp

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30122717 | Site Location: SUNLAND PARK, NM | Well ID: MW-35

Date: 6/6/2023 | Sampled By: Doug Solon

Sampling Time: 0935 | Recorded By: Doug Solon

Weather: 73°F | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 6.08 | Purge Time: Start 9:05 | Finish 9:40

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
9:10	250		21.3	7.46	13.29	69.3	2.56	2.70	6.36
9:15	↓		21.0	7.40	13.38	56.3	1.61	1.72	6.50
9:20			20.8	7.40	13.42	69.3	1.32	1.26	6.55
9:25			20.8	7.40	13.42	69.9	1.19	1.18	6.59
9:30			20.9	7.45	13.41	66.4	1.13	0.78	6.63
9:35	↓		21.3	7.47	13.40	66.6	1.09	1.18	6.70

Collected Sample Condition | Color: Clear | Odor: no | Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-3D
Date	6/6/23	Sampled By	Doug Solon		
Sampling Time	1010	Recorded By	Doug Solon		
Weather	73°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	6.13	Purge Time	Start 9:41 Finish 10:15

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
9:45	250		21.1	7.46	23.66	88.7	2.32	59.6	6.14
9:50	↓		21.4	7.41	23.45	98.7	1.73	52.0	6.14
9:55			21.5	7.40	23.40	104.0	1.47	45.5	6.14
10:00			21.6	7.58	23.39	107.9	1.40	32.2	6.14
10:05			21.7	7.63	23.30	112.5	1.16	38.5	6.14
10:10	↓		21.6	7.43	23.36	115.2	1.23	31.7	6.14

Collected Sample Condition	Color	Odor	Appearance
	Clear	no	Organics

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments: FD060623 - Field Dup
FB060623 @ 10:20 - Field Blank

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-6S
Date	10/6/23	Sampled By	Doug Solon		
Sampling Time	10:55	Recorded By	Doug Solon		
Weather	76°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.31	Purge Time	Start 10:25 Finish 11:00

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
10:30	250		22.2	7.33	14.607	76.2	1.57	14.0	7.46
10:35	↓		22.1	7.29	14.63	71.3	1.31	14.6	7.47
10:40			22.2	7.33	14.62	66.2	1.10	14.62	7.47
10:45			22.2	7.29	14.63	62.9	0.98	8.36	7.47
10:50			22.3	7.26	14.64	61.9	0.90	7.44	7.47
10:55			22.4	7.25	14.66	60.3	0.88	7.95	7.47

Collected Sample Condition — Color: Clear — Odor: no — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-6D
Date	6/6/23	Sampled By	Doug Solon		
Sampling Time	11:30	Recorded By	Doug Solon		
Weather	80°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	6.93	Purge Time	Start 11:00 Finish 11:35

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or ~~mS/cm~~)[1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
11:05	250		23.1	7.38	23.59	113.4	1.41	2.67	6.95
11:10	↓		23.1	7.35	23.79	114.9	1.05	1.88	6.95
11:15	↓		23.1	7.33	23.88	115.6	0.90	1.88	6.95
11:20	↓		23.0	7.32	23.95	116.8	0.81	3.43	6.95
11:25	↓		23.1	7.32	23.93	117.5	0.72	3.41	6.95
11:30	↓		23.2	7.32	23.96	118.2	0.72	1.53	6.95

Collected Sample Condition — Color: clear — Odor: no — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-9
Date	6/6/23	Sampled By	Doug Solon		
Sampling Time	1215	Recorded By	Doug Solon		
Weather	80°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.90	Purge Time	Start 11:45 Finish 12:20

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)[1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
11:50	250		23.2	7.23	21.44	60.9	0.92	2.33	8.90
11:55	↓		23.0	7.20	21.41	50.4	0.75	1.67	8.90
12:00			22.9	7.21	21.38	42.0	0.56	1.83	8.90
12:05			23.1	7.24	21.36	39.2	0.50	1.13	8.90
12:10			23.2	7.22	21.36	40.0	0.48	1.25	8.90
12:15	↓		23.3	7.22	21.37	40.4	0.48	1.03	8.90

Collected Sample Condition — Color: clear — Odor: none — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments: EB060623 @ 12:25 - Equipment Blank

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-17
Date	6/10/23	Sampled By	DWG SOLON		
Sampling Time	1310	Recorded By	DWG SOLON		
Weather	86°F	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.00	Purge Time	Start 12:40 Finish 1:10

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
12:45	250		24.6	7.53	13.50	-10.3	10.90	3.02	8.02
12:50	"		24.7	7.44	14.26	-34.3	3.65	2.52	8.02
12:55	"		24.6	7.53	14.95	-47.2	1.60	3.36	8.02
1:00	"		24.8	7.52	13.54	-54.7	1.18	4.94	8.02
1:05	"		24.9	7.53	15.04	-54.5	0.88	4.65	8.02
1:10	"		25.0	7.46	15.04	-47.8	0.71	5.39	8.02

Collected Sample Condition — Color: Clear — Odor: no — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-5
Date	6-7-23	Sampled By	DS		
Sampling Time	0855	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.47	Purge Time	Start 0825 Finish 0900

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)[1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0830	250ml		21.9	~~15.93~~ 6.68	15.93	24.8	2.39	19.3	5.85
0835	↓		21.9	6.66	16.18	10.6	1.90	4.43	6.07
0840			21.9	6.60	16.33	-2.0	1.65	2.92	6.24
0845			21.9	6.62	16.53	-17.7	1.41	2.80	6.45
0850			21.9	6.75	16.76	-27.0	1.29	2.62	6.62
0855	↓		21.9	6.63	17.09	-30.5	1.22	2.85	6.78

Collected Sample Condition: Color Clear Odor hydrocarbon Appearance

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 67.2

Comments

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-8
Date	6/7/23	Sampled By	Doug Solan		
Sampling Time	0940	Recorded By	Doug Solan		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC		
Casing Diameter	2-INCH/4-INCH				
Sounded Depth (ft bmp)					
Depth to Water (ft bmp)	5.25	Purge Time	Start 0911	Finish	0955

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
9:15	250		22.7	7.15	12.14	104.1	1.98	2.13	5.57
9:20	|		22.7	7.07	12.44	100.9	1.24	1.45	5.70
9:25	|		22.8	7.11	12.45	102.4	0.87	1.33	5.90
9:30	|		22.7	7.09	12.30	103.5	0.79	1.61	6.12
9:35	|		22.8	7.12	12.19	101.1	0.70	1.27	6.12
9:40	↓		22.8	7.13	12.13	113.1	0.58	1.15	6.59

Collected Sample Condition — Color: clear — Odor: hydrocarbon — Appearance: slight tint

Parameter	Container	No.	Preservative
Benzene, PAH	40ml/VOA	21	Raw

PID Reading: 0.9

Comments: MW-8 (PAH, Benzene)
FD060723 (PAH) Field Dup
FB060723 (PAH, Benzene) Field Blank - 0945
EB060723 (PAH, Benzene) Eq. Blank - 0950

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-11
Date	06/07/23	Sampled By	Doug Solon		
Sampling Time	1045	Recorded By	Doug Solon		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.55	Purge Time	Start 1017 Finish 1055

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or ~~mS/cm~~)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1020	250		24.6	7.55	11.22	139.0	0.98	1.93	7.96
1025	↓		24.4	7.06	11.15	136.4	0.71	1.25	8.08
1030			24.6	7.59	10.90	134.6	0.50	1.30	8.32
1035			24.6	7.48	10.84	136.3	0.44	1.85	8.52
1040			24.4	7.49	10.77	134.1	0.42	2.60	8.08
1045	↓		24.4	7.53	10.71	131.3	0.41	2.24	8.80

Collected Sample Condition — Color: ~~Dk~~ sl yellow — Odor: hydrocarbon — Appearance: slight yellow

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30122717	Site Location	SUNLAND PARK, NM	Well ID	MW-10
Date	06/07/23	Sampled By	Doug Solan		
Sampling Time	11:30	Recorded By	Doug Solan		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.61	Purge Time	Start 11:00 Finish 11:35

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
11:05	250		24.1	7.25	11.31	124.6	0.97	3.60	8.87
11:10	↓		24.0	7.23	11.41	122.5	0.61	2.60	8.95
11:15			24.1	7.21	11.43	119.7	0.45	2.52	9.00
11:20			24.2	7.23	11.45	117.2	0.40	2.38	9.03
11:25			24.3	7.22	11.48	115.6	0.40	2.16	9.06
11:30			24.4	7.22	11.56	119.9	0.38	2.16	9.00

Collected Sample Condition — Color: Slight Yellow — Odor: Hydrocarbon — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 2.4

Comments:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 269095

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	US3460007057	Project Name	30167857 Bricklandd Refinery 2Q23	A	(8260 Benzene (*Unpreserved*)-7 day HT [3xVOANeat]
Work Order		Project Number	30167857	B	8270_PAH_LVI (8270 PAHs (LVI)) [3xVOAAmbNeat]
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3698	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-3S	6.6.23	0935	W	8	3	X										
2	MW-3D	6.6.23	1010	W	8	3	X										
3	MW-6S	6.6.23	1055	W	8	3	X										
4	MW-6D	6.6.23	1130	W	8	3	X										
5	MW-9S	6.6.23	1215	W	8	3	X										
6	FB060623	6.6.23	1020	W	8	3	X										
7	FD060623	6.6.23	—	W	8	3	X										
8	EB060623	6.6.23	1225	W	8	3	X										
9																	
10																	

Sampler(s) Please Print & Sign

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other _____

Results Due Date:

Relinquished by:	Date: 6.7.23	Time: 1210	Received by:	Notes: [AGM Bricklandd NM]
Relinquished by:	Date:	Time:	Received by (Laboratory):	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
[X] Level II Std QC
[ ] Level III Std QC/Raw Data
[ ] Level IV SW846/CLP
[ ] Other
[ ] TRRP Check list
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Holland, MI +1 616 399 6070
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Salt Lake City, UT +1 801 266 7700
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Chain of Custody Form

Page _____ of _____

COC ID: 269094

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	US3460007057	Project Name	30167857 Brickland Refinery 2Q23	A	(8260 Benzene ("Unpreserved")-7 day HT [3xVOANeat]
Work Order		Project Number	30167857	B	8270_PAH_LVI (8270 PAHs (LVI)) [3xVOAAmbNeat]
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3599	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-17	6-6-23	1310	W	8	3	X										
2	MW-5	6-7-23	0855	W	8	3	X										
3	MW-8	6-7-23	0940	W	8	6	X	X									
4	FD060723	6-7-23	—	W	8	3		X									
5	FB060723	6-7-23	0945	W	8	6	X	X									
6	EB060723	6-7-23	0950	W	8	6	X	X									
7	MW-11	6-7-23	1045	W	8	3	X										
8	MW-10	6-7-23	1130	W	8	3	X										
9																	
10																	

Sampler(s) Please Print & Sign

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other _____

Results Due Date:

Relinquished by: DM Fulton	Date: 6-7-23	Time: 1211	Received by:	Notes: [AGM Bridgeland NM]	
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		

QC Package: (Check One Box Below)

- [X] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SVM843/CLP
- [ ] Other
- [ ] TRRP Check list
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ARCADIS Design & Consultancy for natural and built assets

DAILY LOG

Project Name and No. Huntsman Brickland Refinery -30167857

Site Location Sunland Park, NM

Prepared by D. Jolan

Date/Time	Description of Activities
9-5-23 0730	Arrived on site / H&S Tailgate meeting
0730 - 0820	Gauged all wells / PID readings
- 0950	Pumped & Sampled mw-3S
- 1030	Pumped & Sampled mw-3D / Field Dup and Field Blank
- 1115	Pumped & Sampled mw-6S
- 1200	Pumped & Sampled mw-6D
- 1240	Pumped & Sampled mw-9S / Equipment Blank
- 1330	Dumped Purge water / secured site / Returned to office
- 1530	Packaged samples / Delivered cooler to FEDEX

ARCADIS Design & Consultancy for natural and built assets

DAILY LOG

Project Name and No. Huntsman Brickland Refinery - 30167857

Site Location Sunland Park, nm

Prepared by D. Solon

Date/Time	Description of Activities
09-07-23 - 0805	arrived onsite / H&S Tailgate meeting
- 0840	Pumped and sampled mw-17
- 0925	Pumped & Sampled mw-5
- 1020	Pumped & sampled mw-8 / Field Dup / Field Blank /
	Equipment Blank (Benzene & PAH)
- 1140	Pumped & Sampled mw-11
- 1150	Pumped & Sampled mw-10
- 1240	Resampled mw-6D - Lab indicated sample was not
	received on 09-05-23.
- 1330	Dumped Purge water / Perimeter inspection
	Fence line & Gates. Returned to office
- 1530	Packaged samples Plus equipment
- 1615	Delivered Samples/Equipment to FEDEX
09-08-23 1230	Completed Review of Field notes.

Control Number: TSM- 5285051

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Hunts mar	**Project Location:** Sunland Park, nm
Date: 9-5-23 **Time:** 0730 **Conducted by:** D. Solon	**Signature/Title:** D Solon / Field Sup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: Gauge Wells / GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [X] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*):
- [ ] Permits (*specify type or #*):
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*):
- [X] H&S Standard (*specify number*):
- [ ] H&S checklist (*specify type*):
- [ ] Activity specific hazard analysis:

Activity:

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental		Gravity		Mechanical		Motion	
Personal Safety	X	Pressure		Radiation		Sound	

Controls required to be used:

PPE Required (If not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [ ] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*):
- [ ] Life Vest (*specify type*):
- [ ] Protective Suit (*specify type*):
- [ ] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

SSE Employee*

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

Printed Name/Signature/Company	Sign In Time	Sign Out Time
Doug Solon / DSolon / ARcadis	0730	
Ana Gutierrez / [signature] / Arcadis	0730	

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager

*Short Service Employee (SSE) working for Arcadis <1 year.

Control Number: TSM- 5285051

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Huntsman	**Project Location:** Bonland Park, NM
Date: 9-7-23 **Time:** 805 **Conducted by:** Doug Solon	**Signature/Title:** Doug Solon / Field Sup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [X] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*): _____
- [ ] Permits (*specify type or #*): _____
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*): _____
- [X] H&S Standard (*specify number*): _____
- [ ] H&S checklist (*specify type*): _____
- [ ] Activity specific hazard analysis:

Activity: _____

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental	X	Gravity		Mechanical		Motion	
Personal Safety	X	Pressure		Radiation		Sound	

Controls required to be used:

PPE Required (If not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [X] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*): _____
- [ ] Life Vest (*specify type*): _____
- [ ] Protective Suit (*specify type*):
- [ ] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

SSE Employee*	Printed Name/Signature/Company	Sign In Time	Sign Out Time
	Doug Solon / Doug Solon / ARCADIS	0806	
	Ana Gutierrez / Ana Gutierrez / ARCADIS	0806	

*Short Service Employee (SSE) working for Arcadis <1 year.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

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Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager

ARCADIS
Performance Water Environment Buildings

WELL GAUGING LOG

Site Name: Hurtsman
Project Number: 30167857
Date & Time: 9-5-23 0730

Gauging Equations (before purging) LNAPL Only

water column height = (well depth in feet) - (initial depth to water in feet)

product layer thickness = (initial depth to water in feet) - (depth to product in feet)

Well Gauging Information

Well ID	Total Depth (feet bgs)	Depth to Product (feet bgs)	Depth to Water (feet bgs)	Water Column Height (feet bgs)	Product Layer Thickness (feet bgs)	Product Removed (gallons)	Comments PID ppm	
mw-3S			5.81				0.0	0730
mw-3D			5.86				0.0	0732
mw-6S			7.11				0.0	0740
mw-6D			6.74				0.0	0741
mw-9S			8.61				0.0	0745
mw-17			7.80				0.0	0752
mw-5			5.32				102.9	0758
mw-8			5.11				1.13	0804
mw-11			7.41				0.1	0808
mw-10			8.49				2.1	0812

Equipment and Decon Procedures

Gauging Equipment

Decon Procedures

file stamp

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30167857	Site Location	SUNLAND PARK, NM	Well ID	MW-35
Date	090523	Sampled By	Doug Solon		
Sampling Time	0950	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.81	Purge Time	Start 0920 Finish 0950

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0925	250		24.4	6.85	18978	~~-135~~ -144.0	2.39	1.35	6.12
0930	↓		24.4	6.86	18949	-161.7	1.86	1.35	6.21
0935	↓		24.4	6.86	18919	-153.3	1.92	1.64	6.30
0940	↓		24.4	6.86	18836	-146.2	1.67	1.82	6.35
0945	↓		24.6	6.87	18716	-141.6	1.67	1.03	6.37
0950	↓		24.6	6.87	18614	-137.8	1.61	1.12	6.40

Collected Sample Condition: Color clear Odor no Appearance organics

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30167857	Site Location	SUNLAND PARK, NM	Well ID	MW-3D
Date	090523	Sampled By	Doug Solon		
Sampling Time	1030	Recorded By	Doug Solon		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.84	Purge Time	Start 1000 Finish 1035

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1005			24.0	7.19	19039	-109.3	1.70	-109.1	5.85
1010			24.3	7.18	18943	-102.3	1.73	22.0	5.85
1015			24.2	7.19	18979	-98.5	1.78	14.4	5.85
1020			24.5	7.19	19032	-96.0	1.75	14.1	5.85
1025			24.3	7.19	19064	-96.1	1.74	9.46	5.85
1030	250		24.6	7.19	19086	-94.3	1.82	9.41	5.85

Collected Sample Condition: Color Clear Odor no Appearance Organics

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	8 9	Raw

PID Reading: 0.0

Comments: Field Dup - FD090523
Field Blank - FB090523 @ 1040

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-65

Date: 090523 | Sampled By: Doug Solon

Sampling Time: 1115 | Recorded By: Doug Solon

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 7.07 | Purge Time | Start: 1045 | Finish:

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1050	250		27.0	7.14	12060	-124.7	1.24	31.0	7.19
1055	↓		26.7	7.15	12199	-124.8	0.90	21.5	7.22
1100			27.0	7.15	12382	-126.5	0.83	16.8	7.22
1105			26.7	7.15	12391	-126.5	0.82	11.1	7.22
1110			27.1	7.15	12385	-127.7	0.79	10.3	7.22
1115			27.1	7.14	12380	-126.9	0.80	10.4	7.22

Collected Sample Condition | Color: Clear | Odor: no | Appearance: Organics

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

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Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-6D

Date: 090723 | Sampled By: Doug Solon

Sampling Time: 1240 | Recorded By: Doug Solon

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 6.70 | Purge Time | Start 1209 | Finish 1245

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) 1)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1215	250		26.4	7.20	20396	-113.7	0.54	11.6	6.75
1220			26.3	7.22	20280	-132.9	0.48	9.73	6.74
1225			26.3	7.20	20228	-126.3	0.78	8.53	6.74
1230			26.2	7.22	20211	-129.4	0.59	8.02	6.74
1235			26.4	7.23	20186	-130.3	0.53	7.78	6.74
1240	↓		26.6	7.23	20144	-133.6	0.50	6.20	6.74

Collected Sample Condition | Color: Clear | Odor: no | Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments: Well Resampled from 090523 - Sampled misplaced

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30167857	Site Location	SUNLAND PARK, NM	Well ID	MW-9
Date	090523	Sampled By	Doug Solon		
Sampling Time	1240	Recorded By	Doug Solon		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.61	Purge Time	Start 1210 Finish 1245

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1215	250		30.0	7.10	160637	-87.7	0.86	49.5	8.63
1220	↓		29.8	7.07	160622	-102.9	0.81	28.1	8.63
1225			29.7	7.08	160643	-116.8	0.78	11.7	8.63
1230			29.7	7.10	160705	-130.6	0.76	9.51	8.63
1235			29.7	7.07	160955	-134.2	0.75	11.4	8.63
1240	↓		29.5	7.09	17130	-138.5	0.79	5.56	8.63

Collected Sample Condition — Color: clear — Odor: no — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	6	Raw

PID Reading: 0.0

Comments: Equipment Blank - EB090523 @ 1245

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: mw-17

Date: 9.7.23 | Sampled By: DS

Sampling Time: 0840 | Recorded By: DS

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 7.82 | Purge Time | Start: 0810 | Finish: 0845

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0815	250mL/m		25.1	7.29	12607	-146.2	1.18	6.15	7.86
0820			25.3	7.28	12609	-146.5	1.24	4.60	7.86
0825			25.3	7.28	12626	-148.1	0.76	4.70	7.86
0830			25.4	7.26	12627	-151.0	0.58	3.43	7.86
0835			25.4	7.25	12650	-148.0	0.60	3.86	7.86
0840			25.5	7.24	12660	-145.8	0.58	3.90	7.86

Collected Sample Condition | Color: clear | Odor: none | Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading:

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30167857	Site Location	SUNLAND PARK, NM	Well ID	MW-5
Date	9-7-23	Sampled By	DS		
Sampling Time	0925	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/~~4-INCH~~		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.32	Purge Time	Start 0855 Finish 0930

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (~~umhos~~ or ~~mS/cm~~) 1)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0900	250ml/m		27.2	6.64	18412	-230.3	0.83	6.51	5.71
0905	↓		27.3	6.61	18377	-231.6	0.77	5.26	5.93
0910			27.3	6.57	18342	-238.5	0.75	5.44	6.38
0915			27.5	6.54	18318	-248.5	0.63	5.67	6.66
0920			27.5	6.52	18279	-255.4	0.63	5.29	6.86
0925	↓		27.6	6.50	18203	-261.3	0.65	7.97	6.87

Collected Sample Condition — Color: clear slight yellow tint — Odor: hydrocarbons — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 102.9

Comments:

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY			Well ID	MW-8
Project Number	30167857	Site Location	SUNLAND PARK, NM		
Date	090723	Sampled By	Doug Salon		
Sampling Time	1020	Recorded By	Doug Salon		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	5.12	Purge Time	Start 0947 Finish 1035

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0955	250		27.9	7.06	13812	-236.6	0.80	3.49	5.57
1000	↓		27.9	7.04	13663	-237.6	0.81	2.64	5.84
1005			27.9	7.05	13476	-235.7	0.88	2.31	6.07
1010			28.1	7.04	13308	-235.2	0.85	2.64	6.28
1015			28.2	7.00	13173	-235.1	0.84	2.60	6.44
1020	↓		28.3	7.05	12940	-235.9	0.96	2.97	6.58

Collected Sample Condition		Color	slight yellow tint	Odor	slight hydrocarbon
Parameter	Container		No.		Preservative
Benzene / PAH	40ml/VOA		x 21		Raw

PID Reading: 1.13

Comments: MW-8 (PAH Benzene)
FD090723 (PAH) Field Dup
FB090723 (PAH, Benzene) Field Blank @ 1025
EB090723 (PAH, Benzene) Eq. Blank @ 1030

https://arcadiso365-my.sharepoint.com/personal/douglas_salon_arcadis-us_com/Documents/Documents/Huntsmanlowflowsampforms - Sheet1

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Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30167857	Site Location	SUNLAND PARK, NM	Well ID	MW-11
Date	090723	Sampled By	Dwg Solan		
Sampling Time	1110	Recorded By	Dwg Solan		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.42	Purge Time	Start 1040 Finish 1115

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity ~~umhos~~ or ~~mS/cm~~ [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1045	250		27.6	7.04	13176	-146.0	0.57	7.36	8.09
1050	↓		27.4	7.03	13082	-150.2	0.55	4.50	8.12
1055			27.4	7.05	12825	-151.4	0.53	5.29	8.38
1100			27.4	7.05	12685	-151.6	0.56	4.90	8.63
1105			27.5	7.05	12507	-154.6	0.56	4.58	8.86
1110	↓		27.6	7.07	12239	-157.1	0.62	3.55	9.07

Collected Sample Condition — Color: Slight yellow tint — Odor: no — Appearance:

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.1

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY		
Project Number	30167857	Site Location	SUNLAND PARK, NM
Date	090723	Sampled By	Dwg Solon
Sampling Time	1150	Recorded By	Dwg Solon
Weather		Coded Replicate No.	

Well ID MW-10

Instrument Identification

Water Quality Meter(s) YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.52	Purge Time	Start 1120 Finish 1155

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or ~~ms/cm~~) 1)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1125	250		29.7	7.26	12338	-190.0	1.54	5.43	8.66
1130	↓		28.9	7.22	12287	-199.7	0.99	5.95	8.84
1135			28.4	7.23	12207	-204.5	1.08	4.60	8.84
1140			29.2	7.22	12151	-204.9	1.52	4.50	8.84
1145			29.5	7.20	12100	-205.6	0.86	4.86	8.95
1150	↓		29.5	7.20	12086	-207.2	0.91	5.46	9.06

Collected Sample Condition Color slight yellow Odor hydrocarbons Appearance organics

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading 2.1

Comments

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 269093

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	US3460007057	Project Name	30167857 Brickland Refinery 2Q23	A	(8260 Benzene (*Unpreserved*)-7 day HT [3xVOANeat]
Work Order		Project Number	30167857	B	8270_PAH_LVI (8270 PAHs (LVI)) [3xVOAAmbNeat]
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-3S	9-5-23	0950	W	Raw	3	X										
2	MW-3D	9-5-23	1030	W	Raw	3	X										
3	FD090523	9-5-23	—	W	Raw	3	X										
4	FB090523	9-5-23	1040	W	Raw	3	X										
5	MW-6S	9-5-23	1115	W	Raw	3	X										
6	MW-6D	9-5-23	1200	W	Raw	3	X										
7	~~tt~~ MW-9	9-5-23	1240	W	Raw	3	X										
8	EB090523	9-5-23	1245	W	Raw	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Sitton DMSitton

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) ☐ Other _____ ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 -Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
DMSitton	9-5-23	1430	
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: [AGM Brickland NM]

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
☒ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other _____
☐ TRRP Check list
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 269092

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	US3460007057	Project Name	30167857 Brickland Refinery 2Q23	A	(8260 Benzene ("Unpreserved")-7 day HT [3xVOANeat]
Work Order		Project Number	30167857	B	8270_PAH_LVI (8270 PAHs (LVI)) [3xVOAAmbNeat]
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-17	9-7-23	0840	W	neat	3	X										
2	MW-5	9-7-23	0925	W	neat	3	X										
3	MW-8	9-7-23	1020	W	neat	6	X	X									
4	FD090723	9-7-23	—	W	neat	3		X									
5	FB090723	9-7-23	1025	W	neat	6	X	X									
6	EB090723	9-7-23	1030	W	neat	6	X	X									
7	MW-11	9-7-23	1110	W	neat	3	X										
8	MW-10	9-7-23	1150	W	neat	3	X										
9	MW-6D	9-7-23	1240	W	neat	3	X										
10	Trip Blank	9-7-23	—	W	neat	3	X										

Sampler(s) Please Print & Sign: Doug Solon

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Doug Solon	9-7-23	1430	
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: [AGM Brickland NM]

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
- [X] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SVM43/CLP
- [ ] Other _____
- [ ] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
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3. The Chain of Custody is a legal document. All information must be completed accurately.

DAILY LOG

ARCADIS Design & Consultancy for natural and built assets

Project Name and No. Huntsman Brickland Refinery - 30167857

Site Location Sunland Park, NM

Prepared by D. Solon

Date/Time	Description of Activities
11/20/23 0700	arrived on site / HTS-Tailgate
0710 - 0800	Gauged all wells / PID Readings
-0840	Pumped and sampled MW-3S
-0920	Pumped and sampled MW-3D / Field Dup / Field Blank
-1005	Pumped and sampled MW-6S
-1040	Pumped and sampled MW-6D
-1130	Pumped and sampled MW-9S / Equipment Blank
-1230	Dumped Purge water / secured site / Returned to offic
-1330	secured Samples in Refridgerator - completed field notes

ARCADIS Design & Consultancy for natural and built assets

DAILY LOG

Project Name and No. Huntsman Brickland Refinery - 30167857

Site Location Saveland Park, NM

Prepared by D. Solon

Date/Time	Description of Activities
11/21/23 - 0740	arrived onsite / H&S Tailgate
- 0815	Pumped and sampled MW-17
- 0850	Pumped and sampled MW-5
- 0930	Pumped and sampled MW-8 / Field Dup / Field Blank
- 1005	Pumped and Sampled MW-11
- 1045	Pumped and Sampled MW-10
- 1130	Dumped Purge water / Perimeter inspection - Fence line and gates / Returned to office
- 1400	Packaged samples in cooler
- 1530	Delivered cooler to FEDEX
11/22/23 - 0830	Completed and compiled Field notes and final Report

Control Number: TSM- 5285051

ARCADIS Design & Consultancy for natural and built assets

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Huntsman	Project Location: Sunland Park, NM
Date: 11-20-23 Time: 0700 Conducted by: D. Solon	Signature/Title: DSolon / Field Sup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: WELL Gauging / GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [X] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*): _____
- [ ] Permits (*specify type or #*): _____
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*): _____
- [ ] H&S Standard (*specify number*): _____
- [ ] H&S checklist (*specify type*): _____
- [ ] Activity specific hazard analysis:

Activity: _____

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental	X	Gravity		Mechanical		Motion	X
Personal Safety	X	Pressure		Radiation	X	Sound	

Controls required to be used:

PPE Required (if not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [X] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*): _____
- [ ] Life Vest (*specify type*): _____
- [ ] Protective Suit (*specify type*):
- [X] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

SSE Employee*	Printed Name/Signature/Company	Sign In Time	Sign Out Time
	Doug Solon / DSolon	0700	

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.888.449-7787 and then notify the field supervisor.

Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager

*Short Service Employee (SSE) working for Arcadis <1 year.

Control Number: TSM- 5285051

ARCADIS for natural and built assets

TSM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

TAILGATE HEALTH & SAFETY MEETING FORM

Project Name: Huntsman		**Project Location:** Sunland Park, NM	
Date: 11/21/23	**Time:** 0740	**Conducted by:** D. Solon	**Signature/Title:** DM Solon / Field Sup

Issues or concerns from previous day's activities:

Task anticipated to be performed today: GW Sampling

The following was used to communicate H&S information in this briefing (check all that apply):

- [X] HASP (*including THA*)
- [ ] JSAs (*specify JSA #s*): _____
- [ ] Permits (*specify type or #*): _____
- [ ] Traffic Safety Plan
- [ ] FHSHB (*specify sections*): _____
- [ ] H&S Standard (*specify number*): _____
- [ ] H&S checklist (*specify type*): _____
- [ ] Activity specific hazard analysis:

Activity: _____

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	X	Chemical		Driving	X	Electrical	
Environmental	X	Gravity		Mechanical		Motion	X
Personal Safety	X	Pressure		Radiation	X	Sound	

Controls required to be used:

PPE Required (if not using JSA or Permit with PPE requirements):

- [X] Hard hat
- [X] Safety glasses
- [ ] Face shield
- [X] Safety goggles
- [X] Steel/composite toe boots
- [X] Traffic vest (*specify II or III*): _____
- [ ] Life Vest (*specify type*): _____
- [ ] Protective Suit (*specify type*):
- [X] Protective gloves (*specify type*):
- [ ] Other (*specify*):

Signature and Certification: I have read and understand the project specific HASP for this project.

Non-Life Threatening Injury or Illness
Call WorkCare 1-888-449-7787

SSE Employee*	Printed Name/Signature/Company	Sign In Time	Sign Out Time
	Doug Solon / DM Solon / ARCADIS	0740	

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

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*Short Service Employee (SSE) working for Arcadis <1 year.

ARCADIS

WELL GAUGING LOG

Site Name: Huntsman

Project Number: 30167857

Date & Time: 4/20/23

Gauging Equations (before purging) LNAPL Only

water column height = (well depth in feet) - (initial depth to water in feet)

product layer thickness = (initial depth to water in feet) - (depth to product in feet)

Well Gauging Information

Well ID	Total Depth (feet bgs)	Depth to Product (feet bgs)	Depth to Water (feet bgs)	Water Column Height (feet bgs)	Product Layer Thickness (feet bgs)	Product Removed (gallons)	Comments
MW-3S			8.05				PID → 0.0 ppm
MW-3D			8.10				PID → 0.0 ppm
MW-6S			9.28				PID → 0.0 ppm
MW-6D			~~9.04~~	8.94			PID → 0.0 ppm
MW-9S			10.72				PID → 0.0 ppm
MW-17			9.98				PID → 0.0 ppm
MW-5			7.45	strong Odor	Slight Sheen		PID → 481.6 ppm
MW-8			7.13				PID → 11.2 ppm
MW-11			9.36				PID → 0.0 ppm
MW-10			10.63				PID → 2.1 ppm

Equipment and Decon Procedures

Gauging Equipment

Decon Procedures

file stamp

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY				
Project Number	30167857	Site Location	SUNLAND PARK, NM	Well ID	MW-035
Date	11/20/23	Sampled By	DS		
Sampling Time	0835	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	8.04	Purge Time	Start 8:05 Finish 0840

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or ~~mS/cm~~)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0810	250ml/m		18.5	7.08	12.350	-215.2	2.83	0.80	8.18
0815			18.6	7.05	12.060	-222.1	2.37	0.67	8.25
0820			18.7	7.05	11.970	-219.6	1.94	0.58	8.32
0825			18.7	7.04	11.630	-218.3	1.59	0.81	8.37
0830			18.6	7.06	11.540	-217.4	1.45	0.48	8.44
0835			18.1	7.07	11.560	-216.6	1.32	0.41	8.47

Collected Sample Condition	Color	clear	Odor	none	Appearance	clear	
Parameter	Container		No.		Preservative		
Benzene	40ml/VOA		3		Raw		

PID Reading: 0.0

Comments

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-3D

Date: 11/20/23 | Sampled By: DS

Sampling Time: 0915 | Recorded By: DS

Weather: | Coded Replicate No.: DUP 112023

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH (4-INCH)

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 08.11 | Purge Time | Start 0845 | Finish 0920

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or (mS/cm))	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0850	250ml/M		19.3	7.16	16.580	-130.0	1.00	32.6	8.13
0855			19.1	7.15	16.570	-137.1	0.80	24.7	8.13
0900			19.4	7.13	16.630	-140.7	0.72	18.1	8.13
0905			19.2	7.13	16.530	-141.2	0.68	13.9	8.13
0910			19.1	7.13	16.500	-143.0	0.64	11.4	8.13
0915	↓		19.4	7.13	16.550	-144.5	0.62	8.20	8.13

Collected Sample Condition | Color: clear | Odor: None | Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	x 9	Raw

PID Reading: 0.0

Comments: Dup Taken - DUP112023
Field Blank - FB 112023 -0920 - DI H2O

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-65

Date: 11/20/23 | Sampled By: DS

Sampling Time: 1000 | Recorded By: DS

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH (4-INCH)

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 9.30 | Purge Time | Start 0930 | Finish 1005

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)[1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0935	250 ml/m		20.4	7.17	10.900	-134.7	1.65	18.5	~~9.30~~ 9.37
0940			20.7	7.13	10.950	-145.7	1.04	11.5	9.39
0945			20.5	7.12	10.900	-151.9	0.79	12.2	9.40
0950			20.7	7.10	10.980	-165.3	0.70	8.30	9.40
0955			20.7	7.10	10.900	-174.2	0.64	10.1	9.40
1000	↓		21.0	7.10	10.950	-182.0	0.61	8.11	9.40

Collected Sample Condition | Color: clear | Odor: none | Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-6D

Date: 11/20/23 | Sampled By: DS

Sampling Time: 1035 | Recorded By: DS

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 8.94 | Purge Time | Start: 1005 | Finish: 1040

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1010	250ml/m		20.8	7.27	17.950	-119.1	0.69	2.15	8.95
1015	↓		20.9	7.25	18.000	-131.4	0.52	0.95	8.95
1020			21.2	7.24	18.110	-136.2	0.51	1.07	8.95
1025			20.7	7.25	17.950	-143.4	0.44	1.08	8.95
1030			20.7	7.26	17.860	-147.6	0.41	0.76	8.95
1035	↓		20.9	7.24	17.950	-152.0	0.40	1.25	8.95

Collected Sample Condition | Color: clear | Odor: none | Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY			Well ID	MW-9S
Project Number	30167857	Site Location	SUNLAND PARK, NM		
Date	11/20/23	Sampled By	DS		
Sampling Time	11:20	Recorded By	DS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC		
Casing Diameter	2-INCH/4-INCH				
Sounded Depth (ft bmp)					
Depth to Water (ft bmp)	10.69	Purge Time	Start 10:50	Finish	1130

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
10:55	250 mL/m		20.4	7.40	15.380	-188.2	2.42	3.00	10.75
11:00	↓		20.6	7.22	15.640	-192.4	1.27	1.22	10.74
11:05			21.2	7.17	15.810	-190.7	0.75	2.18	10.74
11:10			20.8	7.19	15.690	-191.2	0.58	1.80	10.74
11:15			21.1	7.16	15.790	-191.3	0.51	1.81	10.74
11:20			21.1	7.13	15.770	-191.4	0.46	1.77	10.74

Collected Sample Condition	Color	Odor	Appearance

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments: Equipment Blank - EB112023 - 1125 - DI over Tubing weight

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-17

Date: 11/21/23 | Sampled By: DS

Sampling Time: 0810 | Recorded By: DS

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 10.00 | Purge Time | Start 0745 | Finish 0815

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0750	250mL/M		21.5	7.10	11.420	-99.8	2.72	2.67	10.05
0755	↓		21.8	7.04	11.460	-133.9	1.58	2.96	10.05
0800			21.7	7.04	11.430	-144.7	1.10	2.11	10.05
0805			21.5	7.04	11.380	-150.0	0.92	1.11	10.05
0810			21.9	7.05	11.480	-155.5	0.81	1.49	10.05

Collected Sample Condition | Color: clear | Odor: none | Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project	HUNTSMAN BRICKLAND REFINERY			Well ID	MW-5
Project Number	30167857	Site Location	SUNLAND PARK, NM		
Date	11/21/23	Sampled By	PS		
Sampling Time	0845	Recorded By	PS		
Weather		Coded Replicate No.			

Instrument Identification

Water Quality Meter(s): YSI

Casing Material	PVC	Purge Method	LOW FLOW PERISTALTIC
Casing Diameter	2-INCH/4-INCH		
Sounded Depth (ft bmp)			
Depth to Water (ft bmp)	7.50	Purge Time	Start 0820 Finish 0850

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0825	250 mL/m		20.9	6.72	16.100	-259.6	3.20	17.8	7.71
0830			20.9	6.68	16.333	-281.1	1.19	21.1	7.92
0835			21.1	6.67	16.410	-283.9	1.04	12.2	8.02
0840			20.0	6.60	16.310	-287.6	0.89	10.8	8.08
0845	↓		20.8	6.63	16.250	-291.7	0.80	10.1	8.15

Collected Sample Condition

Color: clear/sl Tint Odor: strong Hydro Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 481 ppm

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-8

Date: 11/21/23 | Sampled By: DS

Sampling Time: 0920 | Recorded By: DS

Weather: | Coded Replicate No.: DUP112123

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 7.21 | Purge Time: Start 855 | Finish 0930

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or ~~mS/cm~~)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0900	250ml/m		20.3	7.18	11.580	-236.3	3.71	13.0	7.36
0905	↓		21.6	7.09	12.080	-266.2	1.33	6.18	7.53
0910			21.7	7.01	11.880	-271.0	1.08	1.96	7.68
0915			22.4	7.09	11.670	-275.7	0.93	1.66	7.83
0920	↓		22.2	7.09	11.390	-278.7	0.79	0.79	7.95

Collected Sample Condition | Color: clear/sl Tint | Odor: sl odor | Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	x 9	Raw

PID Reading: 11.2 ppm

Comments: Duplicate - DUP112123
Field Blank - FB112123 @ 0925 - DI H2O

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857

Site Location: SUNLAND PARK, NM

Well ID: MW-11

Date: 11/21/23

Sampled By: DS

Sampling Time: 1000

Recorded By: DS

Weather:

Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC

Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 9.46

Purge Time: Start 0935 Finish 1005

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
0940	250 mL/m			23.2	9.830	-214.8	1.72	1.20	9.75
0945	↓			23.3	9.780	-216.4	1.04	1.00	10.02
0950				23.2	9.440	-223.3	0.91	1.59	10.27
0955				23.4	9.360	-231.7	0.79	1.69	10.50
1000				23.2	9.260	-237.3	0.70	1.53	10.60

Collected Sample Condition

Color: clear Odor: none Appearance: clear

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	3	Raw

PID Reading: 0.0

Comments:

ARCADIS

Low-Flow Groundwater Sampling Log

Project: HUNTSMAN BRICKLAND REFINERY

Project Number: 30167857 | Site Location: SUNLAND PARK, NM | Well ID: MW-10

Date: 11/21/23 | Sampled By: DS

Sampling Time: 1035 | Recorded By: DS

Weather: | Coded Replicate No.:

Instrument Identification

Water Quality Meter(s): YSI

Casing Material: PVC | Purge Method: LOW FLOW PERISTALTIC

Casing Diameter: 2-INCH/4-INCH

Sounded Depth (ft bmp):

Depth to Water (ft bmp): 10.61 | Purge Time | Start 1010 | Finish 1045

Field Parameter Measurements During Purging

Time	Flow Rate (mL/min)	Volume Purged	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
1015	250mL/m		21.4	7.31	10.650	-232.7	2.03	2.61	10.83
1020	↓		21.2	7.26	10.560	-250.3	1.07	2.99	11.09
1025			21.3	7.24	10.540	-260.2	0.86	3.24	11.17
1030			21.6	7.26	10.660	-268.5	0.79	3.08	11.20
1035			21.5	7.24	10.660	-274.2	0.72	2.18	11.23

Collected Sample Condition: Color slight tint/floaters Odor slodor Appearance sl Tint

Parameter	Container	No.	Preservative
Benzene	40ml/VOA	x6	Raw

PID Reading: 2.1 ppm

Comments: Equipment Blank – EB 112123 @ 1040

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 305343

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30167857	Project Name	Huntsman	A	8260_LL_W (8260 Benzene (*Unpreserved*))
Work Order		Project Number		B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Doug Solon	Invoice Attn	Accounts Payable	D	
Address	401 East Main Street, Suite 400	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	El Paso, TX 79901	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(915) 747-3902	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Douglas.Solon@arcadis.com	e-Mail Address	Accountspayable.administration@arcadi	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-3S	11/20/23	0835	W	Raw	3	X										
2	MW-3D	11/20/23	0915	W	Raw	3	X										
3	FB 112023	11/20/23	0920	W	Raw	3	X										
4	DUP 112023	11/20/23	—	W	Raw	3	X										
5	MW-6S	11/20/23	1000	W	Raw	3	X										
6	MW-6D	11/20/23	1035	W	Raw	3	X										
7	MW-9S	11/20/23	1120	W	Raw	3	X										
8	EB 112023	11/20/23	1125	W	Raw	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon Douglas Solon

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: DMSolon	Date: 11/21/23	Time: 1400	Received by:	
Relinquished by:	Date:	Time:	Received by (Laboratory):	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Notes: Arcadis Huntsman

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
☒ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 305342

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30167857	Project Name	Huntsman	A	8260_LL_W (8260 Benzene (*Unpreserved*))
Work Order		Project Number		B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Doug Solon	Invoice Attn	Accounts Payable	D	
Address	401 East Main Street, Suite 400	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	El Paso, TX 79901	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(915) 747-3902	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Douglas.Solon@arcadis.com	e-Mail Address	Accountspayable.administration@arcadi	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-17	11/21/23	0810	W	Raw	3	X										
2	MW-5	11/21/23	0845	W	Raw	3	X										
3	MW-8	11/21/23	0920	W	Raw	3	X										
4	DUP 112123	11/21/23	—	W	Raw	3	X										
5	FB 112123	11/21/23	0925	W	Raw	3	X										
6	MW-11	11/21/23	1000	W	Raw	3	X										
7	MW-10	11/21/23	1035	W	Raw	3	X										
8	EB 112123	11/21/23	1040	W	Raw	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon, Douglas M. Solon

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by: DM Solon	Date: 11/21/23	Time: 1401	Received by:	Notes: Arcadis Huntsman
Relinquished by:	Date:	Time:	Received by (Laboratory):	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
- [X] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SVM/MCLP
- [ ] Other
- [ ] TRRP CheckList
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Appendix B

Laboratory Analytical Reports

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 24, 2023

Max Moran
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS23030565**

Laboratory Results for: **30122717 Brickland Refinery 1Q23**

Dear Max Moran,

ALS Environmental received 16 sample(s) on Mar 09, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Work Order: HS23030565

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23030565-01	MW-3S	Water		07-Mar-2023 09:50	09-Mar-2023 10:30	☐
HS23030565-02	MW-3D	Water		07-Mar-2023 10:25	09-Mar-2023 10:30	☐
HS23030565-03	MW-6S	Water		07-Mar-2023 11:10	09-Mar-2023 10:30	☐
HS23030565-04	MW-6D	Water		07-Mar-2023 11:50	09-Mar-2023 10:30	☐
HS23030565-05	MW-9S	Water		07-Mar-2023 12:35	09-Mar-2023 10:30	☐
HS23030565-06	FB030723	Water		07-Mar-2023 10:30	09-Mar-2023 10:30	☐
HS23030565-07	FD030723	Water		07-Mar-2023 00:00	09-Mar-2023 10:30	☐
HS23030565-08	EB030723	Water		07-Mar-2023 12:40	09-Mar-2023 10:30	☐
HS23030565-09	MW-17	Water		08-Mar-2023 08:30	09-Mar-2023 10:30	☐
HS23030565-10	MW-5	Water		08-Mar-2023 09:15	09-Mar-2023 10:30	☐
HS23030565-11	MW-8	Water		08-Mar-2023 10:00	09-Mar-2023 10:30	☐
HS23030565-12	FD030823	Water		08-Mar-2023 00:00	09-Mar-2023 10:30	☐
HS23030565-13	FB030823	Water		08-Mar-2023 10:05	09-Mar-2023 10:30	☐
HS23030565-14	EB030823	Water		08-Mar-2023 10:10	09-Mar-2023 10:30	☐
HS23030565-15	MW-11	Water		08-Mar-2023 10:55	09-Mar-2023 10:30	☐
HS23030565-16	MW-10	Water		08-Mar-2023 11:40	09-Mar-2023 10:30	☐

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Work Order: HS23030565

CASE NARRATIVE

GCMS Semivolatiles by Method SW8270

Batch ID: 190830

Sample ID: LCSD-190830

- LCS/LCSD RPD exceeded the laboratory acceptance limit. Recovery met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R429832

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-3S
Collection Date: 07-Mar-2023 09:50

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 01:59
Surr: 1,2-Dichloroethane-d4	*103*		*70-126*	*%REC*	*1*	*11-Mar-2023 01:59*
Surr: 4-Bromofluorobenzene	*104*		*77-113*	*%REC*	*1*	*11-Mar-2023 01:59*
Surr: Dibromofluoromethane	*91.4*		*77-123*	*%REC*	*1*	*11-Mar-2023 01:59*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 01:59*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-3D
Collection Date: 07-Mar-2023 10:25

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 02:20
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*11-Mar-2023 02:20*
Surr: 4-Bromofluorobenzene	*104*		*77-113*	*%REC*	*1*	*11-Mar-2023 02:20*
Surr: Dibromofluoromethane	*91.6*		*77-123*	*%REC*	*1*	*11-Mar-2023 02:20*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 02:20*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-6S
Collection Date: 07-Mar-2023 11:10

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 02:42
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*11-Mar-2023 02:42*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*1*	*11-Mar-2023 02:42*
Surr: Dibromofluoromethane	*92.7*		*77-123*	*%REC*	*1*	*11-Mar-2023 02:42*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 02:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-6D
Collection Date: 07-Mar-2023 11:50

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-04
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 03:03
Surr: 1,2-Dichloroethane-d4	*101*		*70-126*	*%REC*	*1*	*11-Mar-2023 03:03*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*1*	*11-Mar-2023 03:03*
Surr: Dibromofluoromethane	*91.0*		*77-123*	*%REC*	*1*	*11-Mar-2023 03:03*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 03:03*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-9S
Collection Date: 07-Mar-2023 12:35

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-05
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 03:24
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*11-Mar-2023 03:24*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*1*	*11-Mar-2023 03:24*
Surr: Dibromofluoromethane	*92.2*		*77-123*	*%REC*	*1*	*11-Mar-2023 03:24*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 03:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: FB030723
Collection Date: 07-Mar-2023 10:30

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	10-Mar-2023 22:50
Surr: 1,2-Dichloroethane-d4	*99.3*		*70-126*	*%REC*	*1*	*10-Mar-2023 22:50*
Surr: 4-Bromofluorobenzene	*106*		*77-113*	*%REC*	*1*	*10-Mar-2023 22:50*
Surr: Dibromofluoromethane	*91.3*		*77-123*	*%REC*	*1*	*10-Mar-2023 22:50*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*10-Mar-2023 22:50*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: FD030723
Collection Date: 07-Mar-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-07
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 00:35
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*11-Mar-2023 00:35*
Surr: 4-Bromofluorobenzene	*103*		*77-113*	*%REC*	*1*	*11-Mar-2023 00:35*
Surr: Dibromofluoromethane	*90.6*		*77-123*	*%REC*	*1*	*11-Mar-2023 00:35*
Surr: Toluene-d8	*108*		*82-127*	*%REC*	*1*	*11-Mar-2023 00:35*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: EB030723
Collection Date: 07-Mar-2023 12:40

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-08
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	10-Mar-2023 23:11
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*10-Mar-2023 23:11*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*1*	*10-Mar-2023 23:11*
Surr: Dibromofluoromethane	*91.2*		*77-123*	*%REC*	*1*	*10-Mar-2023 23:11*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*10-Mar-2023 23:11*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-17
Collection Date: 08-Mar-2023 08:30

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-09
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 03:45
Surr: 1,2-Dichloroethane-d4	*101*		*70-126*	*%REC*	*1*	*11-Mar-2023 03:45*
Surr: 4-Bromofluorobenzene	*107*		*77-113*	*%REC*	*1*	*11-Mar-2023 03:45*
Surr: Dibromofluoromethane	*89.9*		*77-123*	*%REC*	*1*	*11-Mar-2023 03:45*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 03:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-5
Collection Date: 08-Mar-2023 09:15

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-10
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	**0.12**		**0.0010**	**mg/L**	1	11-Mar-2023 04:06
Surr: 1,2-Dichloroethane-d4	*99.1*		*70-126*	*%REC*	*1*	*11-Mar-2023 04:06*
Surr: 4-Bromofluorobenzene	*106*		*77-113*	*%REC*	*1*	*11-Mar-2023 04:06*
Surr: Dibromofluoromethane	*89.1*		*77-123*	*%REC*	*1*	*11-Mar-2023 04:06*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 04:06*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-8
Collection Date: 08-Mar-2023 10:00

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-11
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: PC
Benzene	**0.0023**		**0.0010**	**mg/L**	1	11-Mar-2023 04:27
Surr: 1,2-Dichloroethane-d4	*103*		*70-126*	*%REC*	*1*	*11-Mar-2023 04:27*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*1*	*11-Mar-2023 04:27*
Surr: Dibromofluoromethane	*90.7*		*77-123*	*%REC*	*1*	*11-Mar-2023 04:27*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 04:27*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 15-Mar-2023		Analyst: MBG
Acenaphthene	**0.000155**		**0.000100**	**mg/L**	1	16-Mar-2023 15:09
Acenaphthylene	**0.000267**		**0.000100**	**mg/L**	1	16-Mar-2023 15:09
Anthracene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Benz(a)anthracene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Benzo(a)pyrene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Benzo(b)fluoranthene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Benzo(g,h,i)perylene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Benzo(k)fluoranthene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Chrysene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Dibenz(a,h)anthracene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Fluoranthene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Fluorene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Indeno(1,2,3-cd)pyrene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Naphthalene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Phenanthrene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Pyrene	< 0.000100		0.000100	mg/L	1	16-Mar-2023 15:09
Surr: 2-Fluorobiphenyl	*121*		*32-130*	*%REC*	*1*	*16-Mar-2023 15:09*
Surr: 4-Terphenyl-d14	*117*		*40-135*	*%REC*	*1*	*16-Mar-2023 15:09*
Surr: Nitrobenzene-d5	*125*		*45-142*	*%REC*	*1*	*16-Mar-2023 15:09*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: FD030823
Collection Date: 08-Mar-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-12
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D	**Method:SW8270**			Prep:SW3511 / 15-Mar-2023		Analyst: MBG
Acenaphthene	**0.000190**		**0.000101**	**mg/L**	1	16-Mar-2023 15:29
Acenaphthylene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Anthracene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Benz(a)anthracene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Benzo(a)pyrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Benzo(b)fluoranthene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Benzo(g,h,i)perylene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Benzo(k)fluoranthene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Chrysene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Dibenz(a,h)anthracene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Fluoranthene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Fluorene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Indeno(1,2,3-cd)pyrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Naphthalene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Phenanthrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Pyrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 15:29
Surr: 2-Fluorobiphenyl	*125*		*32-130*	*%REC*	*1*	*16-Mar-2023 15:29*
Surr: 4-Terphenyl-d14	*104*		*40-135*	*%REC*	*1*	*16-Mar-2023 15:29*
Surr: Nitrobenzene-d5	*85.9*		*45-142*	*%REC*	*1*	*16-Mar-2023 15:29*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc. **ANALYTICAL REPORT**
Project: 30122717 Brickland Refinery 1Q23 WorkOrder:HS23030565
Sample ID: FB030823 Lab ID:HS23030565-13
Collection Date: 08-Mar-2023 10:05 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	10-Mar-2023 23:32
Surr: 1,2-Dichloroethane-d4	*100*		*70-126*	*%REC*	*1*	*10-Mar-2023 23:32*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*1*	*10-Mar-2023 23:32*
Surr: Dibromofluoromethane	*90.8*		*77-123*	*%REC*	*1*	*10-Mar-2023 23:32*
Surr: Toluene-d8	*110*		*82-127*	*%REC*	*1*	*10-Mar-2023 23:32*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 15-Mar-2023		Analyst: MBG
Acenaphthene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Acenaphthylene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Anthracene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Benz(a)anthracene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Benzo(a)pyrene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Benzo(b)fluoranthene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Benzo(g,h,i)perylene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Benzo(k)fluoranthene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Chrysene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Dibenz(a,h)anthracene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Fluoranthene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Fluorene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Indeno(1,2,3-cd)pyrene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Naphthalene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Phenanthrene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Pyrene	< 0.0000998		0.0000998	mg/L	1	16-Mar-2023 15:49
Surr: 2-Fluorobiphenyl	*102*		*32-130*	*%REC*	*1*	*16-Mar-2023 15:49*
Surr: 4-Terphenyl-d14	*78.6*		*40-135*	*%REC*	*1*	*16-Mar-2023 15:49*
Surr: Nitrobenzene-d5	*98.3*		*45-142*	*%REC*	*1*	*16-Mar-2023 15:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: EB030823
Collection Date: 08-Mar-2023 10:10

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-14
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	10-Mar-2023 23:53
Surr: 1,2-Dichloroethane-d4	*101*		*70-126*	*%REC*	*1*	*10-Mar-2023 23:53*
Surr: 4-Bromofluorobenzene	*106*		*77-113*	*%REC*	*1*	*10-Mar-2023 23:53*
Surr: Dibromofluoromethane	*91.0*		*77-123*	*%REC*	*1*	*10-Mar-2023 23:53*
Surr: Toluene-d8	*108*		*82-127*	*%REC*	*1*	*10-Mar-2023 23:53*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 15-Mar-2023		Analyst: MBG
Acenaphthene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Acenaphthylene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Anthracene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Benz(a)anthracene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Benzo(a)pyrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Benzo(b)fluoranthene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Benzo(g,h,i)perylene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Benzo(k)fluoranthene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Chrysene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Dibenz(a,h)anthracene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Fluoranthene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Fluorene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Indeno(1,2,3-cd)pyrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Naphthalene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Phenanthrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Pyrene	< 0.000101		0.000101	mg/L	1	16-Mar-2023 16:10
Surr: 2-Fluorobiphenyl	*102*		*32-130*	*%REC*	*1*	*16-Mar-2023 16:10*
Surr: 4-Terphenyl-d14	*102*		*40-135*	*%REC*	*1*	*16-Mar-2023 16:10*
Surr: Nitrobenzene-d5	*99.0*		*45-142*	*%REC*	*1*	*16-Mar-2023 16:10*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-11
Collection Date: 08-Mar-2023 10:55

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-15
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 04:48
Surr: 1,2-Dichloroethane-d4	*101*		*70-126*	*%REC*	*1*	*11-Mar-2023 04:48*
Surr: 4-Bromofluorobenzene	*104*		*77-113*	*%REC*	*1*	*11-Mar-2023 04:48*
Surr: Dibromofluoromethane	*90.5*		*77-123*	*%REC*	*1*	*11-Mar-2023 04:48*
Surr: Toluene-d8	*109*		*82-127*	*%REC*	*1*	*11-Mar-2023 04:48*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
Sample ID: MW-10
Collection Date: 08-Mar-2023 11:40

ANALYTICAL REPORT
WorkOrder:HS23030565
Lab ID:HS23030565-16
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	11-Mar-2023 05:09
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*11-Mar-2023 05:09*
Surr: 4-Bromofluorobenzene	*106*		*77-113*	*%REC*	*1*	*11-Mar-2023 05:09*
Surr: Dibromofluoromethane	*91.7*		*77-123*	*%REC*	*1*	*11-Mar-2023 05:09*
Surr: Toluene-d8	*108*		*82-127*	*%REC*	*1*	*11-Mar-2023 05:09*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 24-Mar-23

Weight / Prep Log

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: HS23030565

Batch ID: 190830 **Start Date:** 15 Mar 2023 10:00 **End Date:** 15 Mar 2023 13:00
Method: SW3511 **Prep Code:** 3511_PAH

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23030565-11		32.93 (mL)	2 (mL)	0.06073	40 mL Amber
HS23030565-12		32.74 (mL)	2 (mL)	0.06109	40 mL Amber
HS23030565-13		33.05 (mL)	2 (mL)	0.06051	40 mL Amber
HS23030565-14		32.52 (mL)	2 (mL)	0.0615	40 mL Amber

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: HS23030565

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 190830 (0)	**Test Name :** LOW-LEVEL PAHS - 8270D				**Matrix:** Water	
HS23030565-11	MW-8	08 Mar 2023 10:00		15 Mar 2023 10:00	16 Mar 2023 15:09	1
HS23030565-12	FD030823	08 Mar 2023 00:00		15 Mar 2023 10:00	16 Mar 2023 15:29	1
HS23030565-13	FB030823	08 Mar 2023 10:05		15 Mar 2023 10:00	16 Mar 2023 15:49	1
HS23030565-14	EB030823	08 Mar 2023 10:10		15 Mar 2023 10:00	16 Mar 2023 16:10	1
Batch ID: R429832 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23030565-01	MW-3S	07 Mar 2023 09:50			11 Mar 2023 01:59	1
HS23030565-02	MW-3D	07 Mar 2023 10:25			11 Mar 2023 02:20	1
HS23030565-03	MW-6S	07 Mar 2023 11:10			11 Mar 2023 02:42	1
HS23030565-04	MW-6D	07 Mar 2023 11:50			11 Mar 2023 03:03	1
HS23030565-05	MW-9S	07 Mar 2023 12:35			11 Mar 2023 03:24	1
HS23030565-06	FB030723	07 Mar 2023 10:30			10 Mar 2023 22:50	1
HS23030565-07	FD030723	07 Mar 2023 00:00			11 Mar 2023 00:35	1
HS23030565-08	EB030723	07 Mar 2023 12:40			10 Mar 2023 23:11	1
HS23030565-09	MW-17	08 Mar 2023 08:30			11 Mar 2023 03:45	1
HS23030565-10	MW-5	08 Mar 2023 09:15			11 Mar 2023 04:06	1
HS23030565-11	MW-8	08 Mar 2023 10:00			11 Mar 2023 04:27	1
HS23030565-13	FB030823	08 Mar 2023 10:05			10 Mar 2023 23:32	1
HS23030565-14	EB030823	08 Mar 2023 10:10			10 Mar 2023 23:53	1
HS23030565-15	MW-11	08 Mar 2023 10:55			11 Mar 2023 04:48	1
HS23030565-16	MW-10	08 Mar 2023 11:40			11 Mar 2023 05:09	1

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: HS23030565

QC BATCH REPORT

Batch ID: 190830 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

MBLK Sample ID: **MBLK-190830** Units: **ug/L** Analysis Date: **16-Mar-2023 14:08**
Client ID: Run ID: **SV-6_430922** SeqNo: **7194012** PrepDate: **15-Mar-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	< 0.100	0.100								
Acenaphthylene	< 0.100	0.100								
Anthracene	< 0.100	0.100								
Benz(a)anthracene	< 0.100	0.100								
Benzo(a)pyrene	< 0.100	0.100								
Benzo(b)fluoranthene	< 0.100	0.100								
Benzo(g,h,i)perylene	< 0.100	0.100								
Benzo(k)fluoranthene	< 0.100	0.100								
Chrysene	< 0.100	0.100								
Dibenz(a,h)anthracene	< 0.100	0.100								
Fluoranthene	< 0.100	0.100								
Fluorene	< 0.100	0.100								
Indeno(1,2,3-cd)pyrene	< 0.100	0.100								
Naphthalene	< 0.100	0.100								
Phenanthrene	< 0.100	0.100								
Pyrene	< 0.100	0.100								
Surr: 2-Fluorobiphenyl	*3.224*	*0.100*	*3.03*	*0*	*106*	*32 - 130*				
Surr: 4-Terphenyl-d14	*3.272*	*0.100*	*3.03*	*0*	*108*	*40 - 135*				
Surr: Nitrobenzene-d5	*3.142*	*0.100*	*3.03*	*0*	*104*	*45 - 142*				

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: HS23030565

QC BATCH REPORT

Batch ID: 190830 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

LCS Sample ID: **LCS-190830** Units: **ug/L** Analysis Date: **16-Mar-2023 14:29**
Client ID: Run ID: **SV-6_430922** SeqNo: **7194013** PrepDate: **15-Mar-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	3.125	0.100	3.03	0	103	40 - 140				
Acenaphthylene	2.907	0.100	3.03	0	95.9	40 - 140				
Anthracene	3.697	0.100	3.03	0	122	40 - 140				
Benz(a)anthracene	1.871	0.100	3.03	0	61.7	40 - 140				
Benzo(a)pyrene	2.226	0.100	3.03	0	73.5	40 - 140				
Benzo(b)fluoranthene	2.27	0.100	3.03	0	74.9	40 - 140				
Benzo(g,h,i)perylene	2.57	0.100	3.03	0	84.8	40 - 140				
Benzo(k)fluoranthene	1.925	0.100	3.03	0	63.5	40 - 140				
Chrysene	2.218	0.100	3.03	0	73.2	40 - 140				
Dibenz(a,h)anthracene	3.312	0.100	3.03	0	109	40 - 140				
Fluoranthene	2.395	0.100	3.03	0	79.0	40 - 140				
Fluorene	2.569	0.100	3.03	0	84.8	40 - 140				
Indeno(1,2,3-cd)pyrene	2.77	0.100	3.03	0	91.4	40 - 140				
Naphthalene	3.246	0.100	3.03	0	107	40 - 140				
Phenanthrene	2.003	0.100	3.03	0	66.1	40 - 140				
Pyrene	2.853	0.100	3.03	0	94.1	40 - 140				
Surr: 2-Fluorobiphenyl	*2.521*	*0.100*	*3.03*	*0*	*83.2*	*32 - 130*				
Surr: 4-Terphenyl-d14	*2.657*	*0.100*	*3.03*	*0*	*87.7*	*40 - 135*				
Surr: Nitrobenzene-d5	*2.214*	*0.100*	*3.03*	*0*	*73.1*	*45 - 142*				

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: HS23030565

QC BATCH REPORT

Batch ID: 190830 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

LCSD Sample ID: **LCSD-190830** Units: **ug/L** Analysis Date: **16-Mar-2023 14:49**
Client ID: Run ID: **SV-6_430922** SeqNo: **7194014** PrepDate: **15-Mar-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Acenaphthene	2.969	0.100	3.03	0	98.0	40 - 140	3.125	5.09	25	
Acenaphthylene	2.804	0.100	3.03	0	92.5	40 - 140	2.907	3.6	25	
Anthracene	2.849	0.100	3.03	0	94.0	40 - 140	3.697	25.9	25	R
Benz(a)anthracene	2.023	0.100	3.03	0	66.8	40 - 140	1.871	7.84	25	
Benzo(a)pyrene	2.309	0.100	3.03	0	76.2	40 - 140	2.226	3.65	25	
Benzo(b)fluoranthene	2.173	0.100	3.03	0	71.7	40 - 140	2.27	4.38	25	
Benzo(g,h,i)perylene	2.582	0.100	3.03	0	85.2	40 - 140	2.57	0.487	25	
Benzo(k)fluoranthene	2.679	0.100	3.03	0	88.4	40 - 140	1.925	32.7	25	R
Chrysene	2.032	0.100	3.03	0	67.1	40 - 140	2.218	8.76	25	
Dibenz(a,h)anthracene	3.583	0.100	3.03	0	118	40 - 140	3.312	7.88	25	
Fluoranthene	2.481	0.100	3.03	0	81.9	40 - 140	2.395	3.52	25	
Fluorene	2.283	0.100	3.03	0	75.4	40 - 140	2.569	11.8	25	
Indeno(1,2,3-cd)pyrene	3.087	0.100	3.03	0	102	40 - 140	2.77	10.8	25	
Naphthalene	3.259	0.100	3.03	0	108	40 - 140	3.246	0.399	25	
Phenanthrene	2.053	0.100	3.03	0	67.8	40 - 140	2.003	2.44	25	
Pyrene	3.132	0.100	3.03	0	103	40 - 140	2.853	9.35	25	
Surr: 2-Fluorobiphenyl	*2.523*	*0.100*	*3.03*	*0*	*83.3*	*32 - 130*	*2.521*	*0.0817*	*25*	
Surr: 4-Terphenyl-d14	*3.046*	*0.100*	*3.03*	*0*	*101*	*40 - 135*	*2.657*	*13.6*	*25*	
Surr: Nitrobenzene-d5	*2.276*	*0.100*	*3.03*	*0*	*75.1*	*45 - 142*	*2.214*	*2.77*	*25*	

The following samples were analyzed in this batch: HS23030565-11 HS23030565-12 HS23030565-13 HS23030565-14

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: HS23030565

QC BATCH REPORT

Batch ID: R429832 (0) **Instrument: VOA6** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230310** Units: **ug/L** Analysis Date: **10-Mar-2023 22:29**
Client ID: Run ID: **VOA6_429832** SeqNo: **7167660** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	< 1.0	1.0							
Surr: 1,2-Dichloroethane-d4	*49.35*	*1.0*	*50*	*0*	*98.7*	*70 - 123*			
Surr: 4-Bromofluorobenzene	*53.26*	*1.0*	*50*	*0*	*107*	*77 - 113*			
Surr: Dibromofluoromethane	*45.61*	*1.0*	*50*	*0*	*91.2*	*73 - 126*			
Surr: Toluene-d8	*54.79*	*1.0*	*50*	*0*	*110*	*81 - 120*			

LCS Sample ID: **VLCSW-230310** Units: **ug/L** Analysis Date: **10-Mar-2023 21:47**
Client ID: Run ID: **VOA6_429832** SeqNo: **7167659** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	21.25	1.0	20	0	106	74 - 120			
Surr: 1,2-Dichloroethane-d4	*60.47*	*1.0*	*50*	*0*	*121*	*70 - 123*			
Surr: 4-Bromofluorobenzene	*54.22*	*1.0*	*50*	*0*	*108*	*77 - 113*			
Surr: Dibromofluoromethane	*54.87*	*1.0*	*50*	*0*	*110*	*73 - 126*			
Surr: Toluene-d8	*50.11*	*1.0*	*50*	*0*	*100*	*81 - 120*			

MS Sample ID: **HS23030452-10MS** Units: **ug/L** Analysis Date: **11-Mar-2023 00:56**
Client ID: Run ID: **VOA6_429832** SeqNo: **7167667** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.19	1.0	20	0	91.0	70 - 127			
Surr: 1,2-Dichloroethane-d4	*50.58*	*1.0*	*50*	*0*	*101*	*70 - 126*			
Surr: 4-Bromofluorobenzene	*52.68*	*1.0*	*50*	*0*	*105*	*77 - 113*			
Surr: Dibromofluoromethane	*45.27*	*1.0*	*50*	*0*	*90.5*	*77 - 123*			
Surr: Toluene-d8	*54.52*	*1.0*	*50*	*0*	*109*	*82 - 127*			

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: HS23030565

QC BATCH REPORT

Batch ID: R429832 (0) **Instrument: VOA6** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS23030452-10MSD** Units: **ug/L** Analysis Date: **11-Mar-2023 01:17**
Client ID: Run ID: **VOA6_429832** SeqNo: **7167668** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.2	1.0	20	0	96.0	70 - 127	18.19	5.41	20	
Surr: 1,2-Dichloroethane-d4	*49.8*	*1.0*	*50*	*0*	*99.6*	*70 - 126*	*50.58*	*1.55*	*20*	
Surr: 4-Bromofluorobenzene	*52.47*	*1.0*	*50*	*0*	*105*	*77 - 113*	*52.68*	*0.389*	*20*	
Surr: Dibromofluoromethane	*44.95*	*1.0*	*50*	*0*	*89.9*	*77 - 123*	*45.27*	*0.722*	*20*	
Surr: Toluene-d8	*54.17*	*1.0*	*50*	*0*	*108*	*82 - 127*	*54.52*	*0.657*	*20*	

The following samples were analyzed in this batch:

HS23030565-01	HS23030565-02	HS23030565-03	HS23030565-04
HS23030565-05	HS23030565-06	HS23030565-07	HS23030565-08
HS23030565-09	HS23030565-10	HS23030565-11	HS23030565-13
HS23030565-14	HS23030565-15	HS23030565-16	

ALS Houston, US Date: 24-Mar-23

Client: ARCADIS U.S., Inc.
Project: 30122717 Brickland Refinery 1Q23
WorkOrder: **HS23030565**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

ALS Houston, US Date: 24-Mar-23

Sample Receipt Checklist

Work Order ID: HS23030565 **Date/Time Received:** 09-Mar-2023 10:30

Client Name: Arcadis-Baton Rouge **Received by:** Malcolm Burleson

Completed By:	/S/ Corey Grandits	10-Mar-2023 11:26	**Reviewed by:**	/S/ Dane J. Wacasey	24-Mar-2023 16:30
	eSignature	Date/Time		eSignature	Date/Time

Matrices: W Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:292573
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.1UC/0.6C	IR31	
Cooler(s)/Kit(s):	M Blue		
Date/Time sample(s) sent to storage:	3/09/23		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 292573

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis
Purchase Order	30122717 Task 250	Project Name	30122717 Brickland Refinery 1Q23	A 8260_LL_W (8260 Benzene ("Unpreserved")-7 day HT
Work Order		Project Number	30122717 Task 250	B 8270_PAH_LVI (8270 PAHs LVI)
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E F
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G
Phone	(225) 292-1004	Phone	(303) 471-3699	H
Fax		Fax		I
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis	J

HS23030565

ARCADIS U.S., Inc.

30122717 Brickland Refinery 1Q23

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-3S	3-7-23	0950	W	8	3	X										
2	MW-3D	3-7-23	1025	W	8	3	X										
3	MW-6S	3-7-23	1110	W	8	3	X										
4	MW-6D	3-7-23	1150	W	8	3	X										
5	MW-9S	3-7-23	1235	W	8	3	X										
6	FB030723	3-7-23	1030	W	8	3	X										
7	FD030723	3-7-23	—	W	8	3	X										
8	EB030723	3-7-23	1240	W	8	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon DMSolon

Shipment Method: FED EX

Required Turnaround Time: (Check Box) [X] STD 10 WK Days [ ] 5 WK Days [ ] 2 WK Days [ ] 48 Hour [ ] Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
DMSolon	3-8-23	1300	
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: [AGM Brickland NM]

Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)
	1.1	[X] Level II Standard QC
	-0.3	[ ] Level III Std QC + Forms
		[ ] Level IV (Full Data Pkg)
		[ ] EDD (Type)

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 292572

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30122717 Task 250	Project Name	30122717 Brickland Refinery 1Q23	A	8260 LL VI (8296 Benzene, "Unpreserved" 7 day HT
Work Order		Project Number	30122717 Task 250	B	8270 PAH LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi	J	

HS23030565
ARCADIS U.S., Inc.
30122717 Brickland Refinery 1Q23

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-17	3-8-23	0830	W	8	3	X										
2	MW-5	3-8-23	0915	W	8	3	X										
3	MW-8	3-8-23	1000	W	8	6	X	X									
4	FD030823	3-8-23	—	W	8	3		X									
5	FB030823	3-8-23	1005	W	8	6	X	X									
6	EB030823	3-8-23	1010	W	8	6	X	X									
7	MW-11	3-8-23	1055	W	8	3	X										
8	MW-10	3-8-23	1140	W	8	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 Bus. Days [ ] 5 Bus. Days [ ] 2 Bus. Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by: Date: 3-8-23 Time: 1305 Received by:

Relinquished by: Date: Time: Received by (Laboratory):

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: [AGM: Brickland NM]

Cooler ID | Cooler Temp.

QC Package: (Check One Box Below) [X] Standard

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

M. Blue

CUSTODY SEAL
Date: 3.8.23 Time: 7:10
Name: D. Solon
Company:

Seal Broken By:
Date: 03/09/23

M. Blue

M. Blue

ORIGIN ID:SGRA (915) 603-1015
DOUG SOLON
ARCADIS U.S., INC.
401 E MAIN STREET
SUITE 400
EL PASO, TX 79901
UNITED STATES US

SHIP DATE: 01MAR23
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3816
DIMS: 19x16x13 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5856
REF: BRICKLAND REFINERY - 91207 - DW

RMA:

FedEx Express

FedEx
TRK# 0221 6230 2995 7581

THU - 09 MAR 10:30A
PRIORITY OVERNIGHT

NA SGRA

77099
TX-US IAH

EXP 08/23

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 15, 2023

Max Moran
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS23060569**

Laboratory Results for: **30167857 Brickland Refinery 1Q23**

Dear Max Moran,

ALS Environmental received 16 sample(s) on Jun 08, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
James Guin

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Work Order: HS23060569

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23060569-01	MW-3S	Water		06-Jun-2023 09:35	08-Jun-2023 09:40	☐
HS23060569-02	MW-3D	Water		06-Jun-2023 10:10	08-Jun-2023 09:40	☐
HS23060569-03	MW-6S	Water		06-Jun-2023 10:55	08-Jun-2023 09:40	☐
HS23060569-04	MW-6D	Water		06-Jun-2023 11:30	08-Jun-2023 09:40	☐
HS23060569-05	MW-9S	Water		06-Jun-2023 12:15	08-Jun-2023 09:40	☐
HS23060569-06	FB060623	Water		06-Jun-2023 10:20	08-Jun-2023 09:40	☐
HS23060569-07	FD060623	Water		06-Jun-2023 00:00	08-Jun-2023 09:40	☐
HS23060569-08	EB060623	Water		06-Jun-2023 12:25	08-Jun-2023 09:40	☐
HS23060569-09	MW-17	Water		06-Jun-2023 13:10	08-Jun-2023 09:40	☐
HS23060569-10	MW-5	Water		07-Jun-2023 08:55	08-Jun-2023 09:40	☐
HS23060569-11	MW-8	Water		07-Jun-2023 09:40	08-Jun-2023 09:40	☐
HS23060569-12	FD060723	Water		07-Jun-2023 00:00	08-Jun-2023 09:40	☐
HS23060569-13	FB060723	Water		07-Jun-2023 09:45	08-Jun-2023 09:40	☐
HS23060569-14	EB060723	Water		07-Jun-2023 09:50	08-Jun-2023 09:40	☐
HS23060569-15	MW-11	Water		07-Jun-2023 10:45	08-Jun-2023 09:40	☐
HS23060569-16	MW-10	Water		07-Jun-2023 11:30	08-Jun-2023 09:40	☐

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc. **CASE NARRATIVE**
Project: 30167857 Brickland Refinery 1Q23
Work Order: HS23060569

GCMS Semivolatiles by Method SW8270

Batch ID: 195114

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R437699

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R437820

Sample ID: HS23060563-11MSD

- MSD was performed on unrelated sample

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-3S
Collection Date: 06-Jun-2023 09:35

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 12:27
Surr: 1,2-Dichloroethane-d4	*105*		*70-126*	*%REC*	*1*	*13-Jun-2023 12:27*
Surr: 4-Bromofluorobenzene	*99.5*		*77-113*	*%REC*	*1*	*13-Jun-2023 12:27*
Surr: Dibromofluoromethane	*102*		*77-123*	*%REC*	*1*	*13-Jun-2023 12:27*
Surr: Toluene-d8	*103*		*82-127*	*%REC*	*1*	*13-Jun-2023 12:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-3D
Collection Date: 06-Jun-2023 10:10

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 11:01
Surr: 1,2-Dichloroethane-d4	*104*		*70-126*	*%REC*	*1*	*13-Jun-2023 11:01*
Surr: 4-Bromofluorobenzene	*102*		*77-113*	*%REC*	*1*	*13-Jun-2023 11:01*
Surr: Dibromofluoromethane	*100*		*77-123*	*%REC*	*1*	*13-Jun-2023 11:01*
Surr: Toluene-d8	*104*		*82-127*	*%REC*	*1*	*13-Jun-2023 11:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-6S
Collection Date: 06-Jun-2023 10:55

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 11:22
Surr: 1,2-Dichloroethane-d4	*103*		*70-126*	*%REC*	*1*	*13-Jun-2023 11:22*
Surr: 4-Bromofluorobenzene	*103*		*77-113*	*%REC*	*1*	*13-Jun-2023 11:22*
Surr: Dibromofluoromethane	*100*		*77-123*	*%REC*	*1*	*13-Jun-2023 11:22*
Surr: Toluene-d8	*105*		*82-127*	*%REC*	*1*	*13-Jun-2023 11:22*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-6D
Collection Date: 06-Jun-2023 11:30

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-04
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 11:45
Surr: 1,2-Dichloroethane-d4	*104*		*70-126*	*%REC*	*1*	*13-Jun-2023 11:45*
Surr: 4-Bromofluorobenzene	*100*		*77-113*	*%REC*	*1*	*13-Jun-2023 11:45*
Surr: Dibromofluoromethane	*99.2*		*77-123*	*%REC*	*1*	*13-Jun-2023 11:45*
Surr: Toluene-d8	*105*		*82-127*	*%REC*	*1*	*13-Jun-2023 11:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-9S
Collection Date: 06-Jun-2023 12:15

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-05
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 12:06
Surr: 1,2-Dichloroethane-d4	*101*		*70-126*	*%REC*	*1*	*13-Jun-2023 12:06*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*1*	*13-Jun-2023 12:06*
Surr: Dibromofluoromethane	*99.6*		*77-123*	*%REC*	*1*	*13-Jun-2023 12:06*
Surr: Toluene-d8	*104*		*82-127*	*%REC*	*1*	*13-Jun-2023 12:06*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: FB060623
Collection Date: 06-Jun-2023 10:20

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 10:19
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*13-Jun-2023 10:19*
Surr: 4-Bromofluorobenzene	*104*		*77-113*	*%REC*	*1*	*13-Jun-2023 10:19*
Surr: Dibromofluoromethane	*100*		*77-123*	*%REC*	*1*	*13-Jun-2023 10:19*
Surr: Toluene-d8	*102*		*82-127*	*%REC*	*1*	*13-Jun-2023 10:19*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: FD060623
Collection Date: 06-Jun-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-07
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 12:48
Surr: 1,2-Dichloroethane-d4	*107*		*70-126*	*%REC*	*1*	*13-Jun-2023 12:48*
Surr: 4-Bromofluorobenzene	*103*		*77-113*	*%REC*	*1*	*13-Jun-2023 12:48*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*1*	*13-Jun-2023 12:48*
Surr: Toluene-d8	*105*		*82-127*	*%REC*	*1*	*13-Jun-2023 12:48*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: EB060623
Collection Date: 06-Jun-2023 12:25

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-08
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 10:40
Surr: 1,2-Dichloroethane-d4	*105*		*70-126*	*%REC*	*1*	*13-Jun-2023 10:40*
Surr: 4-Bromofluorobenzene	*101*		*77-113*	*%REC*	*1*	*13-Jun-2023 10:40*
Surr: Dibromofluoromethane	*104*		*77-123*	*%REC*	*1*	*13-Jun-2023 10:40*
Surr: Toluene-d8	*101*		*82-127*	*%REC*	*1*	*13-Jun-2023 10:40*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-17
Collection Date: 06-Jun-2023 13:10

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-09
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 14:54
Surr: 1,2-Dichloroethane-d4	*102*		*70-126*	*%REC*	*1*	*13-Jun-2023 14:54*
Surr: 4-Bromofluorobenzene	*102*		*77-113*	*%REC*	*1*	*13-Jun-2023 14:54*
Surr: Dibromofluoromethane	*99.8*		*77-123*	*%REC*	*1*	*13-Jun-2023 14:54*
Surr: Toluene-d8	*104*		*82-127*	*%REC*	*1*	*13-Jun-2023 14:54*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-5
Collection Date: 07-Jun-2023 08:55

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-10
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	**0.026**		**0.0050**	**mg/L**	5	13-Jun-2023 13:51
Surr: 1,2-Dichloroethane-d4	*103*		*70-126*	*%REC*	*5*	*13-Jun-2023 13:51*
Surr: 4-Bromofluorobenzene	*102*		*77-113*	*%REC*	*5*	*13-Jun-2023 13:51*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*5*	*13-Jun-2023 13:51*
Surr: Toluene-d8	*103*		*82-127*	*%REC*	*5*	*13-Jun-2023 13:51*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-8
Collection Date: 07-Jun-2023 09:40

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-11
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: FT
Benzene	**0.30**		**0.010**	**mg/L**	10	14-Jun-2023 11:41
Surr: 1,2-Dichloroethane-d4	*105*		*70-126*	*%REC*	*10*	*14-Jun-2023 11:41*
Surr: 4-Bromofluorobenzene	*100*		*77-113*	*%REC*	*10*	*14-Jun-2023 11:41*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*10*	*14-Jun-2023 11:41*
Surr: Toluene-d8	*101*		*82-127*	*%REC*	*10*	*14-Jun-2023 11:41*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 13-Jun-2023		Analyst: JL
Acenaphthene	**0.000822**		**0.000105**	**mg/L**	1	13-Jun-2023 21:51
Acenaphthylene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Anthracene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Benz(a)anthracene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Benzo(a)pyrene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Benzo(b)fluoranthene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Benzo(g,h,i)perylene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Benzo(k)fluoranthene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Chrysene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Dibenz(a,h)anthracene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Fluoranthene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Fluorene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Indeno(1,2,3-cd)pyrene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Naphthalene	**0.00148**		**0.000105**	**mg/L**	1	13-Jun-2023 21:51
Phenanthrene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Pyrene	< 0.000105		0.000105	mg/L	1	13-Jun-2023 21:51
Surr: 2-Fluorobiphenyl	*122*		*32-130*	*%REC*	*1*	*13-Jun-2023 21:51*
Surr: 4-Terphenyl-d14	*126*		*40-135*	*%REC*	*1*	*13-Jun-2023 21:51*
Surr: Nitrobenzene-d5	*132*		*45-142*	*%REC*	*1*	*13-Jun-2023 21:51*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: FD060723
Collection Date: 07-Jun-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-12
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D	**Method:SW8270**			Prep:SW3511 / 13-Jun-2023		Analyst: JL
Acenaphthene	**0.000777**		**0.000104**	**mg/L**	1	13-Jun-2023 22:11
Acenaphthylene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Anthracene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Benz(a)anthracene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Benzo(a)pyrene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Benzo(b)fluoranthene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Benzo(g,h,i)perylene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Benzo(k)fluoranthene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Chrysene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Dibenz(a,h)anthracene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Fluoranthene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Fluorene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Indeno(1,2,3-cd)pyrene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Naphthalene	**0.00127**		**0.000104**	**mg/L**	1	13-Jun-2023 22:11
Phenanthrene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Pyrene	< 0.000104		0.000104	mg/L	1	13-Jun-2023 22:11
Surr: 2-Fluorobiphenyl	*115*		*32-130*	*%REC*	*1*	*13-Jun-2023 22:11*
Surr: 4-Terphenyl-d14	*118*		*40-135*	*%REC*	*1*	*13-Jun-2023 22:11*
Surr: Nitrobenzene-d5	*131*		*45-142*	*%REC*	*1*	*13-Jun-2023 22:11*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc. **ANALYTICAL REPORT**
Project: 30167857 Brickland Refinery 1Q23 WorkOrder:HS23060569
Sample ID: FB060723 Lab ID:HS23060569-13
Collection Date: 07-Jun-2023 09:45 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 14:12
Surr: 1,2-Dichloroethane-d4	*103*		*70-126*	*%REC*	*1*	*13-Jun-2023 14:12*
Surr: 4-Bromofluorobenzene	*102*		*77-113*	*%REC*	*1*	*13-Jun-2023 14:12*
Surr: Dibromofluoromethane	*100*		*77-123*	*%REC*	*1*	*13-Jun-2023 14:12*
Surr: Toluene-d8	*106*		*82-127*	*%REC*	*1*	*13-Jun-2023 14:12*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 13-Jun-2023		Analyst: JL
Acenaphthene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Acenaphthylene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Anthracene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Benz(a)anthracene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Benzo(a)pyrene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Benzo(b)fluoranthene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Benzo(g,h,i)perylene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Benzo(k)fluoranthene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Chrysene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Dibenz(a,h)anthracene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Fluoranthene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Fluorene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Indeno(1,2,3-cd)pyrene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Naphthalene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Phenanthrene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Pyrene	< 0.000106		0.000106	mg/L	1	13-Jun-2023 22:32
Surr: 2-Fluorobiphenyl	*129*		*32-130*	*%REC*	*1*	*13-Jun-2023 22:32*
Surr: 4-Terphenyl-d14	*127*		*40-135*	*%REC*	*1*	*13-Jun-2023 22:32*
Surr: Nitrobenzene-d5	*131*		*45-142*	*%REC*	*1*	*13-Jun-2023 22:32*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: EB060723
Collection Date: 07-Jun-2023 09:50

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-14
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 14:33
Surr: 1,2-Dichloroethane-d4	*103*		*70-126*	*%REC*	*1*	*13-Jun-2023 14:33*
Surr: 4-Bromofluorobenzene	*101*		*77-113*	*%REC*	*1*	*13-Jun-2023 14:33*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*1*	*13-Jun-2023 14:33*
Surr: Toluene-d8	*104*		*82-127*	*%REC*	*1*	*13-Jun-2023 14:33*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 13-Jun-2023		Analyst: JL
Acenaphthene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Acenaphthylene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Anthracene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Benz(a)anthracene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Benzo(a)pyrene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Benzo(b)fluoranthene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Benzo(g,h,i)perylene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Benzo(k)fluoranthene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Chrysene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Dibenz(a,h)anthracene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Fluoranthene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Fluorene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Indeno(1,2,3-cd)pyrene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Naphthalene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Phenanthrene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Pyrene	< 0.000107		0.000107	mg/L	1	13-Jun-2023 22:52
Surr: 2-Fluorobiphenyl	*129*		*32-130*	*%REC*	*1*	*13-Jun-2023 22:52*
Surr: 4-Terphenyl-d14	*125*		*40-135*	*%REC*	*1*	*13-Jun-2023 22:52*
Surr: Nitrobenzene-d5	*128*		*45-142*	*%REC*	*1*	*13-Jun-2023 22:52*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-11
Collection Date: 07-Jun-2023 10:45

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-15
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 15:36
Surr: 1,2-Dichloroethane-d4	*107*		*70-126*	*%REC*	*1*	*13-Jun-2023 15:36*
Surr: 4-Bromofluorobenzene	*104*		*77-113*	*%REC*	*1*	*13-Jun-2023 15:36*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*1*	*13-Jun-2023 15:36*
Surr: Toluene-d8	*103*		*82-127*	*%REC*	*1*	*13-Jun-2023 15:36*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
Sample ID: MW-10
Collection Date: 07-Jun-2023 11:30

ANALYTICAL REPORT
WorkOrder:HS23060569
Lab ID:HS23060569-16
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: FT
Benzene	< 0.0010		0.0010	mg/L	1	13-Jun-2023 15:57
Surr: 1,2-Dichloroethane-d4	*104*		*70-126*	*%REC*	*1*	*13-Jun-2023 15:57*
Surr: 4-Bromofluorobenzene	*99.4*		*77-113*	*%REC*	*1*	*13-Jun-2023 15:57*
Surr: Dibromofluoromethane	*100*		*77-123*	*%REC*	*1*	*13-Jun-2023 15:57*
Surr: Toluene-d8	*103*		*82-127*	*%REC*	*1*	*13-Jun-2023 15:57*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 15-Jun-23

Weight / Prep Log

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

Batch ID: 195114 **Start Date:** 13 Jun 2023 14:00 **End Date:** 13 Jun 2023 14:00
Method: SW3511 **Prep Code:** 3511_PAH

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23060569-11		31.53 (mL)	2 (mL)	0.06343	40 mL Amber
HS23060569-12		31.81 (mL)	2 (mL)	0.06287	40 mL VOA vial, Neat
HS23060569-13		31.19 (mL)	2 (mL)	0.06412	40 mL Amber
HS23060569-14		30.94 (mL)	2 (mL)	0.06464	40 mL Amber

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 195114 (0)	**Test Name :** LOW-LEVEL PAHS - 8270D				**Matrix:** Water	
HS23060569-11	MW-8	07 Jun 2023 09:40		13 Jun 2023 14:00	13 Jun 2023 21:51	1
HS23060569-12	FD060723	07 Jun 2023 00:00		13 Jun 2023 14:00	13 Jun 2023 22:11	1
HS23060569-13	FB060723	07 Jun 2023 09:45		13 Jun 2023 14:00	13 Jun 2023 22:32	1
HS23060569-14	EB060723	07 Jun 2023 09:50		13 Jun 2023 14:00	13 Jun 2023 22:52	1
Batch ID: R437699 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23060569-01	MW-3S	06 Jun 2023 09:35			13 Jun 2023 12:27	1
HS23060569-02	MW-3D	06 Jun 2023 10:10			13 Jun 2023 11:01	1
HS23060569-03	MW-6S	06 Jun 2023 10:55			13 Jun 2023 11:22	1
HS23060569-04	MW-6D	06 Jun 2023 11:30			13 Jun 2023 11:45	1
HS23060569-05	MW-9S	06 Jun 2023 12:15			13 Jun 2023 12:06	1
HS23060569-06	FB060623	06 Jun 2023 10:20			13 Jun 2023 10:19	1
HS23060569-07	FD060623	06 Jun 2023 00:00			13 Jun 2023 12:48	1
HS23060569-08	EB060623	06 Jun 2023 12:25			13 Jun 2023 10:40	1
HS23060569-09	MW-17	06 Jun 2023 13:10			13 Jun 2023 14:54	1
HS23060569-10	MW-5	07 Jun 2023 08:55			13 Jun 2023 13:51	5
HS23060569-13	FB060723	07 Jun 2023 09:45			13 Jun 2023 14:12	1
HS23060569-14	EB060723	07 Jun 2023 09:50			13 Jun 2023 14:33	1
HS23060569-15	MW-11	07 Jun 2023 10:45			13 Jun 2023 15:36	1
HS23060569-16	MW-10	07 Jun 2023 11:30			13 Jun 2023 15:57	1
Batch ID: R437820 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23060569-11	MW-8	07 Jun 2023 09:40			14 Jun 2023 11:41	10

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

QC BATCH REPORT

Batch ID: 195114 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

MBLK Sample ID: **MBLK-195114** Units: **ug/L** Analysis Date: **13-Jun-2023 17:27**
Client ID: Run ID: **SV-6_437803** SeqNo: **7360710** PrepDate: **13-Jun-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	< 0.100	0.100								
Acenaphthylene	< 0.100	0.100								
Anthracene	< 0.100	0.100								
Benz(a)anthracene	< 0.100	0.100								
Benzo(a)pyrene	< 0.100	0.100								
Benzo(b)fluoranthene	< 0.100	0.100								
Benzo(g,h,i)perylene	< 0.100	0.100								
Benzo(k)fluoranthene	< 0.100	0.100								
Chrysene	< 0.100	0.100								
Dibenz(a,h)anthracene	< 0.100	0.100								
Fluoranthene	< 0.100	0.100								
Fluorene	< 0.100	0.100								
Indeno(1,2,3-cd)pyrene	< 0.100	0.100								
Naphthalene	< 0.100	0.100								
Phenanthrene	< 0.100	0.100								
Pyrene	< 0.100	0.100								
Surr: 2-Fluorobiphenyl	*3.92*	*0.100*	*3.03*	*0*	*129*	*32 - 130*				
Surr: 4-Terphenyl-d14	*3.715*	*0.100*	*3.03*	*0*	*123*	*40 - 135*				
Surr: Nitrobenzene-d5	*4.087*	*0.100*	*3.03*	*0*	*135*	*45 - 142*				

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

QC BATCH REPORT

Batch ID: 195114 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

LCS Sample ID: **LCS-195114** Units: **ug/L** Analysis Date: **13-Jun-2023 17:47**
Client ID: Run ID: **SV-6_437803** SeqNo: **7360711** PrepDate: **13-Jun-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	3.826	0.100	3.03	0	126	40 - 140				
Acenaphthylene	3.58	0.100	3.03	0	118	40 - 140				
Anthracene	3.445	0.100	3.03	0	114	40 - 140				
Benz(a)anthracene	3.889	0.100	3.03	0	128	40 - 140				
Benzo(a)pyrene	3.094	0.100	3.03	0	102	40 - 140				
Benzo(b)fluoranthene	3.419	0.100	3.03	0	113	40 - 140				
Benzo(g,h,i)perylene	3.896	0.100	3.03	0	129	40 - 140				
Benzo(k)fluoranthene	3.556	0.100	3.03	0	117	40 - 140				
Chrysene	2.941	0.100	3.03	0	97.0	40 - 140				
Dibenz(a,h)anthracene	2.941	0.100	3.03	0	97.1	40 - 140				
Fluoranthene	3.656	0.100	3.03	0	121	40 - 140				
Fluorene	3.111	0.100	3.03	0	103	40 - 140				
Indeno(1,2,3-cd)pyrene	3.08	0.100	3.03	0	102	40 - 140				
Naphthalene	3.11	0.100	3.03	0	103	40 - 140				
Phenanthrene	3.467	0.100	3.03	0	114	40 - 140				
Pyrene	3.488	0.100	3.03	0	115	40 - 140				
Surr: 2-Fluorobiphenyl	*3.639*	*0.100*	*3.03*	*0*	*120*	*32 - 130*				
Surr: 4-Terphenyl-d14	*3.832*	*0.100*	*3.03*	*0*	*126*	*40 - 135*				
Surr: Nitrobenzene-d5	*3.806*	*0.100*	*3.03*	*0*	*126*	*45 - 142*				

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

QC BATCH REPORT

Batch ID: 195114 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

LCSD Sample ID: **LCSD-195114** Units: **ug/L** Analysis Date: **13-Jun-2023 18:08**
Client ID: Run ID: **SV-6_437803** SeqNo: **7360712** PrepDate: **13-Jun-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Acenaphthene	3.892	0.100	3.03	0	128	40 - 140	3.826	1.73	25	
Acenaphthylene	3.755	0.100	3.03	0	124	40 - 140	3.58	4.77	25	
Anthracene	3.215	0.100	3.03	0	106	40 - 140	3.445	6.9	25	
Benz(a)anthracene	3.799	0.100	3.03	0	125	40 - 140	3.889	2.36	25	
Benzo(a)pyrene	3.025	0.100	3.03	0	99.8	40 - 140	3.094	2.28	25	
Benzo(b)fluoranthene	3.535	0.100	3.03	0	117	40 - 140	3.419	3.33	25	
Benzo(g,h,i)perylene	3.631	0.100	3.03	0	120	40 - 140	3.896	7.05	25	
Benzo(k)fluoranthene	3.507	0.100	3.03	0	116	40 - 140	3.556	1.4	25	
Chrysene	2.789	0.100	3.03	0	92.0	40 - 140	2.941	5.3	25	
Dibenz(a,h)anthracene	2.807	0.100	3.03	0	92.6	40 - 140	2.941	4.66	25	
Fluoranthene	3.428	0.100	3.03	0	113	40 - 140	3.656	6.45	25	
Fluorene	3.288	0.100	3.03	0	109	40 - 140	3.111	5.52	25	
Indeno(1,2,3-cd)pyrene	2.922	0.100	3.03	0	96.4	40 - 140	3.08	5.25	25	
Naphthalene	3.312	0.100	3.03	0	109	40 - 140	3.11	6.28	25	
Phenanthrene	3.282	0.100	3.03	0	108	40 - 140	3.467	5.47	25	
Pyrene	3.436	0.100	3.03	0	113	40 - 140	3.488	1.51	25	
Surr: 2-Fluorobiphenyl	*3.8*	*0.100*	*3.03*	*0*	*125*	*32 - 130*	*3.639*	*4.31*	*25*	
Surr: 4-Terphenyl-d14	*3.373*	*0.100*	*3.03*	*0*	*111*	*40 - 135*	*3.832*	*12.7*	*25*	
Surr: Nitrobenzene-d5	*3.877*	*0.100*	*3.03*	*0*	*128*	*45 - 142*	*3.806*	*1.86*	*25*	

The following samples were analyzed in this batch: HS23060569-11 HS23060569-12 HS23060569-13 HS23060569-14

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

QC BATCH REPORT

Batch ID: R437699 (0) **Instrument: VOA11** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230613** Units: **ug/L** Analysis Date: **13-Jun-2023 09:58**
Client ID: Run ID: **VOA11_437699** SeqNo: **7358410** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	< 1.0	1.0								
Surr: 1,2-Dichloroethane-d4	*50.34*	*1.0*	*50*	*0*	*101*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*51.01*	*1.0*	*50*	*0*	*102*	*77 - 113*				
Surr: Dibromofluoromethane	*49.32*	*1.0*	*50*	*0*	*98.6*	*73 - 126*				
Surr: Toluene-d8	*50.88*	*1.0*	*50*	*0*	*102*	*81 - 120*				

LCS Sample ID: **VLCSW-230613** Units: **ug/L** Analysis Date: **13-Jun-2023 09:16**
Client ID: Run ID: **VOA11_437699** SeqNo: **7358409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.56	1.0	20	0	92.8	74 - 120				
Surr: 1,2-Dichloroethane-d4	*49.85*	*1.0*	*50*	*0*	*99.7*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*52.96*	*1.0*	*50*	*0*	*106*	*77 - 113*				
Surr: Dibromofluoromethane	*50.48*	*1.0*	*50*	*0*	*101*	*73 - 126*				
Surr: Toluene-d8	*52.16*	*1.0*	*50*	*0*	*104*	*81 - 120*				

MS Sample ID: **HS23060569-01MS** Units: **ug/L** Analysis Date: **13-Jun-2023 13:09**
Client ID: **MW-3S** Run ID: **VOA11_437699** SeqNo: **7358607** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	16.63	1.0	20	0	83.1	70 - 127				
Surr: 1,2-Dichloroethane-d4	*50.86*	*1.0*	*50*	*0*	*102*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.88*	*1.0*	*50*	*0*	*102*	*77 - 113*				
Surr: Dibromofluoromethane	*50.44*	*1.0*	*50*	*0*	*101*	*77 - 123*				
Surr: Toluene-d8	*51.16*	*1.0*	*50*	*0*	*102*	*82 - 127*				

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

QC BATCH REPORT

Batch ID: R437699 (0) **Instrument:** VOA11 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS23060569-01MSD** Units: **ug/L** Analysis Date: **13-Jun-2023 13:30**
Client ID: **MW-3S** Run ID: **VOA11_437699** SeqNo: **7358608** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	15.45	1.0	20	0	77.3	70 - 127	16.63	7.34	20	
Surr: 1,2-Dichloroethane-d4	*50.14*	*1.0*	*50*	*0*	*100*	*70 - 126*	*50.86*	*1.44*	*20*	
Surr: 4-Bromofluorobenzene	*51.28*	*1.0*	*50*	*0*	*103*	*77 - 113*	*50.88*	*0.783*	*20*	
Surr: Dibromofluoromethane	*50.33*	*1.0*	*50*	*0*	*101*	*77 - 123*	*50.44*	*0.226*	*20*	
Surr: Toluene-d8	*50.17*	*1.0*	*50*	*0*	*100*	*82 - 127*	*51.16*	*1.95*	*20*	

The following samples were analyzed in this batch:

HS23060569-01	HS23060569-02	HS23060569-03	HS23060569-04
HS23060569-05	HS23060569-06	HS23060569-07	HS23060569-08
HS23060569-09	HS23060569-10	HS23060569-13	HS23060569-14
HS23060569-15	HS23060569-16		

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

QC BATCH REPORT

Batch ID: R437820 (0) **Instrument: VOA11** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230614** Units: **ug/L** Analysis Date: **14-Jun-2023 10:17**
Client ID: Run ID: **VOA11_437820** SeqNo: **7361033** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	< 1.0	1.0								
Surr: 1,2-Dichloroethane-d4	*52.12*	*1.0*	*50*	*0*	*104*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*50.66*	*1.0*	*50*	*0*	*101*	*77 - 113*				
Surr: Dibromofluoromethane	*51.4*	*1.0*	*50*	*0*	*103*	*73 - 126*				
Surr: Toluene-d8	*52.04*	*1.0*	*50*	*0*	*104*	*81 - 120*				

LCS Sample ID: **VLCSW-230614** Units: **ug/L** Analysis Date: **14-Jun-2023 09:35**
Client ID: Run ID: **VOA11_437820** SeqNo: **7361032** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	17.38	1.0	20	0	86.9	74 - 120				
Surr: 1,2-Dichloroethane-d4	*50.08*	*1.0*	*50*	*0*	*100*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*51.92*	*1.0*	*50*	*0*	*104*	*77 - 113*				
Surr: Dibromofluoromethane	*50.52*	*1.0*	*50*	*0*	*101*	*73 - 126*				
Surr: Toluene-d8	*50.81*	*1.0*	*50*	*0*	*102*	*81 - 120*				

MS Sample ID: **HS23060563-11MS** Units: **ug/L** Analysis Date: **14-Jun-2023 10:59**
Client ID: Run ID: **VOA11_437820** SeqNo: **7361035** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	65.64	1.0	20	51.19	72.3	70 - 127				
Surr: 1,2-Dichloroethane-d4	*49.88*	*1.0*	*50*	*0*	*99.8*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.97*	*1.0*	*50*	*0*	*102*	*77 - 113*				
Surr: Dibromofluoromethane	*48.72*	*1.0*	*50*	*0*	*97.4*	*77 - 123*				
Surr: Toluene-d8	*50.86*	*1.0*	*50*	*0*	*102*	*82 - 127*				

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: HS23060569

QC BATCH REPORT

Batch ID: R437820 (0) **Instrument:** VOA11 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS23060563-11MSD** Units: **ug/L** Analysis Date: **14-Jun-2023 11:20**
Client ID: Run ID: **VOA11_437820** SeqNo: **7361036** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	63.98	1.0	20	51.19	64.0	70 - 127	65.64	2.56	20	S
Surr: 1,2-Dichloroethane-d4	*50.4*	*1.0*	*50*	*0*	*101*	*70 - 126*	*49.88*	*1.03*	*20*	
Surr: 4-Bromofluorobenzene	*50.22*	*1.0*	*50*	*0*	*100*	*77 - 113*	*50.97*	*1.48*	*20*	
Surr: Dibromofluoromethane	*48.12*	*1.0*	*50*	*0*	*96.2*	*77 - 123*	*48.72*	*1.24*	*20*	
Surr: Toluene-d8	*51.69*	*1.0*	*50*	*0*	*103*	*82 - 127*	*50.86*	*1.62*	*20*	

The following samples were analyzed in this batch: HS23060569-11

ALS Houston, US Date: 15-Jun-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 1Q23
WorkOrder: **HS23060569**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
Dept of Defense	L23-358	31-May-2025
Florida	E87611-37	30-Jun-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-23-31	30-Apr-2024
Utah	TX026932022-13	31-Jul-2023

ALS Houston, US Date: 15-Jun-23

Sample Receipt Checklist

Work Order ID: HS23060569 **Date/Time Received:** 08-Jun-2023 09:40

Client Name: Arcadis-Baton Rouge **Received by:** Malcolm Burleson

Completed By: /S/ Nilesh D. Ranchod (eSignature) 10-Jun-2023 11:36 (Date/Time) **Reviewed by:** (eSignature) (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:269094/269095
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.0C/1.9C UC/C	IR 31	
Cooler(s)/Kit(s):	51033		
Date/Time sample(s) sent to storage:	06/08/2023 18:00		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 269094

ALS Project Manager:	ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	US3460007057	Project Name	30167657 Brickland Refinery 2023	A	(8260 Benzene ("Unpreserved")-7 day HT [3xV/OANeat]
Work Order		Project Number	30167657	B	8270_PAH_LVI (8270 PAHs (LVI)) [3xV/OAAmbNeat]
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3099	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis		

HS23060569
ARCADIS U.S., Inc.
30167857 Brickland Refinery 1Q23

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H
1	MW-17	6-6-23	1310	W	8	3	X							
2	MW-5	6-7-23	0855	W	8	3	X							
3	MW-8	6-7-23	0940	W	8	6	X	X						
4	FD060723	6-7-23	—	W	8	3		X						
5	FB060723	6-7-23	0945	W	8	36	X	X						
6	EB060723	6-7-23	0950	W	8	6	X	X						
7	MW-11	6-7-23	1045	W	8	3	X							
8	MW-10	6-7-23	1130	W	8	3	X							
9														
10														

Sampler(s) Please Print & Sign

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 W. Days [ ] 5 W. Days [ ] 2 W. Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
D M Solon	6-7-23	1211	
Relinquished by:	Date:	Time:	Received by (Laboratory): 0830303 0924
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: [AGM Brickland NM]

Cooler ID	Cooler Temp.
51033	6.0 inc
	0.1c

QC Package: (Check One Box Below)
[X] Level II Std QC
[ ] Level III Std QC + Forms
[ ] Level IV Std QC + EDD/ELIP
[ ] Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 269095

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	US346000705 7	Project Name	30167857 Brickland Refinery 2Q23	A	(8260 Benzene ("Unpreserved")-7 day HT [3x/CoANeat]
Work Order		Project Number	30167857	B	8270_PAH_LVI (8270 PAHs (LVI)) [3x/OAAmbNeat]
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D	
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(225) 292-1004	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadi	J	

HS23060569
ARCADIS U.S., Inc.
30167857 Brickland Refinery 1Q23

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H
1	MW-3S	6-6-23	0935	W	8	3	X							
2	MW-3D	6-6-23	1010	W	8	3	X							
3	MW-6S	6-6-23	1055	W	8	3	X							
4	MW-6D	6-6-23	1130	W	8	3	X							
5	MW-9S	6-6-23	1215	W	8	3	X							
6	FB060623	6-6-23	1020	W	8	3	X							
7	FD060623	6-6-23	—	W	8	3	X							
8	EB060623	6-6-23	1225	W	8	3	X							
9														
10														

Sampler(s) Please Print & Sign

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 W. Days [ ] 5 W. Days [ ] 2 W. Days [ ] Other

Results Due Date:

Relinquished by:	Date: 6-7-23	Time: 1210	Received by:	Notes: [AGM Brickland NM]
Relinquished by:	Date:	Time:	Received by (Laboratory): 06/07/23 0940	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Cooler ID	Cooler Temp.
	1.2-3.1
S10 33	2.0 w4
	0.1 C

QC Package: (Check One Box Below)
[X] Level II Std QC
[ ] Level II Std QC/Raw Data
[ ] Level IV (SW846) EP
[ ] Other
[ ] [illegible]
[ ] [illegible]

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS
19450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 6-7-23 Time: 1215

Name: Doug Soter

Company: ARCADIS

Seal Broken By:

Date:

FedEx
TRK# 0221 6230 2999 8880

THU – 08 JUN 10:30A
PRIORITY OVERNIGHT

NA SGRA

77099
TX – US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

September 08, 2023

Brooke Fontenot
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS23090270**

Laboratory Results for: **30167857 Brickland Refinery 2Q23**

Dear Brooke Fontenot,

ALS Environmental received 8 sample(s) on Sep 06, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
James Guin

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Work Order: HS23090270

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23090270-01	MW-3S	Water		05-Sep-2023 09:50	06-Sep-2023 09:40	☐
HS23090270-02	MW-3D	Water		05-Sep-2023 10:30	06-Sep-2023 09:40	☐
HS23090270-03	FD090523	Water		05-Sep-2023 00:00	06-Sep-2023 09:40	☐
HS23090270-04	FB090523	Water		05-Sep-2023 10:40	06-Sep-2023 09:40	☐
HS23090270-05	MW-6S	Water		05-Sep-2023 11:15	06-Sep-2023 09:40	☐
HS23090270-06	MW-9	Water		05-Sep-2023 12:40	06-Sep-2023 09:40	☐
HS23090270-07	EB090523	Water		05-Sep-2023 12:45	06-Sep-2023 09:40	☐
HS23090270-08	Trip Blank	Water	CG-071023-531	05-Sep-2023 00:00	06-Sep-2023 09:40	☐

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc. **CASE NARRATIVE**
Project: 30167857 Brickland Refinery 2Q23
Work Order: HS23090270

GCMS Volatiles by Method SW8260

Batch ID: R445639,R445763

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-3S
Collection Date: 05-Sep-2023 09:50

ANALYTICAL REPORT
WorkOrder:HS23090270
Lab ID:HS23090270-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	06-Sep-2023 21:21
Surr: 1,2-Dichloroethane-d4	*100*		*70-126*	*%REC*	*1*	*06-Sep-2023 21:21*
Surr: 4-Bromofluorobenzene	*88.9*		*77-113*	*%REC*	*1*	*06-Sep-2023 21:21*
Surr: Dibromofluoromethane	*102*		*77-123*	*%REC*	*1*	*06-Sep-2023 21:21*
Surr: Toluene-d8	*106*		*82-127*	*%REC*	*1*	*06-Sep-2023 21:21*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-3D
Collection Date: 05-Sep-2023 10:30

ANALYTICAL REPORT
WorkOrder:HS23090270
Lab ID:HS23090270-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	06-Sep-2023 21:41
Surr: 1,2-Dichloroethane-d4	*97.9*		*70-126*	*%REC*	*1*	*06-Sep-2023 21:41*
Surr: 4-Bromofluorobenzene	*91.7*		*77-113*	*%REC*	*1*	*06-Sep-2023 21:41*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*1*	*06-Sep-2023 21:41*
Surr: Toluene-d8	*106*		*82-127*	*%REC*	*1*	*06-Sep-2023 21:41*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: FD090523
Collection Date: 05-Sep-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23090270
Lab ID:HS23090270-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	06-Sep-2023 22:02
Surr: 1,2-Dichloroethane-d4	*98.7*		*70-126*	*%REC*	*1*	*06-Sep-2023 22:02*
Surr: 4-Bromofluorobenzene	*92.4*		*77-113*	*%REC*	*1*	*06-Sep-2023 22:02*
Surr: Dibromofluoromethane	*100*		*77-123*	*%REC*	*1*	*06-Sep-2023 22:02*
Surr: Toluene-d8	*104*		*82-127*	*%REC*	*1*	*06-Sep-2023 22:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: FB090523
Collection Date: 05-Sep-2023 10:40

ANALYTICAL REPORT
WorkOrder:HS23090270
Lab ID:HS23090270-04
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	06-Sep-2023 20:40
Surr: 1,2-Dichloroethane-d4	*98.7*		*70-126*	*%REC*	*1*	*06-Sep-2023 20:40*
Surr: 4-Bromofluorobenzene	*88.3*		*77-113*	*%REC*	*1*	*06-Sep-2023 20:40*
Surr: Dibromofluoromethane	*102*		*77-123*	*%REC*	*1*	*06-Sep-2023 20:40*
Surr: Toluene-d8	*105*		*82-127*	*%REC*	*1*	*06-Sep-2023 20:40*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-6S
Collection Date: 05-Sep-2023 11:15

ANALYTICAL REPORT
WorkOrder:HS23090270
Lab ID:HS23090270-05
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	06-Sep-2023 22:22
Surr: 1,2-Dichloroethane-d4	*99.0*		*70-126*	*%REC*	*1*	*06-Sep-2023 22:22*
Surr: 4-Bromofluorobenzene	*92.0*		*77-113*	*%REC*	*1*	*06-Sep-2023 22:22*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*1*	*06-Sep-2023 22:22*
Surr: Toluene-d8	*101*		*82-127*	*%REC*	*1*	*06-Sep-2023 22:22*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-9
Collection Date: 05-Sep-2023 12:40

ANALYTICAL REPORT
WorkOrder:HS23090270
Lab ID:HS23090270-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	07-Sep-2023 22:42
Surr: 1,2-Dichloroethane-d4	*99.9*		*70-126*	*%REC*	*1*	*07-Sep-2023 22:42*
Surr: 4-Bromofluorobenzene	*93.2*		*77-113*	*%REC*	*1*	*07-Sep-2023 22:42*
Surr: Dibromofluoromethane	*98.1*		*77-123*	*%REC*	*1*	*07-Sep-2023 22:42*
Surr: Toluene-d8	*99.3*		*82-127*	*%REC*	*1*	*07-Sep-2023 22:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: EB090523
Collection Date: 05-Sep-2023 12:45

ANALYTICAL REPORT
WorkOrder:HS23090270
Lab ID:HS23090270-07
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: PC
Benzene	< 0.0010		0.0010	mg/L	1	06-Sep-2023 21:00
Surr: 1,2-Dichloroethane-d4	*96.6*		*70-126*	*%REC*	*1*	*06-Sep-2023 21:00*
Surr: 4-Bromofluorobenzene	*88.9*		*77-113*	*%REC*	*1*	*06-Sep-2023 21:00*
Surr: Dibromofluoromethane	*99.4*		*77-123*	*%REC*	*1*	*06-Sep-2023 21:00*
Surr: Toluene-d8	*103*		*82-127*	*%REC*	*1*	*06-Sep-2023 21:00*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090270

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R445639 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23090270-01	MW-3S	05 Sep 2023 09:50			06 Sep 2023 21:21	1
HS23090270-02	MW-3D	05 Sep 2023 10:30			06 Sep 2023 21:41	1
HS23090270-03	FD090523	05 Sep 2023 00:00			06 Sep 2023 22:02	1
HS23090270-04	FB090523	05 Sep 2023 10:40			06 Sep 2023 20:40	1
HS23090270-05	MW-6S	05 Sep 2023 11:15			06 Sep 2023 22:22	1
HS23090270-07	EB090523	05 Sep 2023 12:45			06 Sep 2023 21:00	1
Batch ID: R445763 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23090270-06	MW-9	05 Sep 2023 12:40			07 Sep 2023 22:42	1

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090270

QC BATCH REPORT

Batch ID: R445639 (0) **Instrument: VOA6** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230906** Units: **ug/L** Analysis Date: **06-Sep-2023 14:31**
Client ID: Run ID: **VOA6_445639** SeqNo: **7528228** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	< 1.0	1.0								
Surr: 1,2-Dichloroethane-d4	*49.69*	*1.0*	*50*	*0*	*99.4*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*45.34*	*1.0*	*50*	*0*	*90.7*	*77 - 113*				
Surr: Dibromofluoromethane	*51.16*	*1.0*	*50*	*0*	*102*	*73 - 126*				
Surr: Toluene-d8	*52.92*	*1.0*	*50*	*0*	*106*	*81 - 120*				

LCS Sample ID: **VLCSW-230906** Units: **ug/L** Analysis Date: **06-Sep-2023 13:50**
Client ID: Run ID: **VOA6_445639** SeqNo: **7528227** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.4	1.0	20	0	97.0	74 - 120				
Surr: 1,2-Dichloroethane-d4	*50.75*	*1.0*	*50*	*0*	*101*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*50.15*	*1.0*	*50*	*0*	*100*	*77 - 113*				
Surr: Dibromofluoromethane	*51*	*1.0*	*50*	*0*	*102*	*73 - 126*				
Surr: Toluene-d8	*48.86*	*1.0*	*50*	*0*	*97.7*	*81 - 120*				

MS Sample ID: **HS23090138-01MS** Units: **ug/L** Analysis Date: **06-Sep-2023 17:15**
Client ID: Run ID: **VOA6_445639** SeqNo: **7528231** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.4	1.0	20	0	107	70 - 127				
Surr: 1,2-Dichloroethane-d4	*49.09*	*1.0*	*50*	*0*	*98.2*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*46.93*	*1.0*	*50*	*0*	*93.9*	*77 - 113*				
Surr: Dibromofluoromethane	*49.94*	*1.0*	*50*	*0*	*99.9*	*77 - 123*				
Surr: Toluene-d8	*52.26*	*1.0*	*50*	*0*	*105*	*82 - 127*				

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090270

QC BATCH REPORT

Batch ID: R445639 (0) **Instrument: VOA6** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS23090138-01MSD** Units: **ug/L** Analysis Date: **06-Sep-2023 17:36**
Client ID: Run ID: **VOA6_445639** SeqNo: **7528232** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.11	1.0	20	0	106	70 - 127	21.4	1.35	20	
Surr: 1,2-Dichloroethane-d4	*48.27*	*1.0*	*50*	*0*	*96.5*	*70 - 126*	*49.09*	*1.69*	*20*	
Surr: 4-Bromofluorobenzene	*47.01*	*1.0*	*50*	*0*	*94.0*	*77 - 113*	*46.93*	*0.166*	*20*	
Surr: Dibromofluoromethane	*50.17*	*1.0*	*50*	*0*	*100*	*77 - 123*	*49.94*	*0.47*	*20*	
Surr: Toluene-d8	*51.29*	*1.0*	*50*	*0*	*103*	*82 - 127*	*52.26*	*1.86*	*20*	

The following samples were analyzed in this batch: HS23090270-01 HS23090270-02 HS23090270-03 HS23090270-04 HS23090270-05 HS23090270-07

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090270

QC BATCH REPORT

Batch ID: R445763 (0) **Instrument: VOA9** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230907** Units: **ug/L** Analysis Date: **07-Sep-2023 14:29**
Client ID: Run ID: **VOA9_445763** SeqNo: **7530757** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	< 1.0	1.0								
Surr: 1,2-Dichloroethane-d4	*48.93*	*1.0*	*50*	*0*	*97.9*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*47.3*	*1.0*	*50*	*0*	*94.6*	*77 - 113*				
Surr: Dibromofluoromethane	*50.15*	*1.0*	*50*	*0*	*100*	*73 - 126*				
Surr: Toluene-d8	*50.24*	*1.0*	*50*	*0*	*100*	*81 - 120*				

LCS Sample ID: **VLCSW-230907** Units: **ug/L** Analysis Date: **07-Sep-2023 13:44**
Client ID: Run ID: **VOA9_445763** SeqNo: **7530756** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.82	1.0	20	0	104	74 - 120				
Surr: 1,2-Dichloroethane-d4	*48.74*	*1.0*	*50*	*0*	*97.5*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*51.56*	*1.0*	*50*	*0*	*103*	*77 - 113*				
Surr: Dibromofluoromethane	*50.16*	*1.0*	*50*	*0*	*100*	*73 - 126*				
Surr: Toluene-d8	*50.47*	*1.0*	*50*	*0*	*101*	*81 - 120*				

MS Sample ID: **HS23090255-03MS** Units: **ug/L** Analysis Date: **07-Sep-2023 15:13**
Client ID: Run ID: **VOA9_445763** SeqNo: **7530759** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	110.5	5.0	100	0	111	70 - 127				
Surr: 1,2-Dichloroethane-d4	*204*	*5.0*	*250*	*0*	*81.6*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*256.8*	*5.0*	*250*	*0*	*103*	*77 - 113*				
Surr: Dibromofluoromethane	*222.2*	*5.0*	*250*	*0*	*88.9*	*77 - 123*				
Surr: Toluene-d8	*259.3*	*5.0*	*250*	*0*	*104*	*82 - 127*				

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090270

QC BATCH REPORT

Batch ID: R445763 (0) **Instrument:** VOA9 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS23090255-03MSD** Units: **ug/L** Analysis Date: **07-Sep-2023 15:36**
Client ID: Run ID: **VOA9_445763** SeqNo: **7530760** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	110.9	5.0	100	0	111	70 - 127	110.5	0.371	20	
Surr: 1,2-Dichloroethane-d4	*242.4*	*5.0*	*250*	*0*	*97.0*	*70 - 126*	*204*	*17.2*	*20*	
Surr: 4-Bromofluorobenzene	*259.3*	*5.0*	*250*	*0*	*104*	*77 - 113*	*256.8*	*0.97*	*20*	
Surr: Dibromofluoromethane	*249*	*5.0*	*250*	*0*	*99.6*	*77 - 123*	*222.2*	*11.4*	*20*	
Surr: Toluene-d8	*253*	*5.0*	*250*	*0*	*101*	*82 - 127*	*259.3*	*2.45*	*20*	

The following samples were analyzed in this batch: HS23090270-06

ALS Houston, US Date: 08-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: **HS23090270**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L23-358	31-May-2025
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2023-2024	30-Apr-2024
Texas	T104704231-23-31	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

ALS Houston, US Date: 08-Sep-23

Sample Receipt Checklist

Work Order ID: HS23090270 **Date/Time Received:** 06-Sep-2023 09:40

Client Name: Arcadis-Baton Rouge **Received by:** Corey Grandits

Completed By:	/S/ Malcolm Burleson	06-Sep-2023 14:13	**Reviewed by:**	/S/ James Guin	07-Sep-2023 09:52
	eSignature	Date/Time		eSignature	Date/Time

Matrices: water Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:269093
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.5uc 1.4c	ir31	
Cooler(s)/Kit(s):	blue		
Date/Time sample(s) sent to storage:	09062023		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Trip Blank received, not listed on COC and was placed on hold. Sample MW-6D was not received.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS

…, OH +1 513 733 5336 | Everett, WA +1 425 356 2600 | Fort Collins, CO +1 970 490 1511 | Holland, MI +1 616 399 6070

Chain of Custody Form

Page ____ of ____

COC ID: 269093

HS23090270
ARCADIS U.S., Inc.
30167857 Brickland Refinery 1Q23

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	US3460007057		
Work Order		Project Name	30167857 Brickland Refinery 2023
Company Name	ARCADIS U.S., Inc.	Project Number	30167857
Send Report To	Brooke Fontenot	Bill To Company	ARCADIS
Address	10352 Plaza Americana Drive	Invoice Attn	Accounts Payable
		Address	630 Plaza Drive, Suite 300
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129
Phone	(225) 292-1004	Phone	(303) 471-3696
Fax		Fax	
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis

	Analysis
A	8260 Benzene (Unpreserved) - 7 day HT [3xVOANeat]
B	8270_PAH_LVI (8270 PAHs (LVI)) [3xVOAAmbNeat]
C	
D	
E	
F	
G	
H	
I	
J	

Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
MW-3S	9-5-23	0950	W	Raw	3	X										
MW-3D	9-5-23	1030	W	Raw	3	X										
FD090523	9-5-23	—	W	Raw	3	X										
FB090523	9-5-23	1040	W	Raw	3	X										
MW-6S	9-5-23	1115	W	Raw	3	X										
MW-6D	9-5-23	1200	W	Raw	3	X										
~~t~~ MW-9	9-5-23	1240	W	Raw	3	X										
EB090523	9-5-23	1245	W	Raw	3	X										

Sampler(s) Please Print & Sign: [signature]

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other ____

Results Due Date:

Relinquished by: [signature] Date: 9-5-23 Time: 1430 Received by:

Relinquished by: Date: Time: Received by (Laboratory): [signature] 9.6.23 0946

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: [AGM Brickland NM]

Cooler ID	Cooler Temp.
RWE 1024	1.5°

QC Package: (Check One Box Below) [X] Level II Std QC [ ] Level III Std QC/Raw Data [ ] Level IV SW846/CLP [ ] Other [ ] TRRP Checklist [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
The Chain of Custody is a legal document. All information must be completed accurately.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Blue

CUSTODY SEAL

Date: 9.5.23 Time: 1430

Name: ARCADIS

Company:

Seal Broken By: SLV

Date: 09/06/23

Blue SEP 0 5 2023

ALS

Blue

ORIGIN ID:SGRA (915) 603-1015
DOUG SOLON
ARCADIS U.S., INC.
401 E MAIN STREET
SUITE 400
EL PASO, TX 79901
UNITED STATES US

SHIP DATE: 22AUG23
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3751
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: HUNTSMAN - B085081 - JG

RMA:

FedEx Express

FedEx

TRK# 6230 3004 4488
0221

WED - 06 SEP 10:30A
PRIORITY OVERNIGHT

NA SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

September 19, 2023

Max Moran
ARCADIS U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge, LA 70816

Work Order: **HS23090521**

Laboratory Results for: **30167857 Brickland Refinery 2Q23**

Dear Max Moran,

ALS Environmental received 10 sample(s) on Sep 08, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
James Guin

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Work Order: HS23090521

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23090521-01	MW-17	Water		07-Sep-2023 08:40	08-Sep-2023 09:45	☐
HS23090521-02	MW-5	Water		07-Sep-2023 09:25	08-Sep-2023 09:45	☐
HS23090521-03	MW-8	Water		07-Sep-2023 10:20	08-Sep-2023 09:45	☐
HS23090521-04	FD090723	Water		07-Sep-2023 00:00	08-Sep-2023 09:45	☐
HS23090521-05	FB090723	Water		07-Sep-2023 10:25	08-Sep-2023 09:45	☐
HS23090521-06	EB090723	Water		07-Sep-2023 10:30	08-Sep-2023 09:45	☐
HS23090521-07	MW-11	Water		07-Sep-2023 11:10	08-Sep-2023 09:45	☐
HS23090521-08	MW-10	Water		07-Sep-2023 11:50	08-Sep-2023 09:45	☐
HS23090521-09	MW-6D	Water		07-Sep-2023 12:40	08-Sep-2023 09:45	☐
HS23090521-10	Trip Blank	Water	cg-032223-NEAT-12	07-Sep-2023 00:00	08-Sep-2023 09:45	☐

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc. **CASE NARRATIVE**
Project: 30167857 Brickland Refinery 2Q23
Work Order: HS23090521

GCMS Semivolatiles by Method SW8270

Batch ID: 200333

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R446016,R446129

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-17
Collection Date: 07-Sep-2023 08:40

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	11-Sep-2023 22:52
Surr: 1,2-Dichloroethane-d4	*109*		*70-126*	*%REC*	*1*	*11-Sep-2023 22:52*
Surr: 4-Bromofluorobenzene	*95.6*		*77-113*	*%REC*	*1*	*11-Sep-2023 22:52*
Surr: Dibromofluoromethane	*110*		*77-123*	*%REC*	*1*	*11-Sep-2023 22:52*
Surr: Toluene-d8	*98.1*		*82-127*	*%REC*	*1*	*11-Sep-2023 22:52*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-5
Collection Date: 07-Sep-2023 09:25

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-02
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: KDN
Benzene	**0.076**		**0.0010**	**mg/L**	1	12-Sep-2023 12:02
Surr: 1,2-Dichloroethane-d4	*98.8*		*70-126*	*%REC*	*1*	*12-Sep-2023 12:02*
Surr: 4-Bromofluorobenzene	*96.6*		*77-113*	*%REC*	*1*	*12-Sep-2023 12:02*
Surr: Dibromofluoromethane	*94.8*		*77-123*	*%REC*	*1*	*12-Sep-2023 12:02*
Surr: Toluene-d8	*102*		*82-127*	*%REC*	*1*	*12-Sep-2023 12:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-8
Collection Date: 07-Sep-2023 10:20

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-03
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	12-Sep-2023 13:26
Surr: 1,2-Dichloroethane-d4	*98.0*		*70-126*	*%REC*	*1*	*12-Sep-2023 13:26*
Surr: 4-Bromofluorobenzene	*97.3*		*77-113*	*%REC*	*1*	*12-Sep-2023 13:26*
Surr: Dibromofluoromethane	*95.8*		*77-123*	*%REC*	*1*	*12-Sep-2023 13:26*
Surr: Toluene-d8	*102*		*82-127*	*%REC*	*1*	*12-Sep-2023 13:26*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 13-Sep-2023		Analyst: JLJ
Acenaphthene	**0.000803**		**0.000103**	**mg/L**	1	18-Sep-2023 13:27
Acenaphthylene	**0.000248**		**0.000103**	**mg/L**	1	18-Sep-2023 13:27
Anthracene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Benz(a)anthracene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Benzo(a)pyrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Benzo(b)fluoranthene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Benzo(g,h,i)perylene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Benzo(k)fluoranthene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Chrysene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Dibenz(a,h)anthracene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Fluoranthene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Fluorene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Indeno(1,2,3-cd)pyrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Naphthalene	**0.000524**		**0.000103**	**mg/L**	1	18-Sep-2023 13:27
Phenanthrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Pyrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 13:27
Surr: 2-Fluorobiphenyl	*102*		*32-130*	*%REC*	*1*	*18-Sep-2023 13:27*
Surr: 4-Terphenyl-d14	*110*		*40-135*	*%REC*	*1*	*18-Sep-2023 13:27*
Surr: Nitrobenzene-d5	*76.6*		*45-142*	*%REC*	*1*	*18-Sep-2023 13:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: FD090723
Collection Date: 07-Sep-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-04
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL PAHS - 8270D	**Method:SW8270**			Prep:SW3511 / 13-Sep-2023		Analyst: JLJ
Acenaphthene	**0.000951**		**0.000102**	**mg/L**	1	18-Sep-2023 13:48
Acenaphthylene	**0.000264**		**0.000102**	**mg/L**	1	18-Sep-2023 13:48
Anthracene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Benz(a)anthracene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Benzo(a)pyrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Benzo(b)fluoranthene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Benzo(g,h,i)perylene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Benzo(k)fluoranthene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Chrysene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Dibenz(a,h)anthracene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Fluoranthene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Fluorene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Indeno(1,2,3-cd)pyrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Naphthalene	**0.000575**		**0.000102**	**mg/L**	1	18-Sep-2023 13:48
Phenanthrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Pyrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 13:48
Surr: 2-Fluorobiphenyl	*120*		*32-130*	*%REC*	*1*	*18-Sep-2023 13:48*
Surr: 4-Terphenyl-d14	*114*		*40-135*	*%REC*	*1*	*18-Sep-2023 13:48*
Surr: Nitrobenzene-d5	*82.9*		*45-142*	*%REC*	*1*	*18-Sep-2023 13:48*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: FB090723
Collection Date: 07-Sep-2023 10:25

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-05
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	11-Sep-2023 21:49
Surr: 1,2-Dichloroethane-d4	*111*		*70-126*	*%REC*	*1*	*11-Sep-2023 21:49*
Surr: 4-Bromofluorobenzene	*94.8*		*77-113*	*%REC*	*1*	*11-Sep-2023 21:49*
Surr: Dibromofluoromethane	*111*		*77-123*	*%REC*	*1*	*11-Sep-2023 21:49*
Surr: Toluene-d8	*97.4*		*82-127*	*%REC*	*1*	*11-Sep-2023 21:49*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 13-Sep-2023		Analyst: JLJ
Acenaphthene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Acenaphthylene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Anthracene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Benz(a)anthracene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Benzo(a)pyrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Benzo(b)fluoranthene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Benzo(g,h,i)perylene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Benzo(k)fluoranthene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Chrysene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Dibenz(a,h)anthracene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Fluoranthene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Fluorene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Indeno(1,2,3-cd)pyrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Naphthalene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Phenanthrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Pyrene	< 0.000103		0.000103	mg/L	1	18-Sep-2023 14:08
Surr: 2-Fluorobiphenyl	*94.1*		*32-130*	*%REC*	*1*	*18-Sep-2023 14:08*
Surr: 4-Terphenyl-d14	*127*		*40-135*	*%REC*	*1*	*18-Sep-2023 14:08*
Surr: Nitrobenzene-d5	*82.8*		*45-142*	*%REC*	*1*	*18-Sep-2023 14:08*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: EB090723
Collection Date: 07-Sep-2023 10:30

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-06
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	11-Sep-2023 22:10
Surr: 1,2-Dichloroethane-d4	*111*		*70-126*	*%REC*	*1*	*11-Sep-2023 22:10*
Surr: 4-Bromofluorobenzene	*95.5*		*77-113*	*%REC*	*1*	*11-Sep-2023 22:10*
Surr: Dibromofluoromethane	*114*		*77-123*	*%REC*	*1*	*11-Sep-2023 22:10*
Surr: Toluene-d8	*98.1*		*82-127*	*%REC*	*1*	*11-Sep-2023 22:10*
LOW-LEVEL PAHS - 8270D		**Method:SW8270**		Prep:SW3511 / 13-Sep-2023		Analyst: JLJ
Acenaphthene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Acenaphthylene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Anthracene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Benz(a)anthracene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Benzo(a)pyrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Benzo(b)fluoranthene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Benzo(g,h,i)perylene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Benzo(k)fluoranthene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Chrysene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Dibenz(a,h)anthracene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Fluoranthene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Fluorene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Indeno(1,2,3-cd)pyrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Naphthalene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Phenanthrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Pyrene	< 0.000102		0.000102	mg/L	1	18-Sep-2023 14:28
Surr: 2-Fluorobiphenyl	*99.2*		*32-130*	*%REC*	*1*	*18-Sep-2023 14:28*
Surr: 4-Terphenyl-d14	*112*		*40-135*	*%REC*	*1*	*18-Sep-2023 14:28*
Surr: Nitrobenzene-d5	*72.2*		*45-142*	*%REC*	*1*	*18-Sep-2023 14:28*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-11
Collection Date: 07-Sep-2023 11:10

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-07
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	12-Sep-2023 13:47
Surr: 1,2-Dichloroethane-d4	*101*		*70-126*	*%REC*	*1*	*12-Sep-2023 13:47*
Surr: 4-Bromofluorobenzene	*96.4*		*77-113*	*%REC*	*1*	*12-Sep-2023 13:47*
Surr: Dibromofluoromethane	*97.4*		*77-123*	*%REC*	*1*	*12-Sep-2023 13:47*
Surr: Toluene-d8	*103*		*82-127*	*%REC*	*1*	*12-Sep-2023 13:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-10
Collection Date: 07-Sep-2023 11:50

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-08
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	12-Sep-2023 14:08
Surr: 1,2-Dichloroethane-d4	*97.2*		*70-126*	*%REC*	*1*	*12-Sep-2023 14:08*
Surr: 4-Bromofluorobenzene	*94.5*		*77-113*	*%REC*	*1*	*12-Sep-2023 14:08*
Surr: Dibromofluoromethane	*93.2*		*77-123*	*%REC*	*1*	*12-Sep-2023 14:08*
Surr: Toluene-d8	*102*		*82-127*	*%REC*	*1*	*12-Sep-2023 14:08*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: MW-6D
Collection Date: 07-Sep-2023 12:40

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-09
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	12-Sep-2023 14:29
Surr: 1,2-Dichloroethane-d4	*98.4*		*70-126*	*%REC*	*1*	*12-Sep-2023 14:29*
Surr: 4-Bromofluorobenzene	*94.7*		*77-113*	*%REC*	*1*	*12-Sep-2023 14:29*
Surr: Dibromofluoromethane	*94.9*		*77-123*	*%REC*	*1*	*12-Sep-2023 14:29*
Surr: Toluene-d8	*101*		*82-127*	*%REC*	*1*	*12-Sep-2023 14:29*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
Sample ID: Trip Blank
Collection Date: 07-Sep-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23090521
Lab ID:HS23090521-10
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**					Analyst: KDN
Benzene	< 0.0010		0.0010	mg/L	1	11-Sep-2023 22:31
Surr: 1,2-Dichloroethane-d4	*111*		*70-126*	*%REC*	*1*	*11-Sep-2023 22:31*
Surr: 4-Bromofluorobenzene	*93.8*		*77-113*	*%REC*	*1*	*11-Sep-2023 22:31*
Surr: Dibromofluoromethane	*110*		*77-123*	*%REC*	*1*	*11-Sep-2023 22:31*
Surr: Toluene-d8	*95.4*		*82-127*	*%REC*	*1*	*11-Sep-2023 22:31*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 19-Sep-23

Weight / Prep Log

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

Batch ID: 200333 **Start Date:** 13 Sep 2023 13:00 **End Date:** 13 Sep 2023 13:00
Method: SW3511 **Prep Code:** 3511_PAH

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23090521-03		32.16 (mL)	2 (mL)	0.06219	40 mL Amber
HS23090521-04		32.43 (mL)	2 (mL)	0.06167	40 mL Amber
HS23090521-05		32 (mL)	2 (mL)	0.0625	40 mL Amber
HS23090521-06		32.47 (mL)	2 (mL)	0.0616	40 mL Amber

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 200333 (0)	**Test Name :** LOW-LEVEL PAHS - 8270D				**Matrix:** Water	
HS23090521-03	MW-8	07 Sep 2023 10:20		13 Sep 2023 13:00	18 Sep 2023 13:27	1
HS23090521-04	FD090723	07 Sep 2023 00:00		13 Sep 2023 13:00	18 Sep 2023 13:48	1
HS23090521-05	FB090723	07 Sep 2023 10:25		13 Sep 2023 13:00	18 Sep 2023 14:08	1
HS23090521-06	EB090723	07 Sep 2023 10:30		13 Sep 2023 13:00	18 Sep 2023 14:28	1
Batch ID: R446016 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23090521-01	MW-17	07 Sep 2023 08:40			11 Sep 2023 22:52	1
HS23090521-05	FB090723	07 Sep 2023 10:25			11 Sep 2023 21:49	1
HS23090521-06	EB090723	07 Sep 2023 10:30			11 Sep 2023 22:10	1
HS23090521-10	Trip Blank	07 Sep 2023 00:00			11 Sep 2023 22:31	1
Batch ID: R446129 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23090521-02	MW-5	07 Sep 2023 09:25			12 Sep 2023 12:02	1
HS23090521-03	MW-8	07 Sep 2023 10:20			12 Sep 2023 13:26	1
HS23090521-07	MW-11	07 Sep 2023 11:10			12 Sep 2023 13:47	1
HS23090521-08	MW-10	07 Sep 2023 11:50			12 Sep 2023 14:08	1
HS23090521-09	MW-6D	07 Sep 2023 12:40			12 Sep 2023 14:29	1

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

QC BATCH REPORT

Batch ID: 200333 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

MBLK Sample ID: **MBLK-200333** Units: **ug/L** Analysis Date: **14-Sep-2023 16:10**
Client ID: Run ID: **SV-6_446354** SeqNo: **7545826** PrepDate: **13-Sep-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	< 0.100	0.100								
Acenaphthylene	< 0.100	0.100								
Anthracene	< 0.100	0.100								
Benz(a)anthracene	< 0.100	0.100								
Benzo(a)pyrene	< 0.100	0.100								
Benzo(b)fluoranthene	< 0.100	0.100								
Benzo(g,h,i)perylene	< 0.100	0.100								
Benzo(k)fluoranthene	< 0.100	0.100								
Chrysene	< 0.100	0.100								
Dibenz(a,h)anthracene	< 0.100	0.100								
Fluoranthene	< 0.100	0.100								
Fluorene	< 0.100	0.100								
Indeno(1,2,3-cd)pyrene	< 0.100	0.100								
Naphthalene	< 0.100	0.100								
Phenanthrene	< 0.100	0.100								
Pyrene	< 0.100	0.100								
Surr: 2-Fluorobiphenyl	*2.47*	*0.100*	*3.03*	*0*	*81.5*	*32 - 130*				
Surr: 4-Terphenyl-d14	*2.573*	*0.100*	*3.03*	*0*	*84.9*	*40 - 135*				
Surr: Nitrobenzene-d5	*1.706*	*0.100*	*3.03*	*0*	*56.3*	*45 - 142*				

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

QC BATCH REPORT

Batch ID: 200333 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

LCS Sample ID: **LCS-200333** Units: **ug/L** Analysis Date: **14-Sep-2023 16:30**
Client ID: Run ID: **SV-6_446354** SeqNo: **7545827** PrepDate: **13-Sep-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	2.382	0.100	3.03	0	78.6	40 - 140				
Acenaphthylene	2.087	0.100	3.03	0	68.9	40 - 140				
Anthracene	2.922	0.100	3.03	0	96.4	40 - 140				
Benz(a)anthracene	2.665	0.100	3.03	0	88.0	40 - 140				
Benzo(a)pyrene	2.008	0.100	3.03	0	66.3	40 - 140				
Benzo(b)fluoranthene	2.466	0.100	3.03	0	81.4	40 - 140				
Benzo(g,h,i)perylene	3.37	0.100	3.03	0	111	40 - 140				
Benzo(k)fluoranthene	2.054	0.100	3.03	0	67.8	40 - 140				
Chrysene	1.626	0.100	3.03	0	53.7	40 - 140				
Dibenz(a,h)anthracene	3.179	0.100	3.03	0	105	40 - 140				
Fluoranthene	2.781	0.100	3.03	0	91.8	40 - 140				
Fluorene	2.224	0.100	3.03	0	73.4	40 - 140				
Indeno(1,2,3-cd)pyrene	3.182	0.100	3.03	0	105	40 - 140				
Naphthalene	2.012	0.100	3.03	0	66.4	40 - 140				
Phenanthrene	1.902	0.100	3.03	0	62.8	40 - 140				
Pyrene	1.818	0.100	3.03	0	60.0	40 - 140				
Surr: 2-Fluorobiphenyl	*2.062*	*0.100*	*3.03*	*0*	*68.0*	*32 - 130*				
Surr: 4-Terphenyl-d14	*1.913*	*0.100*	*3.03*	*0*	*63.1*	*40 - 135*				
Surr: Nitrobenzene-d5	*2.185*	*0.100*	*3.03*	*0*	*72.1*	*45 - 142*				

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

QC BATCH REPORT

Batch ID: 200333 (0) **Instrument: SV-6** **Method: LOW-LEVEL PAHS - 8270D**

LCSD Sample ID: **LCSD-200333** Units: **ug/L** Analysis Date: **14-Sep-2023 16:50**
Client ID: Run ID: **SV-6_446354** SeqNo: **7545828** PrepDate: **13-Sep-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Acenaphthene	2.5	0.100	3.03	0	82.5	40 - 140	2.382	4.81	25	
Acenaphthylene	2.168	0.100	3.03	0	71.5	40 - 140	2.087	3.78	25	
Anthracene	2.817	0.100	3.03	0	93.0	40 - 140	2.922	3.66	25	
Benz(a)anthracene	2.54	0.100	3.03	0	83.8	40 - 140	2.665	4.8	25	
Benzo(a)pyrene	1.991	0.100	3.03	0	65.7	40 - 140	2.008	0.852	25	
Benzo(b)fluoranthene	2.468	0.100	3.03	0	81.5	40 - 140	2.466	0.086	25	
Benzo(g,h,i)perylene	3.158	0.100	3.03	0	104	40 - 140	3.37	6.5	25	
Benzo(k)fluoranthene	1.864	0.100	3.03	0	61.5	40 - 140	2.054	9.67	25	
Chrysene	1.636	0.100	3.03	0	54.0	40 - 140	1.626	0.628	25	
Dibenz(a,h)anthracene	3.003	0.100	3.03	0	99.1	40 - 140	3.179	5.7	25	
Fluoranthene	2.698	0.100	3.03	0	89.1	40 - 140	2.781	3.02	25	
Fluorene	2.331	0.100	3.03	0	76.9	40 - 140	2.224	4.66	25	
Indeno(1,2,3-cd)pyrene	2.98	0.100	3.03	0	98.3	40 - 140	3.182	6.57	25	
Naphthalene	2.167	0.100	3.03	0	71.5	40 - 140	2.012	7.4	25	
Phenanthrene	1.818	0.100	3.03	0	60.0	40 - 140	1.902	4.5	25	
Pyrene	1.733	0.100	3.03	0	57.2	40 - 140	1.818	4.84	25	
Surr: 2-Fluorobiphenyl	*2.079*	*0.100*	*3.03*	*0*	*68.6*	*32 - 130*	*2.062*	*0.849*	*25*	
Surr: 4-Terphenyl-d14	*1.856*	*0.100*	*3.03*	*0*	*61.2*	*40 - 135*	*1.913*	*3.02*	*25*	
Surr: Nitrobenzene-d5	*2.224*	*0.100*	*3.03*	*0*	*73.4*	*45 - 142*	*2.185*	*1.8*	*25*	

The following samples were analyzed in this batch: HS23090521-03 HS23090521-04 HS23090521-05 HS23090521-06

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

QC BATCH REPORT

Batch ID: R446016 (0) **Instrument: VOA10** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230911** Units: **ug/L** Analysis Date: **11-Sep-2023 21:28**
Client ID: Run ID: **VOA10_446016** SeqNo: **7537221** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	< 1.0	1.0								
Surr: 1,2-Dichloroethane-d4	*55.06*	*1.0*	*50*	*0*	*110*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.66*	*1.0*	*50*	*0*	*97.3*	*77 - 113*				
Surr: Dibromofluoromethane	*56.3*	*1.0*	*50*	*0*	*113*	*73 - 126*				
Surr: Toluene-d8	*49.48*	*1.0*	*50*	*0*	*99.0*	*81 - 120*				

LCS Sample ID: **VLCSW-230911** Units: **ug/L** Analysis Date: **11-Sep-2023 20:46**
Client ID: Run ID: **VOA10_446016** SeqNo: **7537220** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.61	1.0	20	0	108	74 - 120				
Surr: 1,2-Dichloroethane-d4	*50.66*	*1.0*	*50*	*0*	*101*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.85*	*1.0*	*50*	*0*	*97.7*	*77 - 113*				
Surr: Dibromofluoromethane	*52.24*	*1.0*	*50*	*0*	*104*	*73 - 126*				
Surr: Toluene-d8	*50.37*	*1.0*	*50*	*0*	*101*	*81 - 120*				

MS Sample ID: **HS23090521-01MS** Units: **ug/L** Analysis Date: **11-Sep-2023 23:13**
Client ID: **MW-17** Run ID: **VOA10_446016** SeqNo: **7537226** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.86	1.0	20	0	99.3	70 - 127				
Surr: 1,2-Dichloroethane-d4	*51.47*	*1.0*	*50*	*0*	*103*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*47.24*	*1.0*	*50*	*0*	*94.5*	*77 - 113*				
Surr: Dibromofluoromethane	*52.88*	*1.0*	*50*	*0*	*106*	*77 - 123*				
Surr: Toluene-d8	*48.24*	*1.0*	*50*	*0*	*96.5*	*82 - 127*				

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

QC BATCH REPORT

Batch ID: R446016 (0) **Instrument:** VOA10 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS23090521-01MSD** Units: **ug/L** Analysis Date: **11-Sep-2023 23:33**
Client ID: **MW-17** Run ID: **VOA10_446016** SeqNo: **7537227** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.27	1.0	20	0	96.4	70 - 127	19.86	3	20	
Surr: 1,2-Dichloroethane-d4	*55.42*	*1.0*	*50*	*0*	*111*	*70 - 126*	*51.47*	*7.39*	*20*	
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*77 - 113*	*47.24*	*4.98*	*20*	
Surr: Dibromofluoromethane	*52.66*	*1.0*	*50*	*0*	*105*	*77 - 123*	*52.88*	*0.411*	*20*	
Surr: Toluene-d8	*49.4*	*1.0*	*50*	*0*	*98.8*	*82 - 127*	*48.24*	*2.38*	*20*	

The following samples were analyzed in this batch: HS23090521-01 HS23090521-05 HS23090521-06 HS23090521-10

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

QC BATCH REPORT

Batch ID: R446129 (0) **Instrument: VOA11** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230912** Units: **ug/L** Analysis Date: **12-Sep-2023 11:41**
Client ID: Run ID: **VOA11_446129** SeqNo: **7539438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	< 1.0	1.0								
Surr: 1,2-Dichloroethane-d4	*48.97*	*1.0*	*50*	*0*	*97.9*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*46.28*	*1.0*	*50*	*0*	*92.6*	*77 - 113*				
Surr: Dibromofluoromethane	*47.58*	*1.0*	*50*	*0*	*95.2*	*73 - 126*				
Surr: Toluene-d8	*50.94*	*1.0*	*50*	*0*	*102*	*81 - 120*				

LCS Sample ID: **VLCSW-230912** Units: **ug/L** Analysis Date: **12-Sep-2023 10:59**
Client ID: Run ID: **VOA11_446129** SeqNo: **7539437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.82	1.0	20	0	99.1	74 - 120				
Surr: 1,2-Dichloroethane-d4	*48.2*	*1.0*	*50*	*0*	*96.4*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*47.78*	*1.0*	*50*	*0*	*95.6*	*77 - 113*				
Surr: Dibromofluoromethane	*48.62*	*1.0*	*50*	*0*	*97.2*	*73 - 126*				
Surr: Toluene-d8	*49.85*	*1.0*	*50*	*0*	*99.7*	*81 - 120*				

MS Sample ID: **HS23090521-02MS** Units: **ug/L** Analysis Date: **12-Sep-2023 12:23**
Client ID: **MW-5** Run ID: **VOA11_446129** SeqNo: **7539440** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	97.74	1.0	20	76.28	107	70 - 127				
Surr: 1,2-Dichloroethane-d4	*49.88*	*1.0*	*50*	*0*	*99.8*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*48.4*	*1.0*	*50*	*0*	*96.8*	*77 - 113*				
Surr: Dibromofluoromethane	*48.16*	*1.0*	*50*	*0*	*96.3*	*77 - 123*				
Surr: Toluene-d8	*49.64*	*1.0*	*50*	*0*	*99.3*	*82 - 127*				

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: HS23090521

QC BATCH REPORT

Batch ID: R446129 (0) **Instrument:** VOA11 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS23090521-02MSD** Units: **ug/L** Analysis Date: **12-Sep-2023 12:44**
Client ID: **MW-5** Run ID: **VOA11_446129** SeqNo: **7539441** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	97.84	1.0	20	76.28	108	70 - 127	97.74	0.0953	20	
Surr: 1,2-Dichloroethane-d4	*49.54*	*1.0*	*50*	*0*	*99.1*	*70 - 126*	*49.88*	*0.68*	*20*	
Surr: 4-Bromofluorobenzene	*49.7*	*1.0*	*50*	*0*	*99.4*	*77 - 113*	*48.4*	*2.66*	*20*	
Surr: Dibromofluoromethane	*48.35*	*1.0*	*50*	*0*	*96.7*	*77 - 123*	*48.16*	*0.404*	*20*	
Surr: Toluene-d8	*49.08*	*1.0*	*50*	*0*	*98.2*	*82 - 127*	*49.64*	*1.14*	*20*	

The following samples were analyzed in this batch: HS23090521-02 HS23090521-03 HS23090521-07 HS23090521-08 HS23090521-09

ALS Houston, US Date: 19-Sep-23

Client: ARCADIS U.S., Inc.
Project: 30167857 Brickland Refinery 2Q23
WorkOrder: **HS23090521**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L23-358	31-May-2025
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2023-2024	30-Apr-2024
Texas	T104704231-23-31	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

ALS Houston, US Date: 19-Sep-23

Sample Receipt Checklist

Work Order ID: HS23090521 **Date/Time Received:** 08-Sep-2023 09:45

Client Name: Arcadis-Baton Rouge **Received by:** Malcolm Burleson

Completed By:	/S/ Corey Grandits	09-Sep-2023 13:58	**Reviewed by:**	/S/ James Guin	11-Sep-2023 15:28
	eSignature	Date/Time		eSignature	Date/Time

Matrices: W Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:269092
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0UC/3.9C	IR31	
Cooler(s)/Kit(s):	50418		
Date/Time sample(s) sent to storage:	9/9/23		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 269092

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis
Purchase Order	US3460007057	Project Name	30167857 Brickland Refinery 2023	A (8260 Benzene ("Unpreserved")-7 day HT [3xVOAsNeat]
Work Order		Project Number	30167857	B 8270_PAH_LVI (8270 PAHs (LVI)) [3xVOAAmbNeat]
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C
Send Report To	Brooke Fontenot	Invoice Attn	Accounts Payable	D
Address	10352 Plaza Americana Drive	Address	630 Plaza Drive, Suite 600	E F
City/State/Zip	Baton Rouge, LA 70816	City/State/Zip	Highlands Ranch CO 80129	G
Phone	(225) 292-1004	Phone	(303) 471-3699	H
Fax		Fax		I
e-Mail Address	Brooke.Fontenot@arcadis-us.com	e-Mail Address	Accountspayable.administration@arcadis	

HS23090521
ARCADIS U.S., Inc.
30167857 Brickland Refinery 2Q23

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-17	9-7-23	0840	W	neat	3	X										
2	MW-5	9-7-23	0925	W	neat	3	X										
3	MW-8	9-7-23	1020	W	neat	6	X	X									
4	FD090723	9-7-23	—	W	neat	3		X									
5	FB090723	9-7-23	1025	W	neat	6	X	X									
6	EB090723	9-7-23	1030	W	neat	6	X	X									
7	MW-11	9-7-23	1110	W	neat	3	X										
8	MW-10	9-7-23	1150	W	neat	3	X										
9	MW-6D	9-7-23	1240	W	neat	3	X										
10	Trip Blank	9-7-23	—	W	neat	3	X										

Sampler(s) Please Print & Sign	Shipment Method	Required Turnaround Time: (Check Box)	Results Due Date:
Doug Solom	FED EX	[X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other	

Relinquished by:	Date:	Time:	Received by:	Notes: [AGM Brickland NM]
	9-7-23	1430		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID / Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

QC Package: (Check One Box Below)
[X] Level II Std QC
[ ] Level III Std QC/Raw Data
[ ] Level IV SW846/CLP
[ ] Other
[ ] TRRP Checklist
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

50418

CUSTODY SEAL

Date: 9.7.23 Time: 1430

Name: Doug Solon

Company:

Seal Broken By: EM

Date: 09/08/23

50418 SEP 08 2023

ALS

50418

ORIGIN ID:SGRA (915) 603-1015
DOUG SOLON
ARCADIS
207 MONTEBELLO

EL PASO, TX 79912
UNITED STATES US

SHIP DATE: 01SEP23
ACTWGT: 12.00 LB MAN
CAD: 0221247/CAFE3751

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: DOUG BRICKLAND REFINERY BO#95296 D.W

RMA:

FedEx Express

FedEx
TRK# 0221 6862 6795 9574

FRI - 08 SEP 10:30
PRIORITY OVERNIGHT

NA SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 29, 2023

Garett Ferguson
ARCADIS U.S., Inc.
401 East Main Street, Suite 400
El Paso, TX 79901

Work Order: **HS23111516**

Laboratory Results for: **Huntsman**

Dear Garett Ferguson,

ALS Environmental received 9 sample(s) on Nov 22, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
James Guin

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Work Order: HS23111516

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23111516-01	MW-3S	Water		20-Nov-2023 08:35	22-Nov-2023 09:40	☐
HS23111516-02	MW-3D	Water		20-Nov-2023 09:15	22-Nov-2023 09:40	☐
HS23111516-03	FB112023	Water		20-Nov-2023 09:20	22-Nov-2023 09:40	☐
HS23111516-04	DUP112023	Water		20-Nov-2023 00:00	22-Nov-2023 09:40	☐
HS23111516-05	MW-6S	Water		20-Nov-2023 10:00	22-Nov-2023 09:40	☐
HS23111516-06	MW-6D	Water		20-Nov-2023 10:35	22-Nov-2023 09:40	☐
HS23111516-07	MW-9S	Water		20-Nov-2023 11:20	22-Nov-2023 09:40	☐
HS23111516-08	EB112023	Water		20-Nov-2023 11:25	22-Nov-2023 09:40	☐
HS23111516-09	Trip Blank	Water		20-Nov-2023 00:00	22-Nov-2023 09:40	☐

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Work Order: HS23111516

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R452587

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-3S
Collection Date: 20-Nov-2023 08:35

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 04:46
Surr: 1,2-Dichloroethane-d4	*92.7*			*70-126*	*%REC*	*1*	*23-Nov-2023 04:46*
Surr: 4-Bromofluorobenzene	*99.7*			*77-113*	*%REC*	*1*	*23-Nov-2023 04:46*
Surr: Dibromofluoromethane	*88.5*			*77-123*	*%REC*	*1*	*23-Nov-2023 04:46*
Surr: Toluene-d8	*113*			*82-127*	*%REC*	*1*	*23-Nov-2023 04:46*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-3D
Collection Date: 20-Nov-2023 09:15

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 05:07
Surr: 1,2-Dichloroethane-d4	*91.6*			*70-126*	*%REC*	*1*	*23-Nov-2023 05:07*
Surr: 4-Bromofluorobenzene	*96.8*			*77-113*	*%REC*	*1*	*23-Nov-2023 05:07*
Surr: Dibromofluoromethane	*89.8*			*77-123*	*%REC*	*1*	*23-Nov-2023 05:07*
Surr: Toluene-d8	*113*			*82-127*	*%REC*	*1*	*23-Nov-2023 05:07*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: FB112023
Collection Date: 20-Nov-2023 09:20

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 01:37
Surr: 1,2-Dichloroethane-d4	*94.8*			*70-126*	*%REC*	*1*	*23-Nov-2023 01:37*
Surr: 4-Bromofluorobenzene	*101*			*77-113*	*%REC*	*1*	*23-Nov-2023 01:37*
Surr: Dibromofluoromethane	*90.0*			*77-123*	*%REC*	*1*	*23-Nov-2023 01:37*
Surr: Toluene-d8	*115*			*82-127*	*%REC*	*1*	*23-Nov-2023 01:37*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: DUP112023
Collection Date: 20-Nov-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-04
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 05:28
Surr: 1,2-Dichloroethane-d4	*95.2*			*70-126*	*%REC*	*1*	*23-Nov-2023 05:28*
Surr: 4-Bromofluorobenzene	*99.3*			*77-113*	*%REC*	*1*	*23-Nov-2023 05:28*
Surr: Dibromofluoromethane	*88.9*			*77-123*	*%REC*	*1*	*23-Nov-2023 05:28*
Surr: Toluene-d8	*114*			*82-127*	*%REC*	*1*	*23-Nov-2023 05:28*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-6S
Collection Date: 20-Nov-2023 10:00

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-05
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 05:49
Surr: 1,2-Dichloroethane-d4	*98.6*			*70-126*	*%REC*	*1*	*23-Nov-2023 05:49*
Surr: 4-Bromofluorobenzene	*99.6*			*77-113*	*%REC*	*1*	*23-Nov-2023 05:49*
Surr: Dibromofluoromethane	*90.7*			*77-123*	*%REC*	*1*	*23-Nov-2023 05:49*
Surr: Toluene-d8	*112*			*82-127*	*%REC*	*1*	*23-Nov-2023 05:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-6D
Collection Date: 20-Nov-2023 10:35

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-06
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 06:10
Surr: 1,2-Dichloroethane-d4	*97.0*			*70-126*	*%REC*	*1*	*23-Nov-2023 06:10*
Surr: 4-Bromofluorobenzene	*102*			*77-113*	*%REC*	*1*	*23-Nov-2023 06:10*
Surr: Dibromofluoromethane	*93.2*			*77-123*	*%REC*	*1*	*23-Nov-2023 06:10*
Surr: Toluene-d8	*115*			*82-127*	*%REC*	*1*	*23-Nov-2023 06:10*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-9S
Collection Date: 20-Nov-2023 11:20

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-07
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 06:31
Surr: 1,2-Dichloroethane-d4	*98.4*			*70-126*	*%REC*	*1*	*23-Nov-2023 06:31*
Surr: 4-Bromofluorobenzene	*99.1*			*77-113*	*%REC*	*1*	*23-Nov-2023 06:31*
Surr: Dibromofluoromethane	*92.9*			*77-123*	*%REC*	*1*	*23-Nov-2023 06:31*
Surr: Toluene-d8	*111*			*82-127*	*%REC*	*1*	*23-Nov-2023 06:31*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: EB112023
Collection Date: 20-Nov-2023 11:25

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-08
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 01:16
Surr: 1,2-Dichloroethane-d4	*94.2*			*70-126*	*%REC*	*1*	*23-Nov-2023 01:16*
Surr: 4-Bromofluorobenzene	*100*			*77-113*	*%REC*	*1*	*23-Nov-2023 01:16*
Surr: Dibromofluoromethane	*91.7*			*77-123*	*%REC*	*1*	*23-Nov-2023 01:16*
Surr: Toluene-d8	*115*			*82-127*	*%REC*	*1*	*23-Nov-2023 01:16*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: Trip Blank
Collection Date: 20-Nov-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23111516
Lab ID:HS23111516-09
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene		U	0.00020	0.0010	mg/L	1	23-Nov-2023 01:58
Surr: 1,2-Dichloroethane-d4	*94.1*			*70-126*	*%REC*	*1*	*23-Nov-2023 01:58*
Surr: 4-Bromofluorobenzene	*98.1*			*77-113*	*%REC*	*1*	*23-Nov-2023 01:58*
Surr: Dibromofluoromethane	*90.1*			*77-123*	*%REC*	*1*	*23-Nov-2023 01:58*
Surr: Toluene-d8	*112*			*82-127*	*%REC*	*1*	*23-Nov-2023 01:58*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
WorkOrder: HS23111516

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R452587 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23111516-01	MW-3S	20 Nov 2023 08:35			23 Nov 2023 04:46	1
HS23111516-02	MW-3D	20 Nov 2023 09:15			23 Nov 2023 05:07	1
HS23111516-03	FB112023	20 Nov 2023 09:20			23 Nov 2023 01:37	1
HS23111516-04	DUP112023	20 Nov 2023 00:00			23 Nov 2023 05:28	1
HS23111516-05	MW-6S	20 Nov 2023 10:00			23 Nov 2023 05:49	1
HS23111516-06	MW-6D	20 Nov 2023 10:35			23 Nov 2023 06:10	1
HS23111516-07	MW-9S	20 Nov 2023 11:20			23 Nov 2023 06:31	1
HS23111516-08	EB112023	20 Nov 2023 11:25			23 Nov 2023 01:16	1
HS23111516-09	Trip Blank	20 Nov 2023 00:00			23 Nov 2023 01:58	1

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
WorkOrder: HS23111516

QC BATCH REPORT

Batch ID: R452587 (0) **Instrument: VOA11** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-231122** Units: **ug/L** Analysis Date: **23-Nov-2023 00:13**
Client ID: Run ID: **VOA11_452587** SeqNo: **7691574** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Surr: 1,2-Dichloroethane-d4	*43.71*	*1.0*	*50*	*0*	*87.4*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*50.4*	*1.0*	*50*	*0*	*101*	*77 - 113*				
Surr: Dibromofluoromethane	*42.63*	*1.0*	*50*	*0*	*85.3*	*73 - 126*				
Surr: Toluene-d8	*57.56*	*1.0*	*50*	*0*	*115*	*81 - 120*				

LCS Sample ID: **VLCSW-231122** Units: **ug/L** Analysis Date: **22-Nov-2023 23:10**
Client ID: Run ID: **VOA11_452587** SeqNo: **7691572** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.52	1.0	20	0	97.6	74 - 120				
Surr: 1,2-Dichloroethane-d4	*52.58*	*1.0*	*50*	*0*	*105*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*51.52*	*1.0*	*50*	*0*	*103*	*77 - 113*				
Surr: Dibromofluoromethane	*51.69*	*1.0*	*50*	*0*	*103*	*73 - 126*				
Surr: Toluene-d8	*51.81*	*1.0*	*50*	*0*	*104*	*81 - 120*				

LCSD Sample ID: **VLCSDW-231122** Units: **ug/L** Analysis Date: **22-Nov-2023 23:31**
Client ID: Run ID: **VOA11_452587** SeqNo: **7691573** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.6	1.0	20	0	98.0	74 - 120	19.52	0.427	20	
Surr: 1,2-Dichloroethane-d4	*50.78*	*1.0*	*50*	*0*	*102*	*70 - 123*	*52.58*	*3.47*	*20*	
Surr: 4-Bromofluorobenzene	*51.19*	*1.0*	*50*	*0*	*102*	*77 - 113*	*51.52*	*0.636*	*20*	
Surr: Dibromofluoromethane	*50.47*	*1.0*	*50*	*0*	*101*	*73 - 126*	*51.69*	*2.39*	*20*	
Surr: Toluene-d8	*51.4*	*1.0*	*50*	*0*	*103*	*81 - 120*	*51.81*	*0.798*	*20*	

The following samples were analyzed in this batch: HS23111516-01 HS23111516-02 HS23111516-03 HS23111516-04 HS23111516-05 HS23111516-06 HS23111516-07 HS23111516-08 HS23111516-09

ALS Houston, US Date: 29-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
WorkOrder: **HS23111516**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L23-358	31-May-2025
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-32	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

ALS Houston, US Date: 29-Nov-23

Sample Receipt Checklist

Work Order ID: HS23111516 **Date/Time Received:** 22-Nov-2023 09:40

Client Name: ARCADIS-EL PASO **Received by:** Malcolm Burleson

Completed By: /S/ Malcolm Burleson (eSignature) 22-Nov-2023 12:03 (Date/Time) **Reviewed by:** /S/ James Guin (eSignature) 28-Nov-2023 15:35 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:305343
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☐	No ☑	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.9UC 1.8C	IR31	
Cooler(s)/Kit(s):	51530		
Date/Time sample(s) sent to storage:	11222023		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700

Chain of Custody Form

Page 1 of 1

COC ID: 305343

SHORT HOLDING TIME

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30167857	Project Name	Huntsman	A	8260_LL_W (8260 Benzene ("Unpreserved"))
Work Order		Project Number		B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Doug Solon	Invoice Attn	Accounts Payable	D	
Address	401 East Main Street, Suite 400	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	El Paso, TX 79901	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(915) 747-3902	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Douglas.Solon@arcadis.com	e-Mail Address	Accountspayable.administration@arcadi	J	

HS23111516
ARCADIS U.S., Inc.
Huntsman

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-3S	11/20/23	0835	W	Raw	3	X										
2	MW-3D	11/20/23	0915	W	Raw	3	X										
3	FB 112023	11/20/23	0920	W	Raw	3	X										
4	DUP 112023	11/20/23	—	W	Raw	3	X										
5	MW-6S	11/20/23	1000	W	Raw	3	X										
6	MW-6D	11/20/23	1035	W	Raw	3	X										
7	MW-9S	11/20/23	1120	W	Raw	3	X										
8	EB 112023	11/20/23	1125	W	Raw	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon Douglas Solon

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

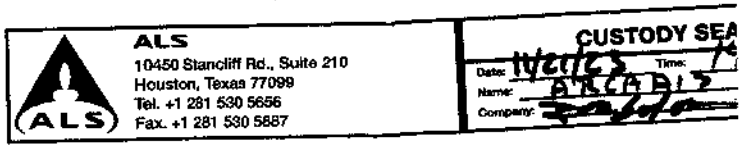
Relinquished by:	Date:	Time:	Received by:
D Mjolon	11/21/23	1400	
Relinquished by:	Date:	Time:	Received by (Laboratory): 11/22/23 0740
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

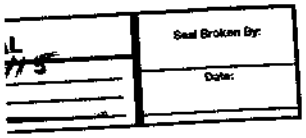
Notes: Arcadis Huntsman

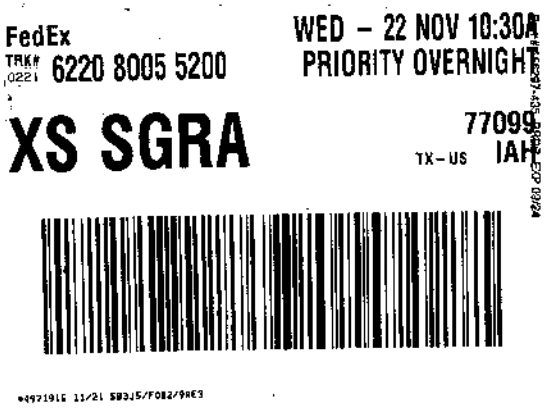
Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)
5130	1R-3 1.9 -0.1	[X] Level II Std QC; [ ] Level III Std QC/Raw Data; [ ] Level IV SW846/CLP; [ ] Other; [ ] TRRP Checklist; [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.







10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 30, 2023

Garett Ferguson
ARCADIS U.S., Inc.
401 East Main Street, Suite 400
El Paso, TX 79901

Work Order: **HS23111520**

Laboratory Results for: **Huntsman**

Dear Garett Ferguson,

ALS Environmental received 9 sample(s) on Nov 22, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
James Guin

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Work Order: HS23111520

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23111520-01	MW-17	Water		21-Nov-2023 08:10	22-Nov-2023 09:40	☐
HS23111520-02	MW-5	Water		21-Nov-2023 08:45	22-Nov-2023 09:40	☐
HS23111520-03	MW-8	Water		21-Nov-2023 09:20	22-Nov-2023 09:40	☐
HS23111520-04	DUP112123	Water		21-Nov-2023 00:00	22-Nov-2023 09:40	☐
HS23111520-05	FB112123	Water		21-Nov-2023 09:25	22-Nov-2023 09:40	☐
HS23111520-06	MW-11	Water		21-Nov-2023 10:00	22-Nov-2023 09:40	☐
HS23111520-07	MW-10	Water		21-Nov-2023 10:35	22-Nov-2023 09:40	☐
HS23111520-08	EB112123	Water		21-Nov-2023 10:40	22-Nov-2023 09:40	☐
HS23111520-09	Trip Blank	Water		20-Nov-2023 00:00	22-Nov-2023 09:40	☐

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Work Order: HS23111520

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R452587

Sample ID: Trip Blank (HS23111520-09)

- The trip blank data was imported from HS23111516-09 trip blank analysis.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-17
Collection Date: 21-Nov-2023 08:10

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 06:52
Surr: 1,2-Dichloroethane-d4	*97.8*			*70-126*	*%REC*	*1*	*23-Nov-2023 06:52*
Surr: 4-Bromofluorobenzene	*101*			*77-113*	*%REC*	*1*	*23-Nov-2023 06:52*
Surr: Dibromofluoromethane	*91.6*			*77-123*	*%REC*	*1*	*23-Nov-2023 06:52*
Surr: Toluene-d8	*114*			*82-127*	*%REC*	*1*	*23-Nov-2023 06:52*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-5
Collection Date: 21-Nov-2023 08:45

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	**0.00053**	J	**0.00020**	**0.0010**	**mg/L**	1	23-Nov-2023 07:13
Surr: 1,2-Dichloroethane-d4	*92.2*			*70-126*	*%REC*	*1*	*23-Nov-2023 07:13*
Surr: 4-Bromofluorobenzene	*102*			*77-113*	*%REC*	*1*	*23-Nov-2023 07:13*
Surr: Dibromofluoromethane	*89.3*			*77-123*	*%REC*	*1*	*23-Nov-2023 07:13*
Surr: Toluene-d8	*114*			*82-127*	*%REC*	*1*	*23-Nov-2023 07:13*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-8
Collection Date: 21-Nov-2023 09:20

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	**0.0014**		**0.00020**	**0.0010**	**mg/L**	1	23-Nov-2023 03:22
Surr: 1,2-Dichloroethane-d4	*92.8*			*70-126*	*%REC*	*1*	*23-Nov-2023 03:22*
Surr: 4-Bromofluorobenzene	*104*			*77-113*	*%REC*	*1*	*23-Nov-2023 03:22*
Surr: Dibromofluoromethane	*90.3*			*77-123*	*%REC*	*1*	*23-Nov-2023 03:22*
Surr: Toluene-d8	*113*			*82-127*	*%REC*	*1*	*23-Nov-2023 03:22*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: DUP112123
Collection Date: 21-Nov-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-04
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	**0.0010**		**0.00020**	**0.0010**	**mg/L**	1	23-Nov-2023 03:43
Surr: 1,2-Dichloroethane-d4	*91.3*			*70-126*	*%REC*	*1*	*23-Nov-2023 03:43*
Surr: 4-Bromofluorobenzene	*105*			*77-113*	*%REC*	*1*	*23-Nov-2023 03:43*
Surr: Dibromofluoromethane	*88.7*			*77-123*	*%REC*	*1*	*23-Nov-2023 03:43*
Surr: Toluene-d8	*114*			*82-127*	*%REC*	*1*	*23-Nov-2023 03:43*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: FB112123
Collection Date: 21-Nov-2023 09:25

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-05
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 00:34
Surr: 1,2-Dichloroethane-d4	*90.7*			*70-126*	*%REC*	*1*	*23-Nov-2023 00:34*
Surr: 4-Bromofluorobenzene	*100*			*77-113*	*%REC*	*1*	*23-Nov-2023 00:34*
Surr: Dibromofluoromethane	*88.7*			*77-123*	*%REC*	*1*	*23-Nov-2023 00:34*
Surr: Toluene-d8	*114*			*82-127*	*%REC*	*1*	*23-Nov-2023 00:34*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-11
Collection Date: 21-Nov-2023 10:00

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-06
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 04:04
Surr: 1,2-Dichloroethane-d4	*92.3*			*70-126*	*%REC*	*1*	*23-Nov-2023 04:04*
Surr: 4-Bromofluorobenzene	*102*			*77-113*	*%REC*	*1*	*23-Nov-2023 04:04*
Surr: Dibromofluoromethane	*89.8*			*77-123*	*%REC*	*1*	*23-Nov-2023 04:04*
Surr: Toluene-d8	*114*			*82-127*	*%REC*	*1*	*23-Nov-2023 04:04*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: MW-10
Collection Date: 21-Nov-2023 10:35

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-07
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 04:25
Surr: 1,2-Dichloroethane-d4	*92.4*			*70-126*	*%REC*	*1*	*23-Nov-2023 04:25*
Surr: 4-Bromofluorobenzene	*103*			*77-113*	*%REC*	*1*	*23-Nov-2023 04:25*
Surr: Dibromofluoromethane	*89.6*			*77-123*	*%REC*	*1*	*23-Nov-2023 04:25*
Surr: Toluene-d8	*111*			*82-127*	*%REC*	*1*	*23-Nov-2023 04:25*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: EB112123
Collection Date: 21-Nov-2023 10:40

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-08
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 00:55
Surr: 1,2-Dichloroethane-d4	*91.9*			*70-126*	*%REC*	*1*	*23-Nov-2023 00:55*
Surr: 4-Bromofluorobenzene	*100*			*77-113*	*%REC*	*1*	*23-Nov-2023 00:55*
Surr: Dibromofluoromethane	*91.4*			*77-123*	*%REC*	*1*	*23-Nov-2023 00:55*
Surr: Toluene-d8	*114*			*82-127*	*%REC*	*1*	*23-Nov-2023 00:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
Sample ID: Trip Blank
Collection Date: 20-Nov-2023 00:00

ANALYTICAL REPORT
WorkOrder:HS23111520
Lab ID:HS23111520-09
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: PC
Benzene	U		0.00020	0.0010	mg/L	1	23-Nov-2023 01:58
Surr: 1,2-Dichloroethane-d4	*94.1*			*70-126*	*%REC*	*1*	*23-Nov-2023 01:58*
Surr: 4-Bromofluorobenzene	*98.1*			*77-113*	*%REC*	*1*	*23-Nov-2023 01:58*
Surr: Dibromofluoromethane	*90.1*			*77-123*	*%REC*	*1*	*23-Nov-2023 01:58*
Surr: Toluene-d8	*112*			*82-127*	*%REC*	*1*	*23-Nov-2023 01:58*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
WorkOrder: HS23111520

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R452587 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23111520-01	MW-17	21 Nov 2023 08:10			23 Nov 2023 06:52	1
HS23111520-02	MW-5	21 Nov 2023 08:45			23 Nov 2023 07:13	1
HS23111520-03	MW-8	21 Nov 2023 09:20			23 Nov 2023 03:22	1
HS23111520-04	DUP112123	21 Nov 2023 00:00			23 Nov 2023 03:43	1
HS23111520-05	FB112123	21 Nov 2023 09:25			23 Nov 2023 00:34	1
HS23111520-06	MW-11	21 Nov 2023 10:00			23 Nov 2023 04:04	1
HS23111520-07	MW-10	21 Nov 2023 10:35			23 Nov 2023 04:25	1
HS23111520-08	EB112123	21 Nov 2023 10:40			23 Nov 2023 00:55	1
HS23111520-09	Trip Blank	20 Nov 2023 00:00			23 Nov 2023 01:58	1

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
WorkOrder: HS23111520

QC BATCH REPORT

Batch ID: R452587 (0) **Instrument: VOA11** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-231122** Units: **ug/L** Analysis Date: **23-Nov-2023 00:13**
Client ID: Run ID: **VOA11_452587** SeqNo: **7691574** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Surr: 1,2-Dichloroethane-d4	*43.71*	*1.0*	*50*	*0*	*87.4*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*50.4*	*1.0*	*50*	*0*	*101*	*77 - 113*				
Surr: Dibromofluoromethane	*42.63*	*1.0*	*50*	*0*	*85.3*	*73 - 126*				
Surr: Toluene-d8	*57.56*	*1.0*	*50*	*0*	*115*	*81 - 120*				

LCS Sample ID: **VLCSW-231122** Units: **ug/L** Analysis Date: **22-Nov-2023 23:10**
Client ID: Run ID: **VOA11_452587** SeqNo: **7691572** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.52	1.0	20	0	97.6	74 - 120				
Surr: 1,2-Dichloroethane-d4	*52.58*	*1.0*	*50*	*0*	*105*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*51.52*	*1.0*	*50*	*0*	*103*	*77 - 113*				
Surr: Dibromofluoromethane	*51.69*	*1.0*	*50*	*0*	*103*	*73 - 126*				
Surr: Toluene-d8	*51.81*	*1.0*	*50*	*0*	*104*	*81 - 120*				

LCSD Sample ID: **VLCSDW-231122** Units: **ug/L** Analysis Date: **22-Nov-2023 23:31**
Client ID: Run ID: **VOA11_452587** SeqNo: **7691573** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.6	1.0	20	0	98.0	74 - 120	19.52	0.427	20	
Surr: 1,2-Dichloroethane-d4	*50.78*	*1.0*	*50*	*0*	*102*	*70 - 123*	*52.58*	*3.47*	*20*	
Surr: 4-Bromofluorobenzene	*51.19*	*1.0*	*50*	*0*	*102*	*77 - 113*	*51.52*	*0.636*	*20*	
Surr: Dibromofluoromethane	*50.47*	*1.0*	*50*	*0*	*101*	*73 - 126*	*51.69*	*2.39*	*20*	
Surr: Toluene-d8	*51.4*	*1.0*	*50*	*0*	*103*	*81 - 120*	*51.81*	*0.798*	*20*	

The following samples were analyzed in this batch: HS23111520-01 HS23111520-02 HS23111520-03 HS23111520-04 HS23111520-05 HS23111520-06 HS23111520-07 HS23111520-08 HS23111520-09

ALS Houston, US Date: 30-Nov-23

Client: ARCADIS U.S., Inc.
Project: Huntsman
WorkOrder: **HS23111520**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L23-358	31-May-2025
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-32	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

ALS Houston, US Date: 30-Nov-23

Sample Receipt Checklist

Work Order ID: HS23111520 **Date/Time Received:** 22-Nov-2023 09:40

Client Name: ARCADIS-EL PASO **Received by:** Malcolm Burleson

Completed By: /S/ Malcolm Burleson (eSignature) 22-Nov-2023 12:03 (Date/Time) **Reviewed by:** /S/ James Guin (eSignature) 28-Nov-2023 15:39 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:305343
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.9UC 1.8C	IR31	
Cooler(s)/Kit(s):	51530		
Date/Time sample(s) sent to storage:	11222023		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Trip Blank placed on work Order Hs23111516

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700

Chain of Custody Form

Page _____ of _____

COC ID: 305342

SHORT HOLDING TIME

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	30167857	Project Name	Huntsman	A	8260_LL_W (8260 Benzene ("Unpreserved"))
Work Order		Project Number		B	8270_PAH_LVI (8270 PAHs (LVI))
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	
Send Report To	Doug Solon	Invoice Attn	Accounts Payable	D	
Address	401 East Main Street, Suite 400	Address	630 Plaza Drive, Suite 600	E	
				F	
City/State/Zip	El Paso, TX 79901	City/State/Zip	Highlands Ranch CO 80129	G	
Phone	(915) 747-3902	Phone	(303) 471-3699	H	
Fax		Fax		I	
e-Mail Address	Douglas.Solon@arcadis.com	e-Mail Address	Accountspayable.administration@arcadi	J	

HS23111520
ARCADIS U.S., Inc.
Huntsman

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-17	11/21/23	0810	W	Raw	3	X										
2	MW-5	11/21/23	0845	W	Raw	3	X										
3	MW-8	11/21/23	0920	W	Raw	3	X										
4	DUP 112123	11/21/23	—	W	Raw	3	X										
5	FB 112123	11/21/23	0925	W	Raw	3	X										
6	MW-11	11/21/23	1000	W	Raw	3	X										
7	MW-10	11/21/23	1035	W	Raw	3	X										
8	EB 112123	11/21/23	1040	W	Raw	3	X										
9																	
10																	

Sampler(s) Please Print & Sign: Doug Solon, Douglas M. Solon

Shipment Method: FED EX

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
DM Solon	11/21/23	1401	
Relinquished by:	Date:	Time:	Received by (Laboratory): 11/22/23 0940
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Arcadis Huntsman

Cooler ID	Cooler Temp.
	1.R31
51530	1.9hz
	-0.1C

QC Package: (Check One Box Below)
[X] Level II Std QC
[ ] Level III Std QC/Raw Data
[ ] Level IV SW846/CLP
[ ] Other
[ ] TRRP Checklist
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEA
Date: 11/21/23 Time:
Name: ARCADIS
Company:

Seal Broken by:
Date:

FedEx
TRK# (0221) 6220 8005 5200

WED – 22 NOV 10:30A
PRIORITY OVERNIGHT

XS SGRA

77099
TX – US IAH

#4971916 11/21 5B3J5/F082/94E3

Arcadis U.S., Inc.
10352 Plaza Americana Drive
Baton Rouge
Louisiana 70816
Phone: 225 292 1004
Fax: 225 218 9677
www.arcadis.com

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 327675

CONDITIONS

Operator:	OGRID:
Huntsman Advanced Materials LLC 10003 Woodloch Forest Drive The Woodlands, TX 77380	330766
	Action Number: 327675
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the 2023 Annual Groundwater Report for the Former Brickland Refinery Site: Content Satisfactory 1. Continue LNAPL removal, if present, at MW-10 by bailing or pumping at quarterly intervals 2. Continue to monitor BTEX at MW-3S, MW-3D, MW-5, MW-6S, MW-6D, MW-8, MW-9S, MW-10, MW-11, and MW-17 3. Continue evaluations as planned for the relationship between river stages, elevated water level measurements, and seasonal increases in concentrations of benzene. 4. Submit the 2024 Annual Groundwater report by April 1, 2025.	6/12/2024