Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation
I-40 Exit 39
Jamestown, NM 87347

September 30, 2021

Mr. Kevin Pierard, Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

RE: SWMU-1 Closure Plan
Western Refining Southwest LLC, D/B/A Marathon Gallup Refinery
(DBA Western Refining Southwest LLC)
EPA ID# NMD000333211

Dear Mr. Pierard:

Western Refining Southwest LLC, D/B/A Marathon Gallup Refinery is submitting this Closure Plan for Solid Waste Management Unit 1 (SWMU-1) in accordance with the requirements of the refinery's Resource Conservation and Recovery Act (RCRA) Post-Closure Permit, issued in October 2013 and modified in September 2017. Included with this submittal are two copies of the report and an electronic copy.

If you have any questions or comments regarding the information contained herein, please do not hesitate to contact John Moore at (505) 879-7643.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction of supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Western Refining Southwest LLC, DBA Marathon Gallup Refinery

Ruth A. Cade

Ruth Cade
Vice-President

Enclosures

cc: D. Cobrain, NMED HWB
L. Barr, OCD
K. Luka, MPC
H. Jones, Trihydro Corporation
M. Suzuki, NMED HWB
G. McCartney, MPC
J. Moore, Gallup Refinery

WESTERN REFINING SOUTHWEST LLC, D/B/A

MARATHON GALLUP REFINERY

SWMU-1 CLOSURE PLAN

SEPTEMBER 22, 2021

Executive Summary

Trihydro Corporation (Trihydro) has prepared this Closure Plan (Plan) to address environmental impacts associated with Solid Waste Management Unit (SWMU) 1 at the Marathon Gallup Refinery (Refinery), owned and operated by Western Refining Southwest LLC. SWMU-1 consists of the former aeration lagoons (AL-1 and AL-2) and an evaporation pond (EP-1). Lagoons AL-1 and AL-2 were formerly operated as a biological treatment unit for the treatment of Refinery wastewater. This Plan describes the activities necessary to complete corrective action associated with AL-1 and AL-2 at the Refinery in 2022.

Closure of SWMU-1 involves submittal of this Plan to the New Mexico Environment Department (NMED) Hazardous Waste Bureau, Plan approval, and implementation of the approved Plan. Implementation will involve excavation of SWMU-1 accumulated sludge (waste), waste stabilization for transportation if needed, waste transportation, and disposal at a permitted Treatment, Storage, and Disposal Facility (TSDF) or recycled as an oil bearing secondary material at another Marathon Refinery. AL-1 and AL-2 wastes are classified as F-listed (F037/F038) hazardous waste as approved by the New Mexico Environment Department (NMED) on June 30, 2021 (Suzuki 2021). EP-1 waste is non-hazardous.

This Plan is submitted pursuant to the requirements of the Refinery's Resource Conservation and Recovery Act (RCRA) Post-Closure Permit issued in October 2013 and modified in September 2017. SWMU-1 will meet the Closure Performance Standards as provided in the Code of Federal Regulations (CFR) Chapter 40 264.111(a), (b), and (c). The Refinery will utilize the NMED Residential Soil Standards and United States Environmental Protection Agency Regional Screening Levels to guide the removal of sludge. In the event that Residential Soil Standards cannot be met, the Refinery will utilize the NMED Industrial and Commercial Soil Standards with requisite institutional controls to complete the corrective action.

SWMU-1 closure will include excavation and removal of the accumulated sludge, followed by confirmation sampling and laboratory analysis, submission of the laboratory analysis to the NMED, and transportation and disposal of the waste to an approved disposal facility. Following sludge removal, an interceptor trench will be installed within AL-1 to collect groundwater in the area and convey it to the existing and future groundwater treatment systems. Installing a trench in AL-1 will reduce the potential of impacted groundwater contacting clean backfill in both AL-1 and AL-2. Backfilling of AL-1 and AL-2 will generally match the existing grade using clean backfill, following NMED approval of the extents of excavation.

Excavation and backfill of AL-1 and AL-2 will be completed in 2022 and EP-1 will be completed in 2023. To meet these milestones, the contractor evaluation and selection process will occur in the third and fourth quarters of 2021. This process will determine sludge management methodology (excavation, handling, and loading, etc.) and the final disposal facility. In general, waste excavation will involve establishment of work areas, including an exclusion zone and decontamination zone, as necessary. Berms will be established around the waste handling areas to contain any storm water runoff. Any accumulated storm water and water from waste dewatering will be removed by vacuum truck and transported to the Refinery's permitted wastewater treatment system.

Final grading of SWMU-1 will provide a relatively flat surface for potential future Refinery use while maintaining positive drainage to reduce ponding.

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Acronyms

ABTU	aggressive biological treatment unit
amsl	above mean sea level
AL	aeration lagoon
bgs	below ground surface
CAFO	Consent Agreement and Final Order
CMIWP	Corrective Measures Investigation Work Plan
CFR	Code of Federal Regulations
decon	decontamination
DRO	diesel range organics
EP	evaporation pond
FID	flame ionization detector
ft	foot or feet
ft^2	square feet
GPS	global positioning system
GRO	gasoline range organics
Hall	Hall Environmental Laboratory
HAZWOPER	hazardous waste operations
I-40	Interstate 40
LCS	Laboratory Control Spike
NM	New Mexico
NMED	New Mexico Environment Department
NOD	Notice of Disapproval
OM&M	Operation, Maintenance, and Monitoring
OBSM	Oil-Bearing Secondary Material

Acronyms (continued)

PM	Project Manager
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RSL	regional screening level
SSL	soil screening levels
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbons
Trihydro	Trihydro Corporation
TSDF	Treatment, Storage, and Disposal Facility
USEPA	United States Environmental Protection Agency
UAS	unmanned aerial survey
VOC	volatile organic compound
Western	Western Refining
WWTP	Wastewater Treatment Plant
yds^3	cubic yards

1.0 Introduction

Trihydro Corporation (Trihydro) has prepared this Closure Plan (Plan) of Solid Waste Management Unit SWMU 1 (SWMU-1) for Western Refining Southwest LLC D/B/A the Marathon Gallup Refinery (Refinery). The Refinery is located approximately 17 miles east of Gallup, McKinley County, New Mexico (NM) along the north side of Interstate 40 (I-40) (Figure 1-1). The physical address is I-40, Exit #39, Jamestown, NM 87347. The Refinery property covers approximately 810 acres.

SWMU-1 consists of two former aeration lagoons (AL-1 and AL-2) and an evaporation pond (EP-1) (Figure 1-2). AL-1 and AL-2 were formerly operated as an aggressive biological treatment unit (ABTU) for the treatment of Refinery wastewater. Following ABTU treatment, water flowed by gravity to EP-1 for initial evaporation, followed by gravity flow to several downstream evaporation ponds, which are within SWMU-2 and are not a part of SWMU-1. SWMU-1 was constructed in 1987 and operated until 2013, when it was replaced by the current system, including a new aeration basin.

The remediation at SWMU-1 involves submittal of this Plan to the New Mexico Environment Department (NMED) Hazardous Waste Bureau, Plan approval, and implementation of the approved Plan. Implementation will involve excavation of SWMU-1 accumulated sludge (waste), waste stabilization for transportation if needed, waste transportation, and disposal at a permitted Treatment, Storage, and Disposal Facility (TSDF) or recycled as an oil-bearing secondary material (OBSM) at another Marathon refinery.

This Plan is submitted pursuant to the requirements of the Refinery's Resource Conservation and Recovery Act (RCRA) Post-Closure Permit, issued in October 2013 and modified in September 2017. SWMU-1 will meet the Closure Performance Standards as provided in the Code of Federal Regulations (CFR) Chapter 40 264.111(a), (b), and (c). The Refinery will utilize the NMED Residential Soil Standards and United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) to guide the removal of sludge. In the event that Residential Soil Standards cannot be met, the Refinery will utilize the NMED Industrial and Commercial Soil Standards with requisite institutional controls to complete the corrective action.

Following excavation and verification sampling that all waste has been removed, an interceptor trench will be installed within the bottom of AL-1 to prevent groundwater from impacting clean backfill. The AL-1 trench will protect both AL-1 and AL-2 by depressing the groundwater surface in the area to reduce the potential for impacted groundwater from contacting clean backfill. The aeration lagoons will be backfilled with clean borrow soil and graded to promote positive drainage and to match the surrounding existing topography

Based on the use of AL-1/AL-2 as an ABTU and with the concurrence of NMED (NMED 2019a), AL-1 and AL-2 waste is classified as F-listed (F037/F038) hazardous waste. SWMU-1 was sampled as part of an investigation conducted in January 2020 (MPC 2021) to characterize SWMU-1 waste as a first step in closure plan preparation. EP-1 was determined to not be a listed waste but was sampled for characteristics.

This Plan describes the activities necessary to close SWMU-1 at the Refinery. This Plan provides a history of SWMU-1, the standards that will be met for closure, the plan for field implementation, and the sampling and analysis plan to verify clean closure.

1.1 Closure Performance Standards

This Plan is submitted pursuant to the requirements of the Refinery's RCRA Post-Closure Permit. SWMU-1 will meet the Closure Performance Standards as provided in the CFR Chapter 40 264.111(a), (b), and (c):

a) Minimizes the need for further maintenance; and

b) Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, and contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and

c) Complies with the closure requirements of this part [264.111]; including, but not limited to, the requirements of 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, 264.601 through 264.603, and 264.1102.

In collaboration with NMED, the Refinery anticipates Closure Plan approval in 2021 or early 2022, with excavation of AL-1 and AL-2 in 2022, and excavation of EP-1 in 2023. An excavation completion report will be prepared in 2022 for AL-1 and AL-2 work; a second report will be provided for EP-1 when excavation is completed in 2023. Once the corrective action has been approved, the Refinery will submit a Class 3 Permit Modification and Long Term Monitoring and Maintenance Plan as described in Condition IV.G of the RCRA permit. The Class 3 Permit Modification will change the status of SWMU-1 from "corrective action required" to "corrective action complete." The timeline of the closure of SWMU-1, approved by NMED, is provided in Appendix A.

1.2 Facility Information

Information regarding the Refinery ownership is below:

Owner/Operator: Western Refining Southwest LLC (Postal Address)
92 Giant Crossing Road
Gallup, New Mexico 87301

Western Refining Southwest LLC (Physical Address)
I-40, Exit 39
Jamestown, New Mexico 87347

The Refinery is situated on 810 acres that are largely located within the lower one quarter of Section 28 and throughout Section 33 of Township 15 North, Range 15 West of the New Mexico Principal Meridian. A small component of the property lies within northeastern one quarter of Section 4 of Township 14 North, Range 15 West.

The Refinery was built in the 1950s within a rural and sparsely populated section of McKinley County in Jamestown, NM, 17 miles east of Gallup, NM. The nearest population centers are the Pilot Flying J Travel Center

refueling plaza, the Interstate 40 highway corridor, and a small cluster of residential homes located on the south side of I-40 approximately 2 miles southwest of the Refinery (Jamestown).

Currently the Refinery is indefinitely idled. When operating, the Refinery is a petroleum refinery that processes crude oil transported by pipeline or tanker truck from the Four Corners region. The Refinery can receive natural gas feed stock from the Western Refining Southwest LLC – Wingate Plant. When operating, process operations at the Refinery include: crude distillation, reformer, fluidized catalytic cracker, alkylation, sulfur recovery, merox treater, and hydrotreater. The Refinery is capable of producing gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

The Refinery has been indefinitely idled since August 2020. The current operations of the Refinery are limited to the Wastewater Treatment Plant (WWTP). Product is not currently stored at the Refinery and all processes have been temporarily shut down as part of the Refinery idling. All process tanks are empty, have been cleaned and inspected, and no longer store or contain material. The Refinery maintains compliance under the RCRA Post-Closure Permit.

1.3 RCRA Compliance

This Plan is covered by the Refinery's RCRA Post-Closure Permit (Modified September 2017) Part IV.H.7.b. The referenced portion of the permit details the elements required for a Corrective Measures Implementation Plan. The elements are listed below followed by the corresponding section (bold) within this Plan or noted deviations:

1. A description of the selected final remedy is provided in Section 5.0.
2. A description of the cleanup goals and remediation system objectives are provided in Section 5.3 and 5.4, respectively.
3. An identification and description of the qualifications of all persons, consultants, and contractors that will be implementing the remedy is required. Specific roles and responsibilities are outlined in Section 1.4.
4. Preliminary engineering design drawings and systems specifications for all elements of the remedy are required and are discussed in Section 5.0. Figures illustrating existing features are included along with a Drawing set that details planned site work.
5. The construction plan is outlined in Section 5.2.
6. An operation, maintenance, and monitoring (OM&M) plan is summarized in Section 5.7.
7. The results of any remedy pilot test (e.g., waste stabilization, etc.) are included in Section 4.3 which summarizes the findings of the SWMU 1 Test Pits excavation.
8. A plan for monitoring the performance of the remedy, including sampling and laboratory analysis of all affected media is provided in Section 5.3.
9. A waste management plan is provided in Section 5.2.

10. A proposed schedule for submission to the NMED of periodic progress reports is presented in Section 5.7.

11. A proposed schedule for implementation of the remedy is presented in Appendix A.

1.4 Program Management

Responsibilities of project personnel and positions that are important to the implementation and performance of the SWMU 1 Closure Activities are described below.

- NMED Representative – the NMED Representative will have the responsibility to review this Closure Plan and subsequent reports submitted by the Refinery.

- Refinery Representatives – the Refinery Environmental staff will serve as the Refinery Project Representatives for the SWMU 1 Closure Plan.

- Consulting Project Team – Various consultants will be retained by the Refinery to complete the closure of SWMU 1. Trihydro presently serves as the Refinery's consultant for implementation of field investigations and data collection efforts. Trihydro is responsible for budget control, contractor oversight and coordination, completion of field activities, and additional assessment activities as requested by the Refinery and/or NMED.

- Consultant Project Manager – the consulting Project Manager (PM) has overall responsibility for ensuring that all field activities and reports meet the objectives outlined in this Closure Plan and the RCRA Post-Closure Care Permit. The consulting PM will report directly to the Refinery and maintain communication with the remainder of the project team. The consulting PM will work in conjunction with the Refinery to complete all necessary tasks associated with this closure.

- Technical Field Staff – The technical field staff implement the closure activities and prepare various reports and supporting materials. Technical field staff are experienced professionals who possess the degree of specialization and technical competence required to perform the required work effectively and efficiently.

- Contractors- Contractors will be selected for field activities and construction associated with this closure. Only contractors with appropriate certifications (i.e., hazardous waste operations [HAZWOPER] and Department of Transportation) will be included on the bidders list. The contractors will work in conjunction with the technical field staff and consulting PM. The contractor will be selected based on experience, certifications, and specialization to perform he required work effectively and efficiently.

2.0 Site Conditions

The Refinery is located within a rural and sparsely populated section of McKinley County. It is situated in the high desert plain on the western flank of the Continental Divide approximately 17 miles east of Gallup, NM. The surrounding land is comprised primarily of public and private lands used for livestock grazing.

2.1 Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. Elevations on the Refinery property range from 7,040 feet (ft) above mean sea level (amsl) to 6,860 ft amsl. The area near the SWMU-1 ponds is at an approximate elevation of 6,910 ft amsl (DiSorbo 2018).

Surface water features of SWMU-1 include only EP-1, AL-1, and AL-2. Additional surface water features in the area are not a part of SWMU 1. The three features that comprise SWMU-1 are blinded from the remaining surface features at the Refinery.

2.2 Subsurface Conditions

The shallow subsurface soil (alluvium) is comprised of clay and silt with some inter-bedded sand layers. Beneath the alluvium is the Petrified Forest Member of the Chinle Group, which primarily consists of interbedded mudstone, siltstone, and sandstone. The Alluvium/Chinle interface at SWMU-1 ranges from 15 ft below ground surface (bgs) to 32 ft bgs. Figure 2-1 shows the potentiometric surface in the area based on groundwater sampling conducted in November 2020. As shown on this figure, the prevailing groundwater flow direction is westward across SWMU-1, which is consistent with prior potentiometric surface maps in this area. Cross-sections through the SWMU-1 area are depicted on Figures 2-2 and 2-3 along with historical ranges (minimum, maximum, and average) of depth to groundwater. These cross-sections were prepared relative to the local ground surface as determined during the aerial survey conducted in November 2018. As shown in these figures, groundwater levels in wells and test pits surrounding SWMU-1 are generally below the anticipated level of the bottom of the sludge in AL-1 and AL-2. The sludge depth in AL-1 and AL-2 is estimated to be 5 to 6 ft, based on SWMU-1 sludge sampling.

Construction as-built drawings of SWMU-1 are not available, but a geotechnical design report entitled "Geotechnical Investigation Three Cell Sludge Pond," dated July 22, 1986, indicates that the plans for the lagoons included clayey soils (NMED 2017). The clay bottom was evident during the recent SWMU-1 investigation (MPC 2021) as a distinct color change and abrupt decrease of waste concentrations measured via laboratory analyses as shown on Table 1.

The topographical data in Figure 2-2 are based on an unmanned aerial survey (UAS) flight conducted in November 2018 using Trihydro's UAS drone. The topographic elevation surface was generated from aerial imagery, with vertical accuracies of 0.1 to 0.2 ft in open areas. All groundwater levels were referenced to ground surface of the UAS survey, thereby providing a basis for comparison of groundwater elevations with respect to the surface water elevations in AL-1 and AL-2 observed in November 2018 during the UAS survey. The photograph on Figure 2-2 was taken at the same time as the ground survey and shows the extent of water

in the two lagoons. The water levels in the area's monitoring wells, in relation to the higher water levels in AL-1 and AL-2, suggest that seepage from groundwater into AL-1 and AL-2 is unlikely.

A cross-section was also prepared for EP-1 (Figure 2-3). As shown in this figure, the water levels in nearby monitoring wells indicates the potential for groundwater seepage into EP-1. In particular, the water level at TP-4, located adjacent to EP-1, is higher in elevation than the EP-1 surface water level. The aerial photograph shown on Figure 2-3 dates from November 2018. EP-1 has been mostly dry for the past several years, but accumulates surface water during monsoon rain events, which then evaporates. Outside of precipitation events, the dry condition of EP-1 indicates that the evaporation rate exceeds any seepage rate of groundwater.

3.0 SWMU-1 History

SWMU-1 consists of the former aeration lagoons, AL-1 and AL-2, and the evaporation pond, EP-1 (Figure 1-2). The lagoons and the pond are located in an area approximately 280 ft by 440 ft. AL-1 and AL-2 are approximately 0.3 acres and 0.5 acres, respectively, and EP-1 is approximately 1.3 acres. The Refinery's process wastewater treatment train historically consisted of an American Petroleum Institute separator, benzene air strippers, and an ABTU consisting of AL-1 and AL-2 in series, followed by evaporation in EP-1. AL-1, AL-2, and EP-1 are earthen surface impoundments with native clay functioning as a bottom liner (DiSorbo 2018).

Western Refining (Western) requested closure of the two aeration lagoons (Western Refining 2009). NMED responded with a Notice of Disapproval (NOD) and requested additional information (NMED 2009). The disapproval noted that the original submitted plan needed to be a Corrective Measures Implementation Action Plan for a SWMU as described in the NMED fee regulations (New Mexico Administrative Code 2016). A Corrective Measures Implementation Work Plan (CMIWP) was subsequently submitted in July of 2009 as requested by NMED in the NOD. The CMIWP was resubmitted and also received a NOD from NMED in June of 2010 (NMED 2010).

During the time that Western was submitting the Closure Plan and CMIWP, the USEPA and Western entered into a Compliance and Consent Agreement and Final Order (CAFO) (Docket No. RCRA-06-2009-0936) (USEPA 2009). A modification to the original CAFO was received by Western in 2010 (USEPA 2010). The CAFO modification was in response to an USEPA inspection of SWMU-1. The inspection identified several USEPA violations with respect to the aeration lagoons. Pursuant to the CAFO, Western was ordered to take action and provide evidence of compliance for the milestones listed in the agreement. One of the requirements included a CMIWP to be approved by NMED. Several milestones identified included the operation of a storm water management system and an upgraded wastewater treatment system. The completion of the milestones allowed Western to discontinue operation of SWMU-1 and begin closure procedures. The CAFO close-out submittal and evidence of milestone completion is under development and will be submitted to the USEPA and NMED during third quarter of 2021.

CMIWPs were submitted several times to NMED and the revised investigation work plan was approved with modifications in September 2019 (MPC 2019a) and additional modifications were submitted in December 2019 (MPC 2019b). NMED approved the modified work plan in December 2019 (NMED 2019a). The approved investigation took place in January of 2020. The investigation report was submitted in March 2020 and disapproved by NMED in August 2020. An approved investigation report with modifications was received by the Refinery from NMED in January 2021. NMED approved the modified work plan and the schedule for submittal of this closure work plan in June 2021 via email. The Refinery submitted the additional changes in April 2021. The investigation report is included in Appendix C of this report.

3.1 Waste Managed

By definition, the lagoons served as primary and secondary separation of petroleum refinery wastewater and therefore contains primary and secondary sludges (F037/F038) which is listed hazardous waste. Sediments

within EP-1 are not classified as hazardous waste. Based on the waste investigation, EP-1 was confirmed as non-hazardous (MPC 2021). Investigations pertaining to SWMU-1 are discussed in Section 4.0.

Waste removed from SWMU-1 during the excavation of AL-1 and AL-2 will be managed in accordance with applicable state and federal regulations.

3.2 Estimated Waste Capacity

The area of the lagoons and pond were determined using CADD software. Volumes for excavation and disposal were calculated using the areas and the average depth of contamination, and then rounded to the nearest 100 cubic yards (yds^3), with resulting waste volumes as follows (MPC 2021):

- AL-1: Average depth 5.2 ft, surface area 13,789 square feet (ft^2), volume 2,700 yds^3.
- AL-2: Average depth 5.3 ft, surface area 23,211 ft^2, volume 4,500 yds^3.
- EP-1: Average depth 5.3 ft, surface area 58,757 ft^2, volume 11,500 yds^3

The Refinery understands that the actual volumes for excavation and disposal may change based on field observations and confirmation sampling during the excavation activities. The Refinery will submit the actual quantities removed in the Excavation Completion Report to be submitted following completion of the work .

4.0 Previous Investigations

Investigations of SWMU-1 have occurred throughout the years to determine remediation efforts and closure requirements. Most recently, investigations were conducted in 2020 and 2021 to provide data needed to develop this Plan. A summary of the most recent investigations is described below.

4.1 Historical Investigations

Sampling has been conducted for soil and waste volume determination and chemical characterization several times since the construction of the aeration lagoons and EP-1. Initial soil sampling took place in the early 1990s and indicated that no significant impacts had occurred near the aeration lagoons from the operation of SWMU-1. Soil sampling was conducted every two years and then reduced to every five years by USEPA request (RPS JDC 2009). Groundwater monitoring wells were installed down-gradient of the SWMU-1 in 2004. GWM-1 has not been sampled since third quarter 2015 due to LNAPL detections in the well. GWM-2 and GWM-3 were not sampled in 2019 due to the lack of groundwater in the wells.

Characterization sampling was conducted in 2008 to compare the analytical results to the relevant screening levels and to calculate the approximate volume of waste that would require excavation. Sampling was conducted using a boat because of the presence of water in the ponds. Laboratory sampling analyses of the wastes consisted of total petroleum hydrocarbons (TPH)-diesel range organics (DRO) and TPH-gasoline range organics (GRO) by USEPA Method 8015, semi-volatile organic compounds (SVOCs) by USEPA Method 8270, volatile organic compounds (VOCs) by USEPA Method 8260, RCRA metals by USEPA Method 6010C, and mercury by USEPA Method 7471.

In the "Aeration Lagoons 1 and 2 and Evaporation Pond 1 Sediment Investigation" report (Trihydro 2008), standards for comparison consisted of NMED Industrial SSLs and the USEPA Maximum Concentrations of Contaminants for the Toxicity Characteristic (CFR Title 40 Part 261). The Toxicity Characteristics Leaching Procedure (TCLP) analysis was not performed. In the absence of TCLP analysis, the sample concentrations were divided by 20 and compared to the TCLP standards as the maximum theoretical leachate concentration that could be observed from the sample. This comparison was to evaluate the potential for soils to exceed the TCLP standard and was used as a screening tool. Through this comparison, 26 samples from various waste depths in the three areas exceeded the TCLP limit for mercury, and three samples from AL-1 exceeded the TCLP limit for lead.

As previously stated, the 2008 sampling was conducted when the ponds were flooded and a boat was required for sample collection. The resulting waste depths and waste volumes were affected by the presence of water. Additional sampling took place in 2020 and is discussed below.

4.2 January 2020 Field Investigation

Sampling took place in January 2020 with the purpose of soil and waste volume determination and chemical characterization. A total of 97 samples were collected from 22 locations, including 10 waste and 12 berm locations. The 2020 samples were analyzed for free liquids to evaluate whether the water accumulating in the lagoons and pond came from outside SWMU-1 or from groundwater. Approximately 6 percent of the samples contained free liquids, showing that the water is likely accumulating from outside the lagoons and pond (i.e.,

precipitation) because the remaining samples were dry. This determination is supported by the cross-sections in Figure 2-2 and 2-3.

4.3 April 2021 Test Pits Investigation

An additional investigation was completed in April 2021 to confirm if shallow groundwater is present in the area surrounding SWMU-1 and if that groundwater contributes to the shallow surface water observed in the evaporation ponds. The Test Pit Investigation Report will be submitted to NMED under separate cover. Following is a summary of the investigation findings.

The investigation included excavating four 10- to 15-ft deep test pits outside of the internal berms (Figure 4-1). With the exception of TP-4 (adjacent to EP-1), groundwater was not encountered during drilling of the test pits. Damp soils were observed during excavation of TP-1 through TP-3, and water was detected in the test pits the day after installation. Drill cuttings of the test pits were sampled for disposal and indicated non-hazardous soils.

Yield testing of the test pits was conducted following the installation. The yield tests were to determine a pumping rate that would equal the recharge rate of the lagoons and pond. Of the four test pits, three locations had sufficient water for testing (TP-2, TP-3, and TP-4). The yield tests demonstrated that the groundwater has low transmissivity indicative of the clay soils. The yield tests at TP-2 and TP-3 included observing nearby monitoring wells to record any influence from the yield tests. No apparent influence was observed in the monitoring wells during the yield tests, which further indicated low transmissivity.

As shown in Figure 2-2 and 2-3, groundwater elevations in the area of SWMU-1 indicate the following:

- Surface water is ponded on the surface of the aeration lagoons after periods of precipitation.
- Groundwater levels in wells and test pits surrounding SWMU-1 are generally below the level of the bottom of the sludge in ponds AL-1 and AL-2 (approximate depth of sludge is 5 to 6 ft as determined during SWMU-1 sludge sampling).
- The groundwater levels in the area's monitoring wells, in relation to the higher water levels in AL-1 and AL-2, strongly suggest that seepage from groundwater into the ponds has likely not occurred. During excavation, the bottom excavation elevation may encroach into the historical ranges of local groundwater elevations, but although this indicates the potential for flow into the excavation, the low permeability of the water-bearing unit combined with the compacted natural clay liner of the ponds indicate that groundwater seepage into the excavation should not be a problem. At a minimum, the seepage rate is likely low enough to control with standard excavation practices, such as a shallow diversion trench installed at the excavation bottom. Post closure groundwater management is addressed in Section 5.4.

5.0 Corrective Action

SWMU-1 corrective action will include excavation and removal of the accumulated waste. A description of the planned activities is described in the following sections. Figures with aerial photography have been prepared to illustrate the location of various investigative features (e.g., test pits, etc.). A drawing set has been developed to illustrate planned work activities. Figures and Drawings are referenced below. A process flow chart is included in Section 5.2.3.

The Refinery commits to the following general elements for this plan:

- Excavation of all SWMU-1 waste that meet appropriate standards
- Disposal and/or treatment of AL-1 and AL-2 wastes as hazardous waste or as OBSM
- Disposal and/or treatment of EP-1 waste as nonhazardous waste (to be performed in 2023)
- Confirmation sampling of the excavation, as proposed in detail below
- Transportation of the waste to a permitted TSDF facility or recycled as OBSM at another Marathon refinery

5.1 Dewatering SWMU-1

Dewatering activities began following the April 2021 field event to remove standing water in the lagoons and continues as precipitation accumulates in the lagoons. The initial proposed dewatering sumps were not feasible due to the conditions encountered in the lagoons. Rather than sumps, a suction pipe was suspended in AL-2 and water was pumped into a frac tank using a diaphragm pump. AL-1 did not contain sufficient water to pump during the April 2021 field event. The collected water from the ponds is treated in the Refinery WWTP.

The results of investigation activities at SWMU-1 indicate that groundwater seepage into SWMU-1 is unlikely for AL-1 and AL-2. For EP-1, the seepage potential is higher, but the currently observed dry conditions of EP-1 indicates that if present, the groundwater seepage rate is very low. Should seepage occur into any excavation, typical construction water management methods, such as sumps or drainage ditches will be utilized to collect water for treatment through the Refinery WWTP.

Depending on the waste characteristics during excavation and onsite handling prior to transportation offsite, stabilization of the waste may be required. Stabilization may involve absorption of free liquids, such as water or residual separate phase hydrocarbon. Locally-available soil may be used for this purpose. Alternatively, spent zeolite catalyst is available and may be utilized as an adsorbent material if needed. Analytical characterization data for this material is presented in Appendix B.

5.2 Construction Plan for SWMU-1

Specific excavation and waste handling processes will be determined as part of contractor selection, and waste handling may involve proprietary processes involving stabilizers, centrifugation, or de-emulsification. Similarly, the Refinery will determine the final disposal site for the waste, including transportation to the disposal or treatment site. Specific excavation procedures are outlined below.

5.2.1 SWMU-1 Site Preparation

The initial phase of work will include preparation of the SWMU-1 work area. This phase will include continued dewatering operations (as needed) as discussed in Section 5.1. Berms will be established upgradient of the AL-1 work area to convey storm water run-on around the work area (Drawings Sheets 3 and 4). Any accumulated stormwater and water from waste dewatering will be removed by vacuum truck and transported to Tank 35, entry point for the Refinery WWTP. No surface discharges of storm water from the work area will be allowed.

Site survey control will be established to facilitate surveying of the final base of excavation and the final graded surface. Confirmation sampling points will be located with a hand-held global positioning system (GPS) unit that will be tied into the local survey control.

5.2.2 Auxiliary Site Preparation

This activity includes preparation of a waste management area, development of the backfill borrow source, and coordination of movement of materials in and out of the SWMU 1 work area.

Borrow Area

The Refinery's onsite borrow pit will be utilized to source backfill soil. Site prep may include any or all of the following activities:

- Improvement of area access roads to ensure efficient flow of trucks to/from the borrow pit
- Excavation of test pits within the borrow pit bank to verify the initial quantity and quality of backfill soil
- Stormwater management as needed to reduce the potential for excessive sediment transport

Waste Management/Handling Area

Options for waste transportation include over-the-highway trucking (via trucks or roll-offs) or transport by rail. Management and loadout of trucks versus rail may require the use of a waste management/handling/stockpile area. Design considerations to plan for these scenarios are included on Drawing Sheets 3 and 4. A waste management area site will be selected based upon the mode of transportation. Locations may include the area immediately west of AL-2 or alternatively adjacent to the existing rail spur on the eastern side of the Refinery (Drawing Sheet 2). The location will be selected based upon available access for roll-off containers, off-road trucks, or over-the-highway trucks. Coordination with the Refinery will be required to determine the best route for vehicular access.

The waste management area (if needed) will be constructed on relatively flat ground with all vegetation removed. The resulting surface will be rolled with a smooth drum roller to provide a firm, unyielding surface. A sacrificial high density polyethylene liner will be laid on the prepared surface, followed by a minimum 1 ft layer of borrow material to serve as a working surface. Berms with an equipment-mountable entrance will be utilized to prevent migration of stormwater run-on and runoff. Design details for the waste management pad are provided on Drawing Sheet 4. Ponded precipitation would be removed via vacuum truck for transport to Tank 35 for treatment through the WWTP.

A decontamination (decon) area will be required at the lagoons loadout area to prevent the spread of excavated waste. Waste loadout (e.g., into roll-off containers) will be performed in such a manner to reduce the amount of waste contacting the exterior of the container or truck body. Loose waste will be removed from container exteriors via brooms or with water spray if necessary. Decon pads will be graded such that removed waste is conveyed into sumps for removal via backhoe for management and disposal.

5.2.3 Waste Excavation

Waste excavation will commence in AL-1 first due to its location upgradient of AL-2. Conventional excavation equipment (e.g., track hoe, bulldozer, long-stick excavator, etc.) will be utilized to remove the sludge from lagoons. Depending on final disposition, waste will be loaded into off-road trucks for transport to a waste management location or into roll-off containers or over-the-highway trucks for transportation offsite.

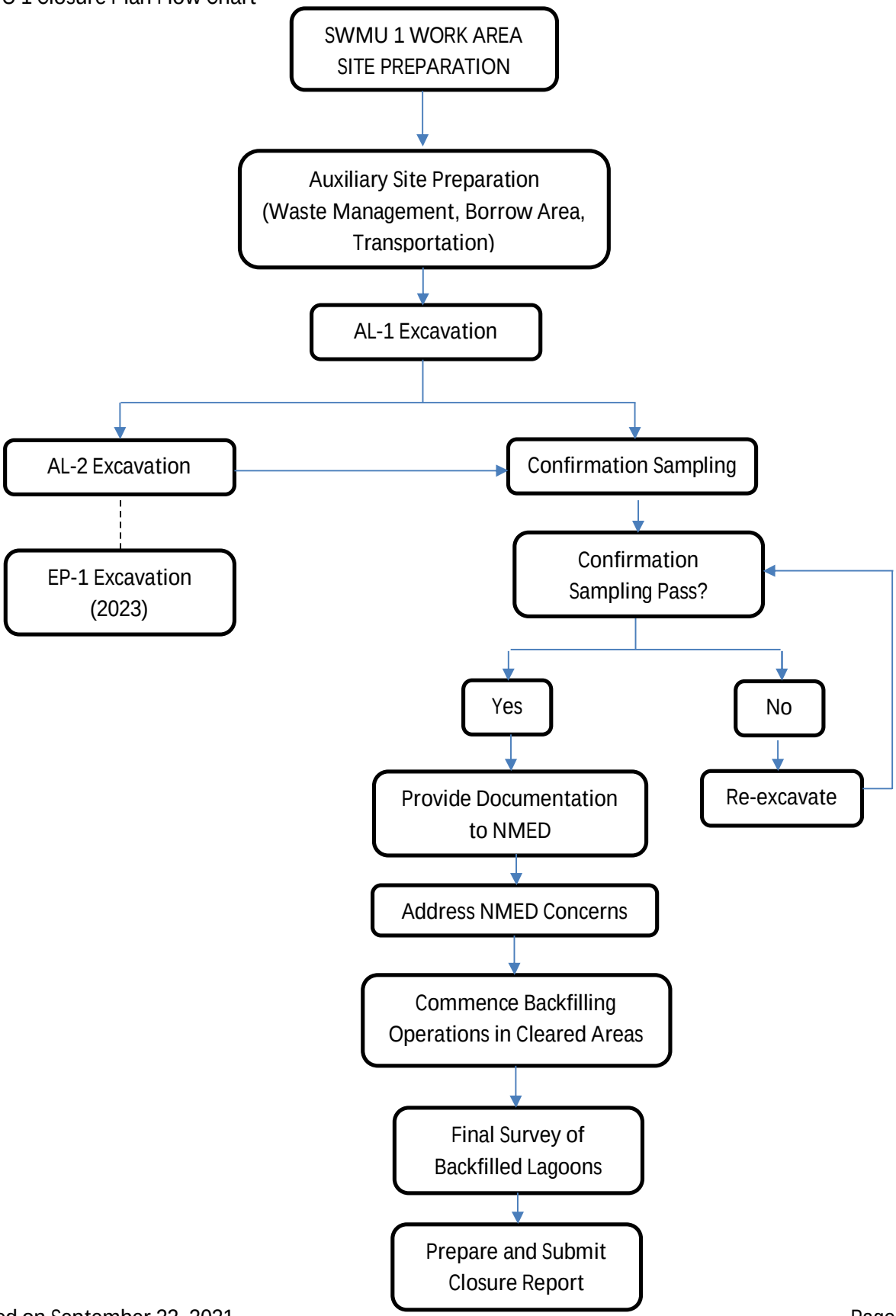
Excavation depth will be determined from field observations of a distinct color change in the clay liners of the ponds. This color change is anticipated to be accompanied by an abrupt change of contaminant concentrations, as documented in the SWMU-1 sampling results report (MPC 2021) and as summarized in Table 1. As summarized in this report, flame ionization detector (FID) field screening results also exhibited a correlation with TPH-GRO, TPH-DRO and TPH-oil range organics laboratory results. FID field screening will involve the standard field screening method using a sealed plastic bag and headspace measurement using an FID. As an alternative, the Refinery may deploy a combustible gas indicator to screen for contaminant concentrations in situations where high moisture content soil interferes with FID operation.

The following flow chart depicts the sequence of work activities for the SWMU 1 closure.

5.2.4 Berm Excavation

The berms separating and surrounding the lagoons will be removed during the excavation process. As discussed in NMED correspondence (NMED 2021), the upper 1.5 ft of berm soil will be excavated and segregated for composite soil testing to determine suitability for use as clean backfill. Soil will be tested for the following constituents: VOCs, SVOCs, and metals at a frequency of one sample for every 100 yd^3 of segregated material. The soil will be required to meet NMED Residential Soil Standards for use as backfill. Berm soil underlying the upper 1.5 ft will be segregated and evaluated for disposal at a permitted TSD facility.

SWMU 1 Closure Plan Flow Chart



5.3 Closure Sampling and Analysis Plan

Post-excavation confirmation samples will be collected from SWMU-1 ponds and berms. Proposed sampling locations will include vertical sampling of lagoon floors and horizontal sampling of lagoon berms and excavation sidewalls.

5.3.1 Confirmation Soil Sampling Frequency

Following are the frequencies specified by NMED (2010) for confirmation sampling:

- Grid spacing of approximately 30 ft for all faces of the excavation (bottom and sides). This will equate to a coverage of one sample approximately every 900 ft^2 for the bottom of the excavation.
- All sidewall confirmation samples will be collected from two locations: one soil sample will be collected from the sidewall at the base of the excavation, and the other soil sample must be collected approximately five ft below the base of the average water line. In areas where these dimensions are separated by less than three vertical ft, then only one sidewall sample will be collected from the base of the excavation.
- For areas requiring additional excavation, the resampling will be spaced every 20 ft to confirm removal of impacted material. This will equate to a single sample up to 400 ft^2 of re-excavated area and then an additional sample for every additional 400 ft^2 area. Re-excavated sidewalls will be sampled by collecting one sample from the base of the re-excavated sidewall at 20 ft intervals.
- Sampling below the base of the excavation will be performed by collecting samples at a total depth of 5 ft below the bottom of the excavation. The frequency of this sampling will equal ½ of the total confirmation samples collected from the base (i.e., if 20 samples are collected from the base of the excavation, then 10 samples will be collected from a depth of 5 ft below the base).
- Additional sidewall samples will be collected from 3 ft into the sidewalls to demonstrate that contamination has not migrated laterally. The frequency of the deeper sidewall samples will be one sample per sidewall at a location approximately 5 ft below the base of the water line.
- Each sample collected for laboratory analysis will be a discreet sample; composite sampling will not be utilized.

Samples will be analyzed for the following constituents:

- Metals, USEPA Method 6010
- SVOCs, USEPA Method 8270
- VOCs, USEPA Method 8260
- TCLP (for hazardous list)

- TPH-GRO and TPH-DRO, USEPA Method 8015
- FID – Headspace sampling

The Refinery will utilize an accredited laboratory for all soil analyses. Analytical data will be screened by comparison with NMED Residential soil screening levels (SSLs). If Residential SSLs are not met, then Industrial SSLs will be utilized for confirmatory sampling. USEPA Residential and Industrial SSLs will be used where NMED standards are not established. Use of Industrial SSLs will require the application of institutional controls and long-term operations and monitoring activities.

5.3.2 Soil Sample Collection

Soil sampling for this Plan will be required for confirmation sampling following excavation, and for characterization of waste as needed (e.g., berm soil that may require disposal, but is not listed hazardous waste). The following procedures will be followed by field staff collecting samples during execution of this Plan.

5.3.2.1 Equipment

Field screening equipment will be inspected prior to beginning work. For soil sampling, the only field monitoring equipment used will be a photoionization detector (PID) or other approved screening instrument. Instruments will be calibrated daily and will be operated according to manufacturer's recommendations.

The following equipment is recommended for soil sampling:

- Required personal protective equipment (PPE), listed in the site-specific health and safety plan (HASP)
- Soil sampling devices (i.e., hand auger, shovel) and stainless steel trowels and bowls for composite sample mixing when needed
- Sampling beaker, bottles, labels, and preservatives
- Gloves
- Chain-of-custody/sample-analysis-request forms
- PID, FID or other approved screening instrument
- Global Positioning System (GPS) unit
- Opaque Cooler(s) and bagged ice or frozen Blue Ice
- Detergent or solvent for cleaning monitoring equipment
- Brushes dedicated for decontamination
- Decontamination containers dedicated for wash, rinse 1, and rinse 2
- Deionized water for decontamination

- Paper towels
- Trash bags
- Field logbook

5.3.2.2 Sample Methodology

Selection of equipment and technique should be appropriate for the volume of material required and the type of analysis to be performed. In general, the sampling equipment and technique will be chosen to minimize, to the extent possible, the amount of handling a sample will undergo prior to analysis. In many cases, the material to be sampled will be easy to access, and simple "grab" samples collected using a shovel, trowel, or drive sampler are appropriate. In other cases, such as heavily saturated samples, the soils may be difficult to access, and sampling will involve the use of specialized soil sampling equipment.

Soil samples located in dry areas will be collected from representative locations using a decontaminated hand auger, shovel, hand trowel. The sampling device will be driven completely into the material manually or using a manually operated auger, drive hammer, or mallet. The sampling device will then be extracted from the material using a shovel or trowel as needed. The material will placed directly from the trowel or other appropriate sampling device into a clean glass jar. The jar will be filled completely to minimize headspace (by tamping during filling), and immediately sealed with a Teflon-lined lid.

If necessary, several samples may be collected from each location to provide adequate sample volume for the laboratory. The sample containers will be labeled with indelible ink. Filled sample containers will be wiped dry and placed in a cooler with ice (or equivalent) for storage at the time of collection. Enough ice and protective packing material should be used to cool the samples to 4°C and ensure that the container remains intact prior to final packing and shipment.

Field screening may involve the use of a PID, FID, or approved instrument. In this case, material will be placed from the trowel or other appropriate sampling device into a plastic bag. The instrument will be inserted into the bag and the reading taken. All samples shall be screened at as close to the same temperature as possible to obtain consistent results. After collecting the reading, the material will be transferred from the bag into a clean glass jar as described above.

Sampling devices will be decontaminated between sampling locations using a four-stage decontamination system consisting of a two detergent/water washes and two deionized water rinses. Sample locations will be recorded with a GPS unit in order to accurately map the sampling locations.

Field logbooks, Soil Sampling Field Log, and Photograph Logs will provide a written record of field data gathered, field observations, field equipment calibrations, the samples collected for analysis, and sample custody. Color photographs will be used to substantiate and augment the field notes, if necessary. Field records will be maintained in the project file.

5.3.3 Field QA/QC Procedures

The procedures outlined below shall be followed by the sampling team to ensure reliable data are generated during each sampling event. The sampling team will record conditions and observations in a field notebook, daily activity record sheet, or sample event activity sheet to document the sampling activities, conditions, and observations. In addition, the quality assurance/quality control (QA/QC) samples that may be used to ensure reliable data are described in the following sections:

- Blind Duplicate: Blind duplicate samples will be collected at a rate of one for every ten soil samples collected, at a minimum of one per day.
- Equipment Blank: Equipment blanks will be collected from the hand-auger at a rate of one for every ten soil samples collected, at a minimum of one per day.
- Trip Blank: One trip blank will be included in each cooler shipped from the Refinery to the laboratory. The trip blank will be prepared by the laboratory. The trip blank analytical results will be used to document and check for potential cross contamination during shipping.

5.3.4 Laboratory QA/QC Procedures

The QA/QC program employed by the contract laboratory will be evaluated to document the quality of analytical data generated from each sampling event. The guidelines used will follow USEPA protocol. The results from blanks, duplicates, and spike samples will be employed to assess the validity of analytical data. The guidelines to be followed by the laboratory may include but are not limited to:

1. Method Blanks: Method blanks are “clean” matrix similar samples prepared and analyzed by the laboratory. Analysis of the method blank is used to identify laboratory derived contaminants introduced during sample preparation, extraction, and analysis. Method blanks will be analyzed at a frequency of one per sample batch or 12-hour period by the laboratory. A batch consists of three samples or less analyzed at the same time using the same method.
2. Initial Calibrations: Initial calibration standards containing both target compounds and system monitoring compounds are analyzed at a range of concentrations at the beginning of each analytical sequence. Initial calibration standards are also analyzed if the percent difference between the initial calibration and the continuing calibration is not within the method specified limits. Compliance limits specifying the acceptable range for instrument calibration are established to document the analytical instrument is capable of quantifying the target compounds within the reporting requirements.
3. Continuing Calibration Verification: Continuing calibration verifications are performed routinely to document the instrument remains within the initial calibration configuration and to demonstrate quantified data are within reporting limits. Continuing calibration standards consisting of both target compounds and system monitoring compounds are analyzed at the beginning of each 12-hour sample batch following the analysis of the instrument performance check and prior to the analysis of the method blank. The continuing calibration relative response factor will be compared to the method specific limits. The percent difference

between the initial calibration and the continuing calibration will be determined and compared to method specified limits.

4. Laboratory Control Spike (LCS) (Performance Evaluation Samples): LCSs are "clean" matrix similar samples prepared by the laboratory and spiked with a known concentration of constituents prior to extraction and analysis. The LCS is used to evaluate laboratory accuracy and method compliance. The LCS will be prepared and analyzed by the laboratory at a frequency of one per every three samples analyzed or one per sample batch.

5. Surrogate Spiking: Surrogate compounds consist of laboratory derived compounds that are introduced to each sample submitted to and prepared by the laboratory prior to extraction and analysis. The surrogate compounds spiked to each sample are specific to the laboratory analytical method. Quantification of the surrogate compounds allows for determination of matrix effects and laboratory performance on individual samples.

6. Holding Times: Samples will be analyzed within a time period beginning on the day the sample was collected and specific to the type of analysis performed. It will be the responsibility of the laboratory to meet these time constraints.

   Deliverables from the laboratory, received via email, will include a standard QA/QC package with the following pertinent information, as appropriate:

   - Dates Report (Procedure and Analyses Times)
   - Case narrative
   - Final completed chain of custody form
   - Sample results
   - Quality Control result summary
   - Additional performance criteria specific to analytical methods
   - Laboratory method detection limit identification/verification

5.3.5 Reporting Limits

The applicable screening and potential cleanup levels are specified in "2019 NMED Risk Assessment Guidance for Site Investigations and Remediation" (NMED 2019b) and in the USEPA "Regional Screening Levels" (RSLs) (USEPA 2021).

For non-residential properties (e.g., the Refinery), the soil screening levels must be protective of commercial/industrial workers throughout the upper one foot of surface soils and construction workers throughout the upper 10 ft based on NMED criteria. NMED's requirement to sample below the base of the excavation to a depth of 5 ft along with the addition of clean soil backfill to the final grade will meet the 10 ft

criteria. NMED residential soil screening levels are applied to the upper ten ft and SSLs for protection of groundwater apply throughout the vadose zone.

5.3.6 Quality Assurance

The analytical sampling results will undergo data validation by Trihydro. Data qualifiers may be applied to the analytical results based on holding times, laboratory QA/QC results, and other results that could impact the quality of the data. Data qualifiers will be reported in the Excavation Completion Report.

5.4 Installation of Groundwater Interceptor Trenches for Future Control of Groundwater

Following excavation of the waste in AL-1, a groundwater interceptor trench will be installed on the eastern, upgradient side of AL-1 in the location shown on Drawing Sheet 3. Based on the depth of local groundwater, the expected depth of this excavation is approximately 4 to 5 ft bgs at the bottom of the excavation. A cross section of the interceptor trench is also shown on Drawing Sheet 4. During backfill, a sump will be installed into the interceptor trench, which will consist of 4-inch polyvinyl chloride pipe. This sump will be brought to the surface to allow access for pumping of the trench, if groundwater levels indicate that this is required.

A similar groundwater interceptor trench will be installed in EP-1 following excavation. Based on the relative depths of the AL-1 and EP-1 interceptor trenches, they may be connected during backfill of EP-1. To facilitate the connection, a blanked pipe will be installed on the north end of the AL-1 interceptor trench, along with a surface riser pipe in that location. If the relative depths do not allow connection, both interceptor trenches will contain dedicated sumps.

Groundwater from these sumps will be extracted by vacuum truck until a permanent groundwater recovery system is installed in 2022. Depending on the depth of the interceptor trenches, such a permanent system may use gravity drainage of the AL-1/EP-1 interceptor trenches into the existing Sanitary Treatment Pond French Drain frac tank.

5.5 Excavation Backfill

Following excavation and confirmation sampling of each aerobic lagoon, NMED will be provided with analytical data and will have the opportunity to review the results prior to beginning placement of backfill.

5.5.1 Backfill Sampling

Excavation backfill will be sourced from onsite borrow material, anticipated to be the currently existing borrow pit which provides a source of clay-rich soil. Soil samples will be collected from the borrow pit via backhoe for chemical analyses to ensure that unimpacted material is utilized for SWMU-1 backfill. Soil samples will continue to be collected at 500 yd^3 intervals to ensure the backfill material is approved for use. Soil will be tested for the following constituents: VOCs, SVOCs, and metals.

5.5.2 Backfill Operations

Backfill soil will be transported to SWMU-1 as needed. Soil will be placed in 1-ft lifts and compacted with approved equipment to create a firm, unyielding surface. Soil placement and compaction will continue until

final grades are achieved as approximated in Drawing Sheet 3. The final surface will provide drainage to prevent ponding. The former SWMU-1 area will be reserved for future Refinery operations.

5.6 Reporting

A summary report will be prepared that describes the excavation, waste handling, sampling and analysis, and backfilling of SWMU-1, including tables and figures. Laboratory analytical reports will also be included. The Refinery will submit two reports covering the AL-1/AL-2 activities scheduled for 2022 and the EP-1 activities scheduled for 2023, respectively. As discussed above, the Refinery expects an interim review and approval of confirmation sampling results by the NMED. The purpose for receiving NMED approval prior to backfill will be used to expedite field operations and minimize the time excavations are open.

5.7 Long-Term OM&M

Long-term OM&M will include maintenance of the interceptor trenches installed within SWMU-1, and inspections and maintenance (when needed) of the backfilled cover soil. Each activity is addressed below.

The groundwater interceptor trenches will be pumped as required to produce a hydraulic depression that will impede groundwater migration westward across the SWMU-1 footprint. Initially, this pumping will be conducted using a vacuum truck and the recovered water will be pumped into Tank 35 for treatment within the Refinery WWTP. The interceptor trench sumps will be gauged on a frequent basis to ensure maintenance of the hydraulic depression. The volume of water recovered will be recorded and reported as part of the Refinery's routine reporting.

Associated SWMU-1 storm water drainage components (cover soil, outlets, etc.) will be inspected, monthly and after major storm events, to ensure proper flow toward outfalls 1 and 2. Inspections will include checking for erosion of cover soil, drainage channels, and/or berms, identifying any growth and/or debris in drainages that may prohibit proper flow, and inspecting culverts for blockage. In the event that maintenance is required, the Refinery will address the issue as soon as practical. These inspections will be documented as part of ongoing environmental monitoring operations.

6.0 Work Contracting

The Refinery intends to solicit contractor competitive proposals and bids for the excavation, waste management and backfill of SWMU-1. AL-1 and AL-2 will be excavated in 2022. EP-1 will be excavated in 2023. Prospective contractors will be provided with a bid package and a bid walk will be held to enable development of competitive bids. Prospective contractors will be encouraged to propose methods of waste handling and treatment that minimize the volume of the waste and any residual hazard posed by the excavated and stabilized waste.

The Refinery expects to retain separate contractors for the SWMU-1 excavation, construction management, and environmental monitoring and sampling. All contractors will be HAZWOPER certified and will meet the qualifications lined out in USEPA regulations. The environmental contractor will provide the equipment, materials, and labor to execute the work, including sludge excavation. The Refinery anticipates that the excavation contractor will submit the following plans:

- Excavation and waste handling operations
- Health and safety
- Storm water management
- General project management

In addition, the excavation contractor must provide proof of necessary health and safety training, including but not limited to HAZWOPER and Refinery-specific training.

Duties of the construction management/environmental contractor will include:

- Overall construction management authority with a direct reporting to the responsible Refinery PM
- Preparation of an organization chart, including lines of communication to the Refinery PM
- Review and approval of the excavation contractor's health and safety plan
- Daily health and safety briefing, including tailgate safety forms and job safety analysis
- Daily preparation of field activity daily logs, including, but not limited to progress notes, equipment used on site, number of contractor personnel
- Collection and field sampling of field screening samples, including waste description, color, and other gross characteristics
- Calibration of field equipment, such as FID and air monitoring instruments

- Documentation of waste transportation
- Collection of confirmation samples for submission to the laboratory

All onsite personnel will have stop work authority. Emergency services are covered by the Gallup Fire Department.

7.0 Schedule

The schedule of closure activities was submitted to NMED in April 2021 and approved in June 2021. This schedule is included as Appendix A. The Refinery expects AL-1/AL-2 excavation and backfill operations to be completed in 2022, with EP-1 excavation and backfill in 2023. Final closure reports will be submitted in 2022 for the aeration lagoons, and in 2023 for the evaporation pond.

8.0 References

DiSorbo. 2018. Investigation Work Plan Solid Waste Management Unit (SWMU) No. 1 Aeration Basin and SWMU No. 14 Old API Separator. Gallup Refinery, Western Refining Southwest, Inc., Gallup, New Mexico. November.

Marathon Petroleum Corporation (MPC). 2021. SWMU-1 Investigation Report, Marathon Petroleum Corporation, Gallup Refining Division. Revised January 5.

MPC. 2019a. 2019 SWMU-1 Soil Sampling Investigation Work Plan, Marathon Petroleum Corporation, Gallup Refining Division. September.

MPC. 2019b. Response to Approval with Modifications, Investigation Work Plan SWMU-1, Marathon Petroleum Company LP, Gallup Refinery, (dba Western Refining Southwest, Inc.), EPA ID# NMD000333211. December.

New Mexico Administrative Code. 2006. Title 20 – Environmental Protection Chapter 4 – Hazardous Waste Part 2 – Hazardous Waste Permit and Corrective Action Fees. (20.4.2). August.

New Mexico Environment Department (NMED). 2009. Notice of Disapproval, Closure Plan Aeration Lagoons, Western Refining Company, Southwest, Inc., Gallup Refinery, EPA ID # NMD000333211, HWB-GRCC-09-003. May.

NMED. 2010. Second Notice of Disapproval, Corrective Measures Implementation Work Plan, SWMU-1, Wastewater Aeration Lagoons, Western Refining Company Southwest, Inc., Gallup Refinery, EPA ID # NMD00333211, HWB-GRCC-09-003. June.

NMED. 2011. Notice of Disapproval, Corrective Measures Implementation Work Plan, SWMU-1, Wastewater Aeration Lagoons, Western Refining Company Southwest, Inc., Gallup Refinery, EPA ID # NMD00333211, HWB-GRCC-09-003. January.

NMED. 2017. Notification of Determination, Hazardous Waste Management Unit, Aeration Basin, Western Refining Company Southwest, Inc., Gallup Refinery, EPA ID # NMD00333211, HWB-WRG-17-MISC. February.

NMED. 2019a. 2019 Response to Approval with Modifications Investigation Work Plan SWMU-1, Marathon Petroleum Company LP, Gallup Refinery (dba Western Refining Southwest, Inc) EPA ID# NMD000333211. December.

NMED. 2019b. 2019 NMED Risk Assessment Guidance for Site Investigations and Remediation. February.

NMED. 2021. Response to Approval with Modifications, SWMU-1 Revised Investigation Report, Marathon Petroleum Company LP, Gallup Refinery (dba Western Refining Southwest, Inc) EPA ID# NMD000333211. April.

RPS JDC. 2009. Closure Plan Aeration Lagoons Gallup Refinery. Western Refining Southwest, Inc., Gallup, New Mexico. February.

Suzuki, M. 2021. Response to Approval with Modifications, dated June 11, 2021 (WRG-14-005). June 30 [Online]. Available email: Michaiya.Suzuki@state.nm.us.

Trihydro Corporation (Trihydro). 2008. Aeration Lagoons 1 and 2 and Evaporation Pond 1 Sediment Investigation Western Refining Company, Gallup Refinery, Gallup, New Mexico. June.

United States Environmental Protection Agency (USEPA). 2009. Complaint and Consent Agreement and Final Order, Docket No. RCRA-06-2009-0936. August.

USEPA. 2010. Re: Western Refining Complaint, Consent Agreement and Final Order Modification. August.

USEPA. 2021. Regional Screening Tables. May.

Western Refining. 2009. Closure Plan Aeration Lagoons, Western Refining Company Southwest, Inc., Gallup Refinery, EPA ID # NMD00333211, HWB-GRCC-09-003. February.

Figures

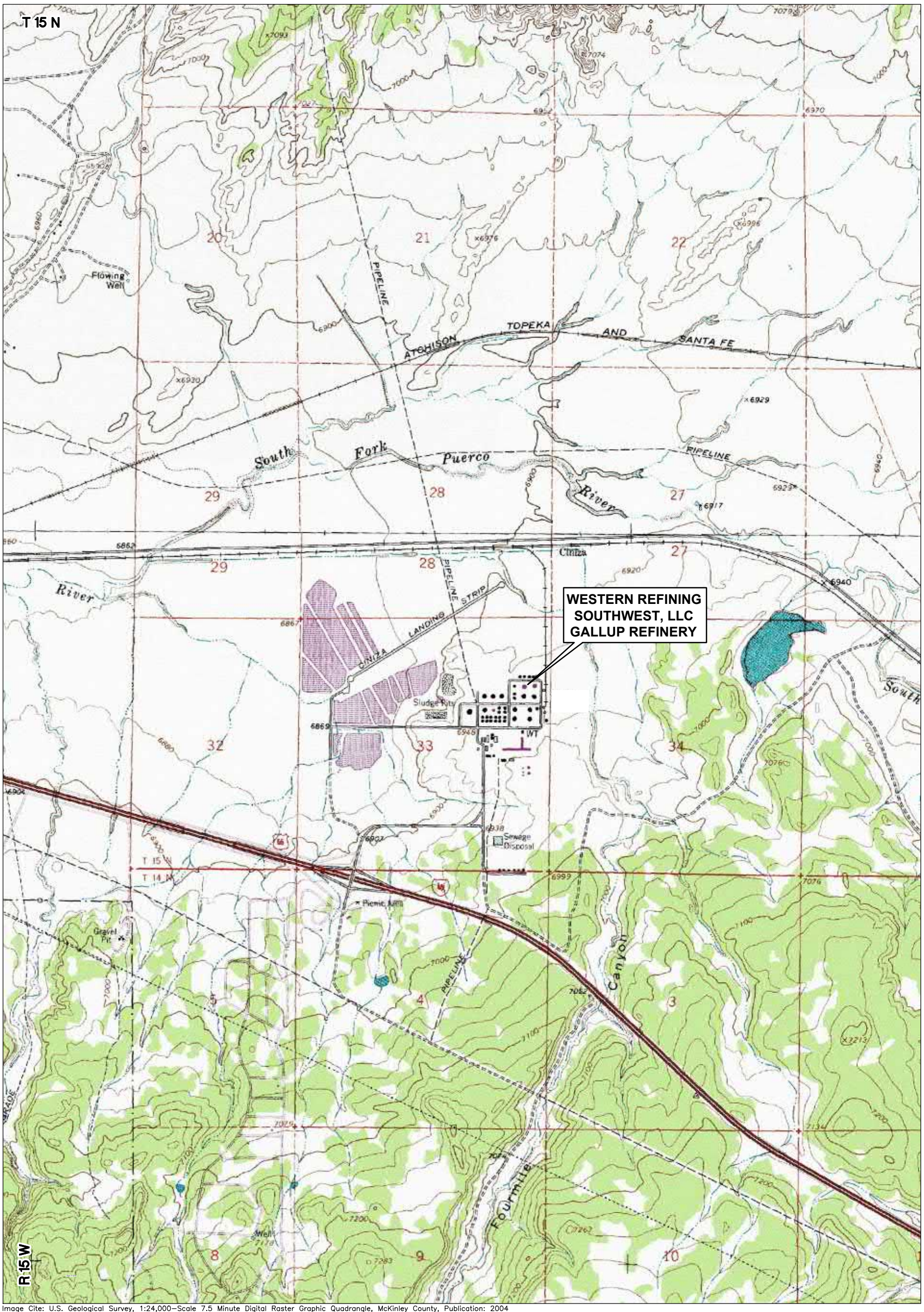


Image Cite: U.S. Geological Survey, 1:24,000–Scale 7.5 Minute Digital Raster Graphic Quadrangle, McKinley County, Publication: 2004

NEW MEXICO

QUADRANGLE LOCATION

NOTE:
SITE LEGAL DESCRIPTION -
TOWNSHIP 15 NORTH,
RANGE 15 WEST, SECTION 33

N

0 2,000'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 1-1

REFINERY LOCATION
SWMU 1 CLOSURE PLAN

WESTERN REFINING SOUTHWEST, LLC
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: BM	Scale: 1" = 2,000'	Date: 4/22/2020	File: 697-CP-REFINERYLOC

M:\TTON\MARATHON\CADD\GALLUP_REPORTS\SWMU1_EVAPPONDCLOSURE\CLOSUREPLAN\697-CP-REFINERYLOC

EXPLANATION

MONITORING WELL LOCATION

NOTES:

AL - AERATION LAGOON
EP - EVAPORATION POND
SWMU - SOLID WASTE MANAGEMENT UNIT

N

0 80'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 1-2

SWMU 1 AERIAL PHOTO (MAY 2018)

WESTERN REFINING SOUTHWEST, LLC MARATHON GALLUP REFINERY GALLUP, NEW MEXICO

Drawn By: KEJ	Checked By: CF	Scale: 1 " = 80 '	Date: 9/2/21	File: 1-2_SWMU1_Fig1-2.mxd

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EXPLANATION

MONITORING WELL LOCATION FOLLOWED BY GROUNDWATER ELEVATION IN FEET

LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FEET ABOVE MEAN SEA LEVEL)

NOTES:

AL - AERATION LAGOON
EP - EVAPORATION POND
SWMU - SOLID WASTE MANAGEMENT UNIT

N

0 120'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 2-1

SWMU-1 CHINLE/ALLUVIUM INTERFACE AQUIFER POTENTIOMETRIC SURFACE MAP (NOVEMBER 2020)

**WESTERN REFINING SOUTHWEST LLC
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO**

Drawn By: KEJ	Checked By: CF	Scale: 1 " = 120 '	Date: 8/23/21	File: 2-1_SWMU_PotSurface_Fig2-1.mxd

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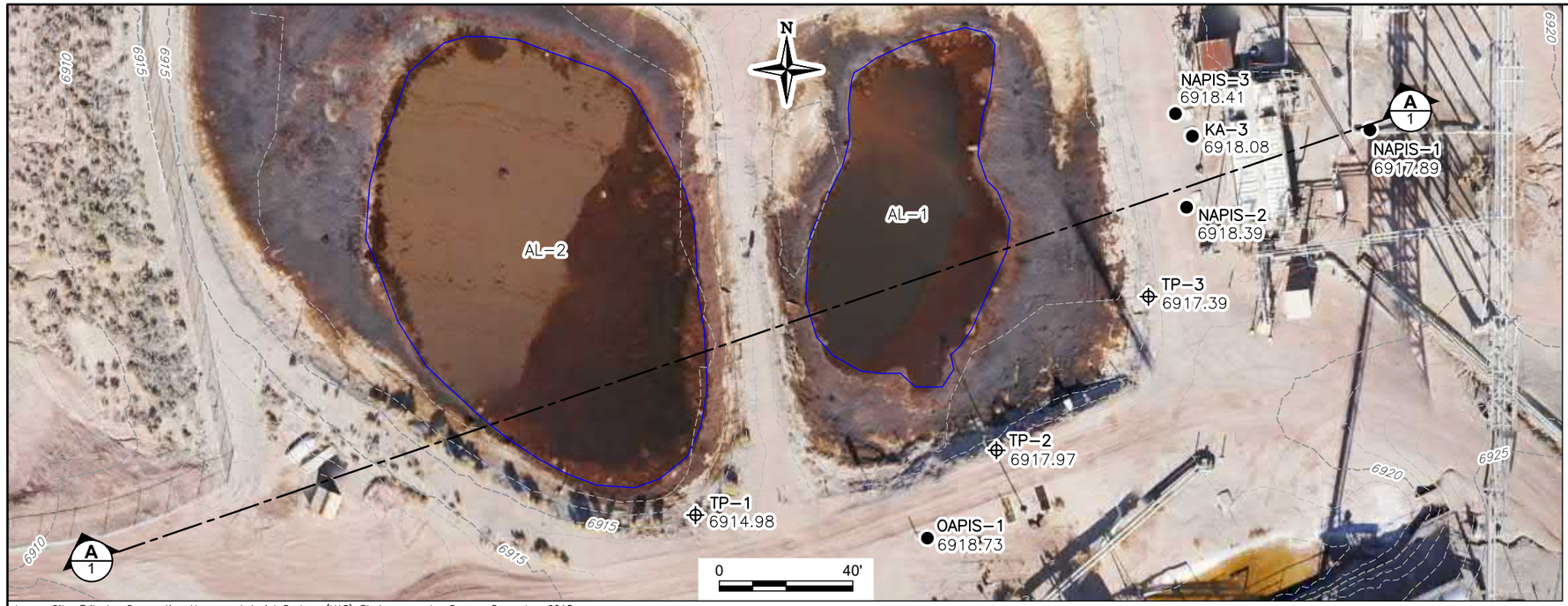


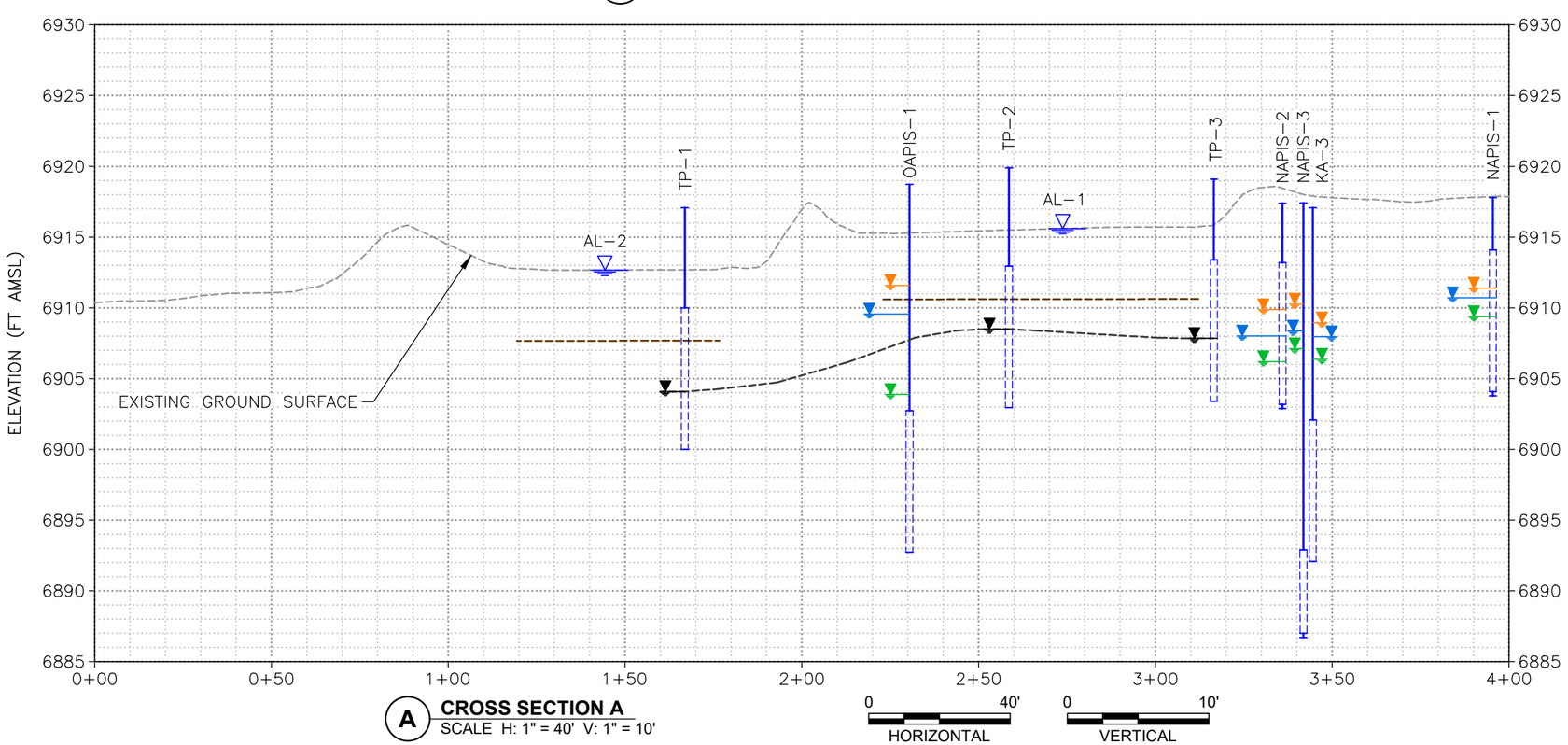
Image Cite: Trihydro Corporation Unmanned Aerial System (UAS) Photogrammetry Survey, December 2018

EXPLANATION

TP–1	TEST PIT AND DESIGNATION
OAPIS–1	MONITORING WELL AND DESIGNATION
6917.89	GROUND SURFACE ELEVATION (FT AMSL)
	POND WATER SURFACE
	WATER LEVEL (MAY 4, 2021 DATA)
	MINIMUM DTW (2011-2020)
	AVERAGE DTW (2011-2020)
	MAXIMUM DTW (2011-2020)
	APPROXIMATE DEPTH OF SLUDGE/TOP OF CLAY LINER
6600	SURFACE CONTOUR (1' INTERVAL)
	POND BOUNDARY
AL	AERATION LAGOON
DTW	DEPTH TO WATER
FT BGS	FEET BELOW GROUND SURFACE
FT AMSL	FEET ABOVE MEAN SEA LEVEL
NAPIS	NEW API SEPARATOR

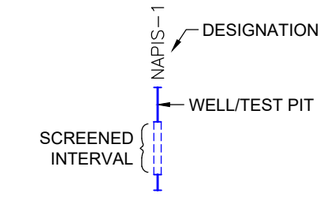
1 CROSS SECTION A PLAN VIEW

SCALE: 1" = 40'



A CROSS SECTION A

SCALE H: 1" = 40' V: 1" = 10'



WATER LEVEL DATA (2011 - 2020)

WELL	NO. OF DATA POINTS	DEPTH TO WATER, FT BGS		
		MAXIMUM	MINIMUM	AVERAGE
NAPIS-1	39	8.41	6.40	7.08
NAPIS-2	39	10.29	7.15	9.05
NAPIS-3	38	11.19	7.51	9.38
OAPIS-1	33	14.85	8.66	9.75
KA-3*	21	10.72	8.14	9.11

* KA-3 DATA 2014-2020

NAPIS REFERENCE DRAWINGS
NAPIS 42400-100, NAPIS 42400-106

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SWMU 1 - AL-1 AND AL-2 CROSS SECTION

WESTERN REFINING SOUTHWEST, LLC
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

FIGURE 2-2

REV: -

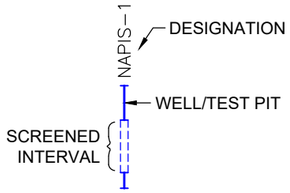
M:\TON\MARATHON\CADD\GALLUP__REPORTS\SWMU1__EVAPPONDCLOSURE\CROSSSECTION\697-SWMU1-XSEC202108

Image Cite: Trihydro Corporation Unmanned Aerial System (UAS) Photogrammetry Survey, December 2018

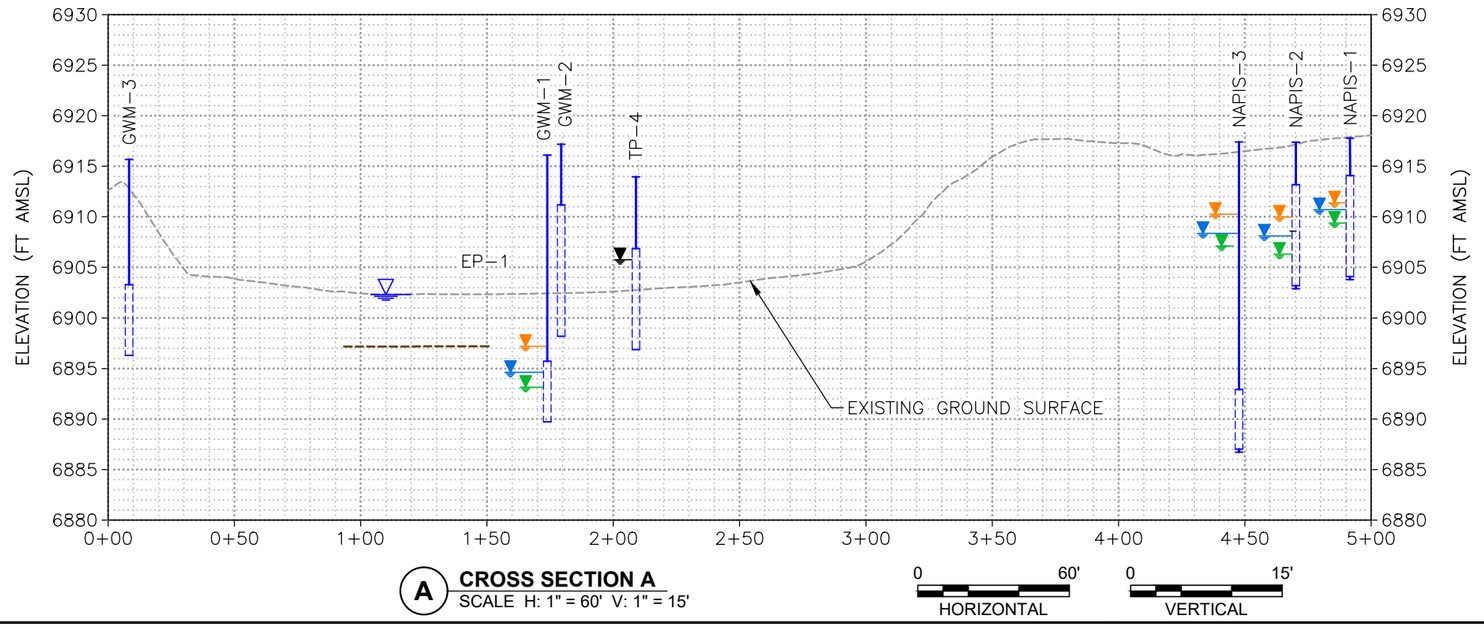
WATER LEVEL DATA					
WELL	NO. OF DATA POINTS	DEPTH TO WATER, FT BGS			DATE
		MAXIMUM	MINIMUM	AVERAGE	
GWM-1	34	20.58	16.53	19.10	2014-2021
GWM-2	35	DRY	DRY	DRY	2014-2021
GWM-3	34	DRY	DRY	DRY	2014-2021
NAPIS-1	39	8.41	6.40	7.08	2011-2020
NAPIS-2	39	10.29	7.15	9.05	2011-2020
NAPIS-3	38	11.19	7.51	9.38	2011-2020
TP-4	1	-	-	8.2	2021

EXPLANATION

TP–4	TEST PIT AND DESIGNATION
NAPIS–1	MONITORING WELL AND DESIGNATION
6917.89	GROUND SURFACE ELEVATION (FT AMSL)
	POND WATER SURFACE
	WATER LEVEL (MAY 4, 2021 DATA)
	MINIMUM DTW (SEE DATE RANGE ABOVE)
	AVERAGE DTW (SEE DATE RANGE ABOVE)
	MAXIMUM DTW (SEE DATE RANGE ABOVE)
	APPROXIMATE DEPTH OF SLUDGE/TOP OF CLAY LINER
6600	SURFACE CONTOUR (1' INTERVAL)
	POND BOUNDARY
DTW	DEPTH TO WATER
EP	EVAPORATION POND
FT BGS	FEET BELOW GROUND SURFACE
FT AMSL	FEET ABOVE MEAN SEA LEVEL
NAPIS	NEW API SEPARATOR



1 CROSS SECTION A PLAN VIEW
SCALE: 1" = 60'



A CROSS SECTION A
SCALE H: 1" = 60' V: 1" = 15'

0 60' HORIZONTAL

0 15' VERTICAL

												CHK'D
												BY
												DESCRIPTION
												REVISIONS
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SWMU-1 EP-1 CROSS SECTION

WESTERN REFINING SOUTHWEST, LLC
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

FIGURE 2-3

REV: -

M:\ITON\MARATHON\CADD\GALLUP_REPORTS\SWMU1_EVAPPONDCLOSURE\CROSSSECTION\697-SWMU1-EP1-XSEC202108

EXPLANATION

- MONITORING WELL LOCATION
- TEST PIT LOCATION

NOTES:

AL - AERATION LAGOON
EP - EVAPORATION POND
SWMU - SOLID WASTE MANAGEMENT UNIT

N

0 50 '

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FIGURE 4-1

SWMU-1 TEST PIT LOCATIONS

WESTERN REFINING SOUTHWEST, LLC
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

Drawn By: KEJ	Checked By: CF	Scale: 1 " = 50 '	Date: 7/19/21	File: 4-1_SWMU1_TestPits_Fig4-1.mxd

M:\TRIHYDRO\GIS\PROJECTS\GALLUP\REFINERY\SWMU1_AERATION\REPORTS\CLOSURE\PLAN\2021\4-1_SWMU1_TESTPITS_FIG4-1.MXD

Preliminary Plan Set

WESTERN REFINING SOUTHWEST LLC, D/B/A MARATHON GALLUP REFINERY

SWMU-1 CLOSURE PLAN

GALLUP, NEW MEXICO

SEPTEMBER 2021

Image Cite: ESRI, World Street Map

1 NEW MEXICO STATE MAP
SCALE: 1" = 100 MILES

N

0 100 MILES

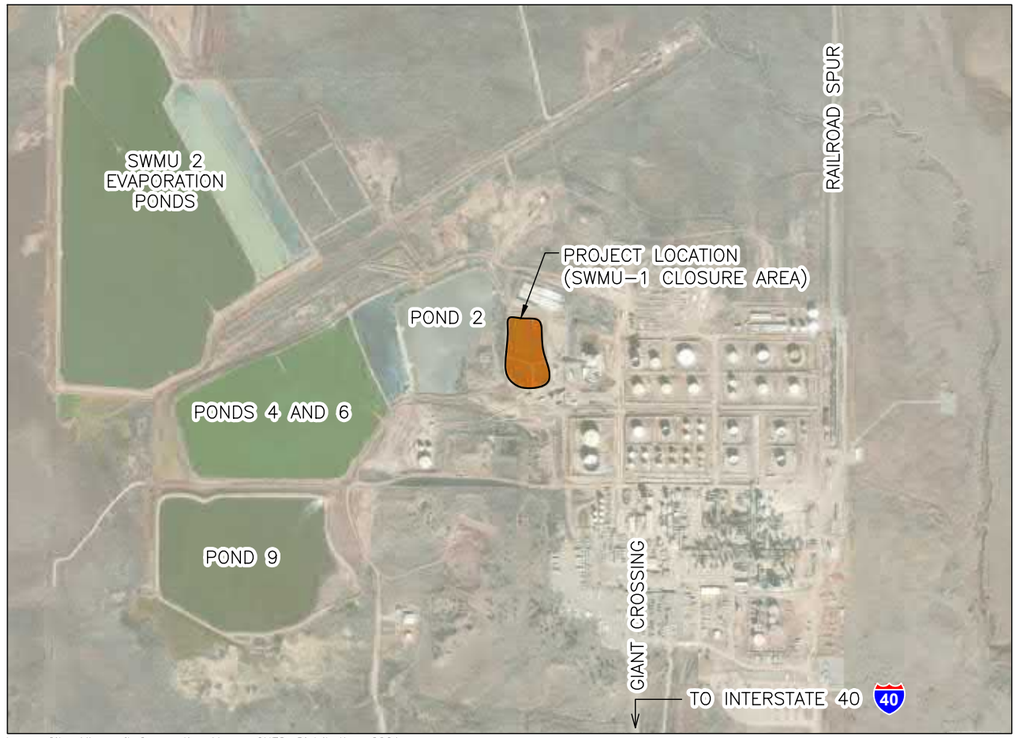

Image Cite: Microsoft Corporation Maxar, CNES, Distribution; 2021

2 PROJECT LOCATION MAP
SCALE: 1" = 1,000'

N

0 1,000'

CERTIFICATE OF ENGINEER

STATE OF --)
) SS:
COUNTY OF --)

I, -ENGINEER'S NAME- HEREBY STATE TO THE BEST OF MY KNOWLEDGE AND UNDERSTANDING THAT THIS DESIGN AND ACCOMPANYING DRAWINGS HAVE BEEN PREPARED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH STANDARD AND GENERALLY ACCEPTED ENGINEERING PRACTICES AND PROCEDURES IN EFFECT AT THE TIME.

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INDEX OF SHEETS		
SHEET NUMBER	SHEET TITLE	REVISION
TITLE	PROJECT LOCATION AND INDEX OF SHEETS	A
1	EXPLANATIONS AND NOTES	A
2	PROJECT MAP	A
3	GRADING PLAN	A
4	DETAILS	A

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PROJECT LOCATION AND INDEX OF SHEETS

SWMU-1 CLOSURE PLAN
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

TITLE

REV: A

M:\TTON\MARATHON\CADD\GALLUP\SOLIDWASTEMANAGEMENTUNIT\SWMU-1_AERATIONBASIN\PLANSETS\697-G-SWMU1AB_TITLE

EXPLANATION

EXISTING

- 2% — APPROXIMATE GRADE
- 2:1 — APPROXIMATE SLOPE IN FORMAT H:V
- UNPAVED ROAD (POTENTIAL HAUL ROAD)
- TANK FARM AND IDLED REFINERY PROCESS AREA
- 6910 — SURFACE CONTOURS (1-FOOT INTERVAL)

PROPOSED

- 6910 — PROPOSED SURFACE CONTOURS (1-FOOT INTERVAL)
- POTENTIAL WASTE MANAGEMENT AREA
- SURFACE WATER INTERCEPTION BERM
- BORROW AREA
- EVAPORATION POND (2023)
- AERATION POND 1
- AERATION POND 2
- GROUNDWATER COLLECTION TRENCH

ABBREVIATIONS

SWMU	SOLID WASTE MANAGEMENT UNIT
WWTP	WASTE WATER TREATMENT PLANT
EP	EVAPORATION POND
AL	AERATION LAGOON

GENERAL NOTES:

DESCRIPTION:

THE PROJECT IS LOCATED APPROXIMATELY 18 MILES EAST OF GALLUP, NEW MEXICO WITHIN THE MARATHON GALLUP REFINERY. THE WORK CONSISTS OF REMOVAL OF POTENTIALLY IMPACTED SOILS STEMMING FROM PREVIOUSLY USED AERATION LAGOONS AND EVAPORATION POND OPERATIONS. FURTHERMORE, ONCE REMOVAL OCCURS, THE PONDS WILL BE CLOSED WITH CLEAN SOIL USING ENVIRONMENTAL BEST PRACTICES. THIS ACTIVITY INCLUDES PREPARATION OF A WASTE MANAGEMENT AREA, DEVELOPMENT OF THE BACKFILL BORROW SOURCE, AND COORDINATION OF MOVEMENT OF MATERIALS IN AND OUT OF THE SWMU 1 WORK AREA.

BORROW AREA:

THE REFINERY'S ONSITE BORROW PIT WILL BE UTILIZED TO SOURCE BACKFILL SOIL. SITE PREP MAY INCLUDE ANY OR ALL OF THE FOLLOWING ACTIVITIES:

1. IMPROVEMENT OF AREA ACCESS ROADS TO ENSURE EFFICIENT FLOW OF TRUCKS TO/FROM THE BORROW PIT.
2. EXCAVATION OF TEST PITS WITHIN THE BORROW PIT BANK TO VERIFY THE INITIAL QUANTITY AND QUALITY OF BACKFILL SOIL.
3. STORMWATER MANAGEMENT AS NEEDED TO REDUCE THE POTENTIAL FOR EXCESSIVE SEDIMENT TRANSPORT.
4. CONTRACTOR TO PROTECT EXISTING WELLS AND FACILITIES IN BORROW AREA.

WASTE MANAGEMENT/HANDLING AREA:

1. OPTIONS FOR WASTE TRANSPORTATION INCLUDE OVER-THE-HIGHWAY TRUCKING (VIA TRUCKS OR ROLL-OFFS) OR TRANSPORT BY RAIL. MANAGEMENT AND LOADOUT OF TRUCKS VERSUS RAIL MAY REQUIRE THE USE OF A WASTE MANAGEMENT/HANDLING/STOCKPILE AREA. DESIGN CONSIDERATIONS TO PLAN FOR THESE SCENARIOS ARE INCLUDED ON DRAWING SHEETS 2 AND 4. A WASTE MANAGEMENT AREA SITE WILL BE SELECTED BASED UPON THE MODE OF TRANSPORTATION. LOCATIONS MAY INCLUDE THE AREA IMMEDIATELY WEST OF AL-2 OR ALTERNATIVELY ADJACENT TO THE EXISTING RAIL SPUR ON THE EASTERN SIDE OF THE REFINERY (DRAWING SHEET 2). THE LOCATION WILL BE SELECTED BASED UPON AVAILABLE ACCESS FOR ROLL-OFF CONTAINERS, OFF-ROAD, OR OVER-THE-HIGHWAY TRUCKS. COORDINATION WITH THE REFINERY WILL BE REQUIRED TO DETERMINE THE BEST ROUTE THROUGH THE PLANT.
2. THE WASTE MANAGEMENT AREA (IF NEEDED) WILL BE CONSTRUCTED ON RELATIVELY FLAT GROUND WITH ALL VEGETATION REMOVED. THE RESULTING SURFACE WILL BE ROLLED WITH A SMOOTH DRUM ROLLER TO PROVIDE A FIRM, UNYIELDING SURFACE. A SACRIFICIAL 20 MIL (0.020-INCH) HIGH DENSITY POLYETHYLENE (HDPE) LINER WILL BE LAID ON THE PREPARED SURFACE FOLLOWED BY A MINIMUM 1 FT LAYER OF CLEAN BORROW MATERIAL TO SERVE AS A WORKING SURFACE. BERMS WITH AN EQUIPMENT MOUNTABLE ENTRANCE WILL BE UTILIZED TO PREVENT MIGRATION OF STORMWATER RUN-ON / RUNOFF. DESIGN DETAILS FOR THE PAD ARE PROVIDED ON DRAWING SHEET 4. PONDED PRECIPITATION WOULD BE REMOVED VIA VACUUM TRUCK FOR TRANSPORT TO TANK 35 FOR TREATMENT THROUGH THE WWTP.
3. A DECONTAMINATION (DECON) AREA WILL BE REQUIRED AT THE LAGOONS LOADOUT AREA TO PREVENT THE SPREAD OF EXCAVATED WASTE. WASTE LOADOUT (E.G., INTO ROLL-OFF CONTAINERS, OVER-THE-ROAD TRUCKS, OFF-ROAD TRUCKS) WILL BE PERFORMED IN SUCH A MANNER TO REDUCE THE AMOUNT OF WASTE CONTACTING THE EXTERIOR OF THE CONTAINER OR TRUCK BODY. LOOSE WASTE WILL BE REMOVED FROM CONTAINER EXTERIORS VIA BROOMS OR WITH WATER SPRAY IF NECESSARY. DECON PADS WILL BE GRADED SUCH THAT REMOVED WASTE IS CONVEYED INTO SUMPS FOR REMOVAL VIA BACKHOE FOR MANAGEMENT AND DISPOSAL.

CONSTRUCTION - GENERAL:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING STAGING AND STORAGE AREAS PRIOR TO THE START OF CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR KEEPING PUBLIC AND REFINERY ROADS CLEAN FROM MUD OR OTHER MATERIAL TRACKED ONTO SURROUNDING ROADS.
3. STORMWATER POLLUTION AND PREVENTION PLANS, AS WELL AS BEST MANAGEMENT PRACTICES AND MAINTENANCE, WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. MATERIAL STOCKPILES SHALL BE UNIFORMLY SHAPED AND PROTECTED FROM TRAFFIC.
5. ASPHALT AND CONCRETE FLATWORK THAT IS TO BE REMOVED IN CONNECTION WITH PROJECT WORK SHALL BE SAW-CUT TO PROVIDE A CLEAN EDGE. CONTRACTOR IS RESPONSIBLE FOR DISPOSING OF REMOVED ASPHALT AND CONCRETE.
6. PARK AND/OR STORE ALL EQUIPMENT, MATERIALS, AND SUPPLIES WITHIN REFINERY-DESIGNATED PARKING AREAS.
7. CONTRACTOR RESPONSIBLE FOR OBTAINING NEW MEXICO ENVIRONMENTAL DEPARTMENT STORMWATER PERMIT.
8. CONTRACTOR WILL NEED TO WORK WITHIN EXISTING EASEMENTS AND RIGHT-OF-WAYS, AND KEEP PROPERTY SECURE WHEN NOT WORKING ON SITE.
9. PROPOSED CONTOURS WILL BE FINALIZED IN "ISSUED FOR CONSTRUCTION" DRAWING SET.

GROUNDWATER INTERCEPTOR TRENCHES:

1. AL-1 TRENCH TO BE INSTALLED IN 2022
2. EP-1 TRENCH TO BE INSTALLED FOLLOWING EXCAVATION IN 2023
3. FINAL GRADES TO BE DETERMINED FOLLOWING EXCAVATION OF WASTE. DESIGN OF TRENCH WATER EXTRACTION WILL DEPEND UPON ABILITY FOR GRAVITY FLOW OF COLLECTED WATER OR THE POSSIBLE NEED FOR PUMPING.
4. TRENCH ORIENTATIONS WILL GENERALLY FOLLOW THOSE SHOWN IN DRAWING SHEET 3

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EXPLANATIONS AND NOTES

SWMU-1 CLOSURE PLAN
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

SHEET 1 1 OF 4

REV: A

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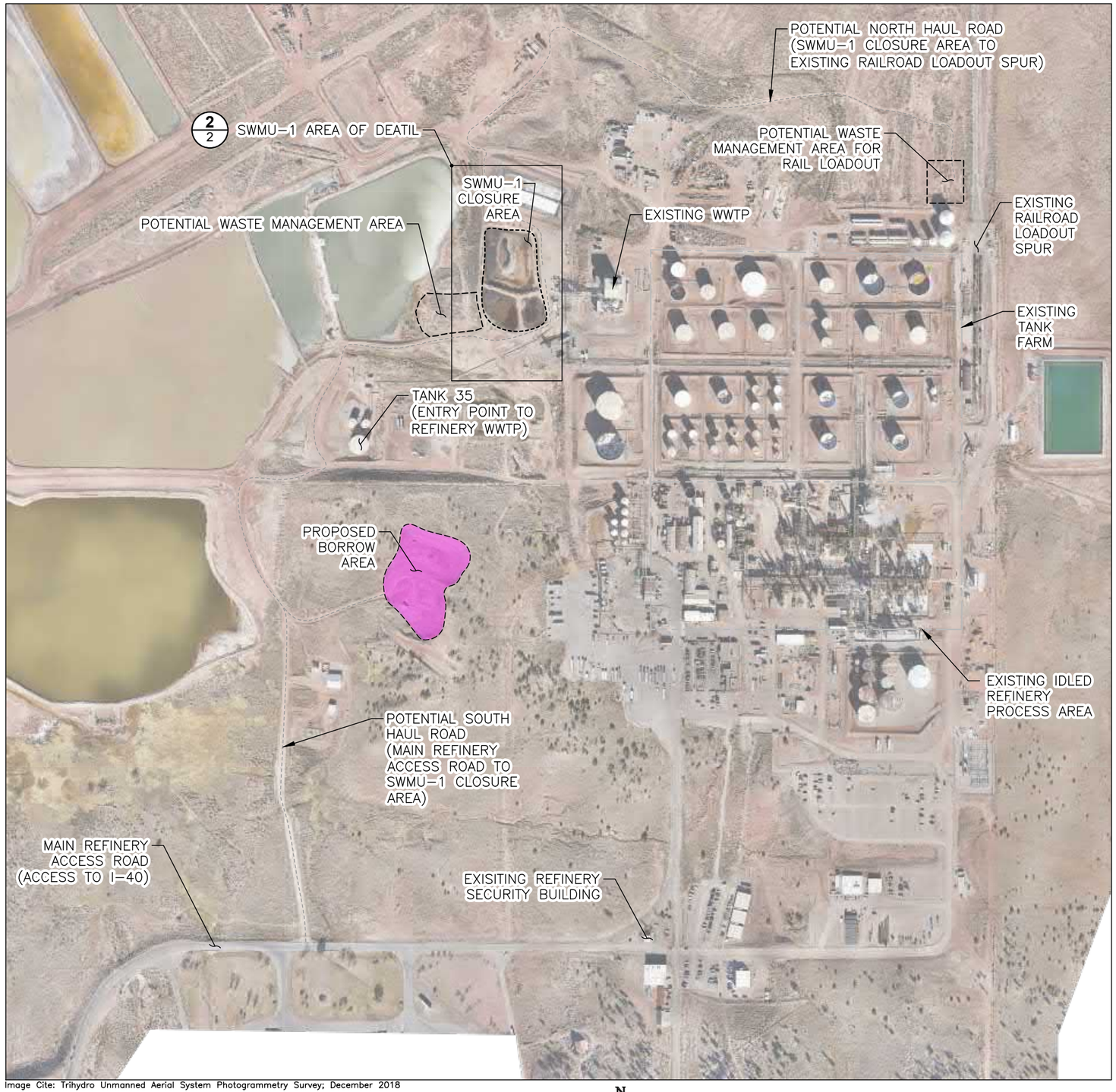
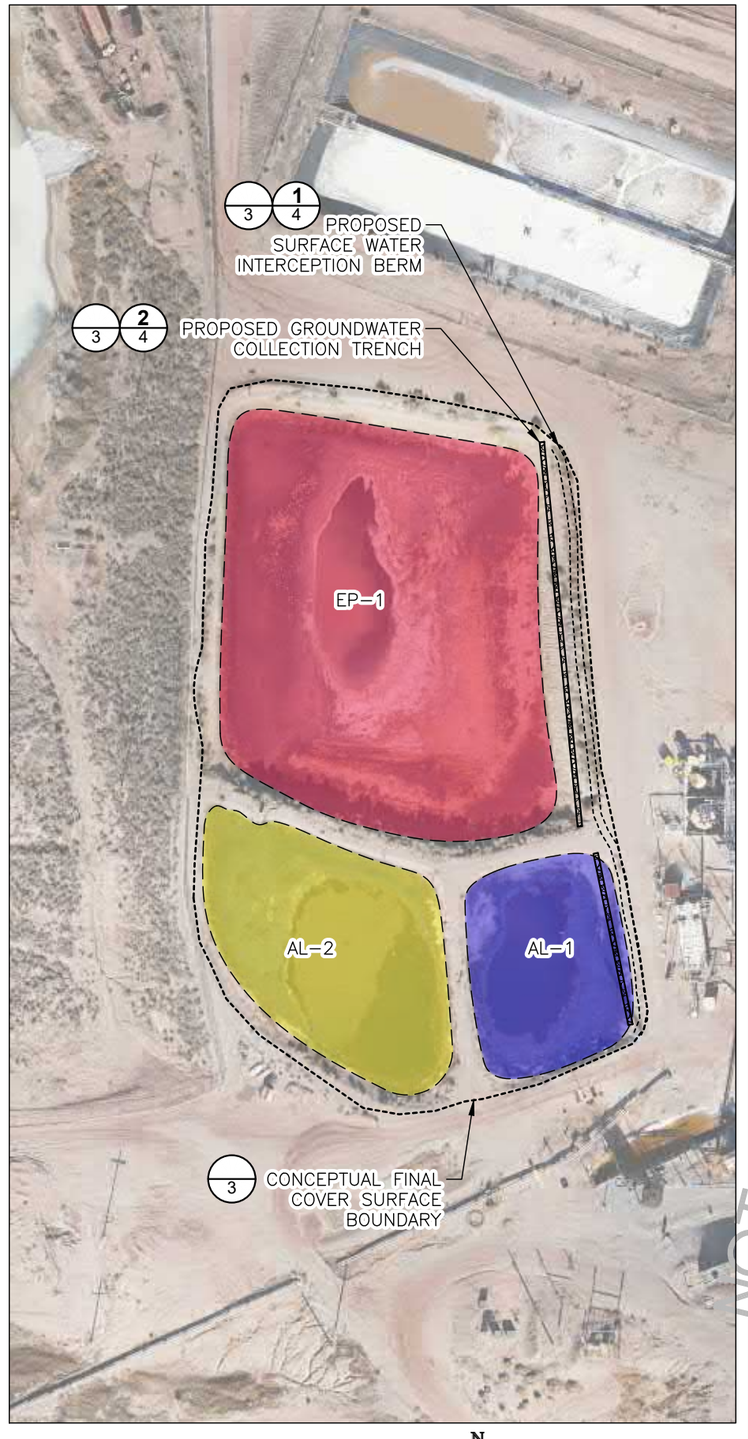


Image Cite: Trihydro Unmanned Aerial System Photogrammetry Survey; December 2018

1 SWMU-1 PROJECT MAP
SCALE: 1" = 500'

N

0 500'



2 SWMU-1 AREA OF DETAIL
SCALE: 1" = 100'

N

0 100'

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PROJECT MAP
SWMU-1 CLOSURE PLAN
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

SHEET 2 2 OF 4

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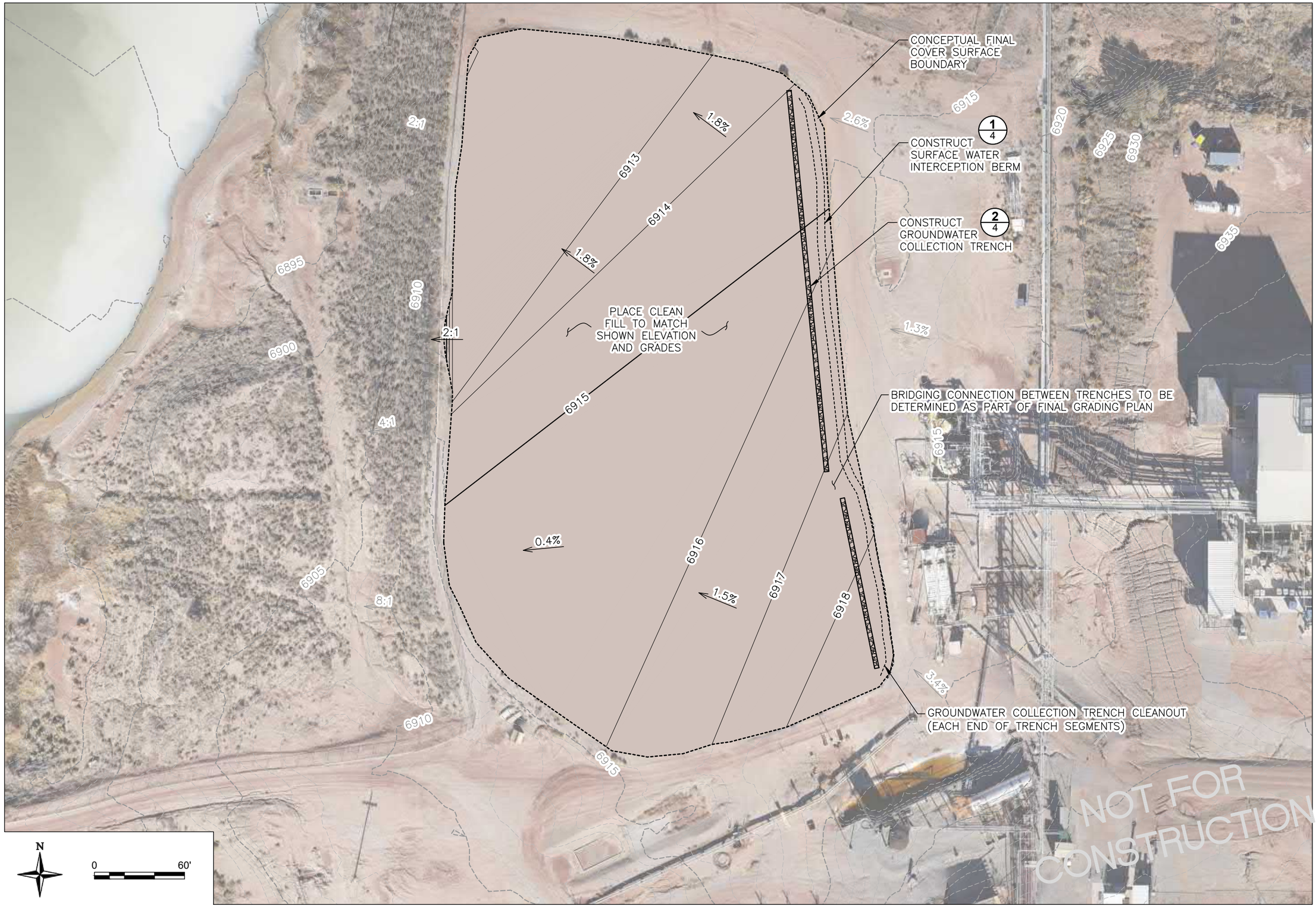

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SCALE: 1" = 60'
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CONCEPTUAL GRADING PLAN

SWMU-1 CLOSURE PLAN
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

SHEET 3 OF 4

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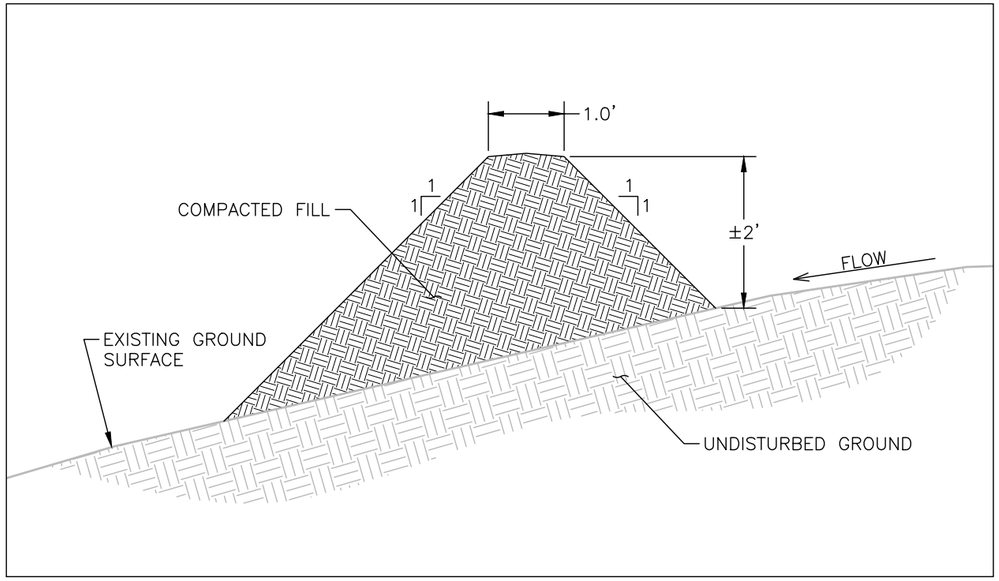
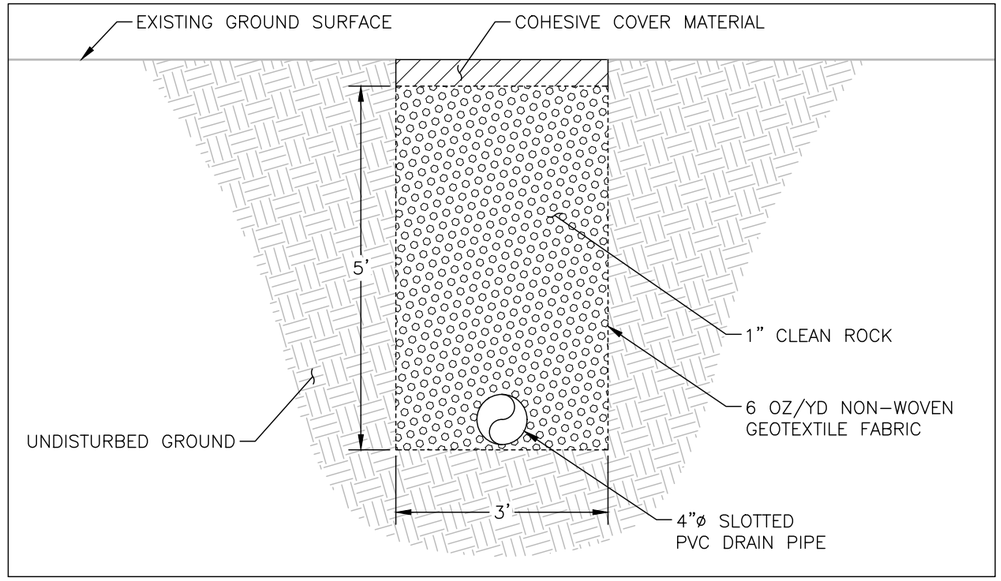
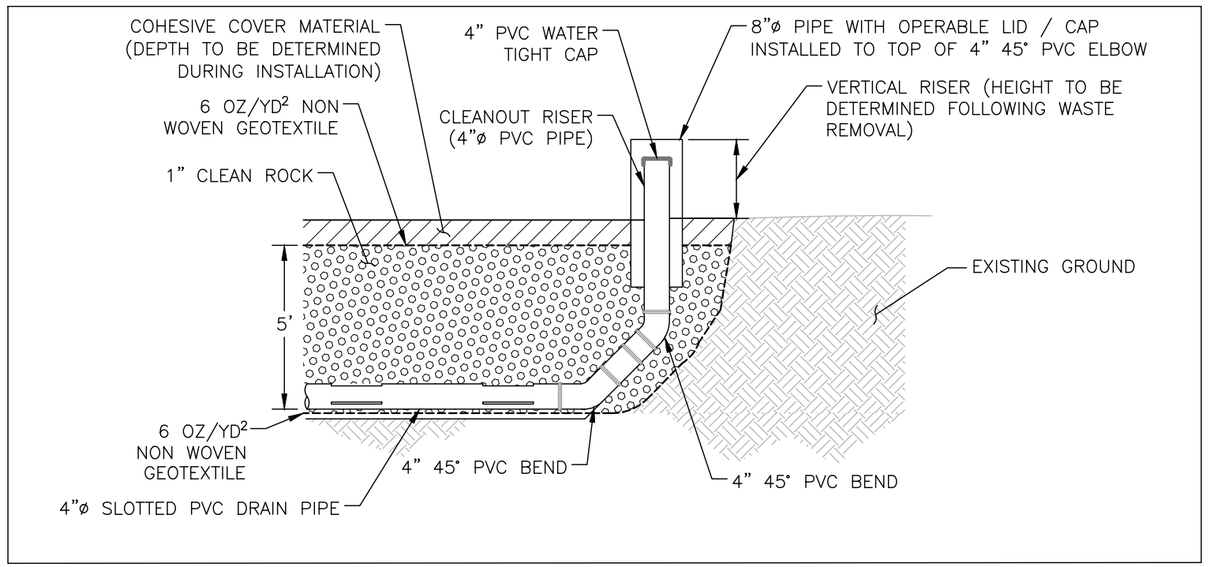


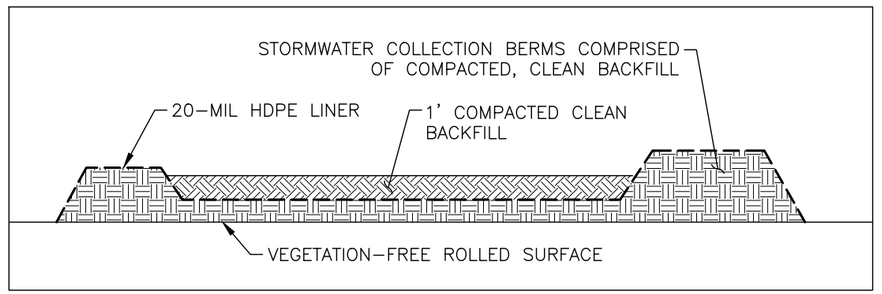
1 TYPICAL STORMWATER INTERCEPTOR BERM SECTION
SCALE: NONE



2 TYPICAL GROUNDWATER COLLECTION TRENCH SECTION
SCALE: NONE



3 CLEANOUT DETAIL
SCALE: NONE



4 WASTE MANAGEMENT AREA SECTION
SCALE: NONE

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SWMU-1 CLOSURE PLAN
MARATHON GALLUP REFINERY
GALLUP, NEW MEXICO

SHEET 4 4 OF 4

REV: A

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Table

TABLE 1. SWMU 1 PETROLEUM HYDROCARBON ANALYTICAL RESULTS
WESTERN REFINING SOUTHWEST LLC, MARATHON GALLUP REFINERY, GALLUP, NEW MEXICO

Location Group Name	Location ID	Date Sampled	Gasoline Range Organics (mg/kg)		Diesel Range Organics (mg/kg)		Oil Range Organics (mg/kg)	
Evaporation Pond EP-1	SWMU 1-1 (2-4 ft)	10/05/12	**410**	b	**4700**	a,b	ND(5000)	
	SWMU 1-1 (10-12 ft)	10/05/12	ND(25)		820		ND(510)	
	SWMU 1-1 (13-14 ft)	10/05/12	ND(5)		55		ND(51)	
	SWMU 1-1	01/15/20	6.9		**84000**	a,b	**29000**	a,b
	SWMU 1-1 (0.5-3 ft)	01/15/20	39		**47000**	a,b	**8700**	a,b
	SWMU 1-1 (5 ft)	01/15/20	0.81		72		ND(47)	
	SWMU 1-2 (6-8 ft)	10/02/12	ND(5)		ND(9.9)		ND(49)	
	SWMU 1-2 (10-11 ft)	10/02/12	ND(5)		ND(10)		ND(52)	
	SWMU 1-2 (14-16 ft)	10/02/12	ND(5)		ND(9.9)		ND(50)	
	SWMU 1-2 (17-17.25 ft)	10/02/12	ND(5)		ND(9.6)		ND(48)	
	SWMU 1-2 (19.5-20 ft)	10/02/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-2 Dup	01/15/20	8.2		**130000**	a,b	**42000**	a,b
	SWMU 1-2	01/15/20	7.7		**150000**	a,b	**50000**	a,b
	SWMU 1-2 (2-2.5 ft)	01/15/20	44		**68000**	a,b	**9400**	a,b
	SWMU 1-2 (3-3.5 ft)	01/15/20	ND(13)		**1700**	b	280	
	SWMU 1-3 (2-4 ft)	10/02/12	ND(5)		ND(10)		ND(51)	
	SWMU 1-3 (10-11 ft)	10/02/12	ND(5)		ND(9.7)		ND(48)	
	SWMU 1-3 (11-11.25 ft)	10/02/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-3 (18.5-19.5 ft)	10/02/12	ND(5)		ND(9.7)		ND(49)	
	SWMU 1-3 (19.5-20 ft)	10/02/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-3 (0-0.5 ft)	01/14/20	ND(17)		**29000**	a,b	**15000**	a,b
	SWMU 1-3 (0.5-3 ft)	01/14/20	78		**46000**	a,b	**7200**	a,b
	SWMU 1-3 (3 ft)	01/14/20	23		**1700**	b	370	
	SWMU 1-4 (8-10 ft)	10/03/12	ND(5)		ND(9.9)		ND(50)	
	SWMU 1-4 (10-12 ft)	10/03/12	ND(5)		ND(16)		ND(82)	
	SWMU 1-4 (17-18 ft)	10/03/12	13		ND(10)		ND(51)	
	SWMU 1-4 (23-24 ft)	10/03/12	ND(5)		ND(9.7)		ND(48)	
	SWMU 1-4	01/14/20	40		**140000**	a,b	**34000**	a,b
	SWMU 1-4 (3 ft)	01/14/20	86		**42000**	a,b	**6400**	a,b
	SWMU 1-4 (3-3.5 ft)	01/14/20	13		810		160	
	SWMU 1-11 (berm) (1.5 ft)	01/13/20	ND(3.5)		140		230	
	SWMU 1-11 (berm) (2.5 ft)	01/13/20	ND(3.4)		520		650	
	SWMU 1-11 (berm) (5 ft)	01/13/20	ND(3.5)		24		ND(50)	
	SWMU 1-11 (berm) (7.5 ft)	01/13/20	8.9		**4900**	a,b	**3200**	a,b
	SWMU 1-11 (toe)	01/15/20	91		**92000**	a,b	**52000**	a,b
	SWMU 1-11 (toe) (2.5 ft)	01/15/20	71		**8100**	a,b	**3300**	a,b
[a] NMED Industrial SSL			500		3,000		3,000	
[b] NMED Residential SSL			100		1,000		1,000	
[c] CFR TCLP			NA		NA		NA	
[d] USEPA RSL Industrial Soil HQ 0.1			NA		NA		NA	

Notes:
NMED SSL's - New Mexico Environmental Department Industrial and Residential Soil Screening Levels, June 2019
TCLP SL - Toxicity Characteristic Levels from 40 CFR 261.24.
USEPA RSL Industrial Soil HQ 0.1 - United States Environmental Protection Agency, Regional Screening Levels, Hazard Quotient 0.1, November 2019
AL - Aeration Lagoon
EP - Evaporation Pond
TCLP - toxicity characteristic leaching procedure
ft - feet mg/kg - milligrams per kilogram
NA - Not Applicable ND - Not Detected (Reporting Limit)
SWMU - Solid Waste Management Unit
Dup - Duplicate Sample
(toe) samples composited in the field (berm) samples taken along the berm
Benzene was analyzed for TCLP if the initial sample was detected above 0.5 ug/kg.
Samples without location depths were taken from the surface.
Bolded values exceed the standard.

TABLE 1. SWMU 1 PETROLEUM HYDROCARBON ANALYTICAL RESULTS
WESTERN REFINING SOUTHWEST LLC, MARATHON GALLUP REFINERY, GALLUP, NEW MEXICO

Location Group Name	Location ID	Date Sampled	Gasoline Range Organics (mg/kg)	Diesel Range Organics (mg/kg)	Oil Range Organics (mg/kg)
Evaporation Pond EP-1	SWMU 1-12 (berm) (1.5 ft)	01/13/20	ND(3.1)	32	110
	SWMU 1-12 (berm) (2.5 ft)	01/13/20	ND(3.4)	4.2	ND(45)
	SWMU 1-12 (berm) (5 ft)	01/13/20	ND(3)	110	110
	SWMU 1-12 (berm) (7.5 ft)	01/13/20	6.3	**7000** [a,b]	**4600** [a,b]
	SWMU 1-12 (toe)	01/15/20	6.5	**110000** [a,b]	**51000** [a,b]
	SWMU 1-12 (toe) (2.5 ft)	01/15/20	ND(2.5)	150	48
	SWMU 1-12 (toe) (3 ft)	01/15/20	ND(2.4)	190	110
	SWMU 1-13 (berm) (5 ft) Dup	01/13/20	ND(4.1)	5.9	ND(49)
	SWMU 1-13 (berm) (1.5 ft)	01/13/20	ND(3.8)	47	110
	SWMU 1-13 (berm) (2.5 ft)	01/13/20	ND(4.3)	16	ND(49)
	SWMU 1-13 (berm) (5 ft)	01/13/20	ND(3.5)	6.3	ND(49)
	SWMU 1-13 (berm) (7.5 ft)	01/13/20	ND(3.9)	25	ND(46)
	SWMU 1-13 (berm) (9 ft)	01/13/20	ND(3.9)	6.3	ND(48)
	SWMU 1-13 (toe) Dup	01/14/20	1.9	**26000** [a,b]	**18000** [a,b]
	SWMU 1-13 (toe) (3 ft)	01/14/20	ND(15)	24	ND(46)
	SWMU 1-13 (toe)	01/14/20	ND(18)	**37000** [a,b]	**21000** [a,b]
	SWMU 1-14 (berm) (5 ft) Dup	01/14/20	ND(3.4)	18	ND(48)
	SWMU 1-14 (berm) (1.5 ft)	01/14/20	ND(4.1)	7	ND(50)
	SWMU 1-14 (berm) (2.5 ft)	01/14/20	ND(4)	12	ND(48)
	SWMU 1-14 (berm) (5 ft)	01/14/20	ND(3.9)	16	ND(48)
	SWMU 1-14 (berm) (7.5 ft)	01/14/20	ND(3)	**2800** [b]	**1100** [b]
	SWMU 1-14 (toe)	01/14/20	17	**89000** [a,b]	**28000** [a,b]
	SWMU 1-14 (toe) (2.5 ft)	01/14/20	82	**59000** [a,b]	**12000** [a,b]
	SWMU 1-14 (toe) (3 ft)	01/14/20	4.4	120	ND(44)
Former Aeration Lagoon AL-1	SWMU 1-8 (4-6 ft)	10/05/12	ND(5)	ND(10)	ND(52)
	SWMU 1-8 (10-12 ft)	10/05/12	ND(5)	100	280
	SWMU 1-8 (12-14 ft)	10/05/12	ND(5)	53	ND(50)
	SWMU 1-8 (16-18 ft)	10/05/12	ND(5)	ND(9.9)	ND(50)
	SWMU 1-8 (19-20 ft)	10/05/12	ND(5)	ND(10)	ND(50)
	SWMU 1-8	01/16/20	52	**49000** [a,b]	**11000** [a,b]
	SWMU 1-8 (2.5 ft)	01/16/20	**150** [b]	**7800** [a,b]	**1100** [b]
	SWMU 1-8 (5-5.5 ft)	01/16/20	10	56	ND(47)
	SWMU 1-9 (0-0.5 ft)	10/15/12	ND(5)	ND(9.9)	280
	SWMU 1-9 (1.5-2 ft)	10/15/12	ND(5)	ND(10)	ND(50)
	SWMU 1-9	01/16/20	**370** [b]	**150000** [a,b]	**51000** [a,b]
	SWMU 1-9 (4.5 ft)	01/16/20	**240** [b]	**65000** [a,b]	**8600** [a,b]
[a] NMED Industrial SSL			500	3,000	3,000
[b] NMED Residential SSL			100	1,000	1,000
[c] CFR TCLP			NA	NA	NA
[d] USEPA RSL Industrial Soil HQ 0.1			NA	NA	NA

Notes:
NMED SSL's - New Mexico Environmental Department Industrial and Residential Soil Screening Levels, June 2019
TCLP SL - Toxicity Characteristic Levels from 40 CFR 261.24.
USEPA RSL Industrial Soil HQ 0.1 - United States Environmental Protection Agency, Regional Screening Levels, Hazard Quotient 0.1, November 2019
AL - Aeration Lagoon
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TCLP - toxicity characteristic leaching procedure
ft - feet mg/kg - milligrams per kilogram
NA - Not Applicable ND - Not Detected (Reporting Limit)
SWMU - Solid Waste Management Unit
Dup - Duplicate Sample
(toe) samples composited in the field (berm) samples taken along the berm
Benzene was analyzed for TCLP if the initial sample was detected above 0.5 ug/kg.
Samples without location depths were taken from the surface.
Bolded values exceed the standard.

TABLE 1. SWMU 1 PETROLEUM HYDROCARBON ANALYTICAL RESULTS
WESTERN REFINING SOUTHWEST LLC, MARATHON GALLUP REFINERY, GALLUP, NEW MEXICO

Location Group Name	Location ID	Date Sampled	Gasoline Range Organics (mg/kg)		Diesel Range Organics (mg/kg)		Oil Range Organics (mg/kg)	
Former Aeration Lagoon AL-1	SWMU 1-9 (5.5-6 ft)	01/16/20	12		110		ND(48)	
	SWMU 1-10 (0-0.5 ft)	10/15/12	ND(5)		45		230	
	SWMU 1-10 (1.5-2 ft)	10/15/12	ND(5)		42		210	
	SWMU 1-10	01/16/20	**450**	b	**110000**	a,b	**29000**	a,b
	SWMU 1-10 (4-4.5 ft)	01/16/20	**600**	a,b	**33000**	a,b	**4800**	a,b
	SWMU 1-10 (4.5-5 ft)	01/16/20	35		350		67	
	SWMU 1-19 (berm) (1.5 ft)	01/13/20	ND(3.9)		40		ND(44)	
	SWMU 1-19 (berm) (2.5 ft)	01/13/20	5		**6300**	a,b	**3100**	a,b
	SWMU 1-19 (toe) Dup	01/16/20	4.7		**73000**	a,b	**38000**	a,b
	SWMU 1-19 (toe)	01/16/20	3.4		**81000**	a,b	**43000**	a,b
	SWMU 1-19 (toe) (0.5-6 ft)	01/16/20	**250**	b	**22000**	a,b	**4500**	a,b
	SWMU 1-19 (toe) (6-6.5 ft)	01/16/20	20		**2800**	b	730	
	SWMU 1-20 (berm) (2.5 ft)	01/14/20	0.8		560		640	
	SWMU 1-20 (toe) (1.5 ft)	01/14/20	ND(16)		300		450	
	SWMU 1-20 (toe) (5 ft) Dup	01/15/20	**180**	b	**9300**	a,b	**2800**	b
	SWMU 1-20 (toe)	01/15/20	18		**33000**	a,b	**32000**	a,b
	SWMU 1-20 (toe) (0.5-3 ft)	01/15/20	**200**	b	**17000**	a,b	**2900**	b
	SWMU 1-20 (toe) (5 ft)	01/15/20	**220**	b	**6400**	a,b	**1500**	b
	SWMU 1-21 (berm) (1.5 ft)	01/14/20	0.89		340		600	
	SWMU 1-21 (toe)	01/14/20	42		**48000**	a,b	**18000**	a,b
	SWMU 1-21 (toe) (2.5 ft)	01/14/20	47		**2800**	b	860	
	SWMU 1-21 (toe) (5 ft)	01/14/20	3.3		950		620	
	SWMU 1-22 (berm) (1.5 ft)	01/14/20	ND(4.1)		82		140	
	SWMU 1-22 (berm) (2.5 ft)	01/14/20	12		**2100**	b	710	
	SWMU 1-22 (berm) (5 ft)	01/14/20	**120**	b	**140000**	a,b	**27000**	a,b
	SWMU 1-22 (toe)	01/16/20	**140**	b	**89000**	a,b	**36000**	a,b
	SWMU 1-22 (toe) (2.5 ft)	01/16/20	**410**	b	**21000**	a,b	**4400**	a,b
	SWMU 1-22 (toe) (3.5-4 ft)	01/16/20	ND(16)		530		110	
Former Aeration Lagoon AL-2	SWMU 1-5 (10-12 ft)	10/03/12	ND(5)		ND(9.8)		ND(49)	
	SWMU 1-5 (14-16 ft)	10/03/12	ND(5)		ND(9.6)		ND(48)	
	SWMU 1-5 (16-18 ft)	10/03/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-5 (24-25 ft)	10/03/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-5 (26-27 ft)	10/03/12	ND(5)		ND(12)		ND(59)	
	SWMU 1-5 (27-28 ft)	10/03/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-5	01/17/20	**110**	b	**130000**	a,b	**42000**	a,b
	SWMU 1-5 (2.5-5 ft)	01/17/20	48		**99000**	a,b	**21000**	a,b
[a] NMED Industrial SSL			500		3,000		3,000	
[b] NMED Residential SSL			100		1,000		1,000	
[c] CFR TCLP			NA		NA		NA	
[d] USEPA RSL Industrial Soil HQ 0.1			NA		NA		NA	

Notes:
NMED SSL's - New Mexico Environmental Department Industrial and Residential Soil Screening Levels, June 2019
TCLP SL - Toxicity Characteristic Levels from 40 CFR 261.24.
USEPA RSL Industrial Soil HQ 0.1 - United States Environmental Protection Agency, Regional Screening Levels, Hazard Quotient 0.1, November 2019
AL - Aeration Lagoon
EP - Evaporation Pond
TCLP - toxicity characteristic leaching procedure
ft - feet mg/kg - milligrams per kilogram
NA - Not Applicable ND - Not Detected (Reporting Limit)
SWMU - Solid Waste Management Unit
Dup - Duplicate Sample
(toe) samples composited in the field (berm) samples taken along the berm
Benzene was analyzed for TCLP if the initial sample was detected above 0.5 ug/kg.
Samples without location depths were taken from the surface.
Bolded values exceed the standard.

TABLE 1. SWMU 1 PETROLEUM HYDROCARBON ANALYTICAL RESULTS
WESTERN REFINING SOUTHWEST LLC, MARATHON GALLUP REFINERY, GALLUP, NEW MEXICO

Location Group Name	Location ID	Date Sampled	Gasoline Range Organics (mg/kg)		Diesel Range Organics (mg/kg)		Oil Range Organics (mg/kg)	
Former Aeration Lagoon AL-2	SWMU 1-5 (5.5-6 ft)	01/17/20	12		**1200**	b	310	
	SWMU 1-6 (2-4 ft)	10/04/12	ND(5)		ND(9.9)		ND(49)	
	SWMU 1-6 (4-6 ft)	10/04/12	ND(5)		ND(9.8)		ND(49)	
	SWMU 1-6 (7.5-8 ft)	10/04/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-6 (10-11 ft)	10/04/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-6 (11-12 ft)	10/04/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-6 (0-5.5 ft)	01/17/20	55		**19000**	a,b	**2500**	b
	SWMU 1-6 (5.5-6 ft)	01/17/20	7.7		25		ND(42)	
	SWMU 1-7 (12-14 ft)	10/04/12	ND(5)		ND(10)		ND(50)	
	SWMU 1-7 (14-16 ft)	10/04/12	ND(5)		ND(9.8)		ND(49)	
	SWMU 1-7 (16-18 ft)	10/04/12	ND(5)		ND(9.9)		ND(49)	
	SWMU 1-7 Dup	01/17/20	30		**87000**	a,b	**38000**	a,b
	SWMU 1-7	01/17/20	32		**61000**	a,b	**29000**	a,b
	SWMU 1-7 (2.5 ft)	01/17/20	74		**66000**	a,b	**13000**	a,b
	SWMU 1-7 (4-5 ft)	01/17/20	17		**3800**	a,b	**1200**	b
	SWMU 1-15 (berm) (1.5 ft)	01/13/20	ND(4.4)		4.7		ND(46)	
	SWMU 1-15 (berm) (2.5 ft)	01/13/20	5.4		**20000**	a,b	**5500**	a,b
	SWMU 1-15 (toe) Dup	01/16/20	55		**170000**	a,b	**67000**	a,b
	SWMU 1-15 (toe)	01/16/20	42		**160000**	a,b	**68000**	a,b
	SWMU 1-15 (toe) (3 ft)	01/16/20	32		**18000**	a,b	**4700**	a,b
	SWMU 1-15 (toe) (4-5 ft)	01/16/20	78		**56000**	a,b	**14000**	a,b
	SWMU 1-16 (berm) (1.5 ft) Dup	01/13/20	ND(4.7)		310		160	
	SWMU 1-16 (berm) (1.5 ft)	01/13/20	ND(4.8)		230		140	
	SWMU 1-16 (berm) (2.5 ft)	01/13/20	20		**32000**	a,b	**8200**	a,b
	SWMU 1-16 (toe) Dup	01/16/20	28		**130000**	a,b	**69000**	a,b
	SWMU 1-16 (toe)	01/16/20	25		**130000**	a,b	**72000**	a,b
	SWMU 1-16 (toe) (2.5 ft)	01/16/20	100		**69000**	a,b	**14000**	a,b
	SWMU 1-16 (toe) (4-4.5 ft)	01/16/20	14		**16000**	a,b	**5000**	a,b
	SWMU 1-17 (berm) (1.5 ft)	01/13/20	ND(4.5)		290		230	
	SWMU 1-17 (berm) (2.5 ft)	01/13/20	ND(2.7)		130		49	
	SWMU 1-17 (toe)	01/16/20	ND(23)		**62000**	a,b	**48000**	a,b
	SWMU 1-17 (toe) (2.5 ft)	01/16/20	14		**14000**	a,b	**4200**	a,b
	SWMU 1-17 (toe) (4.5-5 ft)	01/16/20	0.95		590		240	
	SWMU 1-18 (berm) (1.5 ft)	01/13/20	ND(4.1)		35		ND(47)	
	SWMU 1-18 (berm) (2.5 ft)	01/13/20	ND(4.8)		280		200	
	SWMU 1-18 (toe)	01/16/20	4.8		**96000**	a,b	**31000**	a,b
[a] NMED Industrial SSL			500		3,000		3,000	
[b] NMED Residential SSL			100		1,000		1,000	
[c] CFR TCLP			NA		NA		NA	
[d] USEPA RSL Industrial Soil HQ 0.1			NA		NA		NA	

Notes:
NMED SSL's - New Mexico Environmental Department Industrial and Residential Soil Screening Levels, June 2019
TCLP SL - Toxicity Characteristic Levels from 40 CFR 261.24.
USEPA RSL Industrial Soil HQ 0.1 - United States Environmental Protection Agency, Regional Screening Levels, Hazard Quotient 0.1, November 2019
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TCLP - toxicity characteristic leaching procedure
ft - feet mg/kg - milligrams per kilogram
NA - Not Applicable ND - Not Detected (Reporting Limit)
SWMU - Solid Waste Management Unit
Dup - Duplicate Sample
(toe) samples composited in the field (berm) samples taken along the berm
Benzene was analyzed for TCLP if the initial sample was detected above 0.5 ug/kg.
Samples without location depths were taken from the surface.
Bolded values exceed the standard.

TABLE 1. SWMU 1 PETROLEUM HYDROCARBON ANALYTICAL RESULTS
WESTERN REFINING SOUTHWEST LLC, MARATHON GALLUP REFINERY, GALLUP, NEW MEXICO

Location Group Name	Location ID	Date Sampled	Gasoline Range Organics (mg/kg)	Diesel Range Organics (mg/kg)	Oil Range Organics (mg/kg)
Former Aeration Lagoon AL-2	SWMU 1-18 (toe) (2.5 ft)	01/16/20	45	**23000** [a,b]	**8300** [a,b]
	SWMU 1-18 (toe) (5 ft)	01/16/20	4.1	520	150
[a] NMED Industrial SSL			500	3,000	3,000
[b] NMED Residential SSL			100	1,000	1,000
[c] CFR TCLP			NA	NA	NA
[d] USEPA RSL Industrial Soil HQ 0.1			NA	NA	NA

Notes:
NMED SSL's - New Mexico Environmental Department Industrial and Residential Soil Screening Levels, June 2019
TCLP SL - Toxicity Characteristic Levels from 40 CFR 261.24.
USEPA RSL Industrial Soil HQ 0.1 - United States Environmental Protection Agency, Regional Screening Levels, Hazard Quotient 0.1, November 2019
AL - Aeration Lagoon
EP - Evaporation Pond
TCLP - toxicity characteristic leaching procedure
ft - feet mg/kg - milligrams per kilogram
NA - Not Applicable ND - Not Detected (Reporting Limit)
SWMU - Solid Waste Management Unit
Dup - Duplicate Sample
(toe) samples composited in the field (berm) samples taken along the berm
Benzene was analyzed for TCLP if the initial sample was detected above 0.5 ug/kg.
Samples without location depths were taken from the surface.
Bolded values exceed the standard.

Appendix A – SWMU-1 Closure Timeline

John Moore, P.E.
Environmental Supervisor
Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation
I-40, Exit 39
Jamestown, NM 87347

April 15, 2021

Mr. Kevin Pierard, Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505

RE: Estimated Schedule of Completion of Closure of AL-1 and AL-2 (Solid Waste Management Unit 1)
Complaint and Consent Agreement and Final Order (Docket No. RCRA-06-2009-0936)
Western Refining Southwest LLC – Marathon Gallup Refinery
EPA ID # NMD000333211

Dear Mr. Pierard:

Based on discussions between representatives of the New Mexico Environment Department (NMED), Hazardous Waste Bureau and Western Refining Southwest LLC (f/ka/ Western Refining Southwest, Inc.), Western Refining Southwest LLC (Western Refining) understands that NMED concurs that Western Refining's completion of the approved selected remedy at the former aeration lagoons (Al-1 and AL-2) and evaporation pond (EP-1), known collectively as Solid Waste Management Unit (SWMU) 1 will satisfy the requirements of Section IV of the Compliance Order, specifically Paragraph 100.A, D and H under the Complaint and Consent Agreement and Final Order entered on August 26, 2009 in the matter referenced above (2009 CAFO), as well as satisfy the requirements of the First Modification to the 2009 CAFO entered on September 1, 2010, specifically Paragraph 100.A and H. In particular, Western Refining understands that NMED concurs with the selected remedy of remedial excavation of SWMU 1 as necessary to remove all contaminated soils to meet risk-based cleanup levels as set forth in Western Refining's SWMU 1 Revised Investigation Report, dated January 5, 2021 (January 5, 2021 Revised Investigation Report) and NMED's January 26, 2021 Approval with Modifications, SWMU 1 Revised Investigation Report (January 26, 2021 Approval with Modifications). Consistently, NMED has requested that Western Refining commit to providing a schedule of milestones to NMED for the excavation activities identified in the January 5, 2021 Revised Investigation Report and January 26, 2021 Approval with Modifications. This letter provides the requested schedule and commitment.

Summary of Work Plan

Western Refining will submit a separate work plan for future remediation excavation and closure of SWMU 1. The work plan will include the following major components:

- Closure Performance Standards

John Moore, P.E.
Environmental Supervisor
Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation
I-40, Exit 39
Jamestown, NM 87347

- Facility Information, Site Conditions, SWMU-1 historical summary including data
- Closure Procedures
- Waste Management Procedures
- Dewatering Procedures
- Closure Sampling and Analysis including Confirmation Sampling
- Closure Operations and Schedule

Planned Schedule for Implementing Remediation and Closure Activities

The table below provides our current, best estimate of the schedule for completing the remedial excavation and closure activities outlined above. It is important to recognize that the scheduled dates provided in the table below are based on Western Refining's current, best estimates; however, in view of the potential for disruptions that might impact the timeline for completing the planned remedial measures, Western Refining reserves the right to revise the schedule. In such event, Western Refining will provide an update to the schedule and an explanation for the change.

SCHEDULE FOR IMPLEMENTING REMEDIAL EXCAVATION MEASURES

Remediation Measure	Scheduled Completion Date	Comment
Submit Revised Investigation Report for SWUM 1 to NMED	Submitted to NMED on January 5, 2021	NMED Approved with Modifications on January 26, 2021
Install test pits and recovery sumps	Second Quarter of 2021	
Install French drains along east and south sides	Third Quarter of 2021	
Submit Final Closure Work Plan	Third Quarter of 2021	
Receive NMED Approval of Final Closure Work Plan	Anticipate Fourth Quarter of 2021	Western Refining understands it will work with NMED to address concerns or requested modifications
Commence field work (AL-1 and AL-2)	First Quarter of 2022	
Commence field work (EP-1)	First Quarter of 2023	
Submit Excavation Completion Report for SWMU 1	Second Quarter of 2023	
Receive NMED Approval of Excavation Completion Report for SWMU 1	Anticipate Third Quarter of 2023	Western Refining understands it will work with NMED to address concerns or requested modifications
Submit Class 3 permit modification & a Long-Term	Fourth Quarter of 2023	

John Moore, P.E.
Environmental Supervisor
Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation
I-40, Exit 39
Jamestown, NM 87347

Monitoring and Maintenance Plan (Condition IV.G of RCRA Permit)		

Western Refining appreciates NMED's review of the information contained in this letter and requests that NMED provide a response concurring with this proposal.

If you have any questions or require further information regarding this matter in the meantime, please do not hesitate to contact John Moore of my staff at 505-722-0205.

Certification

I certify under penalty of law that this document was prepared by me or under my direct supervision in accordance with a system designed to assure that qualified personnel property gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gather the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Robert S. Hanks
Refinery General Manager
Western Refining Southwest LLC – Marathon Gallup Refinery

cc: Dave Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, NMOCD
T. McDill, NMOCD
J. Moore, MPC
H. Jones, Trihydro Corporation

Appendix B – Zeolite Catalyst Characterization Data

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

April 09, 2021

Jake Usrey
Marathon
92 Giant Crossing Rd
Gallup, NM 87301
TEL: (505) 722-3833
FAX

RE: ESP Catalyst Fines OrderNo.: 2103351

Dear Jake Usrey:

Hall Environmental Analysis Laboratory received 1 sample(s) on 3/4/2021 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2103351**
Date Reported: **4/9/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: ESP Catalyst Fines
Project: ESP Catalyst Fines
Collection Date: 3/4/2021 8:30:00 AM
Lab ID: 2103351-001 **Matrix:** SOIL **Received Date:** 3/4/2021 3:40:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	54	7.5		mg/Kg	5	3/9/2021 4:25:44 AM	58583
Sulfate	12000	150		mg/Kg	100	3/15/2021 4:57:22 PM	58583
MERCURY, TCLP						Analyst: **ags**	
Mercury	ND	0.020		mg/L	1	3/19/2021 3:00:29 PM	58832
EPA METHOD 6010B: TCLP METALS						Analyst: **JLF**	
Arsenic	ND	5.0		mg/L	1	3/22/2021 3:40:11 PM	58827
Barium	ND	100		mg/L	1	3/22/2021 2:20:21 PM	58827
Cadmium	ND	1.0		mg/L	1	3/22/2021 2:20:21 PM	58827
Chromium	ND	5.0		mg/L	1	3/22/2021 2:20:21 PM	58827
Lead	ND	5.0		mg/L	1	3/22/2021 2:20:21 PM	58827
Selenium	ND	1.0		mg/L	1	3/22/2021 2:20:21 PM	58827
Silver	ND	5.0		mg/L	1	3/22/2021 2:20:21 PM	58827
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **mb**	
Diesel Range Organics (DRO)	21	9.4		mg/Kg	1	3/9/2021 3:57:51 PM	58572
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	3/9/2021 3:57:51 PM	58572
Surr: DNOP	115	70-130		%Rec	1	3/9/2021 3:57:51 PM	58572
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	24	10		mg/Kg	1	3/10/2021 2:55:54 PM	58564
Surr: BFB	132	75.3-105	S	%Rec	1	3/10/2021 2:55:54 PM	58564
EPA METHOD 8310: PAHS						Analyst: **TOM**	
Naphthalene	ND	0.23		mg/Kg	1	3/18/2021 9:23:14 AM	58729
1-Methylnaphthalene	ND	0.23		mg/Kg	1	3/18/2021 9:23:14 AM	58729
2-Methylnaphthalene	ND	0.23		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Acenaphthylene	ND	0.23		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Acenaphthene	ND	0.23		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Fluorene	ND	0.027		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Phenanthrene	ND	0.014		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Anthracene	ND	0.014		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Fluoranthene	ND	0.027		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Pyrene	ND	0.027		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Benz(a)anthracene	ND	0.0090		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Chrysene	ND	0.023		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Benzo(b)fluoranthene	ND	0.027		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Benzo(k)fluoranthene	ND	0.027		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Benzo(a)pyrene	ND	0.018		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Dibenz(a,h)anthracene	ND	0.014		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Benzo(g,h,i)perylene	ND	0.023		mg/Kg	1	3/18/2021 9:23:14 AM	58729

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

Qualifiers:

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

Analytical Report
Lab Order **2103351**
Date Reported: **4/9/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: ESP Catalyst Fines
Project: ESP Catalyst Fines
Collection Date: 3/4/2021 8:30:00 AM
Lab ID: 2103351-001 **Matrix:** SOIL **Received Date:** 3/4/2021 3:40:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8310: PAHS						Analyst: **TOM**	
Indeno(1,2,3-cd)pyrene	ND	0.014		mg/Kg	1	3/18/2021 9:23:14 AM	58729
Surr: Benzo(e)pyrene	90.4	32.7-129		%Rec	1	3/18/2021 9:23:14 AM	58729
EPA METHOD 8270C TCLP						Analyst: **DAM**	
2-Methylphenol	ND	200		mg/L	1	3/29/2021 7:34:15 PM	58834
3+4-Methylphenol	ND	200		mg/L	1	3/29/2021 7:34:15 PM	58834
2,4-Dinitrotoluene	ND	0.13		mg/L	1	3/29/2021 7:34:15 PM	58834
Hexachlorobenzene	ND	0.13		mg/L	1	3/29/2021 7:34:15 PM	58834
Hexachlorobutadiene	ND	0.50		mg/L	1	3/29/2021 7:34:15 PM	58834
Hexachloroethane	ND	3.0		mg/L	1	3/29/2021 7:34:15 PM	58834
Nitrobenzene	ND	2.0		mg/L	1	3/29/2021 7:34:15 PM	58834
Pentachlorophenol	ND	100		mg/L	1	3/29/2021 7:34:15 PM	58834
Pyridine	ND	5.0		mg/L	1	3/29/2021 7:34:15 PM	58834
2,4,5-Trichlorophenol	ND	400		mg/L	1	3/29/2021 7:34:15 PM	58834
2,4,6-Trichlorophenol	ND	2.0		mg/L	1	3/29/2021 7:34:15 PM	58834
Cresols, Total	ND	200		mg/L	1	3/29/2021 7:34:15 PM	58834
Surr: 2-Fluorophenol	57.8	15-97.5		%Rec	1	3/29/2021 7:34:15 PM	58834
Surr: Phenol-d5	44.6	15-77.3		%Rec	1	3/29/2021 7:34:15 PM	58834
Surr: 2,4,6-Tribromophenol	67.4	15-112		%Rec	1	3/29/2021 7:34:15 PM	58834
Surr: Nitrobenzene-d5	66.4	15-119		%Rec	1	3/29/2021 7:34:15 PM	58834
Surr: 2-Fluorobiphenyl	67.7	15-89.2		%Rec	1	3/29/2021 7:34:15 PM	58834
Surr: 4-Terphenyl-d14	81.1	15-137		%Rec	1	3/29/2021 7:34:15 PM	58834
EPA METHOD 8260B: TCLP COMPOUNDS						Analyst: **JMR**	
Benzene	ND	0.50		ppm	5	3/12/2021 7:15:38 PM	58564
1,2-Dichloroethane (EDC)	ND	0.50		ppm	5	3/12/2021 7:15:38 PM	58564
2-Butanone	ND	200		ppm	5	3/12/2021 7:15:38 PM	58564
Carbon tetrachloride	ND	0.50		ppm	5	3/12/2021 7:15:38 PM	58564
Chlorobenzene	ND	100		ppm	5	3/12/2021 7:15:38 PM	58564
Chloroform	ND	6.0		ppm	5	3/12/2021 7:15:38 PM	58564
1,4-Dichlorobenzene	ND	7.5		ppm	5	3/12/2021 7:15:38 PM	58564
1,1-Dichloroethene	ND	0.70		ppm	5	3/12/2021 7:15:38 PM	58564
Tetrachloroethene (PCE)	ND	0.70		ppm	5	3/12/2021 7:15:38 PM	58564
Trichloroethene (TCE)	ND	0.50		ppm	5	3/12/2021 7:15:38 PM	58564
Vinyl chloride	ND	0.20		ppm	5	3/12/2021 7:15:38 PM	58564
Surr: 1,2-Dichloroethane-d4	97.6	70-130		%Rec	5	3/12/2021 7:15:38 PM	58564
Surr: 4-Bromofluorobenzene	95.0	70-130		%Rec	5	3/12/2021 7:15:38 PM	58564
Surr: Dibromofluoromethane	95.9	70-130		%Rec	5	3/12/2021 7:15:38 PM	58564
Surr: Toluene-d8	104	70-130		%Rec	5	3/12/2021 7:15:38 PM	58564

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

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **MB-58583** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **58583** RunNo: **75780**
Prep Date: **3/8/2021** Analysis Date: **3/9/2021** SeqNo: **2680987** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								
Sulfate	ND	1.5								

Sample ID: **LCS-58583** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **58583** RunNo: **75780**
Prep Date: **3/8/2021** Analysis Date: **3/9/2021** SeqNo: **2680988** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.8	90	110			
Sulfate	29	1.5	30.00	0	95.2	90	110			

Sample ID: **2103351-001AMS** SampType: **MS** TestCode: **EPA Method 300.0: Anions**
Client ID: **ESP Catalyst Fines** Batch ID: **58583** RunNo: **75780**
Prep Date: **3/8/2021** Analysis Date: **3/9/2021** SeqNo: **2681008** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	75	7.5	15.00	53.89	142	36.7	168			

Sample ID: **2103351-001AMSD** SampType: **MSD** TestCode: **EPA Method 300.0: Anions**
Client ID: **ESP Catalyst Fines** Batch ID: **58583** RunNo: **75780**
Prep Date: **3/8/2021** Analysis Date: **3/9/2021** SeqNo: **2681009** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	75	7.5	15.00	53.89	138	36.7	168	0.761	20	

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **MB-58572**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **58572**	RunNo: **75787**
Prep Date: **3/8/2021**	Analysis Date: **3/9/2021**	SeqNo: **2682240** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.9		10.00		99.0	70	130			

Sample ID: **LCS-58572**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **58572**	RunNo: **75787**
Prep Date: **3/8/2021**	Analysis Date: **3/9/2021**	SeqNo: **2682242** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	104	68.9	141			
Surr: DNOP	5.3		5.000		107	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**

09-Apr-21

Client: Marathon

Project: ESP Catalyst Fines

Sample ID: **mb-58564** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **PBS** Batch ID: **58564** RunNo: **75810**

Prep Date: **3/8/2021** Analysis Date: **3/9/2021** SeqNo: **2682091** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1100		1000		106	75.3	105			S

Sample ID: **lcs-58564** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **LCSS** Batch ID: **58564** RunNo: **75810**

Prep Date: **3/8/2021** Analysis Date: **3/9/2021** SeqNo: **2682092** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	111	80	120			
Surr: BFB	1200		1000		116	75.3	105			S

Qualifiers:

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S	% Recovery outside of range due to dilution or matrix
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E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **lcs-58564** SampType: **LCS** TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **LCSS** Batch ID: **58564** RunNo: **75863**
Prep Date: **3/8/2021** Analysis Date: **3/10/2021** SeqNo: **2687077** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.050	1.000	0	97.7	70	130			
Chlorobenzene	ND	10	1.000	0	95.7	70	130			
1,1-Dichloroethene	0.95	0.070	1.000	0	95.5	70	130			
Trichloroethene (TCE)	0.80	0.050	1.000	0	79.6	70	130			
Surr: 1,2-Dichloroethane-d4	0.43		0.5000		86.7	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		98.3	70	130			
Surr: Dibromofluoromethane	0.43		0.5000		86.7	70	130			
Surr: Toluene-d8	0.48		0.5000		95.9	70	130			

Sample ID: **mb-58564** SampType: **MBLK** TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **PBS** Batch ID: **58564** RunNo: **75863**
Prep Date: **3/8/2021** Analysis Date: **3/10/2021** SeqNo: **2687078** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
2-Butanone	ND	20								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	10								
Chloroform	ND	0.60								
1,4-Dichlorobenzene	ND	0.75								
1,1-Dichloroethene	ND	0.070								
Tetrachloroethene (PCE)	ND	0.070								
Trichloroethene (TCE)	ND	0.050								
Vinyl chloride	ND	0.020								
Surr: 1,2-Dichloroethane-d4	0.44		0.5000		88.8	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		101	70	130			
Surr: Dibromofluoromethane	0.51		0.5000		102	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			

Qualifiers:

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H	Holding times for preparation or analysis exceeded
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PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
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RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **lcs-58834** SampType: **LCS** TestCode: **EPA Method 8270C TCLP**
Client ID: **LCSS** Batch ID: **58834** RunNo: **76319**
Prep Date: **3/19/2021** Analysis Date: **3/29/2021** SeqNo: **2702234** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	0.055	0.0010	0.1000	0	55.0	18.9	104			
3+4-Methylphenol	0.11	0.0010	0.2000	0	56.5	11.8	115			
2,4-Dinitrotoluene	0.051	0.0010	0.1000	0	50.8	16.6	95.5			
Hexachlorobenzene	0.084	0.0010	0.1000	0	83.6	42.6	112			
Hexachlorobutadiene	0.057	0.0010	0.1000	0	57.4	11.5	87.7			
Hexachloroethane	0.052	0.0010	0.1000	0	52.1	14.3	71.4			
Nitrobenzene	0.072	0.0010	0.1000	0	71.8	23.2	109			
Pentachlorophenol	0.070	0.0010	0.1000	0	69.8	29.4	102			
Pyridine	0.046	0.0010	0.1000	0	45.7	0	62.1			
2,4,5-Trichlorophenol	0.067	0.0010	0.1000	0	67.4	32.7	112			
2,4,6-Trichlorophenol	0.068	0.0010	0.1000	0	67.5	33.9	111			
Cresols, Total	0.17	0.0010	0.3000	0	56.0	5.83	117			
Surr: 2-Fluorophenol	0.11		0.2000		55.3	15	97.5			
Surr: Phenol-d5	0.085		0.2000		42.3	15	77.3			
Surr: 2,4,6-Tribromophenol	0.15		0.2000		74.5	15	112			
Surr: Nitrobenzene-d5	0.067		0.1000		66.7	15	119			
Surr: 2-Fluorobiphenyl	0.069		0.1000		68.9	15	89.2			
Surr: 4-Terphenyl-d14	0.097		0.1000		97.0	15	137			

Sample ID: **mb-58834** SampType: **MBLK** TestCode: **EPA Method 8270C TCLP**
Client ID: **PBS** Batch ID: **58834** RunNo: **76319**
Prep Date: **3/19/2021** Analysis Date: **3/29/2021** SeqNo: **2702250** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	ND	200								
3+4-Methylphenol	ND	200								
2,4-Dinitrotoluene	ND	0.13								
Hexachlorobenzene	ND	0.13								
Hexachlorobutadiene	ND	0.50								
Hexachloroethane	ND	3.0								
Nitrobenzene	ND	2.0								
Pentachlorophenol	ND	100								
Pyridine	ND	5.0								
2,4,5-Trichlorophenol	ND	400								
2,4,6-Trichlorophenol	ND	2.0								
Cresols, Total	ND	200								
Surr: 2-Fluorophenol	0.095		0.2000		47.3	15	97.5			
Surr: Phenol-d5	0.075		0.2000		37.5	15	77.3			
Surr: 2,4,6-Tribromophenol	0.12		0.2000		62.4	15	112			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **mb-58834** SampType: **MBLK** TestCode: **EPA Method 8270C TCLP**
Client ID: **PBS** Batch ID: **58834** RunNo: **76319**
Prep Date: **3/19/2021** Analysis Date: **3/29/2021** SeqNo: **2702250** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	0.054		0.1000		53.6	15	119			
Surr: 2-Fluorobiphenyl	0.056		0.1000		56.3	15	89.2			
Surr: 4-Terphenyl-d14	0.092		0.1000		92.2	15	137			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **MB-58729** SampType: **MBLK** TestCode: **EPA Method 8310: PAHs**
Client ID: **PBS** Batch ID: **58729** RunNo: **76016**
Prep Date: **3/15/2021** Analysis Date: **3/18/2021** SeqNo: **2691178** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.25								
1-Methylnaphthalene	ND	0.25								
2-Methylnaphthalene	ND	0.25								
Acenaphthylene	ND	0.25								
Acenaphthene	ND	0.25								
Fluorene	ND	0.030								
Phenanthrene	ND	0.015								
Anthracene	ND	0.015								
Fluoranthene	ND	0.030								
Pyrene	ND	0.030								
Benz(a)anthracene	ND	0.010								
Chrysene	ND	0.025								
Benzo(b)fluoranthene	ND	0.030								
Benzo(k)fluoranthene	ND	0.030								
Benzo(a)pyrene	ND	0.020								
Dibenz(a,h)anthracene	ND	0.015								
Benzo(g,h,i)perylene	ND	0.025								
Indeno(1,2,3-cd)pyrene	ND	0.015								
Surr: Benzo(e)pyrene	0.42		0.5000		84.6	32.7	129			

Sample ID: **LCS-58729** SampType: **LCS** TestCode: **EPA Method 8310: PAHs**
Client ID: **LCSS** Batch ID: **58729** RunNo: **76016**
Prep Date: **3/15/2021** Analysis Date: **3/18/2021** SeqNo: **2691179** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	1.3	0.25	2.000	0	62.5	15	113			
1-Methylnaphthalene	1.2	0.25	2.000	0	60.4	15	113			
2-Methylnaphthalene	1.2	0.25	2.000	0	61.4	15	113			
Acenaphthylene	1.3	0.25	2.000	0	64.5	15	117			
Acenaphthene	1.3	0.25	2.000	0	65.7	15	114			
Fluorene	0.14	0.030	0.2000	0	70.8	15	115			
Phenanthrene	0.082	0.015	0.1006	0	81.8	15	115			
Anthracene	0.084	0.015	0.1006	0	83.7	15	118			
Fluoranthene	0.18	0.030	0.2006	0	88.6	20.7	115			
Pyrene	0.17	0.030	0.2000	0	87.2	20.9	116			
Benz(a)anthracene	0.019	0.010	0.02000	0	92.5	20.4	119			
Chrysene	0.092	0.025	0.1006	0	91.0	21.4	116			
Benzo(b)fluoranthene	ND	0.030	0.02500	0	85.0	15.3	114			
Benzo(k)fluoranthene	ND	0.030	0.01250	0	88.0	15	118			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **LCS-58729** SampType: **LCS** TestCode: **EPA Method 8310: PAHs**
Client ID: **LCSS** Batch ID: **58729** RunNo: **76016**
Prep Date: **3/15/2021** Analysis Date: **3/18/2021** SeqNo: **2691179** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(a)pyrene	ND	0.020	0.01250	0	50.0	15	103			
Dibenz(a,h)anthracene	0.024	0.015	0.02500	0	94.0	16.1	119			
Benzo(g,h,i)perylene	ND	0.025	0.02500	0	88.0	19.5	112			
Indeno(1,2,3-cd)pyrene	0.046	0.015	0.05002	0	92.0	17.5	115			
Surr: Benzo(e)pyrene	0.49		0.5000		98.0	32.7	129			

Sample ID: **MB-58729** SampType: **MBLK** TestCode: **EPA Method 8310: PAHs**
Client ID: **PBS** Batch ID: **58729** RunNo: **76016**
Prep Date: **3/15/2021** Analysis Date: **3/18/2021** SeqNo: **2691373** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.25								
1-Methylnaphthalene	ND	0.25								
2-Methylnaphthalene	ND	0.25								
Acenaphthylene	ND	0.25								
Acenaphthene	ND	0.25								
Fluorene	ND	0.030								
Phenanthrene	ND	0.015								
Anthracene	ND	0.015								
Fluoranthene	ND	0.030								
Pyrene	ND	0.030								
Benz(a)anthracene	ND	0.010								
Chrysene	ND	0.025								
Benzo(b)fluoranthene	ND	0.030								
Benzo(k)fluoranthene	ND	0.030								
Benzo(a)pyrene	ND	0.020								
Dibenz(a,h)anthracene	ND	0.015								
Benzo(g,h,i)perylene	ND	0.025								
Indeno(1,2,3-cd)pyrene	ND	0.015								
Surr: Benzo(e)pyrene	0.41		0.5000		82.7	32.7	129			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**

09-Apr-21

Client: Marathon

Project: ESP Catalyst Fines

Sample ID: **MB-58832**	SampType: **MBLK**	TestCode: **MERCURY, TCLP**							
Client ID: **PBW**	Batch ID: **58832**	RunNo: **76073**							
Prep Date: **3/18/2021**	Analysis Date: **3/19/2021**	SeqNo: **2692900**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID: **LLLCS-58832**	SampType: **LCSLL**	TestCode: **MERCURY, TCLP**							
Client ID: **BatchQC**	Batch ID: **58832**	RunNo: **76073**							
Prep Date: **3/18/2021**	Analysis Date: **3/19/2021**	SeqNo: **2692901**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.0001500	0	117	50	150			

Sample ID: **LCS-58832**	SampType: **LCS**	TestCode: **MERCURY, TCLP**							
Client ID: **LCSW**	Batch ID: **58832**	RunNo: **76073**							
Prep Date: **3/18/2021**	Analysis Date: **3/19/2021**	SeqNo: **2692902**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	108	80	120			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103351**
09-Apr-21

Client: Marathon
Project: ESP Catalyst Fines

Sample ID: **MB-58827** SampType: **MBLK** TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **PBW** Batch ID: **58827** RunNo: **76124**
Prep Date: **3/18/2021** Analysis Date: **3/22/2021** SeqNo: **2694973** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	5.0								

Sample ID: **LCS-58827** SampType: **LCS** TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **LCSW** Batch ID: **58827** RunNo: **76124**
Prep Date: **3/18/2021** Analysis Date: **3/22/2021** SeqNo: **2694975** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	100	0.5000	0	111	80	120			
Cadmium	ND	1.0	0.5000	0	103	80	120			
Chromium	ND	5.0	0.5000	0	106	80	120			
Lead	ND	5.0	0.5000	0	111	80	120			
Selenium	ND	1.0	0.5000	0	112	80	120			
Silver	ND	5.0	0.1000	0	106	80	120			

Sample ID: **MB-58827** SampType: **MBLK** TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **PBW** Batch ID: **58827** RunNo: **76124**
Prep Date: **3/18/2021** Analysis Date: **3/22/2021** SeqNo: **2695026** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								

Sample ID: **LCS-58827** SampType: **LCS** TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **LCSW** Batch ID: **58827** RunNo: **76124**
Prep Date: **3/18/2021** Analysis Date: **3/22/2021** SeqNo: **2695028** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.5000	0	97.9	80	120			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **Marathon** Work Order Number: **2103351** RcptNo: 1

Received By: **Isaiah Ortiz** **3/4/2021 3:40:00 PM** I-OK

Completed By: **Isaiah Ortiz** **3/5/2021 1:05:42 PM** I-OK

Reviewed By: SPA 3.5.21

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: (<2 or >12 unless noted)

Adjusted?

Checked by: AU 3/5/21

Special Handling (if applicable)

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

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.4	Good	Not Present			

Chain-of-Custody Record

Client: Marathon Refining

Gallup Refining

Mailing Address:

92 Giant Crossing Road, Gallup NM 87301

Phone #: 505-722-3833

email or Fax#: 505-863-0930

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other_____

☐ EDD (Type) _____

Turn-Around Time:

☐ Standard ☐ **Rush**_____

Project Name:

ESP Catalyst Fines

Project #:

ESP Catalyst Fines

Project Manager:

Jake Usrey 505-870-8373

Jusrey@marathonpetroleum.com

Sampler:

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 4.6+0.2(F) 4.4°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2103351	R8015D (DRO/GRO/MRO)Cl		8260B -TCLP	8270 - TCLP	RCRA 8 METALS -TCLP	RCI	PAINT FILTER	8310 PAH	SULFATES								
3/4/21	8:30a	Media	ESP Catalyst Fines	1 - 1qt can	None	001	X		X	X	X	X		X	X								

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
3/4/21	9:30a	JAKE USREY	IO	courier	3/4/21	1540
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Pace Analytical®

ANALYTICAL REPORT

March 17, 2021

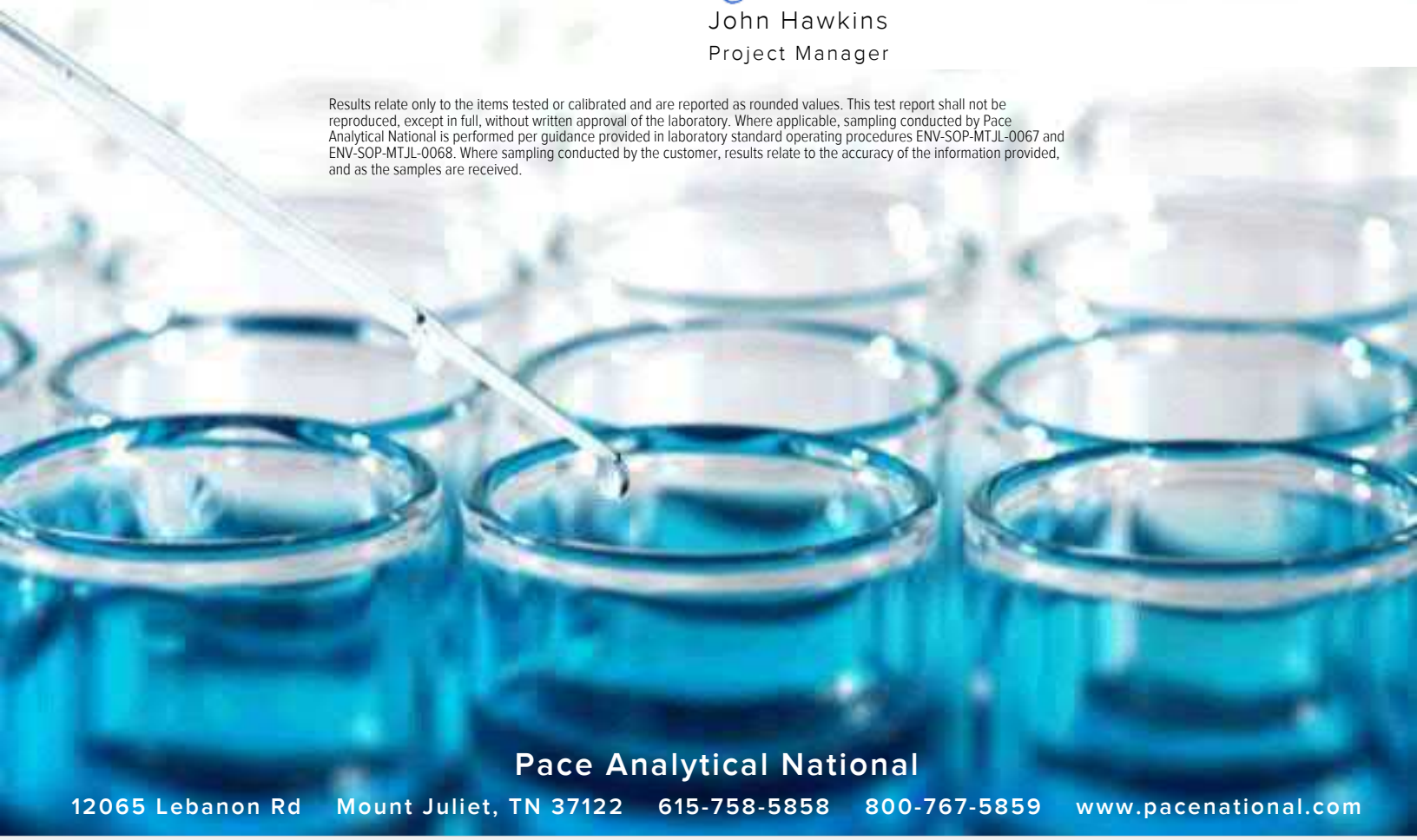
Hall Environmental Analysis Laboratory

Sample Delivery Group:	L1324550
Samples Received:	03/09/2021
Project Number:	
Description:	

Report To: Jackie Bolte
4901 Hawkins NE
Albuquerque, NM 87109

Entire Report Reviewed By: John V Hawkins

John Hawkins
Project Manager



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

TABLE OF CONTENTS

SAMPLE SUMMARY

2103351-001B ESP CATALYST FINES L1324550-01 Solid

Collected by	Collected date/time	Received date/time
	03/04/21 08:30	03/09/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9012 B	WG1634589	1	03/15/21 15:58	03/16/21 17:40	JER	Mt. Juliet, TN
Wet Chemistry by Method 9034-9030B	WG1635787	1	03/16/21 23:00	03/16/21 23:00	LDT	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1632661	1	03/11/21 01:42	03/11/21 06:26	ARD	Mt. Juliet, TN
Wet Chemistry by Method D93/1010A	WG1635024	1	03/16/21 01:59	03/16/21 01:59	CAT	Mt. Juliet, TN

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

John Hawkins
Project Manager

Project Narrative

All Reactive Cyanide results reported in the attached report were determined as totals using method 9012B.
All Reactive Sulfide results reported in the attached report were determined as totals using method 9034/9030B.

Wet Chemistry by Method 9012 B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Reactive Cyanide	ND		0.250	1	03/16/2021 17:40	WG1634589

Wet Chemistry by Method 9034-9030B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Reactive Sulfide	ND		25.0	1	03/16/2021 23:00	WG1635787

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity by pH	7.33	T8	1	03/11/2021 06:26	WG1632661

Sample Narrative:

L1324550-01 WG1632661: 7.33 at 21.6C

Wet Chemistry by Method D93/1010A

Analyte	Result Deg. F	Qualifier	Dilution	Analysis date / time	Batch
Ignitability	DNI at 170		1	03/16/2021 01:59	WG1635024

Method Blank (MB)

(MB) R3631408-1 03/16/21 17:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Reactive Cyanide	U		0.0390	0.250

L1324415-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1324415-02 03/16/21 17:35 • (DUP) R3631408-3 03/16/21 17:36

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	ND	ND	1	0.000		20

L1324758-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1324758-03 03/16/21 17:45 • (DUP) R3631408-4 03/16/21 17:46

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3631408-2 03/16/21 17:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Cyanide	2.50	2.45	98.0	85.0-115	

L1324758-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1324758-08 03/16/21 17:53 • (MS) R3631408-5 03/16/21 17:54 • (MSD) R3631408-6 03/16/21 17:55

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	1.66	ND	1.39	1.36	83.3	81.9	1	75.0-125			1.74	20

L1325883-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1325883-01 03/16/21 17:57 • (MS) R3631408-7 03/16/21 17:58 • (MSD) R3631408-8 03/16/21 17:59

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	1.67	ND	1.62	1.65	97.2	98.8	1	75.0-125			1.63	20

Method Blank (MB)

(MB) R3631483-1 03/16/21 23:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Reactive Sulfide	U		7.63	25.0

Laboratory Control Sample (LCS)

(LCS) R3631483-2 03/16/21 23:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Sulfide	100	88.2	88.2	70.0-130	

Laboratory Control Sample (LCS)

(LCS) R3629532-1 03/11/21 06:26

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
Corrosivity by pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.05 at 20.7C

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3631042-1 03/16/21 01:59 • (LCSD) R3631042-2 03/16/21 01:59

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	Deg. F	Deg. F	Deg. F	%	%	%			%	%
Ignitability	126	127	127	101	101	95.6-104			0.000	10

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

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

ENVIRONMENTAL ANALYSIS LABORATORY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

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

H025

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

ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2103351-001B	ESP Catalyst Fines	4OZGU	Soil	3/4/2021 8:30:00 AM	1	Reactivity, Corrosivity and Ignitability in soil 1324550-01

Sample Receipt Checklist

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

SPECIAL INSTRUCTIONS / COMMENTS: 1749 9998 4252 1 total All Cont <500 CPM

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

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
	3/5/2021	1:30 PM			
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By: MRippas	3-9-21	Time: 900

TAT: Standard ☐ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

REPORT TRANSMITTAL DESIRED
☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE

FOR LAB USE ONLY
Temp of sample: 2.8+2.7 Attempt to Cool ?
Comments: cccsR

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

Operator: Western Refining Southwest LLC 539 South Main Street Findlay, OH 45840	OGRID: 267595
	Action Number: 51841
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
jburdine	Accepted for Record Retention Purposes-Only	11/22/2022