Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation

I-40 Exit 39
Jamestown, NM 87347

January 31, 2021

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

RE: Response to Second Disapproval
Facility Wide Ground Water Monitoring Work Plan – Updates for 2021
Western Refining Southwest LLC, D/B/A Marathon Gallup Refinery
(DBA Western Refining Southwest LLC)
EPA ID# NMD000333211 / HWB-WRG-21-006

Dear Mr. Pierard:

Western Refining Southwest LLC, D/B/A Marathon Gallup Refinery is submitting this response to comments for the Disapproval, Facility Wide Ground Water Monitoring Plan – Updates for 2021. Included with this submittal are the response to comments, two copies of the revised work plan replacement pages, and electronic submittal of the revised work plan and the redline-strikeout text.

A timeline of the report is provided below:

- Facility Wide Ground Water Monitoring Plan – Updates for 2021 submitted March 31, 2021
- Disapproval received May 25, 2021
- Response to Disapproval submitted September 24, 2021
- Disapproval received November 15, 2021

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, D/B/A Marathon Gallup Refinery

Ruth A Cade

Ruth Cade
Vice-President

Enclosures

cc: D. Cobrain, NMED HWB
L. Barr, NMOCD
K. Luka, Marathon Petroleum Corporation
M. Bracey, Marathon Petroleum Corporation
M. Suzuki, NMED HWB
J. Moore, Marathon Gallup Refinery
H. Jones, Trihydro Corporation

ATTACHMENT A

RESPONSE TO COMMENTS

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 1:	**Response 1:**
The response to NMED's Disapproval Comment 5 states, "[t]he new data collected during the evaluation shows that there is no communication between the NAPIS/LDU and groundwater in the area. The NAPIS secondary containment is not leaking." The NAPIS has a history of problems since shortly after it was installed. Groundwater in the vicinity of the NAPIS is contaminated and there is uncertainty regarding the release history. The statements relating to the conclusions about the NAPIS containment should not be included in the Work Plan. Remove the statement(s) relating to the conclusions about the NAPIS secondary containment from the revised Work Plan.	This statement related to the NAPIS secondary containment has been removed from Section 2.4.2 (Areas of Interest [NAPIS Unit]), page 12, of the revised Work Plan.
Comment 2:	**Response 2:**
The response to NMED's Disapproval Comment 7 states, "[i]f SPH recovery system wells (OW-13, OW-14, OW-29, OW-30, RW-1, RW-2, RW-5, and RW-6) do not have measurable SPH, the recovery system will be removed from the well and the well sampled." Whether or not certain wells contain measurable separate phase hydrocarbon (SPH), the Permittee is required to halt the operation of the SPH recovery system prior to gauging and sampling events. This allows the groundwater to equilibrate and provides more accurate data from these wells. Gauging data must be collected from these wells regardless of the presence/absence of measurable SPH. Include the provisions in the revised Work Plan.	The provision has been added to Section 4.0 (Monitoring and Sampling Programs), page 19, to state, "Groundwater samples will not be collected from monitoring wells that have measurable SPH. Prior to sampling, recovery system operation will be halted to allow the groundwater to equilibrate. If SPH recovery system wells (OW-13, OW-14, OW-29, OW-30, RW-1, RW-2, RW-5, and RW-6) do not have measurable SPH, the recovery system will be removed from the well and the well sampled."

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 3:	**Response 3:**
The response to NMED's Disapproval Comment 9 states, "[w]ell OW-13A was proposed to be installed near OW-13 to address concerns that OW-13 may be a migration pathway for constituents (e.g., MTBE) to move vertically downward to the Sonsela aquifer (NMED 2018, Comment 18.4). Water was not observed in the boring and the well was not installed. However, soil samples were collected. Given that water was not observed it the shallow zone, it is not expected that there would be any downward migration of contaminants into the Sonsela." NMED's Disapproval Comment 9 directed the Permittee to collect monitoring data from well OW-13. This comment is not addressed by the Permittee's statement. Address the comment in the revised Work Plan. Based on the Permittee's statement, well OW-13A could not be installed; however, the details of the activities of this particular installation of new wells, abandonment of existing wells, and vertical migration as related to the determination of MTBE to the Sonsela is required to be submitted separately from the Work Plan. The Permittee's response to NMED's Disapproval Comments 10 and 12 states that "the information regarding the installation of well OW-13A will separately be submitted to NMED by **October 13, 2021**." Provide the submittal that discusses the installation of the well OW-13A or submit an extension request for submitting the document.	In Response to NMED's Disapproval Comment 9, OW-13 was sampled in 2021. Text was added to Section 5.1 (Modifications in Monitoring Locations), page 21, to state, "Well OW-13 will continue to be sampled." A discussion of the OW-13A well installation is provided in the "Well Installation and Abandonment Report," submitted to NMED on November 10, 2021.

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 4:	**Response 4:**
The response to NMED's Disapproval Comment 10 states, "six wells were plugged and abandoned and replaced because the well screens have been historically submerged (NMED 2018, Comment 40; NMED 2019b, Comment 4). Wells MKTF-01R, MKTF-02R, MKTF-04R, MKTF-17R, MKTF-18R, and RW-2R were installed adjacent to the original well locations." Comment 3 of the NMED's September 14, 2021 *Approval with Modifications Hydrocarbon Seep Interim Measures 2021 Second Quarter Status Report* (September 2021 Approval with Modifications) states, "[e]xisting wells MKTF-1, MKTF-2, MKTF-4, MKTF-17, and MKTF-18 must not be plugged and abandoned; they must be preserved at this time. Furthermore, the replacement wells must be installed adjacent to the existing wells. NMED will evaluate the abandonment of the existing wells once the data collected from the existing and replacement wells are compared and evaluated. The Permittee must monitor the existing and replacement wells (once they have been installed) and submit the evaluation in a future status report." State whether these wells were plugged and abandoned prior to the receipt of NMED's September 2021 Approval with Modifications in the revised Work Plan. The Permittee is reminded that Section IV.C.3 (Facility Wide Groundwater Monitoring Reports) of the October 2013 RCRA Permit (modified September 2017) requires that "[t]he Permittee shall submit to NMED a Facility-Wide Groundwater Monitoring Report [that] describes all the groundwater monitoring activities, including all well abandonment procedures and activities, conducted in the previous year." Furthermore, the Permittee is reminded that "[a]ll well abandonment must be conducted in accordance with 19.27.4 NMAC" as required by Section IV.K.6 (Well Abandonment) of the Permit. The Permittee must not plug and abandon any additional existing wells prior to notifying NMED and receiving a concurrence.	MKTF-1, MKTF-2, MKTF-4, MKTF-17, MKTF-18, and RW-2 were plugged and abandoned following the NM state guidelines (New Mexico Administrative Code 19.24.4) in July 2021 and August 2021, prior to the receipt of NMED's September 2021 *Approval with Modifications Hydrocarbon Seep Interim Measures 2021 Second Quarter Status Report*. As stated in Section IV.C.3 of the Permit, well abandonment procedures and activities conducted in the previous year will be submitted in the 2021 Facility-Wide Groundwater Monitoring Report. NMED will be notified prior to future plug and abandonment activities. Text was added to Section 5.1 (Modifications in Monitoring Locations), page 20, to state, "In addition, six wells were plugged and abandoned following NM state guidelines (New Mexico Administrative Code 19.24.4) and replaced because the well screens have been historically submerged (NMED 2018, Comment 40; NMED 2019b, Comment 4). Wells MKTF 01R, MKTF-02R, MKTF-04R, MKTF-17R, MKTF-18R, and RW-2R were installed adjacent to the original well locations. Wells that were proposed but not installed include: • Well OW-13A was proposed to be installed near OW 13 to address concerns that OW-13 may be a migration pathway for constituents (e.g., MTBE) to move vertically downward to the Sonsela aquifer (NMED 2018, Comments 18.4 and 39). Water was not observed in the boring and the well was not installed. However, soil samples were collected. Given that water was not

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
	observed in the shallow zone, it is not expected that there would be any downward migration of contaminants into the Sonsela. Well OW-13 will continue to be sampled."
Comment 5:	**Response 5:**
The response to NMED's Disapproval Comment 13 states, "NMED included BW-5B and PW-3 in their approval statement, however, this appears to be a typo and has not been included in the sampling frequency change. Because NMED has not approved changing the frequency of sampling for BW-5B, BW-5C, and PW-3, Table 5-2 has been revised by removing the request for annual in the 2021 Frequency column." NMED's Disapproval Comment 13 did contain a typographical error and the sampling frequency for wells BW-5B, BW-5C, and PW-3 must remain quarterly. No response or revision is required.	This comment has been acknowledged.

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 6:	**Response 6:**
The response to NMED's Disapproval Comment 14 states, "[i]n addition, every compound reported by the laboratory and detected above respective detection limit will be included in the 2021 report. Tables 5-4 and 5-5 have been revised." Although the Permittee states that every compound reported by the laboratory that is detected above the respective detection limit will be reported, Tables 5-4 (Proposed Modifications to the Analyte List) and 5-5 (Analyte List) list a limited number of analytes under the categories of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). For example, only acetone and methylene chloride are listed as analytes under the category of VOC for wells MW-1 through -5. Although it is unnecessary to list every compound analyzed by the analytical method in each category, Tables 5-4 and 5-5 must be revised to: a. remove analytes listed in each category b. indicate the analytical methods utilized (e.g., EPA Methods 8260B/8011 for VOCs/ethylene dibromide and 8270C/8270 SIM for SVOCs/1,4-dioxane) for each well; and c. BTEX and MTBE must not be listed separately from the category of VOCs because EPA Method 8260B includes BTEX and MTBE. The same issues were identified in Table 5-3 (2020 Groundwater Monitoring Schedule). Revise Tables 5-3, 5-4, and 5-5, where applicable, in the revised Work Plan.	Per the meeting with NMED on December 3, 2021, the analyte list in this work plan will not be revised. The 2021 groundwater sampling year is complete. The new analyte list for 2022 discussed in this meeting will be used moving forward and NMED comments will be incorporated as applicable.

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 7:	**Response 7:**
The response to NMED's Disapproval Comment 15 states, "[t]he Refinery agrees that every compound reported by the laboratory and detected above the respective detection limit will be included in the 2021 report. The Refinery disagrees with redundant analyses for any constituent. An analyte should be measured with the method most applicable to their chemical characteristics. While naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene can be measured using either method 8260 (VOCs) and method 8270 (SVOCs), method 8270 is the most applicable." Although the Permittee has agreed with reporting every compound reported by the laboratory that is detected above the respective detection limit, there is a disagreement with reporting naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene analyzed and reported by EPA Method 8260. Report every compound reported by the laboratory that is detected above the respective detection limit regardless of the analytical method. An applicability of analytical methods for particular analytes may be discussed in the text of the reports, if any discrepancy is identified at that time; however, an omission of particular analytes from reporting is not acceptable. Revise applicable sections of the Work Plan accordingly.	Per the meeting with NMED on December 3, 2021, the analyte list in this work plan will not be revised. The 2021 groundwater sampling year is complete. The new analyte list for 2022 discussed in this meeting will be used moving forward and NMED comments will be incorporated as applicable.

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 8:	**Response 8:**
NMED's Disapproval Comment 16 states, "[p]revious groundwater monitoring reports do not appear to include total anions or cations data and an associated discussion. Provide a clarification in the response letter and revise the Work Plan for clarity." The Permittee's response to Comment 16 states, "[t]he statement has been removed from the text. Tables 5-4 and 5-5 have been revised." The Permittee's response to Comment 16 is not clear. Provide a clarification in the response letter to state why the statement was removed from the text and how NMED's comment has been addressed in the response letter.	As stated by NMED, previous groundwater reports did not include a discussion on the general inorganic compounds as cations and anions. Those inorganic compounds were addressed as total and dissolved metals. Therefore, the Permittee's response was to agree with NMED and retract the statement and revise Tables 5-4 and 5-5. No further changes have been made.
Comment 9:	**Response 9:**
NMED's Disapproval Comment 17 states, "[i]f 1,4-dioxane was detected in any of wells OW-54, OW-55, and OW-56 during the sampling events, the Permittee must continue 1,4-dioxane sampling regardless of the level of the concentration. Revise the Work Plan as appropriate." The Permittee's response to Comment 17 states, "[t]he statement has been removed from the text. Tables 5-4 and 5-5 have been revised." The Permittee's response to Comment 17 did not explain why the revisions were made to Tables 5-4 and 5-5 or how the changes impact these tables. Table 5-4 does not indicate that 1,4-dioxane analysis was proposed for wells OW-54, -55, and -56 in 2021, while Table 5-5 lists 1,4-dioxane as an analyte for these wells in 2021. There appears to be a discrepancy between these tables. Correct the discrepancy in the revised Work Plan by revising the appropriate section(s) and table(s).	Per the meeting with NMED on December 3, 2021, the analyte list in this work plan will not be revised. The 2021 groundwater sampling year is complete. The new analyte list for 2022 discussed in the meeting will be used moving forward and NMED comments will be incorporated as applicable.

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 10:	**Response 10:**
The response to NMED's Disapproval Comment 19 a states, "[b]romomethane was detected in EP-2 and outfall STP-1 to EP-2 during the 2019 groundwater sampling event. Both of these sampling points are surface water monitoring locations. In addition, it was not detected at any other evaporation pond, indicating that the detection was not widespread. Because bromomethane is localized to two surface water sample locations, there is no reason to assume that it is present in groundwater. Therefore, the Refinery maintains its position that it will not sample for bromomethane." Bromomethane is a highly volatile compound; therefore, it is not surprising to detect it in surface water samples because gaseous bromomethane can partition into surface water exposed to the atmosphere. Comment 5 of the NMED's September 28, 2021 *Response to Approval with Modifications Annual Groundwater Monitoring Report Gallup Refinery - 2019* states, "[t]he source of bromomethane may potentially be ethylene dibromide (EDB) detected at the Facility. As such, the Permittee must demonstrate that the detected bromomethane concentrations are not the result of Refinery operations. The Permittee must investigate the source of bromomethane or the Permittee must conduct pesticide analysis for samples collected from evaporation pond EP-2 using EPA Method 8081 in the upcoming groundwater monitoring work plan for the next two consecutive sampling events." If the Permittee chooses to conduct pesticide analysis collected from evaporation pond EP-2 using EPA Method 8081 in the upcoming groundwater monitoring work plan for the next two consecutive sampling events, revise the Work Plan to address the comment. Otherwise, provide a date when a work plan to evaluate the source of bromomethane at the Facility will be submitted to NMED in the response letter.	Per the meeting with NMED on December 3, 2021, the analyte list in this work plan will not be revised. The 2021 groundwater sampling year is complete. The new analyte list for 2022 discussed in the meeting will be used moving forward and NMED comments will be incorporated as applicable. In the 2022 analyte list, EDB will be monitored site wide. Pesticide analysis at EP-2 will be continued.

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
Comment 11:	**Response 11:**
The response to NMED's Disapproval Comment 19b, c, and d states, "[a]lthough the natural attenuation report is due the same day as the annual groundwater monitoring work plan update, the Refinery believes that the potential for conflicting comments and responses for updating two reports with the same information is unnecessary. To ensure the natural attenuation evaluation remains as flexible as possible, i.e., wells and analytes can be modified based on the annual evaluation, and the annual groundwater workplan focuses on sitewide groundwater changes, the Refinery recommends keeping the two work plans separate. Therefore, natural attenuation monitoring in the hydrocarbon seep area is not included in the 2021 Facility Wide Ground Water Monitoring Work Plan and will not be included in future annual updates." For continuity, the Permittee must include the natural attenuation monitoring and sampling requirements in the annual groundwater monitoring work plan to track all of the reoccurring monitoring and sampling activities for each well. A section of the revised Work Plan may be dedicated to the natural attenuation monitoring activities, and the Permittee can then state in the Work Plan and the annual groundwater monitoring report that the analytical data and discussions for the natural attenuation evaluation will be submitted in the Natural Attenuation Assessment report. A somewhat similar approach is currently being utilized at the Bloomfield Terminal with the River Terrace Annual Report. In order to include all facility monitoring activities, all changes regarding monitoring/sampling frequency and analytical suites for every groundwater monitoring well must	A section describing MNA activities will be added to the 2022 Facility Wide Groundwater Monitoring Work Plan. References will be included in future Facility Wide Groundwater Monitoring Work Plans and Annual Groundwater Reports that the natural attenuation data will be submitted in the annual Natural Attenuation Assessment report.

New Mexico Environment Department (NMED) to Marathon Gallup Refinery (Refinery) Comment Letter "Second Disapproval [Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" (November 15, 2021)

NMED Comments	Refinery Responses
be provided in the annual groundwater monitoring plan updates. This also includes the analyses of sulfide, the degradation products of MTBE, and the daughter products of vinyl chloride for pertinent wells as required by Comments 19 b, c, and d. The activities required by the NMED's January 26, 2021 *Disapproval Natural Attenuation Assessment and Proposed Workplan for the Hydrocarbon Seep Area* must be referenced in the revised Work Plan. In addition, all changes in monitoring/sampling frequency and analytical suites found to be necessary during the course of monitoring the natural attenuation evaluation or other investigations, must be discussed in the pertinent reports and proposed changes to the monitoring program must be reported in the annual groundwater monitoring work plan updates. Revise the Work Plan to include these provisions.	

ATTACHMENT B

REPLACEMENT PAGES FOR

FINAL FACILITY WIDE GROUND WATER MONITORING WORK PLAN

UPDATES FOR 2021

(TWO HARD COPIES)

Western Refining Southwest LLC D/B/A Marathon Gallup Refinery Facility Wide Groundwater Monitoring Work Plan – Updates for 2021

Gallup Refinery
92 Giant Crossing Road
Gallup, NM 87301
(505) 722-3833

Submitted: March 31, 2021
Revised: September 30, 2021
Revision 2: January 31, 2022

Executive Summary

Western Refining Southwest LLC, Marathon Gallup Refinery (Refinery) conducts quarterly, semi-annual, and annual groundwater monitoring on a site wide basis. This Groundwater Monitoring Work Plan (Plan) documents additions or revisions in groundwater monitoring and details the sampling procedures used.

This Plan divides the facility into six monitoring groups. Group A consists of the boundary wells situated along the northwest corner of the Refinery property and monitoring wells around the land treatment area (LTU). Group B consists of a cluster of wells at the aeration basin and at the sanitary treatment pond 1 (STP-1) near the Wastewater Treatment Unit. Group C consists of the observation wells (OW) on the northeast section of the Refinery, including four product recovery wells and OW-58A. Group D includes the process/production wells and the four OWs located on the south-southwest section of the property. Group E wells include 50 permanent monitoring wells installed to delineate the extent of a hydrocarbon plume associated with a seep discovered in 2013 directly west of the crude tanks (T-101 and T-102). Also included in this group is a pre-existing well located directly west of the truck loading terminal. Group F includes the sampling locations required for the evaporation ponds and effluent from the sanitary treatment pond (STP-1). Group locations are provided on Figure 1-3.

The Refinery will periodically review facility-wide monitoring data and assess the monitoring program presented in this Plan. Revisions to the Plan, as necessary, will be presented annually for agency review and approval. These revisions may include, but are not be limited to, a reduction or change in monitoring locations, monitoring frequency, and/or target chemicals to be analyzed. The proposed modifications to the Plan for 2021 and the rationale are presented in Section 5.0.

A timeline of the Plan is provided below:

- "Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on March 31, 2021.
- "Disapproval" was received from the New Mexico Environment Department (NMED) on May 25, 2021.

- "[Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on September 30, 2021.
- "Second Disapproval" was received from NMED on November 15, 2021.
- "[Second Revision] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" is represented with this document, submitted by the Refinery on January 31, 2022.

Because this document was not approved during the 2021 calendar year, the Refinery followed the most current approved sampling/monitoring schedule from the NMED: "Approval with Modifications Revised Facility-Wide Ground Water Monitoring Work Plan, Gallup Refinery – Updates for 2020," HWB WRG 20-012, dated February 16, 2021. Changes proposed in this Plan [Second Revision] will be incorporated into the 2022 Plan update, as appropriate. The 2022 Plan update will be submitted by March 31, 2022.

The Refinery has created a monitoring work plan with quality assurance practices and controls as well as standard procedures for sampling, and a schedule of activities to monitor groundwater and surface water at select locations of the Refinery. The persons responsible for the implementation and oversight of this plan are:

Vice President

- Ruth Cade

Senior HSE Professional

- Kateri Luka

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List of Acronyms

%	percent
AL	aeration lagoon
AOC	area of concern
API	American Petroleum Institute
cm/s	centimeter per second
DRO	diesel range organics
EP	evaporation pond
ft	feet or foot
GAC	granular activated carbon
GPM	gallons per minute
GRO	gasoline range organics
HWB	Hazardous Waste Bureau
in	inch
in/hr	inches per hour
LDU	Leak Detection Unit
LTU	Land Treatment Unit
MKTF	Market Tank Farm
MPC	Marathon Petroleum Company
MTBE	methyl tert butyl ether
NAPIS	New American Petroleum Institute Separator
NM	New Mexico
NMED	New Mexico Environment Department
No.	number
OAPIS	Old American Petroleum Institute Separator
OW	observation well
OCD	Oil Conservation Division
ORP	oxidation-reduction potential

List of Acronyms – Continued

PVC	polyvinyl chloride
PW	process well
QC	quality control
RW	recovery well
RCRA	Resource Conservation and Recovery Act
SPH	separate phase hydrocarbon
STP	sanitary treatment pond
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WWTP	wastewater treatment plant

1.0 Introduction

This Facility-Wide Groundwater Monitoring Work Plan – Updates for 2021 (Plan) has been prepared for the implementation of the groundwater monitoring program at the Marathon Gallup Refinery (Refinery) owned and operated by Western Refining Southwest LLC. Figure 1-1 shows the regional location of the Gallup Refinery. A topographic map showing the general layout of the Refinery in comparison to the local topography is presented on Figure 1-2.

1.1 Scope of Activities

This Plan has been prepared to collect data that will be used to characterize the nature and extent of potential impacts to groundwater at the Refinery. The Plan is designed to assist in evaluating any levels of constituents that exceed compliance standards. This Plan divides the Facility into six groups for periodic monitoring, Group A through Group F.

Group A consists of the boundary wells situated along the northwest corner of the Refinery property and the monitoring wells around the land treatment unit (LTU). Group B consists of a cluster of monitoring wells and leak detection units for the New American Petroleum Institute (API) Separator (NAPIS) at the aeration basin and at the sanitary treatment pond. Group C includes the observation wells (OWs) located on the northeast section of the plant and recovery wells from which small quantities of free product have been continually removed. Group D includes the process/production wells and four OWs located on the south-southwest section of the Refinery property. Group E includes permanent monitoring wells installed to delineate a hydrocarbon plume associated with a seep discovered in 2013 west of the crude tanks (T-101 and T-102). Also included in this group is pre-existing well MKTF-45, located directly west of the truck loading terminal. Group F includes sampling locations for the evaporation ponds and for the effluent from the sanitary treatment pond. Designated wells and sample points identified are monitored on a quarterly, semi-annual, and annual basis following the procedures presented in this Plan (Figure 1-3).

The Refinery periodically reviews facility-wide monitoring data and evaluates the monitoring program presented in this Plan. Annual revisions to the Plan will be presented for agency review and approval. These revisions may include, but are not be limited to, a reduction or change in monitoring locations,

monitoring frequency, and/or target chemicals to be analyzed. The revisions proposed for 2021 are outlined in Section 5.0.

1.2 Facility Ownership and Operation

This Plan pertains to the Gallup Refinery located at Exit 39 on Interstate I-40 at Jamestown, New Mexico (NM), approximately 17 miles east of Gallup. Figure 1-1 shows the regional location of the Gallup Refinery.

Owner: Marathon Petroleum Company (Parent Corporation)
539 South Main Street
Findlay, OH 45840

Operator: Western Refining Southwest LLC (Postal Address)
Gallup Refinery
92 Giant Crossing Road
Gallup, NM

Western Refining Southwest LLC (Physical address)
Gallup Refinery
I-40, Exit 39 (17 Miles East of Gallup, NM)
Jamestown, NM 87347

The following regulatory identification and permit governs the Gallup Refinery:

- Standard Industrial Classification code 2911 (petroleum refining) and North American Industry Classification System code 32411
- Final Resource Conservation and Recovery Act Post-Closure Permit, United States Environmental Protection Agency (USEPA) ID Number NMD000333211
- NM Oil Conservation Division (OCD) Abatement Plan Number AP-111; and
- 2015 NPDES MSGP, ID #NMR053168.

The Facility status is corrective action/compliance. Quarterly, semi-annual, and annual groundwater sampling is conducted at the Facility to evaluate current groundwater conditions.

The Refinery is situated on an 810-acre irregular shaped tract of land that is 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 Prime Meridian. A small component of the property lies within the northeastern one quarter of Section 4 of Township 14 North, Range 15 West. A topographic map showing the general layout of the Refinery in comparison to the local topography is presented on Figure 1-2.

2.0 Background Information

Built in the 1950s, the Gallup Refinery is located 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 (Travel Center) refueling plaza, the Interstate 40 highway corridor, and a small cluster of residential homes located on the south side of Interstate 40 approximately 2 miles southwest of the Refinery (Jamestown). The Refinery is currently indefinitely idled.

2.1 Historical and Current Site Use

When the Refinery was operating, it primarily received crude oil via a two 6-inch (in) diameter pipelines from the Four Corners Area, which entered the Refinery property from the north. In addition, the Refinery also received natural gasoline feed stock via a 4-in diameter pipeline that came in from the west along the Interstate 40 corridor from the Western Refining Southwest LLC, Marathon Wingate Facility, which is indefinitely idled. Crude oil and other products also arrived at the Facility via railroad cars. These feed stocks were then stored in tanks until refined into products.

Historically, the Gallup Refinery was a crude oil refining and petroleum products manufacturing Facility. There were no organic chemicals, plastics, or synthetic fibers manufactured that contributed to the process flow of wastewater. The Refinery did not manufacture lubricating oils. As a result of the processing steps, the Refinery produced a wide range of petroleum products including propane, butane, unleaded gasoline, diesel, residual fuel, and commercial products of fertilizer and solid elemental sulfur.

Above ground storage tanks were used throughout the Refinery to hold and store crude oil, natural gasoline, intermediate feed stocks, finished products, chemicals, and water. The tanks remain on site and the capacity of these tanks ranges from 80,000 barrels to less than 1,000 barrels. Pumps, valves, and piping systems were used throughout the Refinery to transfer various liquids among storage tanks and processing units. A railroad spur track and a railcar loading rack were used to transfer feed stocks and products from Refinery storage tanks into and out of railcars. Several tank truck loading racks were used at the Refinery to load out finished products and received crude oil, other feed stocks, additives, and chemicals when operating.

A firefighting training Facility was used to conduct employee firefighting training. When training was conducted, wastewater from the Facility was pumped into a tank, which was then pumped out by a vacuum truck. The vacuum truck pumped the oily water into a process sewer upstream of the NAPIS.

Even though the Refinery is on an indefinite idle, the process wastewater system remains in operation. The system is a network of curbing, paving, stormwater catch basins, and underground piping used to collect wastewater from various processing areas within the Refinery. The wastewater effluent then flows into the equalization tanks and the NAPIS. Prior to Refinery idle, the skimmed slop was passed to a collection chamber where it is pumped back into the Refinery process. Currently, only remediation fluids are processed through the system. The clarified water is routed to a wastewater treatment plant (WWTP) where benzene is removed via granular activated carbon (GAC) canisters that are placed at the effluent of the dissolved gas flotation unit. WWTP operations alternate the configuration of these GAC canisters from a single setup to an in-series setup (i.e., primary and secondary canisters). To help monitor the breakthrough of these GAC canisters, several wastewater samples are taken at the effluent of the last GAC canister. Results from benzene analysis of the wastewater samples are monitored to manage the breakthrough from the GAC canisters. When benzene values exceed 0.4 parts per million, one or more of the following actions are taken: the GAC canister configuration is modified to an in-series set-up; the GAC canister is replaced with fresh carbon; and/or the GAC canister effluent is recirculated back through the WWTP. The treated water flows from the GAC canisters into pond STP-1. STP-1 consists of two bays, north and south, and each bay is equipped with five aerators per bay. Effluent from STP-1 then flows into Evaporation Pond 2 and gravitated to the rest of the ponds.

During major storm events, the wastewater is held in one of the three equalization tanks, T-35, T-27, and T-28, to handle large process and storm water flows. By holding wastewater in the tanks, flow to the NAPIS can be controlled. These tanks are also used to store wastewater if problems are encountered with the downstream equipment, i.e., NAPIS or the WWTP.

The storm water system is a network of valves, gates, berms, embankments, culverts, trenches, ditches, natural arroyos, and retention ponds that collect, convey, control, and release storm water that falls

within or passes through Refinery property. Storm water that falls within the processing areas is considered equivalent to process wastewater. Storm water is sent to tanks T-35, T-27, and T-28 when needed before it reaches the NAPIS, WWTP, STP-1, and into Evaporation Pond 2, where flow is gravitated to the rest of the ponds. Storm water discharge from the Refinery is very infrequent due to the arid, desert-like nature of the surrounding geographical areas.

No wastewater is currently discharged from the Refinery to surface waters of the state. At the evaporation ponds, wastewater is converted into vapor via solar and mechanical wind-effect evaporation via two 80 gallons per minute (GPM), electrically driven evaporation pond spraying snow machines located between ponds 4 and 5. Two additional 66 GPM evaporation pond sprayers were installed in October 2014 between ponds 3 and 4 for a total of four evaporators.

In September 2015, the Refinery submitted a Notice of Intent requesting continued coverage under the 2015 National Pollutant Discharge Elimination System Multi-Sector General Permit, which was approved on October 8, 2015 (NMR053168). The Refinery maintains a Storm Water Pollution Prevention Plan that includes best management practices for effective storm water pollution prevention. The Refinery has constructed several new berms in various areas and improved outfalls (installed barrier dams equipped with gate valves) to minimize the possibility of potentially impacted runoff leaving the Facility and also to minimize the stormwater run-on from the I-40 interchange and the Travel Center to the Facility.

2.2 Potential Receptors

Potential receptors at the Facility include those that occur from current land use and may arise from future land uses. Currently, these include on-site workers, nearby residents, wildlife, and livestock. The major route to exposure of humans would be from constituents reaching a drinking water well. Other routes could include using impacted groundwater for showering, cooking, raising crops and vegetables, fishing in surface water, or touching soils and/or plants that contacted impacted groundwater. Fluctuating groundwater elevations can smear inorganic and organic constituents into subsurface soil and rocks, and there is a possibility that plant roots could reach potentially impacted soils and bio-concentrate those constituents. This could create another route of exposure to potential receptors, such as birds and animals that eat the plants. No food crops are currently grown at the Facility.

At this time, the nearest drinking water wells are located on-site in the southwest areas of the Facility at depths of approximately 1,000 ft. These wells are identified as process or production (PW) wells and are designated as PW-2, PW-3, and PW-4 (Figure 2-1). These wells are operated by the Facility to provide process water for refinery operations and drinking water to nearby Refinery-owned houses, Refinery, and Travel Center. Currently, PW-2 is sampled every three years and PW-3 and PW-4 are sampled on a quarterly basis. The analytical results of these and the other water samples collected under this Plan are discussed in the annual facility-wide groundwater monitoring reports.

Other than the on-site wells, there are no known drinking water wells located within a 4-mile radius of the Refinery. The nearest drinking water wells that could be used by off-site residents are located to the northwest of the Refinery at a distance slightly greater than 4 miles, located within the Navajo community of Iyanbito. These wells are northwest of the South Fork of the Rio Puerco, which flows towards the southwest from immediately north of the Facility. The Cibola National Forest lies to the southeast and there are no wells or residents in this protected area.

No surface water at the Facility is used for human consumption, primary contact (such as immersion), or secondary contact (such as recreation). The man-made ponds at the Facility are routinely monitored and are a part of this Plan. Therefore, if they are in contact with shallow groundwater exhibiting elevated levels of constituents, the Plan will detect any commingling of groundwater and surface waters.

2.3 Waste Contaminant Types, Characteristics, and Possible Sources

The types of waste present at the Refinery include volatile and semi-volatile organic compounds (VOCs and SVOCs, respectively), primarily hydrocarbon constituents, but could include other industrial chemicals such as solvents, acids, spent caustic solutions, and heavy metals. These wastes could be in the form of wastewater, sludge, dry solids, or spent chemicals destined for off-site shipping and disposal packed in drums.

Most of the wastes and constituents that could possibly reach groundwater could biodegrade and naturally attenuate. However, any heavy metals present in soil or sludge could leach into groundwater

and would not biodegrade. It is possible that certain long-lived chemicals would not biodegrade, or if they did it would be at a very slow rate. Possible sources include leaks from buried pipes, tanks, surface spills, and historical dumping of wastes on-site.

All above-ground large tanks have leak detection or equivalent systems, such as radar gauges and are within containment/bermed areas to contain spills. However, while the Refinery is indefinitely idled no hydrocarbon is stored on-site. The NAPIS has double walls and a leak detection system installed.

Similarly, surface impoundments can serve as a source of possible groundwater impacts. Historically, wastewater from the railroad loading rack flowed to a settling and separation lagoon north of the rack. Wastewater flow exited at the north end, where the water was distributed across a flat open site known as the fan-out area. The free flow of liquids led to subsurface soil impacts. This area is identified as Solid Waste Management Unit (SWMU) Number (No.) 8 and has been remediated and granted Corrective Action Complete with Controls status. Disposal of wastewater into open fields is not practiced at the Refinery.

There are 14 SWMUs identified at the Refinery and one closed LTU. On December 31, 2013, the Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit ("RCRA Permit") became effective under the New Mexico Administrative Code §20.4.1.901A(10). The RCRA Permit identified an additional 20 Areas of Concern (AOCs) requiring corrective action. These units are listed below.

RCRA Regulated Units

- LTU

SWMUs

- SWMU 1 – Aeration Basin
- SWMU 2 – Evaporation Ponds
- SWMU 3 – Empty Container Storage Area
- SWMU 4 – Old Burn Pit
- SWMU 5 – Landfill Areas

- SWMU 6 – Tank Farm
- SWMU 7 – Fire Training Area
- SWMU 8 – Railroad Rack Lagoon
- SWMU 9 – Drainage Ditch and the Inactive Land farm
- SWMU 10 – Sludge Pits
- SWMU 11 – Secondary Oil Skimmer
- SWMU 12 – Contact Wastewater Collection System
- SWMU 13 – Drainage Ditch between North and South Evaporation Ponds
- SWMU 14 –API Separator

AOCs

- AOC 15 – New API Separator
- AOC 16 – New API Separator Overflow Tanks
- AOC 17 – Railroad Loading/Unloading Facility
- AOC 18 – Asphalt Tank Farm (tanks 701-709, 713, 714)
- AOC 19 – East Fuel Oil Loading Rack
- AOC 20 – Crude Slop and Ethanol Unloading Facility
- AOC 21 – Main Loading Racks
- AOC 22 – Loading Rack Additive Tank Farm
- AOC 23 – Retail Fuel Tank Farm (tanks 1-7, 912, 913, 1001, 1002)
- AOC 24 – Crude Oil Tank Farm (tanks 101 and 102)
- AOC 25 – Tank 573 (Kerosene Tank)
- AOC 26 – Process Units
- AOC 27 – Boiler and Cooling Unit Area
- AOC 28 – Warehouse and Maintenance Shop Area
- AOC 29 – Equipment Yard and Drum Storage Area
- AOC 30 – Laboratory
- AOC 31 – Tanks 27 and 28
- AOC 32 – Flare and Ancillary Tanks (tanks Z85V2, Z85V3, Z84-T105)

- AOC 33 – Storm Water Collection System
- AOC 34 – Scrap Yard
- AOC 35 – Main Truck Loading Rack, Crude Slop and Ethanol Unloading Facility, Additive Tank Farm/Loading Rack, and Retail Tank Farm (tanks 1-7, 912, 913, 1001, and 1002)

Existing groundwater monitoring wells effectively surround the LTU, SWMUs, and AOCs. The RCRA Permit was subsequently modified in September 2017, with SWMU 8 and AOCs 19 and 25 granted Corrective Action Complete status. AOC 32 was combined with SWMU 14; AOC 33 was combined with SWMU 12. AOCs 20, 21, 22, and 23 were combined to make AOC 35. The schedule in the RCRA Permit Appendix E, Table E-1 was amended to reflect prior submittals and revised due dates and deferral of other units. A new Consent Order was executed in January 2017, which resulted in 11 AOCs (AOC 16, 17, 18, 24, 26, 27, 28, 29, 30, 31, and 34) being removed from the RCRA Permit and transferred to the Consent Order for further evaluation. The Refinery received correspondence from the New Mexico Environment Department (NMED) on August 19, 2021 that will restore the 11 AOCs back to the RCRA Permit. The Permit modification was submitted by the Refinery to NMED on December 2, 2021.

2.4 Summary of Historical Impacts

Spills and leaks are known to have occurred from Facility operations and equipment. If a release occurs, immediate action is taken to address the cause and to limit impacts to the subsurface. Although the area is characterized as a semiarid climate with a low annual rainfall, there is a possibility that precipitation could leach into the subsurface.

2.4.1 Constituents of Concern

There are several categories of constituents that are observed at the Facility: general chemistry (e.g., total petroleum hydrocarbons, cations/anions), metals, VOCs, and SVOCs. In addition, separate phase hydrocarbon (SPH) has been found in multiple locations within the Refinery. In the following sections, information regarding two of the primary constituents of concern (SPH and methyl tert butyl ether [MTBE]) is presented. It should be noted that there are other constituents that have been detected above applicable screening levels.

Separate Phase Hydrocarbon

SPH has been observed in the Main Tank Farm, Hydrocarbon Seep Area, Aeration Basin, French Drain, Truck Loading Rack, and NAPIS Unit areas.

In the Main Tank Farm area, SPH was found floating on shallow groundwater in the mid-1990s. A series of recovery wells (RWs) were installed and SPH has been recovered since the initial discovery. Monitoring wells in the Main Tank Farm and the down-gradient area are RW-1, RW-2, RW-5, RW-6, OW-14, OW-30, OW-55, OW-58. In the Hydrocarbon Seep area, data regarding the liquid recovered from the sumps and retention ditch is available in the quarterly Hydrocarbon Seep Reports. In the Aeration Basin, SPH has been detected in GWM-1 since the third quarter sampling event in 2015 through December 2020. The thickness has ranged from a minimum of 0.13 ft in November 2019 to a maximum of 1.0 ft in December 2017. In the French Drain area, a mixture of hydrocarbon and water spilled in 2018. Five monitoring wells (OW-61 thru OW-65) were installed in an effort to delineate the hydrocarbon plume that had been discharging from the PVC pipe. During 2020 quarterly gauging, SPH was detected in OW-61, OW-62, and OW-65 during each event. In the Truck Loading Rack area, a gasoline release was observed in 2019. The source of the release was determined to be an underground transfer line on the north side of the Truck Loading Rack. In the NAPIS unit area, SPH was detected in NAPIS-1 from 2017 to the third quarter of 2020. SPH was not detected in NAPIS-1 during the fourth quarter of 2020. .

Methyl Tert Butyl Ether

MTBE has not been used at the Refinery since April 2006. Several monitoring wells were installed at various depths to monitor SPH and MTBE contaminant constituent plumes from historical contamination impacts. Historical analytical data for the observation wells (OWs) (OW-14, 29, and 30) indicate the MTBE concentration has slowly been increasing over the years in these wells. Based on the information collected, NMED – Hazardous Waste Bureau (HWB) requested two Work Plans to further investigate the known MTBE plume at the Facility and investigate a suspected plume north of the main tank farm (SWMU No. 6). These OWs monitored for SPH and MTBE are located downstream on the northeast section of the plant and are OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, OW-56.

2.4.2 Areas of Interest

There are several areas of the refinery with documented impacts to soil and groundwater. In the following sections, information regarding four areas with known impacts is presented.

NAPIS Unit

The NAPIS is located at the southwest end of the Facility and is used to recover and recycle oil back into the process. The NAPIS has caused some MTBE and hydrocarbon impacts in shallow groundwater through leakage and spills. The NAPIS unit was put into service in October 2004. The NAPIS has one up-gradient well, NAPIS-1, located on the east side and three down-gradient shallow monitoring wells and NAPIS-2, NAPIS-3, and KA-3 which are located along the west side. The NAPIS unit is also equipped with three leak detection units (LDU) on the east and west bays, including the oil sump section on the east bay and are designated as East LDU, West LDU, and oil sump LDU. NMED requested an investigation of the NAPIS to determine if the secondary containment was leaking. The Refinery began an initial investigation of the NAPIS and provided a response in the 2019 Annual Groundwater Monitoring Report Response to Approval with Modifications Comment 2 (Western 2021). The evaluation was performed in May and June 2021, which included pulling the East Bay out of service for an extended period.

Aeration Basin

The aeration basin (SWMU No. 1) in the Facility's RCRA Permit, includes three cells known as aeration lagoon (AL)-1, AL-2 and holding pond 1 (currently referred to as EP-1). EP-1 is not an evaporation pond and is not part of the area covered by SWMU No. 2 – Evaporation Ponds. These three cells have not been in service since the startup of the WWTP in 2012. All Refinery wastewater flow was diverted to the WWTP bypassing AL-1, AL-2, and EP-1. The Refinery experienced intermittent discharges of oil and oily water into AL-1, AL-2, and EP-1, and spills to the ground surface while the aeration basin was in operation. Most of these occurrences were the result of unit upsets and/or large storm events affecting the old API Separator (OAPIS).

Wells around the aeration basin include GWM-1, GWM-2, GWM-3, and OAPIS-1. GWM-1 and GWM-2 were installed immediately down gradient of AL-1, AL-2, and EP-1 in 2004 and 2005 to detect potential leakage from the aeration basin.

Analysis of groundwater samples collected at GWM-1 and GWM-2 have indicated several organic constituents at concentrations above the screening levels in groundwater. NMED was notified of this finding and the Refinery was instructed to collect a hydrocarbon sample for fingerprint analysis (Diesel Range Organics/Gasoline Range Organics [DRO/GRO] and Motor Oil Range Organics). The Refinery was also instructed to purge and gauge the wells on a weekly basis to check the recharge rate. The initial measurement was made without the use of an oil/interface probe and the thickness of the hydrocarbon layer in the well was not immediately known. Measured SPH thickness ranged from 0.35 to 0.45 ft in September, October, and November 2015. On December 10, 2015, the Refinery sent a response to NMED–HWB concurring that the source of the hydrocarbons observed in GWM-1 was from the adjacent AL-1 and AL-2.

MPC submitted the "Solid Waste Management Unit 1 Investigation Report" on March 31, 2020, detailing a SWMU No. 1 sampling event that took place the week of January 13, 2020. The sampling was conducted for the purposes of soil and sediment volume determination and chemical characterization for future SWMU No. 1 excavation, disposal, and closure. In the response titled, "Disapproval SWMU-1 Investigation Report," dated August 31, 2020, NMED requested a revised report and an additional work plan to further delineate horizontal and vertical extents of contamination in the area of SWMU No 1. The revised report and response to comments were submitted on January 5, 2021. The Refinery submitted a response following an approval with modifications from NMED on January 26, 2021. A work plan was requested to be submitted no later than April 30, 2021. The Refinery requested that the work plan describing the removal of AL-1, AL-2, and EP-1 would be submitted at a later date. This work plan was submitted to NMED September 24, 2021.

North Drainage Ditch

On April 22, 2015, the Refinery notified NMED-HWB of the discovery of SPH in a drainage ditch in the northern portion of the property. Surface water samples were collected from the standing water in the drainage ditch and concentrations of benzene, toluene, ethylbenzene, and xylenes were detected as well as MTBE, GRO and DRO. An investigation was conducted in May 2016 with installation of well OW-56. An additional investigation took place during July 2021. An investigation report detailing the results was submitted to NMED on December 15, 2021.

OW-14 Source Area

In correspondence dated May 11, 2015, NMED requested submittal of a work plan to investigate the source of constituents present in groundwater monitoring well OW-14. Subsequently, wells OW-57 and OW-58 were installed in 2016 pursuant to NMED's May 12, 2016 "Approval with Modifications, Revised OW-14 Source Area Investigation Work Plan" (NMED 2016). Well OW-58A was installed in 2019 adjacent to OW-58 to screen a higher interval than was screened in OW-58.

3.0 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 cattle and sheep grazing.

3.1 Current Site Topography and Location of Natural and Manmade Structures

Local topography consists of a gradually inclined down-slope from high ground in the southeast to a lowland fluvial plain in the northwest. The highest point on Refinery property is located at the southeast corner boundary (elevation approximately 7,040 ft) and the lowest point is located at the northwest corner boundary (elevation approximately 6,860 ft). The Refinery is located on a flat man-made terrace at an elevation of approximately 6,950 ft.

3.2 Drainages

Surface water in the region consists of the man-made evaporation ponds and the aeration basin located within the Refinery, a livestock watering pond (Jon Myer's Pond) located east of the Refinery, two small unnamed spring fed ponds located south of the Refinery, and the South Fork of the Rio Puerco and its tributary arroyos. The various ponds and catch basins typically contain water throughout the year. The South Fork of the Rio Puerco and its tributaries are intermittent and generally contain water only during and immediately after precipitation.

There are several storm water conveyance ditches located throughout the Refinery. These ditches are directed to discharge into contained catch basins where storm water is collected and recycled for use as process water, collected and allowed to evaporate, diverted around regulated industrial activity, or discharged into two designated outfalls located on the east and west section of the property, identified as Outfall 001 and Outfall 002 (Figure 3-1). Outfall 001 is located directly south of evaporation pond 8 on the western edge of the Refinery's property boundary and equipped with four separate small diameter overflow pipelines, each with a manual flow valve for independent control. Outfall 002 is located north of the railroad loading rack on the eastern section of the Facility. This outfall consists of a concrete barrier

with a valve to control discharges from a deep ditch that collects/ponds the runoff from the rail rack loading area.

Directly west of the crude tank area, there is a concrete barrier with a control valve that discharges from a culvert that carries storm water flow from the Truck Loading Rack area. This concrete barrier is located downstream of the "hydrocarbon seep area." The flow from this concrete barrier continues in a north-northwest direction alongside the southern bermed areas of evaporation ponds 3, 4, 5, and 6 and outward towards the Outfall 001 area. At the new WWTP, there are three storm drains located on the south, southwest, and west side of the WWTP. These drains are connected to an underground storm culvert that exits on the northwest section of STP-1 into a conveyance ditch along the northern edge of pond 2 and into a holding pond equipped with manual flow valves, located north of evaporation pond 3. The discharge from this holding pond then flows north-northwest towards the Outfall 001 area.

3.3 Vegetation Types

Surface vegetation consists of native xerophytic vegetation, including grasses, shrubs, small junipers, and prickly pear cacti. Average rainfall at the Refinery is less than 7-in per year, although it can vary to slightly higher levels elsewhere in the county depending on elevation.

In alluvial fans on valley sides and drainage ways, the existing vegetation is alkali sacaton, western wheatgrass, Indian rice grass, blue grama, bottlebrush squirreltail, broom snakeweed, fourwing saltbush, threeawn, winterfat, mat muhly, and spike muhly. On fan remnants on valley sides, blue grama, western wheatgrass, Indian ricegrass, big sagebrush, galleta, bottlebrush squirreltail, fourwing saltbrush, needle and thread, one seed juniper, sand dropseed, spineless horsebrush, rabbitbrush, and two-needle pinyon are found. Cattails have been observed in isolated areas and are generally associated with wetlands.

3.4 Erosion Features

The impacts of historic overgrazing are visible at the north-side of the Facility. Arroyos have formed when surface run-off eroded sediments that were not able to hold water due to ground cover loss by overgrazing. Now that the Facility is fenced and no livestock grazing occurs on the site, vegetation has

recovered in these areas. The formation and deepening of erosional features on its land has decreased with Refinery effort to recover vegetation in undeveloped areas.

3.5 Subsurface Conditions

The following subsections discuss the subsurface conditions found at the Refinery.

3.5.1 Soil Types and Associations

Most of the soils found at the surface of on-site wells consist of the Gish-Mentmore complex (USDA 2021). These soils occur in alluvial fans and fan remnants. The parent material for these soils is derived from sandstone and shale. The soils are well drained with moderately slow (0.2 inches per hour [in/hr]) to slow permeability (0.06 in/hr). In the Gish-Mentomore complex, the Gish and similar soils make up about 45 percent (%), the Mentmore and similar soils 35%, and minor components 20%. These minor components include Berryhill and similar soils at 10% and Anodize and similar soils at 10%. The typical profile for these soils is 0- to 2-in fine sandy loam and 2- to 72-in of various clay loam.

Drill logs for various wells have been provided electronically to the NMED-HWB. From the well logs, the soils in the subsurface are generally composed of clays starting at the immediate subsurface, interbedded with narrow sand and silt layers. At about 100 to 150 ft, layers of mudstone, sandstone (from the Chinle Group, Petrified Forest Formation), and siltstone start to appear. Figure 3-2 shows a generalized relationship of soils in and around the Refinery.

3.5.2 Stratigraphy

The 810-acre Refinery property is located on a layered geologic formation. Surface soils consist of fluvial and alluvial deposits, primarily clay and silt with minor inter-bedded sand layers. Below this is the Chinle Group, which consists of low permeability clay stones and siltstones. The Chinle Group (Petrified Forest Formation) effectively serves as an aquiclude. Inter-bedded within the Chinle Group is the Sonsela Sandstone bed, which represents the uppermost potential aquifer in the region.

The Sonsela Sandstone bed lies within and parallels the dip of the Chinle Group. Its high point is located southeast of the Refinery and slopes downward to the northwest as it passes under the Refinery. Due to

the confinement of the Petrified Forest Formation aquitard, the Sonsela Sandstone bed acts as a water-bearing reservoir and is artesian at its lower extremis. Artesian conditions exist through much of the central and western portions of the Refinery.

3.5.3 Presence and Flow Direction of Groundwater

Groundwater flow within the Petrified Forest Formation is extremely slow and typically averages less than 10^{-10} centimeters per second (cm/s) or less than 0.01 ft per year. Groundwater flow within the surface soil layer above the Petrified Forest Formation is highly variable due to the presence of complex and irregular stratigraphy, including sand stringers, cobble beds, and dense clay layers. Hydraulic conductivity may range from less than 10^{-2} cm/s in the gravelly sands immediately overlying the Petrified Forest Formation down to 10^{-8} cm/s in the clay soil layers located near the surface.

Shallow groundwater located under the Refinery generally flows along the upper contact of the Petrified Forest Formation. The prevailing flow direction is from the southeast and toward the northwest.

4.0 Monitoring and Sampling Program

The primary objective of groundwater monitoring is to provide data to assess groundwater quality at and near the Facility. Groundwater elevation data will be collected to evaluate groundwater flow conditions. The groundwater monitoring program for the Facility will consist of sample collection and analysis from a series of monitoring wells, recovery wells, outfalls, and evaporation pond locations.

Appendix A presents the procedures used for sample collection and analysis and includes the following activities:

- Well gauging (i.e., depth to groundwater and SPH, if present, and depth to the bottom of the well)
- Well purging and sampling methods, including equipment, groundwater stabilization criteria, and collection of field quality parameters
- Sample handling and waste management procedures
- Field and laboratory quality assurance procedures

The monitoring network is divided into six investigation areas (Groups A, B, C, D, E, and F). The sampling frequency, analyses, and target analytes will vary for each investigation area. The combined data from these investigation areas will be used to assess groundwater quality beneath and immediately down-gradient of the Facility and evaluate local groundwater flow conditions. Section 5 outlines the sampling locations and analyte list for 2021.

Groundwater samples will not be collected from monitoring wells that have measurable SPH. Prior to sampling, recovery system operation will be halted to allow the groundwater to equilibrate. If SPH recovery system wells (OW-13, OW-14, OW-29, OW-30, RW-1, RW-2, RW-5, and RW-6) do not have measurable SPH, the recovery system will be removed from the well and the well sampled. For wells that are purged dry, samples will be collected if recharge volume is sufficient for sample collection within 24 hours. Wells not sampled due to insufficient recharge will be documented in the field log. If samples cannot be collected from a location due to environmental concerns, such as elevated hydrogen sulfide, arrangements will be made to collect samples from the affected location(s) at a different time.

5.0 Monitoring Program Revisions

The proposed modifications to the Plan for 2021 and the rationale are presented in Tables 5-1 through 5-5 and discussed in the following sections.

A timeline of the Plan is provided below:

- "Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on March 31, 2021.
- "Disapproval" was received from the New Mexico Environment Department (NMED) on May 25, 2021.
- "[Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on September 30, 2021.
- "Second Disapproval" was received from NMED on November 15, 2021.
- "[Second Revision] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" is represented with this document, submitted by the Refinery on January 31, 2022.

Because this document was not approved during the 2021 calendar year, the Refinery followed the most current approved sampling/monitoring schedule from the NMED: "Approval with Modifications Revised Facility-Wide Ground Water Monitoring Work Plan, Gallup Refinery – Updates for 2020," HWB WRG 20-012, dated February 16, 2021. Changes proposed in this Plan [Second Revision] will be incorporated into the 2022 Plan update, as appropriate. The 2022 Plan update will be submitted by March 31, 2022.

5.1 Modifications in Monitoring Locations

The proposed monitoring locations are presented in Table 5-1. One sample location, Boiler Water Inlet to EP-9, has been removed because the Boiler is no longer in service.

Ten new monitoring wells were installed and added to the network in 2021 as shown on Figure 5-1. Four wells proposed for installation were not installed due to dry conditions in the borehole and off-site access. Descriptions of these 14 wells and the installation objectives are provided below.

Wells that were installed include:

- Well OW-66 was installed approximately halfway the distance between OW-29 and OW-13 to evaluate the potential migration of MTBE within the Sonsela aquifer (NMED 2018, Comment 18.3).
- Wells OW-67 and OW-68 were installed north of EP-2 to evaluate the source of elevated chloride and sulfate concentrations detected in well SMW-2 (NMED 2019a).
- Well OW-70 was installed between MKTF-32 and MKTF-33 and downgradient of the borrow pit seep area to serve as a sentinel well for SPH potentially migrating beyond the recovery sumps (NMED 2020, Comment 1).
- In addition, six wells were plugged and abandoned following NM state guidelines (New Mexico Administrative Code 19.24.4) and replaced because the well screens have been historically submerged (NMED 2018, Comment 40; NMED 2019b, Comment 4). Wells MKTF-01R, MKTF-02R, MKTF-04R, MKTF-17R, MKTF-18R, and RW-2R were installed adjacent to the original well locations.

Wells that were proposed but not installed include:

- Well OW-13A was proposed to be installed near OW-13 to address concerns that OW-13 may be a migration pathway for constituents (e.g., MTBE) to move vertically downward to the Sonsela aquifer (NMED 2018, Comments 18.4 and 39). Water was not observed in the boring and the well was not installed. However, soil samples were collected. Given that water was not observed in the shallow zone, it is not expected that there would be any downward migration of contaminants into the Sonsela. Well OW-13 will continue to be sampled.
- Well OW-69 was proposed to be installed between well GWM-1 and EP-2 to evaluate the extent of SPH in the shallow aquifer and to serve as a sentinel well for the eastern perimeter of EP-2 (NMED 2019a). Water was not observed in the boring and the well was not installed. However, soil samples were collected.
- Two proposed wells will be located off site. To delineate the down-gradient extent of the plume detected at OW-1, a new Sonsela well will be installed approximately 100 ft down-gradient of OW-1 to the west (NMED 2018, Comment 22). A new Chinle-Alluvial well will be located approximately 500 ft down-gradient of OW-30 to evaluate MTBE to the northeast of the Refinery

(NMED 2018, Comment 18.2). Property access was not granted by the adjacent landowners prior to the field activities. These wells will be installed after access is obtained.

The new monitoring wells installed in 2021 have not been included in Table 5-1. MPC will submit a separate well completion report by October 13, 2021 documenting the final well completion detailing the ten new monitoring wells and two dry borings, the proposed sampling schedule, and the proposed analytical suites.

5.2 Modifications in Monitoring Frequency

The current monitoring frequency has been evaluated for the 2021 sampling events. The changes made to the monitoring frequency are presented in Table 5-2. In summary, sampling frequency for wells BW-4A, BW-4B, BW-5A, and PW-4 is proposed to be reduced from quarterly to annual sampling because concentrations have remained consistent since 2016.

5.3 Modifications in Target Analytes

The target analytes have been evaluated for the 2021 analyte list. Table 5-3 shows the 2020 analyte list. Table 5-4 presents the proposed changes to the target analyte list. The final analyte list for 2021 is in Table 5-5.

The list was evaluated for analyte modifications by well sets within each of the Refinery groups (A, B, C, D, E, and F). The modification criteria were based on several factors:

- Total and dissolved uranium were removed from all wells per NMED's "Disapproval Facility-Wide Annual Groundwater Report – 2019," (NMED 2020, Comment 21).
- PFAS was added to OW-63 per NMED's "Disapproval Facility-Wide Annual Groundwater Report - 2019," (NMED 2020, Comment 30).
- Pesticides were removed from EP-3, EP-12A, and EP-12B per NMED's "Disapproval Facility-Wide Annual Groundwater Report – 2019," (NMED 2020, Comment 26).
- 1,2-Dibromomethane and 1,4-dioxane was added to OW-11 per NMED's "Disapproval Facility-Wide Annual Groundwater Report -2019," (NMED 2020, Comment 22).
- 1,4-dioxane was added to MW-1, SWM-4, GWM-1, West LDU, OW-50, OW-52, OW-13, OW-14, OW-29, OW-30, PW-2, OW-1, OW-10, OW-11, MKTF-01, MKTF-03, MKTF-05 through MKTF-08,

MKTF-12 through MKTF-17, MKTF-19 through MKTF23, MKTF-26, MKTF-33, MKTF-36, MKTF-37, MKTF-45 for two consecutive sampling events per NMED's "Disapproval Facility Wide Groundwater Monitoring Plan – Updates for 2019," (NMED 2019c, Comment 22).

- Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene are typically classified as SVOCs due to their vapor pressure (VP), which are less than the VOC cut off of 0.1 millimeter-mercury (mmHg) (Jia and Batterman 2010). Naphthalene has a VP of 0.087 mmHg, 1-methylnaphthalene has a VP of 0.054 mmHg, and 2-methylnaphthalene has a VP of 0.068 mmHg (ATSDR 2021). Therefore, these constituents will be included as SVOC in the sitewide analyte list.

6.0 References

Agency for Toxic Substances and Disease Registry (ATSDR). 2021. Chemical and Physical Information for Naphthalene, 1-Methylnapthalene, and 2-Methylnaphthalene. September 14. Available from: https://www.atsdr.cdc.gov/toxprofiles/tp67-c4.pdf.

Jia, Chunrong and Batterman, Stuart. 2010. A Critical Review of Naphthalene Sources and Exposures Relevant to Indoor and Outdoor Air, International Journal of Environmental Research and Public Health, ISSN 1660-4601. July 20. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2922736/.

New Mexico Environment Department (NMED). 2016. Approval with Modifications, Revised OW-14 Source Area Investigation Work Plan, OW Series Wells and Contaminant Plume Migration. May 12.

NMED. 2018. Disapproval, Annual Groundwater Monitoring Report, Gallup Refinery – 2015. January 31.

NMED. 2019a. Disapproval, Investigation Work Plan (SMW-2) and (GWM-1) Areas. February 20.

NMED. 2019b. Disapproval, Work Plan 2015 Annual Groundwater Report Comments, Western Refining Southwest, Inc., Gallup Refinery. January 28.

NMED. 2019c. Disapproval Facility Wide Groundwater Monitoring Plan – Update for 2019. July 12.

NMED. 2020. Disapproval Facility-Wide Annual Groundwater Report – 2019. November 23.

United States Department of Agriculture (USDA). 2021. Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties. March 15. Available from: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/new_mexico/NM692/0/McKinley.Area%20NM.pdf.

Western Refining (Western). 2021. Approval with Modifications, Annual Groundwater Monitoring Report, Gallup Refinery – 2019. Western Refining Southwest LLC, Marathon Gallup Refinery, Gallup, New Mexico, EPA ID #NMD000333211. HWB-WRG-20-013. July 31.

TABLES

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
GROUP A		
BW-1A	Sample	NC
BW-1B	Sample	NC
BW-1C	Sample	NC
BW-2A	Sample	NC
BW-2B	Sample	NC
BW-2C	Sample	NC
BW-3A	Sample	NC
BW-3B	Sample	NC
BW-3C	Sample	NC
BW-4A	Sample	NC
BW-4B	Sample	NC
BW-5A	Sample	NC
BW-5B	Sample	NC
BW-5C	Sample	NC
MW-1	Sample	NC
MW-2	Sample	NC
MW-4	Sample	NC
MW-5	Sample	NC
SMW-2	Sample	NC
SMW-4	Sample	NC
GROUP B		
GWM-1	Sample	NC
GWM-2	Sample	NC
GWM-3	Sample	NC
NAPIS-1	Sample	NC
NAPIS-2	Sample	NC
NAPIS-3	Sample	NC
KA-3	Sample	NC
OAPIS-1	Sample	NC
STP1-NW	Sample	NC
STP1-SW	Sample	NC
OW-59	Sample	NC
OW-60	Sample	NC
OW-62	Sample	NC
East LDU	Sample	NC
West LDU	Sample	NC
Oil Sump LDU	Sample	NC

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
GROUP C		
OW-13	Sample if no measurable SPH is detected	Recovery system installed
OW-14	Sample if no measurable SPH is detected	Recovery system installed
OW-29	Sample if no measurable SPH is detected	Recovery system installed
OW-30	Sample if no measurable SPH is detected	Recovery system installed
OW-50	Sample	NC
OW-52	Sample	NC
OW-53	Sample	NC
OW-54	Sample	NC
OW-55	Sample	NC
OW-56	Sample	NC
OW-57	Sample	NC
OW-58	Sample	NC
OW-58A	Sample	NC
OW-61	Sample	NC
OW-63	Sample	NC
OW-64	Sample	NC
OW-65	Sample	NC
RW-1	Sample if no measurable SPH is detected	Recovery system installed
RW-2	Sample if no measurable SPH is detected	Recovery system installed
RW-5	Sample if no measurable SPH is detected	Recovery system installed
RW-6	Sample if no measurable SPH is detected	Recovery system installed
GROUP D		
PW-2	NS	Sampled on 3-year intervals; next event is 2023
PW-3	Sample	NC
PW-4	Sample	NC
OW-1	Sample	NC
OW-10	Sample	NC
OW-11	Sample	NC
OW-12	Sample	NC

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
GROUP E		
MKTF-01	Sample	NC
MKTF-02	Sample	NC
MKTF-03	Sample	NC
MKTF-04	Sample	NC
MKTF-05	Sample	NC
MKTF-06	Sample	NC
MKTF-07	Sample	NC
MKTF-08	Sample	NC
MKTF-09	Sample	NC
MKTF-10	Sample	NC
MKTF-11	Sample	NC
MKTF-12	Sample	NC
MKTF-13	Sample	NC
MKTF-14	Sample	NC
MKTF-15	Sample	NC
MKTF-16	Sample	NC
MKTF-17	Sample	NC
MKTF-18	Sample	NC
MKTF-19	Sample	NC
MKTF-20	Sample	NC
MKTF-21	Sample	NC
MKTF-22	Sample	NC
MKTF-23	Sample	NC
MKTF-24	Sample	NC
MKTF-25	Sample	NC
MKTF-26	Sample	NC
MKTF-27	Sample	NC
MKTF-28	Sample	NC
MKTF-29	Sample	NC
MKTF-30	Sample	NC
MKTF-31	Sample	NC
MKTF-32	Sample	NC
MKTF-33	Sample	NC
MKTF-34	Sample	NC
MKTF-35	Sample	NC
MKTF-36	Sample	NC
MKTF-37	Sample	NC
MKTF-38	Sample	NC

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
MKTF-39	Sample	NC
MKTF-40	Sample	NC
MKTF-41	Sample	NC
MKTF-42	Sample	NC
MKTF-43	Sample	NC
MKTF-44	Sample	NC
MKTF-45	Sample	NC
MKTF-46	Sample	NC
MKTF-47	Sample	NC
MKTF-48	Sample	NC
MKTF-49	Sample	NC
MKTF-50	Sample	NC
GROUP F		
EP-2	Sample	NC
EP-3	Sample	NC
EP-4	Sample	NC
EP-5	Sample	NC
EP-6	Sample	NC
EP-7	Sample	NC
EP-8	Sample	NC
EP-9	Sample	NC
EP-11	Sample	NC
EP-12A	Sample	NC
EP-12B	Sample	NC
STP-1 to EP-2	Sample	NC
Boiler Water Inlet to EP-9	Remove from List	Boiler no longer in service

Notes:
NC - No change
NS - Not sampled

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
GROUP A		
BW-1A	Annual	NC
BW-1B	Annual	NC
BW-1C	Annual	NC
BW-2A	Annual	NC
BW-2B	Annual	NC
BW-2C	Annual	NC
BW-3A	Annual	NC
BW-3B	Annual	NC
BW-3C	Annual	NC
BW-4A	Quarterly	Annual; constituents have remained consistent since 2018
BW-4B	Quarterly	Annual; constituents have remained consistent since 2018
BW-5A	Quarterly	Annual; constituents have remained consistent since 2018
BW-5B	Quarterly	NC
BW-5C	Quarterly	NC
MW-1	Annual	NC
MW-2	Annual	NC
MW-4	Annual	NC
MW-5	Annual	NC
SMW-2	Annual	NC
SMW-4	Annual	NC
GROUP B		
GWM-1	Quarterly	NC
GWM-2	Quarterly	NC
GWM-3	Quarterly	NC
NAPIS-1	Quarterly	NC
NAPIS-2	Quarterly	NC
NAPIS-3	Quarterly	NC
KA-3	Quarterly	NC
OAPIS-1	Quarterly	NC
STP1-NW	Quarterly	NC
STP1-SW	Quarterly	NC
OW-59	Quarterly	NC
OW-60	Quarterly	NC
OW-62	Quarterly	NC
East LDU	Quarterly	NC
West LDU	Quarterly	NC
Oil Sump LDU	Quarterly	NC

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
GROUP C		
OW-13	Quarterly	Sample if no measurable SPH is detected
OW-14	Quarterly	Sample if no measurable SPH is detected
OW-29	Quarterly	Sample if no measurable SPH is detected
OW-30	Quarterly	Sample if no measurable SPH is detected
OW-50	Quarterly	NC
OW-52	Quarterly	NC
OW-53	Quarterly	NC
OW-54	Quarterly	NC
OW-55	Quarterly	NC
OW-56	Quarterly	NC
OW-57	Quarterly	NC
OW-58	Quarterly	NC
OW-58A	Quarterly	NC
OW-61	Quarterly	NC
OW-63	Quarterly	NC
OW-64	Quarterly	NC
OW-65	Quarterly	NC
RW-1	Quarterly	Sample if no measurable SPH is detected
RW-2	Quarterly	Sample if no measurable SPH is detected
RW-5	Quarterly	Sample if no measurable SPH is detected
RW-6	Quarterly	Sample if no measurable SPH is detected
GROUP D		
PW-2	NS[1]	Every 3 Years
PW-3	Quarterly	NC
PW-4	Quarterly	Annual; constituents have remained consistent since 2016
OW-1	Quarterly	NC
OW-10	Quarterly	NC
OW-11	Annual	NC
OW-12	Annual	NC

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
GROUP E		
MKTF-01	Quarterly	NC
MKTF-02	Quarterly	NC
MKTF-03	Quarterly	NC
MKTF-04	Quarterly	NC
MKTF-05	Quarterly	NC
MKTF-06	Quarterly	NC
MKTF-07	Quarterly	NC
MKTF-08	Quarterly	NC
MKTF-09	Quarterly	NC
MKTF-10	Quarterly	NC
MKTF-11	Quarterly	NC
MKTF-12	Quarterly	NC
MKTF-13	Quarterly	NC
MKTF-14	Quarterly	NC
MKTF-15	Quarterly	NC
MKTF-16	Quarterly	NC
MKTF-17	Quarterly	NC
MKTF-18	Quarterly	NC
MKTF-19	Quarterly	NC
MKTF-20	Quarterly	NC
MKTF-21	Quarterly	NC
MKTF-22	Quarterly	NC
MKTF-23	Quarterly	NC
MKTF-24	Quarterly	NC
MKTF-25	Quarterly	NC
MKTF-26	Quarterly	NC
MKTF-27	Quarterly	NC
MKTF-28	Quarterly	NC
MKTF-29	Quarterly	NC
MKTF-30	Quarterly	NC
MKTF-31	Quarterly	NC
MKTF-32	Quarterly	NC
MKTF-33	Quarterly	NC
MKTF-34	Quarterly	NC
MKTF-35	Quarterly	NC
MKTF-36	Quarterly	NC
MKTF-37	Quarterly	NC
MKTF-38	Quarterly	NC

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
MKTF-39	Quarterly	NC
MKTF-40	Quarterly	NC
MKTF-41	Quarterly	NC
MKTF-42	Quarterly	NC
MKTF-43	Quarterly	NC
MKTF-44	Quarterly	NC
MKTF-45	Quarterly	NC
MKTF-46	Quarterly	NC
MKTF-47	Quarterly	NC
MKTF-48	Quarterly	NC
MKTF-49	Quarterly	NC
MKTF-50	Quarterly	NC
GROUP F		
EP-2	Semiannual	NC
EP-3	Semiannual	NC
EP-4	Semiannual	NC
EP-5	Semiannual	NC
EP-6	Semiannual	NC
EP-7	Semiannual	NC
EP-8	Semiannual	NC
EP-9	Semiannual	NC
EP-11	Semiannual	NC
EP-12A	Semiannual	NC
EP-12B	Semiannual	NC
STP-1 to EP-2	Quarterly	NC
Boiler Water Inlet to EP-9	Semiannual	Removed from list; Boiler no longer in service

NC - No change
NS - Not sampled

[1] Not sampled; next event is 2023.

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP A	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissolved Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
BW-1A	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, EDC, 1,1-DCA, EDB, Carbon disulfide	Benzoic Acid, BEHP, Di-n-octyl phthalate	NA
BW-1B								
BW-1C								
BW-2A								
BW-2B								
BW-2C								
BW-3A								
BW-3B								
BW-3C								
BW-4A								
BW-4B								
BW-5A								
BW-5B								
BW-5C								X
MW-1	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cr, Fe, Pb, Mn, Se, Ag, Hg, U, Zn, CN-	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, Methylene Chloride	Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Pyrene	NA
MW-2								
MW-4								
MW-5								
SMW-2	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Co, Cu, Fe, Hg, Pb, Mn, Ni, Se, U, V, Zn, CN-	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone	Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Phenol, Pyrene	NA
SMW-4								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissolved Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
GWM-1	BTEX, MTBE	Ca (Dis), Mg (Dis), K (Dis), Na (Dis) F, Cl, Br, NO-2, NO-3	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, EDC, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene	Benz(a)anthracene, BAP, Benzo(g,h,i)perylene, Chrysene, 2,4-Dimethylphenol, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Pyrene	NA
GWM-2								
GWM-3								
NAPIS-1	BTEX, MTBE	Fl, Cl, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromodichloromethane, cis-1,2-DCE, 4-Chlorotoluene, 1,1-DCA, 1,1-DCE, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene	Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, BEHP, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol	NA
NAPIS-2								X
NAPIS-3								X
KA-3								X
OAPIS-1	BTEX, MTBE	Fl, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, CN-, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	Acenaphthene, Anthracene, Benzoic Acid, BEHP, Di-n-octylphthalate, Dimethylphthalate, 2,4-Dimethylphenol, Fluorene, 1-MN, Naphthalene, Phenanthrene, Phenol	X

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissolved Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
STP1-NW	BTEX, MTBE	Fl, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Se, Ag, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, Isopropyl-benzene, n-Butylbenzene, n-Propyl-benzene, Sec-butylbenzene, 1,2,4-Trimethyl-benzene, 1,3,5-Trimethyl-benzene	Benzoic Acid, BEHP, Naphthalene, 1-MN, 2-MN, Phenol	NA
STP1-SW[1]								
OW-59								
OW-60								
OW-62								
East LDU	BTEX, MTBE	NA	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, Carbon Disulfide, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Tert-Butylbenzene, TCE	NA	NA
West LDU								
Oil Sump LDU								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP C	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissolved Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
OW-13	BTEX, MTBE	F, Cl, Br, NO-2 + NO-3 as N, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-Butanone, Chloroethane, 1,1-DCA, Isopropylbenzene, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	NA	NA
OW-14								
OW-29								
OW-30								
OW-50	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, EDC, EDB, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloroethane, 1,1-Dichloroethane, Isopropyl benzene, 4-Isopropyltoluene, Methylene Chloride, n-Butyl benzene, n-Propyl benzene, sec-butylbenzene, tert-butylbenzene	Acenaphthene, Benzoic Acid, BEHP, Carbazole, Di-n-octylphalate, dimethylphthalate, 2-4-Dimethylphenol, Flourene, Flouranthene, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methyphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, Dibenzofuran	NA
OW-52								
OW-53								
OW-54								X
OW-55								X
OW-56								X
OW-57								NA
OW-58								
OW-58A								
OW-61								
OW-63								
OW-64								
OW-65								
RW-1	BTEX, MTBE	Ca (Dis), Mg (Dis), K (Dis), Na (Dis) F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-butylbenzene, Styrene, tert-butylbenzene	Aniline, Benzoic Acid, Benzyl Alcohol, 2,4-Dimethyl phenol, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol, Pyridine	NA
RW-2								
RW-5								
RW-6								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP D	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissolved Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
PW-2	BTEX, MTBE	NO-2	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn, CN-	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, n-Propyl benzene, PCE	Benzoic acid, BEHP, Di-n-octylphthalate, Diethyl phthalate, Dimethyl phthalate, 2,4-Dimethyl phenol, 2-Methylphenol, 3,4-Methylphenol, Phenanthrene, Phenol, Naphthalene, 1-MN, 2-MN	NA
PW-3								
PW-4								
OW-1	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, EDC, EDB, Acetone, cis-1,2-DCE, 1,1-Dichloroethane, 1,1-Dichloroethene, Methylene Chloride	Benzoic acid	NA
OW-10								
OW-11	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	As, Ba, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, 1,2,4-Trimethylbenzene, EDC	BEHP	NA
OW-12								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP E	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissolved Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
MKTF-01[2]	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromomethane, 2-Butanone, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-DCE, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-DCA, 1,1-DCE, 1,2-Dichloropropane, 2-Hexanone, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-pentanone, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Styrene, tert-Butylbenzene, PCE, TCE, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Vinyl Chloride	Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, Benzyl Alcohol, BEHP, Butylbenzylphthalate, Carbazole, Chryzene, Di-n-octylphthalate, Dibenzofuran, 1,4-Dichloro benzene, Diethyl phthalate, Dimethylphthalate, 2,4-Dimethyl phenol, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Pentachlorophenol, Phenanthrene, Phenol, Pyrene, Pyridine, 1,4,6-Trichlorophenol	NA
MKTF-02								X
MKTF-03[2]								NA
MKTF-04								X
MKTF-05[2]								NA
MKTF-06[2]								
MKTF-07[2]								
MKTF-08[2]								
MKTF-09								X
MKTF-10								NA
MKTF-11								X
MKTF-12[2]								NA
MKTF-13								X
MKTF-14[2]								NA
MKTF-15								
MKTF-16								X
MKTF-17								X
MKTF-18								X
MKTF-19								X
MKTF-20								X
MKTF-21								X
MKTF-22								X
MKTF-23								NA
MKTF-24								X
MKTF-25								X
MKTF-26[2]								NA
MKTF-27								X
MKTF-28								X
MKTF-29								X
MKTF-30								X
MKTF-31								X
MKTF-32								X
MKTF-33								X
MKTF-34								X
MKTF-35								X
MKTF-36								NA
MKTF-37								
MKTF-38								X
MKTF-39								X
MKTF-40								X
MKTF-41								X
MKTF-42								X
MKTF-43								X
MKTF-44								X
MKTF-45[2]								NA
MKTF-46								X
MKTF-47								X
MKTF-48								X
MKTF-49								X
MKTF-50								X

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP F	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissolved Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)	Pesticides (8011)	Misc Tests
EP-2	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, SO4	NA	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ag, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Chloroform, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, 4-Methylene-2-pentanone, Methylene Chloride	Aniline, Benzoic Acid, Benzyl alcohol, BEHP, Carbazole, Chrysene, Di-n-octylphthalate, Dimethylphthalate, 2.4-Dimethylphenol, Fluoranthene, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, 2-Nitrophenol, Phenanthrene, Phenol, Pyrene, Pyridine, Benzo(a)pyrene, Benzo(b) fluoranthene, Benzo(g,h,i) perylene, Indeno(1,2,3-cd) pyrene, Diethylphthalate, 4-Nitrophenol	NA	**EP-3, EP-12A, EP-12B only:** 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, alpha-BHC, beta-BHC, Chlordane, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, gamma-BHC, Heptachlor, Heptaclor expoxide, Methyoxychlor, Toxaphene	BOD (M5210B), COD (H8000), E. Coli (3014), Total Coliform (9223B)
EP-3										
EP-4										
EP-5										
EP-6										
EP-7										
EP-8										
EP-9										
EP-11										
EP-12A										
EP-12B										
STP-1 to EP-2	BTEX, MTBE	TDS (2540C), TSS (2540D)	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Methylene Chloride	NA	NA	NA	BOD, COD
Boiler Water Inlet to EP-9	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
[1] Not sampled; has required supplied air due to elevated H2S levels.
[2] Not sampled for VOC/SVOC

1,1-DCA - 1,1-Dichloroethane
1,1-DCE - 1,1-Dichloroethene
1-MN - 1-Methyl Naphthalene
2-MN - 2-Methyl Naphthalene
Ag - Silver
As - Arsenic
Ba - Barium
BAP - Benzo(a)Pyrene
BEHP - Bis(2-ethylhexyl) Phthalate
BOD - Biological Oxygen Demand
Br - Bromide
BTEX - Benzene, Ethyl Benzene, Toluene, Total Xylenes
Ca - Calcium
Cd - Cadmium
cis-1,2-DCE - cis-1,2-Dichloroethene
Cl - Chloride
CN- - Cyanide
COD - Chemical Oxygen Demand
Cr - Chromium
Cu - Copper
DRO - Diesel Range Organics
EDB - 1,2-Dibromomethane
EDC - 1,2-Dichloroethane
F - Fluoride
Fe - Iron
GRO - Gasoline Range Organics
Hg - Mercury
K - Potassium
Mg - Magnesium
Mn - Manganese
MRO - Motor Oil Range Organics
MTBE - Methyl tert-Butyl Ether
NA - Not analyzed
Na - Sodium
Ni - Nickel
NO-2 - Nitrite
NO-2 + NO-3, as N - Nitrite + Nitrate as Nitrogen
NO-3 - Nitrate
NS - Not sampled
P - Phosphorus
Pb - Lead
PCE - Tetrachloroethene
Se - Selenium
SO4 - Sulfate
SVOC - Semivolatile Organic Compound
TCE - Trichloroethene
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
U - Uranium
VOC - Volatile Organic Compound
Zn - Zinc

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
	GROUP A	
BW-1A BW-1B BW-1C BW-2A BW-2B BW-2C BW-3B BW-3C BW-4A BW-4B BW-5A BW-5B	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO2, NO3, P, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, 1,1-DCA, EDB, Carbon disulfide	No change
	SVOC: Benzoic Acid, BEHP, Di-n-octyl phthalate	No change
	1,4-dioxane (BW-5C)	No change
MW-1 MW-2 MW-4 MW-5	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO-2, NO-3, P, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cr, Fe, Pb, Mn, Se, CN-, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, Methylene Chloride	No change
	SVOC: Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Pyrene	**Add 1,4-dioxane to MW-1 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
SMW-2 SWM-4	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, CN-, Hg, U, V, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone	No change
	SVOC: Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Phenol, Pyrene	**Add 1,4-dioxane SWM-4 per NMED Disapproval Annual GW Report - 2019 Comment 52 (11/23/20).**
	GROUP B	
GWM-1 GWM-2 GWM-3	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO-2, NO-3	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Ca, Cd, Cr, Cu, Fe, Pb, Mg, Mn, K, Na, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: Benz(a)anthracene, BAP, Benzo(g,h,i)perylene, Chrysene, 2,4-Dimethylphenol, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Pyrene	**Add 1,4-dioxane to Well GMW-1 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
NAPIS-1 NAPIS-2 NAPIS-3 KA-3	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, P, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Cr, Cu, Fe, Pb, Mn, K, NA, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromodichloromethane, cis-1,2-DCE, 4-Chlorotoluene, 1,1-DCA, 1,1-DCE, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, BEHP, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol	No change
	1,4-dioxane (NAPIS-2, NAPIS-3, KA-3)	No change

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
OAPIS-1	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn, CN-	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr. Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: Acenaphthene, Anthracene, Benzoic Acid, BEHP, Di-n-octylphthalate, Dimethylphthalate, 2,4-Dimethylphenol, Fluorene, 1-MN, Naphthalene, Phenanthrene, Phenol	**Add 2-MN. Analyte is considered an SVOC.**
	1,4-dioxane	No change
STP1-NW STP1-SW OW-59 OW-60 OW-62	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, Isopropyl-benzene, n-Butylbenzene, n-Propyl-benzene, Sec-butylbenzene, 1,2,4-Trimethyl-benzene, 1,3,5-Trimethyl-benzene	No change
	SVOC: Benzoic Acid, BEHP, Naphthalene, 1-MN, 2-MN, Phenol	No change
East LDU West LDU Oil Sump LDU	BTEX, MTBE	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, Carbon Disulfide, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Tert-Butylbenzene, TCE	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: None	**Add Naphthalene, 1-MN, 2-MN. Analytes are considered SVOCs.** **Add 1,4-dioxane to West LDU per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/2019).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP C		
OW-13 OW-14 OW-29 OW-30	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO-2 + NO-3 as N, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-Butanone, Chloroethane, 1,1-DCA, Isopropylbenzene, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: None	**Add Naphthalene, 1-MN, 2-MN. Analytes are considered SVOCs.**
OW-50 OW-52 OW-53 OW-54 OW-55 OW-56 OW-57 OW-58 OW-58A OW-61 OW-63 OW-64 OW-65	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC:1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, EDC, EDB, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloroethane, 1,1-Dichloroethane, Isopropyl benzene, 4-Isopropyltoluene, Methylene Chloride, n-Butyl benzene, n-Propyl benzene, sec-butylbenzene, tert-butylbenzene	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: Acenaphthene, Benzoic Acid, BEHP, Carbazole, Di-n-octylphalate, dimethylphthalate, 2-4-Dimethylphenol, Flourene, Flouranthene, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methyphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, Dibenzofuran	**Add Naphthalene. Analytes is considered an SVOC.** **Add PFAS to OW-63 per NMED Disapproval Annual GW Report - 2019 Comment 30 (11/23/20).**
	1,4-dioxane (OW-54, OW-55, OW-56)	**Add 1,4-dioxane to OW-50 and OW-52 per NMED Disapproval Annual GW Report - 2019 Comment 13 (11/23/20).**
RW-1 RW-2 RW-5 RW-6	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO-2, NO-3, P, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, K, Na, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	8260: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloroethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-butylbenzene, Styrene, tert-butylbenzene	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	8270: Aniline, Benzoic Acid, Benzyl Alcohol, 2,4-Dimethyl phenol, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol, Pyridine	No change

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP D		
PW-2 PW-3 PW-4	BTEX + MTBE	No change
	Gen Inorganic: NO-2	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn, CN-	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, n-Propyl benzene, PCE	No change
	SVOC: Benzoic acid, BEHP, Di-n-octylphthalate, Diethyl phthalate, Dimethyl phthalate, 2,4-Dimethyl phenol, 2-Methylphenol, 3,4-Methylphenol, Phenanthrene, Phenol, Naphthalene, 1-MN, 2-MN	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	1,4-dioxane (NA)	**Add Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.** **Add 1,4-dioxane to PW-2 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
OW-1 OW-10	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO-4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: 1,2,4-Trimethylbenzene, EDC, EDB, Acetone, cis-1,2-DCE, 1,1-Dichloroethane 1,1-Dichloroethene, Methylene Chloride	No change
	SVOC: Benzoic acid	No change
	1,4-dioxane (NA)	**Add 1,4-dioxane to OW-1, OW-10 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
OW-11 OW-12	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO-2, NO-3, P, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cu, Fe, Pb, Mn, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, 1,2,4-Trimethylbenzene, EDC	No change
	SVOC: BEHP	No change
	1,4-dioxane (NA)	**Add 1,4-dioxane and EDB to OW-11 per NMED Disapproval Annual GW Report - 2019 Comment 22 (11/23/20).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
	GROUP E	
MKTF-1 through MKTF-50	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromomethane, 2-Butanone, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-DCE, 4-Chlorotoluene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-DCA, 1,1-DCE, 1,2-Dichloropropane, 2-Hexanon, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-pentanone, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Styrene, tert-Butylbenzene, PCE, TCE, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloro ethane, Vinyl Chloride	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, Benzyl Alcohol, BEHP, Butylbenzylphthalate, Carbazole, Chryzene, Di-n-octylphthalate, Dibenzofuran, 1,4-Dichloro benzene, Diethyl phthalate, Dimethylphthalate, 2,4-Dimethyl phenol, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Pentachlorophenol, Phenanthrene, Phenol, Pyrene, Pyridine, 1,4,6-Trichlorophenol	No change
	1,4-dioxane (MKTF-02, MKTF-04, MKTF-09, MKTF-11, MKTF-13, MKTF-16 through MKTF-22, MKTF-24, MKTF-25, MKTF-27 through MKTF-35, MKTF-38 through MKTF-44, MKTF-46 through MKTF-50)	**Add 1,4-dioxane to MKTF-01, MKTF-03, MKTF-05 through MKTF-08, MKTF-12 through MKTF-17, MKTF-19 through MKTF-23, MKTF-26, MKTF-33, MKTF-36, MKTF-37, MKTF-45 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
	GROUP F	
EP-2 EP-3 EP-4 EP-5 EP-6 EP-7 EP-8 EP-9 EP-11 EP12A EP12B	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	BOD, COD, E-coli, Total Coliform	No change
	VOC: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Chloroform, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, 4-Methylene-2-pentanone, Methylene Chloride	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: Aniline, Benzoic Acid, Benzyl alcohol, BEHP, Carbazole, Chrysene, Di-n-octylphthalate, Dimethylphthalate, 2.4-Dimethylphenol, Fluoranthene, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, 2-Nitrophenol, Phenanthrene, Phenol, Pyrene, Pyridine, Benzo(a)pyrene, Benzo(b) fluoranthene, Benzo(g,h,i) perylene, Indeno(1,2,3-cd) pyrene, Diethylphthalate, 4-Nitrophenol	No change
	Pesticides **EP-3, EP-12A, EP-12B only**: 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, alpha-BHC, beta-BHC, Chlordane, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, gamma-BHC, Heptachlor, Heptaclor expoxide, Methyoxychlor, Toxaphene	Remove pesticides from EP-3, EP-12A, and EP-12B per NMED Disapproval Annual GW Report - 2019 Comment 26 (11/23/20). **Add pesticides to EP-2 per NMED Disapproval Annual GW Report - 2019 Comment 25 (11/23/20).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
STP-1 to EP-2	BTEX + MTBE	No change
	Gen Inorganic: TDS, TSS	No change
	General Organic: DRO, GRO, MRO	No change
	BOD, COD	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Methylene Chloride	Remove Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.
	SVOC: None	**Add Naphthalene, 1-MN, and 2-MN. Analytes are considered SVOCs.**
Boiler Water Inlet to EP-9	NA	NA

Notes:

1,1-DCA - 1,1-Dichloroethane
1,1-DCE - 1,1-Dichloroethene
1-MN - 1-Methyl Naphthalene
2-MN - 2-Methyl Naphthalene
Ag - Silver
As - Arsenic
Ba - Barium
BAP - Benzo(a)Pyrene
BEHP - Bis(2-ethylhexyl) Phthalate
BOD - Biological Oxygen Demand
Br - Bromide
BTEX - Benzene, Ethyl Benzene, Toluene, Total Xylenes
Ca - Calcium
Cd - Cadmium
cis-1,2-DCE - cis-1,2-Dichloroethene
Cl - Chloride
CN- - Cyanide
COD - Chemical Oxygen Demand
Cr - Chromium
Cu - Copper
DRO - Diesel Range Organics
EDB - 1,2-Dibromomethane
EDC - 1,2-Dichloroethane
F - Fluoride
Fe - Iron
GRO - Gasoline Range Organics
Hg - Mercury
K - Potassium
Mg - Magnesium
Mn - Manganese
MRO - Motor Oil Range Organics
MTBE - Methyl tert-Butyl Ether
NA - Not analyzed
Na - Sodium
Ni - Nickel
NO-2 - Nitrite
NO-2 + NO-3, as N - Nitrite + Nitrate as Nitrogen
NO-3 - Nitrate
NS - Not sampled
P - Phosphorus
Pb - Lead
PCE - Tetrachloroethene
Se - Selenium
SO4 - Sulfate
SVOC - Semivolatile Organic Compound
TCE - Trichloroethene
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
U - Uranium
VOC - Volatile Organic Compound
Zn - Zinc

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP A	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
BW-1A	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, Zn, Cd	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Zn, Cd	Acetone, 1,2-DCA, 1,1-DCE, EDB, Carbon Disulfide	Benzoic Acid, BEHP, Di-n-octyl Phthalate	NA
BW-1B								
BW-1C								
BW-2A								
BW-2B								
BW-2C								
BW-3A								
BW-3B								
BW-3C								
BW-4A								
BW-4B								
BW-5A								
BW-5B								
BW-5C								X
MW-1	BTEX, MTBE	F, Cl, NO-3, SO4, Br, P, NO-2	DRO, GRO, MRO	As, Ba, Cr, Fe, Pb, Mn, Hg, Zn, Se	As, Ba, Cr, Pb, Mn, Zn, Cd, Cu, Fe, Se	Acetone, Methylene Chloride	Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl Phthalate, Dimethyl Phthalate, Pyrene	X
MW-2								NA
MW-4								
MW-5								
SMW-2	BTEX, MTBE	F, Cl, Br, NO-2, NO-3 SO4	DRO, GRO, MRO	As, Ba, Cr, Co, Fe, Hg, Pb, Mn, Ni, V, Zn, CN-, Cd, Cu, Se	As, Ba, Cr, Cu, Fe, Pb, Mn, Zn, Cd, Ni, Se	Acetone	Benzoic Acid, Di-n-octyl Phthalate, Diethyl Phthalate, Dimethyl Phthalate, Pyrene, BEHP, Phenol	NA
SMW-4								X

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
GWM-1	BTEX, MTBE	F, Cl, Br, NO-2, NO-3	DRO, GRO, MRO	As, Ba, Cu, Fe, Pb, Mn, Se, Zn, Cd, Cr, Hg	As, Ba, Fe, Pb, Mn, Se, Zn, Cd, Cr, Cu, K, Na, Mg, Ca	Acetone, EDC, 1,2,4-Trimethyl Benzene, 1,3,5-Trimethyl Benzene, Isopropyl Benzene, n-Propyl Benzene, n-Butyl Benzene	Benz(a)anthracene, BAP, Benzo(g,h,i)perylene, Chrysene, 2,4-Dimethylphenol, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Pyrene	X
GWM-2								NA
GWM-3								
NAPIS-1	BTEX, MTBE	Fl, Cl, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, Zn	As, Cr, Cu, Fe, Pb, Mn, Se, Zn, K, Na	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Bromodichloromethane, 4-Chlorotoluene, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene, cis-1,2-DCE, 1,1-DCE	Acenaphthene, Anthracene, Benzoic Acid, BEHP, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Phenol, Analine, Benzo(a)anthracene, 2-Methylphenol, 3+4-Methylphenol	NA
NAPIS-2								X
NAPIS-3								X
KA-3								X
OAPIS-1	BTEX, MTBE	Fl, Cl, NO-3, SO4, NO-2	DRO, GRO, MRO	As, Ba, CN-, Cr, Cu, Fe, Pb, Mn, Hg, Se, Zn	As, Ba, Cu, Fe, Pb, Mn, Se, Ag, Zn, Cd, Cr	Acetone, EDC, 1,2,4-Trimethylbenzene, 2-Butanone, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, 1,3,5-trimethyl benzene, EDB	Acenaphthene, Anthracene, Benzoic Acid, BEHP, 2,4-Dimethylphenol, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Phenol, di-n-octyl phthalate, Dimethyl phthalate	X

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
STP1-NW	BTEX, MTBE	Fl, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, Ag, Zn, Cd	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn, Cd	Acetone, Isopropyl-benzene, n-Butylbenzene, n-Propyl-benzene, Sec-butylbenzene, 1,2,4-Trimethyl-benzene, 1,3,5-Trimethyl-benzene	Benzoic Acid, BEHP, Naphthalene, 1-MN, 2-MN, Phenol	NA
STP1-SW								
OW-59								
OW-60								
OW-62								
East LDU	BTEX, MTBE	NA	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Zn, Cd, Ag	As, Ba, Cr, Fe, Mn, Se, Ag, Zn, Cd, Cu, Pb	Acetone, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2-Butanone, Carbon Disulfide, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Tert-Butylbenzene, TCE	Naphthalene, 1-MN, 2-MN	NA
West LDU								X
Oil Sump LDU								NA

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP C	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)	PFAS (537.1)
OW-13	BTEX, MTBE	F, Cl, Br, NO-2 + NO-3 as N, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2-Butanone, Chloroethane, 1,1-DCA, Isopropylbenzene, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	Naphthalene, 1-MN, 2-MN	NA	
OW-14									
OW-29									
OW-30									
OW-50	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, Zn, Cd	As, Ba, Cu, Fe, Pb, Mn, Se, Ag, Zn, Cd, Cr	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,2-EDC, Acetone, 2-Butanone, 1,1-Dichloroethane, Isopropyl benzene, 4-Isopropyl toluene, Methylene Chloride, n-Butyl benzene, n-Propyl benzene, sec-butyl benzene, tert-butyl benzene, EDB, Chloroethane	Acenaphthene, Benzoic Acid, BEHP, Carbazole, Di-n-octylphalate, dimethylphthalate, 2-4-Dimethylphenol, Fluorene, Fluoranthene, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methyphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, Dibenzofuran	X	NA
OW-52								X	
OW-53								NA	
OW-54								X	
OW-55								X	
OW-56								X	
OW-57								NA	
OW-58									
OW-58A									
OW-61									
OW-63									X
OW-64									NA
OW-65									
RW-1	BTEX, MTBE	Ca (Dis), Mg (Dis), K (Dis), Na (Dis) F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, 2-Butanone, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-butylbenzene, Styrene, tert-Butylbenzene	Aniline, Benzoic Acid, Benzyl Alcohol, 2,4-Dimethyl phenol, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol, Pyridine	NA	
RW-2									
RW-5									
RW-6									

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP D	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
PW-2	BTEX, MTBE	NO-2	DRO, GRO, MRO	As, Ba, Cu, Fe, Pb, Mn, Se, Hg, Zn, Cd, Cr, CN-	As, Ba, Fe, Mn, Se, Zn, Cd, Cr, Cu, Pb	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, n-Propyl benzene, PCE	Benzoic acid, BEHP, 1-MN, 2-MN, Naphthalene, Di-n-octyl Phthalate, Diethyl Phthalate, Dimethyl Phthalate, 2,4-Dimethyl phenol, 2-Methyl phenol, 3+4-Dimethyl phenol, Phenanthrene, Phenol	X
PW-3								NA
PW-4								
OW-1	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Fe, Pb, Mn, Se, Hg, Ag, Zn	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn, Cd	Acetone, cis-1,2-DCE, 1,1-DCA, EDC, 1,1-DCE, Methylene Chloride, EDB, 1,2,4-Trimethylbenzene	Benzoic acid	X
OW-10								X
OW-11	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, SO4, P	DRO, GRO, MRO	As, Ba, Cr, Fe, Pb, Mn, Se, Hg, Zn, Cd, Cu	As, Ba, Cu, Fe, Pb, Mn, Se, Zn	Acetone, EDC, EDB 1,2,4-Trimethylbenzene	BEHP	X
OW-12								NA
GROUP E	**BTEX + MTBE (8260B)**	**Cations (200.7) + Anions (300.00)**	**Gen Organics (8015D)**	**Tot Metals (200.7) + Cyanide (335.4)**	**Dis Metals (200.7)**	**VOC (8260B, 8011 for EDB)**	**SVOC (8270C)**	**1,4-Dioxane (8270 SIM)**
MKTF-01	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, Zn, Cd	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, Zn, Cd	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2-Butanone, Chlorobenzene, Chloroethane, Chloroform, cis-1,2-DCE, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-DCA, 1,1-DCE, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-pentanone, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Styrene, tert-Butylbenzene, PCE, TCE, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloro ethane, Vinyl Chloride, Bromomethane, Chloromethane, 1,2-dichloropropane, 2-hexanone	Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, Benzyl Alcohol, BEHP, Butylbenzylphthalate, Carbazole, Chryzene, Di-n-octylphthalate, Dibenzofuran, 1,4-Dichlorobenzene, Diethylphthalate, Dimethylphthalate, 2,4-Dimethyl phenol, Fluorene, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, 2,4,6-Trichlorophenol, 1-MN, 2-MN, Pentachlorophenol, Pyridine	X
MKTF-02								X
MKTF-03								X
MKTF-04								X
MKTF-05								X
MKTF-06								X
MKTF-07								X
MKTF-08								X
MKTF-09								X
MKTF-10								NA
MKTF-11								X
MKTF-12								X
MKTF-13								X
MKTF-14								X
MKTF-15								X
MKTF-16								X
MKTF-17								X
MKTF-18								X
MKTF-19								X
MKTF-20								X
MKTF-21								X
MKTF-22								X
MKTF-23								X
MKTF-24								X
MKTF-25								X
MKTF-26								X
MKTF-27								X
MKTF-28								X
MKTF-29								X
MKTF-30								X
MKTF-31								X
MKTF-32								X
MKTF-33								X
MKTF-34								X
MKTF-35								X
MKTF-36								X
MKTF-37								X
MKTF-38								X
MKTF-39								X
MKTF-40								X
MKTF-41								X
MKTF-42								X
MKTF-43								X
MKTF-44								X
MKTF-45								X
MKTF-46								X
MKTF-47								X
MKTF-48								X
MKTF-49								X
MKTF-50								X

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP F	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)	Pesticides (8011)	Misc Tests
EP-2	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, SO4	NA	As, Ba, Cr, Cu, Fe, Pb, Mn, Ag, Hg, Se, Zn, Cd	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn, Cd	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, 4-Methyl-2-pentanone, Methylene Chloride, Chloroform	Aniline, Benzoic Acid, BEHP, Chrysene, 2,4-Dimethylphenol, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methylphenol, Naphthalene, 2-Nitrophenol, Phenol, Diethylphthalate, 4-Nitrophenol, Benzyl Alcohol, Carbazole, Di-n-octyl Phthalate, Dimethyl Phthalate, Fluoranthene, Fluorene, Phenanathrene, Pyrene, Pyridine, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i,)perylene, Indeno(1,2,3-cd)pyrene	NA	**EP-2 only:** 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, alpha-BHC, beta-BHC, Chlordane, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, gamma-BHC, Heptachlor, Heptaclor expoxide, Methyoxychlor, Toxaphene	BOD (M5210B), COD (H8000), E. Coli (3014), Total Coliform (9223B)
EP-3										
EP-4										
EP-5										
EP-6										
EP-7										
EP-8										
EP-9										
EP-11										
EP-12A										
EP-12B										
STP-1 to EP-2	BTEX, MTBE	TDS (2540C), TSS (2540D)	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Zn, Cd	As, Ba, Cr, Cu, Fe, Mn, Se, Zn, Cd, Pb	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Methylene Chloride	Naphthalene, 1-MN, 2-MN	NA	NA	BOD, COD

Notes:

1,1-DCA - 1,1-Dichloroethane
1,1-DCE - 1,1-Dichloroethene
1-MN - 1-Methyl Naphthalene
2-MN - 2-Methyl Naphthalene
Ag - Silver
As - Arsenic
Ba - Barium
BAP - Benzo(a)Pyrene
BEHP - Bis(2-ethylhexyl) Phthalate
BOD - Biological Oxygen Demand
Br - Bromide
BTEX - Benzene, Ethyl Benzene, Toluene, Total Xylenes
Ca - Calcium
Cd - Cadmium
cis-1,2-DCE - cis-1,2-Dichloroethene
Cl - Chloride
CN- - Cyanide
COD - Chemical Oxygen Demand
Cr - Chromium
Cu - Copper
DRO - Diesel Range Organics
EDB - 1,2-Dibromomethane
EDC - 1,2-Dichloroethane
F - Fluoride
Fe - Iron
GRO - Gasoline Range Organics
Hg - Mercury
K - Potassium
Mg - Magnesium
Mn - Manganese
MRO - Motor Oil Range Organics
MTBE - Methyl tert-Butyl Ether
NA - Not analyzed
Na - Sodium
Ni - Nickel
NO-2 - Nitrite
NO-2 + NO-3, as N - Nitrite + Nitrate as Nitrogen
as Nitrogen
NO-3 - Nitrate
NS - Not sampled
P - Phosphorus
Pb - Lead
PCE - Tetrachloroethene
Se - Selenium
SO4 - Sulfate
SVOC - Semivolatile Organic Compound
TCE - Trichloroethene
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
VOC - Volatile Organic Compound
Zn - Zinc

FIGURES

NOTE:
REGIONAL MAP SHOWING THE LOCATION OF THE GALLUP REFINERY (RED STAR ALONG INTERSTATE-40, 20 MILES EAST OF THE CITY OF GALLUP).

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FIGURE 1-1

REGIONAL MAP

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 14 MI	Date: 1/8/21	File: 697-GW-REGIONMAP-2020

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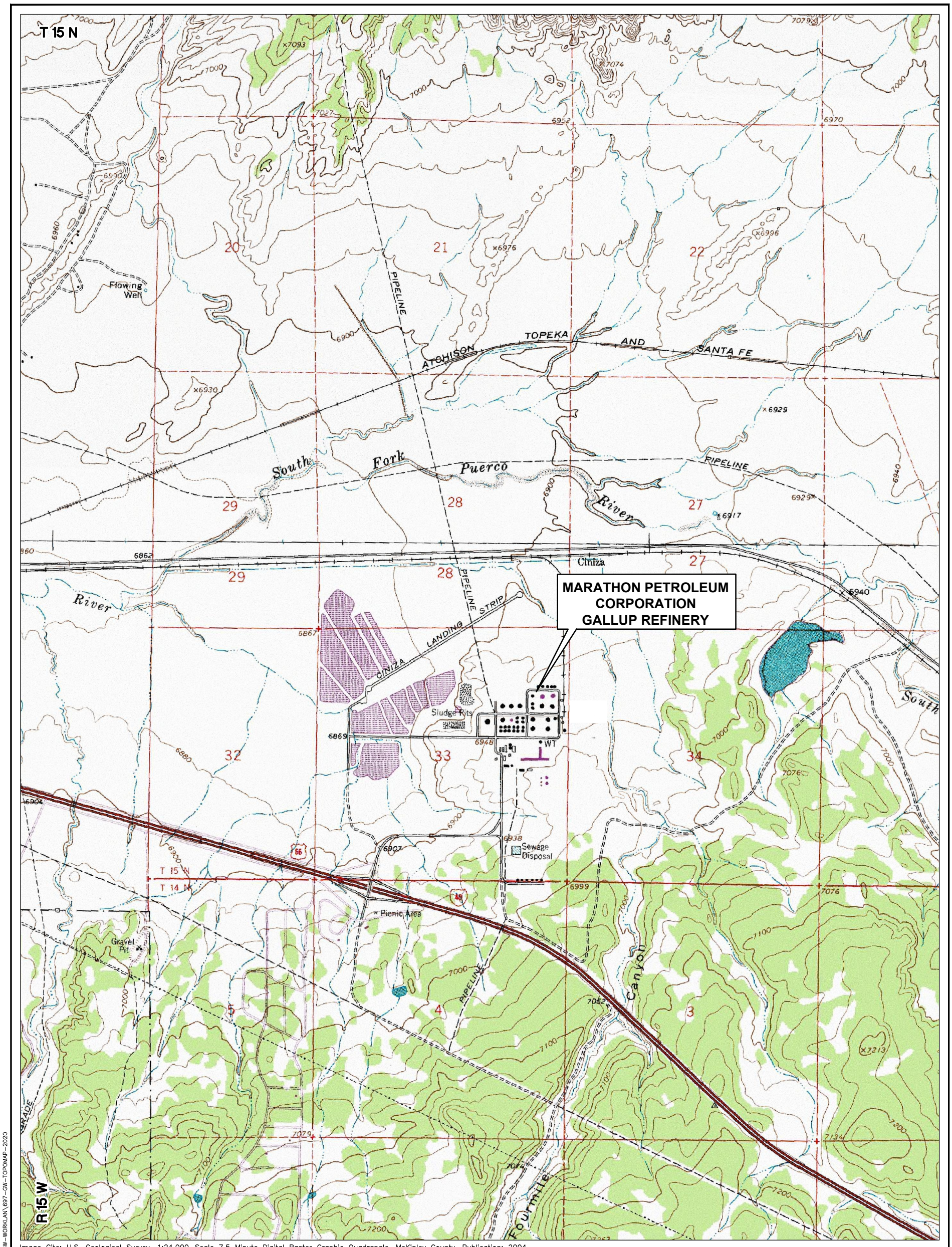

Image Cite: U.S. Geological Survey, 1:24,000–Scale 7.5 Minute Digital Raster Graphic Quadrangle, McKinley County, Publication: 2004

NOTE:

SITE LEGAL DESCRIPTION - TOWNSHIP 15 NORTH, RANGE 15 WEST, SECTION 33, LOWER QUARTER SECTION 28, AND NORTHEAST QUARTER SECTION 4.

QUADRANGLE LOCATION

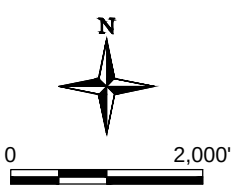

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FIGURE 1-2

TOPOGRAPHIC MAP

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 2,000'	Date: 1/8/21	File: 697-GW-TOPOMAP-2020

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GROUP A

GROUP B

GROUP C

GROUP E

GROUP F EVAPORATION PONDS

BW-3C BW-3A BW-3B

BW-2C BW-2A BW-2B

SMW-4 MW-5 MW-2 MW-1

EP-12B EP-12A EP-11

SMW-2

OW-59

BW-1A BW-1B BW-1C

EP-7

OW-60

MW-4

STP1-NW STP1-EFF STP1-SW STP-1

OW-12

EP-8 EP-3 EP-2

GWM-3 GWM-1(SPH) NAPIS-3

OW-62(SPH)

KA-3 GWM-2 NAPIS-1(SPH)

EP-4

NAPIS-2 OAPIS-1

EP-5

MKTF-29 MKTF-50 MKTF-28

MKTF-30 MKTF-26(SPH) MKTF-27

MKTF-25 MKTF-49

MKTF-40

MKTF-02 MKTF-01(SPH)

MKTF-31 MKTF-24 MKTF-11

MKTF-23(SPH)

MKTF-14(SPH) MKTF-04 MKTF-13

MKTF-22

MKTF-41 MKTF-32 MKTF-12(SPH) MKTF-06(SPH)

MKTF-33

MKTF-05(SPH)

MKTF-42

MKTF-07(SPH)

MKTF-34

MKTF-19

MKTF-17

MKTF-45(SPH)

MKTF-46

MKTF-35 MKTF-36

MKTF-37(SPH) MKTF-47

MKTF-18

MKTF-38

MKTF-08(SPH)

MKTF-21

MKTF-48

MKTF-39

MKTF-20

MKTF-16

MKTF-09

MKTF-15

MKTF-10

MKTF-03(SPH)

OW-64

OW-65(SPH)

OW-61(SPH)

RW-1

OW-52

OW-53 OW-50

OW-54 OW-29(0644)

OW-56 OW-13 OW-55 OW-30(0647)

OW-14

OW-63

OW-57 OW-58

RW-5 RW-6

RW-2

OW-01 BW-4B BW-4A PW-2

BW-5C BW-5B BW-5A

OW-10 MKTF-43

PW-3

PW-4

OW-11

EP-6 EP-9

NOTE:

GROUP D WELLS PW-2, PW-3, PW-4, OW-1, OW-10, OW-11, AND OW-12 ARE SHOWN IN YELLOW HALO.

Image Cite: DigitalGlobe © CNES (2019) Distribution Airbus DS © Microsoft Corporation, BING Imagery

EXPLANATION

OW-10	SONSELA WELL AND DESIGNATION		GROUP F EVAPORATION POND
OW-11	CHINLE/ALLUVIUM INTERFACE WELL AND DESIGNATION	EP	EVAPORATION POND
SMW-2	UPPER SAND WELL AND DESIGNATION	SPH	SINGLE-PHASE HYDROCARBON
MKTF-45	SPH MONITORING WELL AND DESIGNATION	STP	SANITARY TREATMENT POND
PW-4	RAW WATER PRODUCTION WELL AND DESIGNATION	STP-EFF	SANITARY TREATMENT POND EFFLUENT
RW-6	RECOVERY WELL AND DESIGNATION		

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0 400' 800'

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FIGURE 1-3

FACILITIES AND WELL GROUPS 2021

MARATHON PETROLEUM CORP. GALLUP REFINERY GALLUP, NEW MEXICO

Drawn By: REP	Checked By: LA	Scale: 1" = 400'	Date: 9/21/21	File: 697-GW-FACWELLGROUPS-2020

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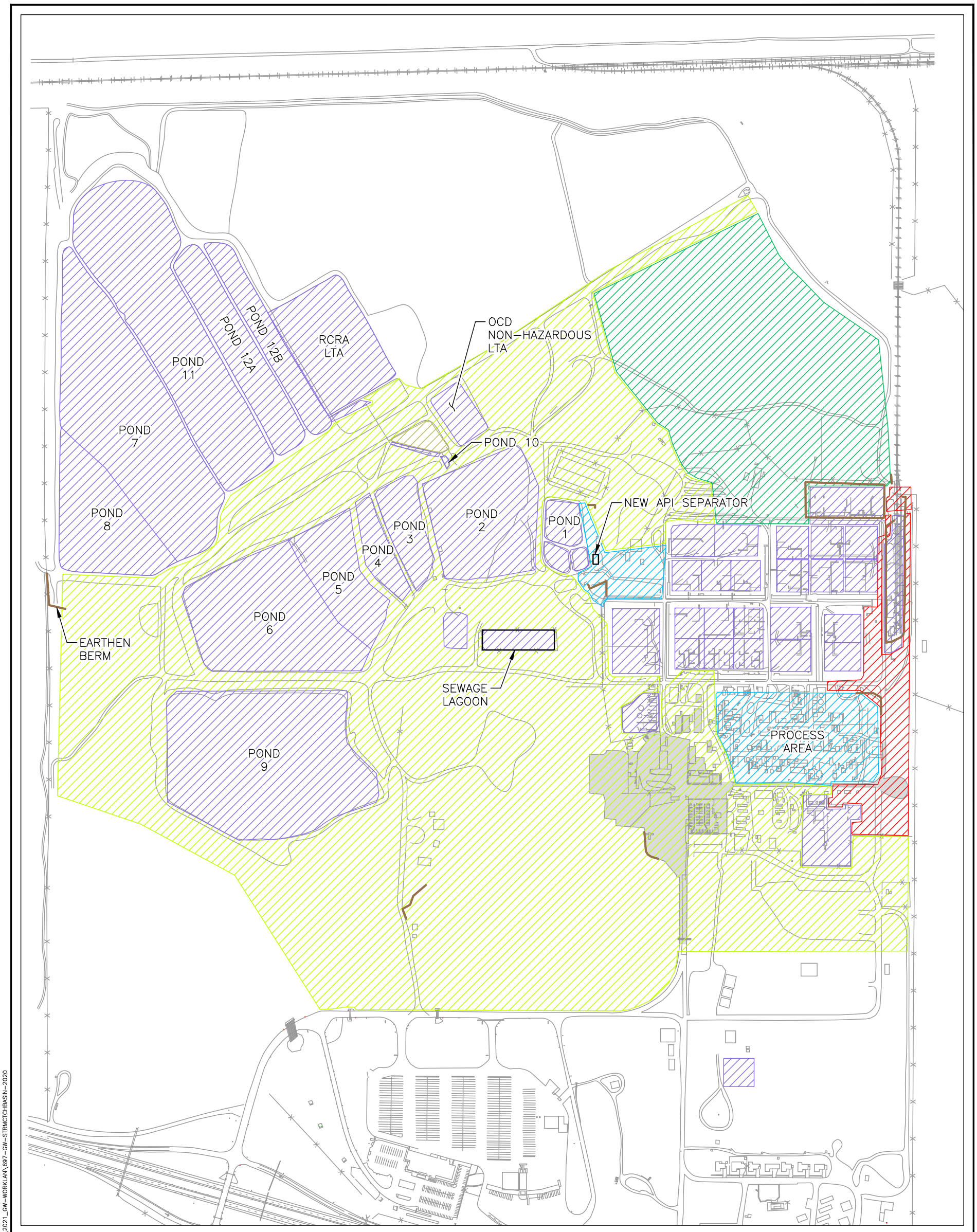

EXPLANATION

- NEW FACILITY BOUNDARY
- EARTHEN BERM
- CONTAINED/BERMED AREA, NO STORMWATER RUN OFF DISCHARGED TO ANOTHER POINT
- AREA CONTRIBUTING FLOW TO OUTFALL 2
- DRAINS TO GRASSY AREA, DOES NOT LEAVE SITE
- NEW STORMWATER COLLECTION BASIN
- AREA CONTRIBUTING FLOW TO OUTFALL 1
- PROCESS AREA, STORMWATER DRAINS TO POND 1
- IMPERVIOUS SURFACE

NOTE:

IMPERVIOUS AREAS ARE IDENTIFIED FOR DISCHARGING AREAS ONLY. IMPERVIOUS SURFACES WITHIN AREAS WHERE STORMWATER DOES NOT DISCHARGE HAVE NOT BEEN IDENTIFIED, CONSIDERING THESE AREAS DO NOT PRODUCE REGULATED STORMWATER DISCHARGES.

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0 600'

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FIGURE 3-1

STORMWATER CATCH BASINS 2020

**MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO**

Drawn By: REP	Checked By: MS	Scale: 1" = 600'	Date: 1/12/21	File: 697-GW-STRMCTCHBASIN-2020

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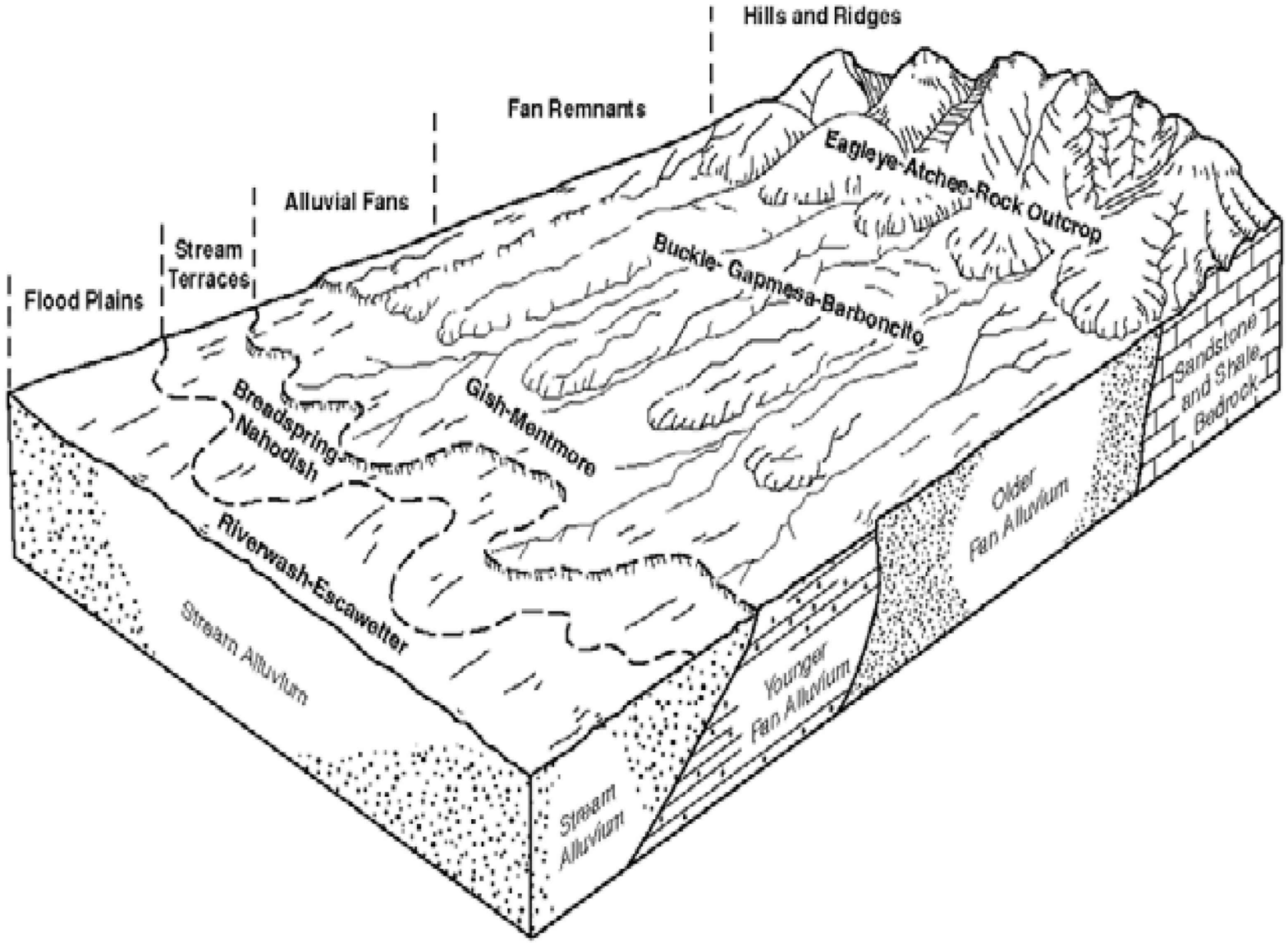

NOTE:
GENERALIZED RELATIONSHIP OF SOILS IN THE GALLUP REFINERY AREA: FROM NRCS/USDA SOIL SURVEY OF MCKINLEY COUNTY.

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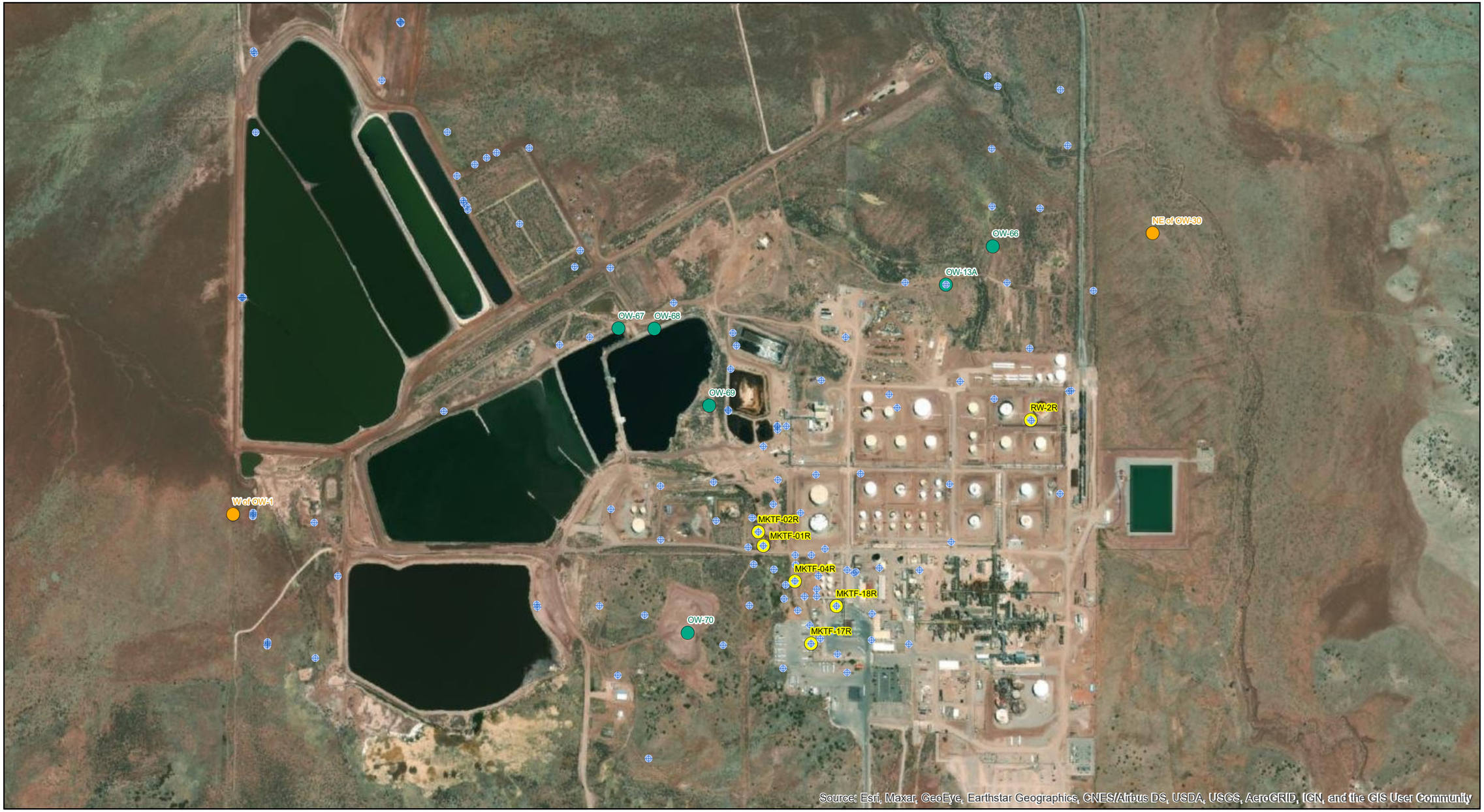
FIGURE 3-2

GENERALIZED RELATIONSHIP OF SOILS

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: NONE	Date: 1/8/21	File: 697-GW-RELATIONSOILS-2020



M:\TON\MARATHON\GIS\PROJECTS\GALLUP\REFINERY\GROUNDWATER\REPORTING\WORKPLANS\GW_WORKPLAN_2021\5-1_ADDNL_WELL_INSTALL2021_FIG5-1.MXD

EXPLANATION

- EXISTING MONITORING WELL LOCATION
- REPLACEMENT OF EXISTING MONITORING WELL LOCATION
- NEW MONITORING WELL
- PROPOSED OFF-SITE WELLL TO BE INSTALLED AFTER ACCESS IS OBTAINED FROM THE LANDOWNER

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FIGURE 5-1

2021 NEW AND PROPOSED WELL LOCATIONS

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: KEJ	Checked By: CF	Scale: 1 " = 600 '	Date: 9/21/21	File: 5-1_Addnl_Well_Install2021_Fig5-1.mxd

APPENDIX A

Appendix A
Investigation Methods

Groundwater Sampling Methodology

All monitoring wells scheduled for sampling during a groundwater sampling event will be sampled within 15 working days of the start of the monitoring and sampling event, weather permitting. Attachment A, *Gallup Refinery Field Sampling Collection and Handling Standard Procedures*, provides the basis for the investigation methods.

Well Gauging

At the beginning of each quarterly, semi-annual, or annual sampling event, monitoring and recovery wells listed in Section 5.1 of the annual "Facility Wide Groundwater Monitoring Work Plan" will be gauged to record the depth to separate phase hydrocarbon (SPH), if present, the depth to water, and the depth to bottom of the well. The gauging will be performed using an oil/water interface probe attached to a measuring tape capable of recording measurements to the nearest 0.01 foot (ft). Each well is field verified with the well number on the well casing or adjacent to the well to ensure that samples are collected at the correct well location. Wells have a permanent marked reference point on the well casing from which groundwater levels and well depths are measured.

Gauging measurements will be recorded on a field gauging form. Data obtained from the gauging will be reported in the annual groundwater monitoring report. The data will be used to develop groundwater contour maps and SPH thickness isopleths which will be included in the annual report.

Figure 1 depicts the potentiometric surface for the Sonsela aquifer and Figure 2 shows the potentiometric surface for the Alluvium/Chinle Group Interface zone. Attachment B-1 is a summary of the fluid level data collected in 2020 for the non-Marketing Tank Farm (MKTF) wells. Attachment B-2 is a summary of the fluid level data collected in 2020 for the MKTF wells. Attachments B-3 and B-4 include well information for the non-MKTF wells and MKTF wells, respectively. The well information consists of the survey data, screened intervals, and stratigraphic unit in which the wells are screened. Attachment B-5 includes well information for artesian wells also known as Process or Production wells. Information provided for the artesian wells was gathered from well boring logs. These wells are encased; therefore, measurement for depth to bottom was not field verified.

Well Purging

Each well will be purged by removing groundwater prior to sampling to ensure that formation water is being sampled. Generally, at least three well volumes (or a minimum of two if the well has low recharge rate) will be purged from each well prior to sampling. Field water quality parameters measured during purging are pH, electrical conductivity, temperature, dissolved oxygen (DO), and oxidation-reduction potential (ORP). One or more parameters must stabilize to within 10 percent (%) for a minimum of three consecutive measurements before collecting groundwater samples using low-flow sampling techniques. When purging wells using a bailer, bailing will be considered complete when three well volumes have been removed from the wells. Field parameters will be measured and recorded while bailing, with the understanding that the process of hand-bailing may prevent stabilization of field parameters. Once purging requirements are met, the well is ready for sample collection. The volume of groundwater purged, the instruments used, and the readings obtained at each interval will be recorded on the field-monitoring log. Well purging and sampling will be performed using 1.5-inch (in) x 3 ft and/or 3-in x 3-ft disposable polyethylene bailers for groundwater sampling and/or appropriately decontaminated portable sampling pumps.

If a well is pumped or bailed dry before two or three well volumes can be evacuated, samples will be collected after sufficient time has elapsed for an adequate volume of water to accumulate for the sampling event. The first sample will be tested for pH, temperature, specific conductivity, DO, and ORP. The well will be retested for pH, temperature, specific conductivity, DO, and ORP after sampling as a measure of purging efficiency and as a check on the stability of the water samples over time. All well evacuation information will be recorded in a logbook.

All wells are purged and sampled with dedicated or disposable equipment. Wells MW-1, MW-2, MW-4, MW-5, BW-1C, BW-2A, BW-2B, BW-3B, BW-4B, BW-5B, BW-5C, SMW-4, OW-1, OW-10, OW-13, OW-14, OW-29, and OW-30 are each equipped with a dedicated electrical pump. Wells SMW-2, OW-11, OW-12, OW-50, and OW-52 are purged and sampled using a portable Grundfos pump with dedicated tubing. The remaining wells are hand-bailed if the presence of water is detected. If SPH is detected in any of these wells, no samples will be collected. If SPH recovery system wells (OW-13, OW-14, OW-29, OW-30, RW-1, RW-2, RW-5, and RW-6) do not have measurable SPH, the recovery system will be removed from the well and the well sampled. Purged well water is collected in 55-gallon drums, buckets, or totes and drained to

the process sewer upstream of the New American Petroleum Institute Separator for treatment in the wastewater treatment plant.

Groundwater Sample Collection

Groundwater samples will be obtained from each well within 24 hours of the completion of well purging or as soon as the well sufficiently recharges. Sample collection methods will be documented in the field monitoring reports. The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory.

Groundwater samples are collected and analyzed for both total and dissolved metals. Groundwater samples obtained for dissolved metals analysis will be filtered through disposable filters with a 0.45-micrometer mesh size.

Sample Handling

All sample containers are supplied by the contracted analytical laboratory and shipped to the Refinery in sealed coolers. Chemical preservation is also provided by the laboratory through pre-preserved bottle ware. Collection of groundwater samples are in the order of most volatile to least volatile, such as: volatile organic compounds (VOCs), semivolatile organic compounds, metals, phenols, cyanide, sulfate, chloride, nitrate, and nitrite. At a minimum, the following procedures will be used when collecting samples:

- Neoprene, nitrile, or other protective gloves will be worn when collecting samples for safety and sampling purity. New disposable gloves will be used to collect each sample.
- All samples collected for chemical analysis will be transferred into clean sample containers supplied by the analytical laboratory. The sample containers will be clearly marked. Sample container volumes and preservation methods will be in accordance with the most recent standard United States Environmental Protection Agency (USEPA) and industry accepted practices for use by accredited analytical laboratories. Sufficient sample volume will be obtained for the laboratory to complete the method-specific quality control (QC) analyses on a laboratory-batch basis.
- Sample labels and documentation will be completed for each sample.

Immediately after the samples are collected, they will be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described in "Sample Custody" section of this Appendix, will be followed for all samples collected. All samples will be submitted to the laboratory to conduct the analyses within the method holding times.

General Well Sampling Procedures

Sample bottles and labels will be separated into plastic bags for each well to be sampled. The plastic bags, with the sample bottles, will be placed in an ice chest to take into the field. A field notebook and sample log will be used to document weather conditions and sample date and time. The label will be complete with location, date, time, analysis, preservative, and the name of the sampler. For low-flow sampling, converter speed will be adjusted prior to filling bottles. Sample labels will be affixed, and bottles will be filled according to lab instructions. Bottles with septa lids will be used for samples intended for VOC analysis. VOC bottles will be filled to minimize headspace.

Any reusable equipment that is not dedicated to a specific well will be decontaminated. Completed samples will be refrigerated until they are shipped to the laboratory. Appropriate shipping methods will be arranged to accommodate holding times. Sampling equipment and supplies will be checked, and proper inventory verified prior to sampling. Before departing, quality assurance (QA)/QC requirements will be checked to ensure there are additional equipment and supplies to meet additional requirements.

Surface Water Sample Collection

At the evaporation ponds, samples will be collected as a grab sample at the pond edge near the inlets. This location will be noted in the field notebooks. The sampler will avoid disturbing sediment and gently allow the sample container to fill making sure that undue disturbance does not allow volatile constituents to be lost. The sample bottle will be used for the sample collection in a shallow location near the bank. If a separate bottle and/or bailer are used to refill the sample container, this will be noted in the field log books. The decision to use a separate bottle/bailer will be made, if at all, by the sampler and the reasons will be noted in the field log books.

Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. Most field equipment used for groundwater sampling will be disposable and, therefore, not require decontamination. To prevent cross-contamination, field equipment that comes into contact with water or soil will be decontaminated between each sampling location. The decontamination procedure will consist of washing the equipment with a non-phosphate detergent solution (e.g., Fantastik™, Liqui-Nox®), followed by two rinses of distilled water, and air dried.

Decontamination water and rinsate will be contained and disposed of the same way as purge water, as described in the "Well Purging" section of this Appendix. Decontamination procedures and the cleaning agents used will be documented in the daily field log.

Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded using indelible ink on field sampling forms. The original field forms will be maintained at the Refinery. Completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. The daily record of field activities will include the following information:

- Well identification
- Date
- Start and finish sampling time
- Field team members, including visitors
- Weather conditions
- Daily activities and times conducted
- Observations
- Record of samples collected with sample designations
- Photo log (if needed)
- Field monitoring data, including health and safety monitoring (if needed)
- Equipment used and calibration records, if appropriate
- List of additional data sheets and maps completed
- An inventory of the waste generated and the method of storage or disposal
- Signature of personnel completing the field record

Sample Custody

All samples collected for analysis will be recorded in the field report or data sheets. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site and will accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody (COC) form will be signed as received by the laboratory, and the conditions of the samples will be recorded on the form. The original COC form will remain with the laboratory; copies will be sent to the Refinery. The Refinery will maintain copies of all COC forms generated as part of sampling activities. Copies of the COC records will be included with all draft and final laboratory reports submitted to the New Mexico Environment Department (NMED) and Oil Conservation Division.

Shipping Procedures

The following shipping procedures will be performed during each sampling event:

- Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other USEPA or industry-wide accepted method. The drainage hole at the bottom of the cooler will be sealed and secured in case of sample container leakage.
- Each cooler or other container will be delivered directly to the analytical laboratory.
- Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
- Plastic containers will be protected from possible puncture during shipping using cushioning material.
- The COC form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
- Signed and dated COC seals will be applied to each cooler prior to transport of samples from the site.

Analytical Methods

Groundwater and surface water samples collected during the monitoring events will be analyzed using the specified analytical methods and for the constituents discussed in Section 5.3 of the annual "Facility Wide Groundwater Monitoring Work Plan."

Quality Assurance Procedures

Contract analytical laboratories will maintain internal QA programs in accordance with USEPA and industry accepted practices and procedures. At a minimum, the laboratories will use a combination of standards, blanks, surrogates, duplicates, matrix spike/matrix spike duplicates (MS/MSD), blank spike/blank spike duplicates (BS/BSD), and laboratory control samples to demonstrate analytical QA/QC. The laboratories will establish control limits for individual chemicals or groups of chemicals based on the long-term performance of the test methods. In addition, the laboratories will establish internal QA/QC that meets USEPA's laboratory certification requirements. The specific procedures to be completed are identified in the following sections.

Equipment Calibration Procedures and Frequency

The laboratory's equipment calibration procedures, calibration frequency, and calibration standards will be in accordance with the USEPA test methodology requirements and documented in the laboratory's QA and Standard Operating Procedures manuals. All instruments and equipment used by the laboratory will be operated, calibrated, and maintained according to the manufacturers' guidelines and recommendations. Operation, calibration, and maintenance will be performed by personnel who have been properly trained in these procedures. A routine schedule and record of instrument calibration and maintenance will be kept on file at the laboratory.

Field QA/QC Samples

Field duplicates, field blanks, equipment rinsate blanks (if required), reagent blanks, and trip blanks may be obtained for QA during sampling activities. The samples will be handled as described in the "Laboratory QA/QC Samples" section of this Appendix.

Field duplicates will consist of two samples either split from the same sample device or collected sequentially. Field duplicate groundwater samples will be collected at a frequency of one per ten regular

samples and will be analyzed for the full set of analyses used for the regular sample collected. At a minimum, one duplicate sample per sampling day will be obtained.

Field blanks shall be obtained at a frequency of no less than one per day per site or unit. Field blanks shall be generated by filling sample containers in the field with deionized water and submitting the samples, along with the groundwater or surface water samples, to the analytical laboratory for the appropriate analyses.

Currently, all samples are collected using dedicated or disposable equipment; therefore, equipment blanks will not be collected. However, if non-dedicated or non-disposable equipment are used, equipment blanks shall be obtained for chemical analysis at the rate of 5% but no fewer than one rinsate blank per sampling day. Rinsate samples shall be generated by rinsing deionized water through decontaminated sampling equipment. The rinsate sample then shall be placed in the appropriate sample container and submitted with the groundwater or surface water samples to the analytical laboratory for the appropriate analyses.

Reagent blanks shall be obtained at a frequency of 10% but no fewer than one per day per unit if chemical analyses requiring the use of chemical reagents are conducted in the field during water sampling activities.

Trip blanks will accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks will consist of a sample of analyte free deionized water placed in an appropriate sample container. Trip blanks will be analyzed at a frequency of one for each shipping container of samples.

Laboratory QA/QC Samples

Analytical procedures will be evaluated by analyzing reagent or method blanks, surrogates, MS/MSDs, BS/BSDs and/or laboratory duplicates, as appropriate for each method. The laboratory QA/QC samples and frequency of analysis to be completed will be documented in the cited USEPA or other test methodologies. At a minimum, the laboratory will analyze laboratory blanks, MS/MSDs, BS/BSDs, and laboratory duplicates at a frequency of one in twenty for all batch runs requiring USEPA test methods and a frequency of one in ten for non-USEPA test methods. Laboratory batch QA/QC samples will be project specific.

Laboratory Deliverables

The analytical data package will be prepared in accordance with USEPA-established Level II analytical support protocol which will include:

- Transmittal letter, including information about the receipt of samples, the testing methodology performed, any deviations from the required procedures, any problems encountered in the analysis of the samples, any data quality exceptions, and any corrective actions taken by the laboratory relative to the quality of the data contained in the report;
- Sample analytical results, including sampling date; date of sample extraction or preparation; date of sample analysis; dilution factors and test method identification; water sample results in consistent units (milligrams per liter or micrograms per liter); and detection limits for undetected analytes. Results will be reported for all field samples, including field duplicates and blanks, submitted for analysis
- Method blank results, including reporting limits for undetected analytes
- Surrogate recovery results and corresponding control limits for samples and method blanks (organic analyses only)
- Laboratory duplicate results for inorganic analyses, including relative percent differences and corresponding control limits
- Sample COC documentation
- Holding times and conditions
- Conformance with required analytical protocol(s)
- Instrument calibration
- Blanks
- Detection/quantitative limits
- Recoveries of surrogates and/or MS/MSDs
- Variability for duplicate analyses
- Completeness
- Data report formats

Data deliverables provided by the laboratory that include analysis of organic compounds will also include the following:

- A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications, including signature from authority representative certifying to the quality and authenticity of data as reported
- A report of sample collection, extraction, and analysis dates, including sample holding conditions
- Tabulated results for samples in units as specified, including data qualification in conformance with USEPA protocol, and definition of data descriptor codes
- Final extract volumes (and dilutions required), sample size, wet-to-dry weight ratios, and instrument practical detection/quantitative limit for each analyte
- Analyte concentrations with reporting units identified, including data qualification and a description of the qualifiers
- Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample
- Recovery assessments and a replicate sample summary, including all surrogate spike recovery data with spike levels/concentrations for each sample and all MS/MSD results (recoveries and spike amounts)

Review of Field and Laboratory QA/QC Data

The sample data, field, and laboratory QA/QC results will be evaluated for acceptability with respect to the data quality objectives (DQOs). Each group of samples will be compared with the DQOs and evaluated using data validation guidelines contained in USEPA guidance documents: "Guidance Document for the Assessment of RCRA Environmental Data Quality, National Functional Guidelines for Organic Data Review," "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses," and the most recent version of SW-846, and industry-accepted QA/QC methods and procedures.

The laboratory will notify the Refinery Project Manager of data quality exceptions within one business day of identifying the data quality exception to allow for sample re-analysis, if possible. The Refinery Project Manager will contact NMED within one business day of receipt of laboratory notification of data quality exceptions to discuss the implementations and determine whether the data will still be considered acceptable, or if sample re-analysis or re-sampling is necessary.

Blanks, Field Duplicates, Reporting Limits and Holding Times

Blanks

The analytical results of field blanks and field rinsate blanks will be reviewed to evaluate the adequacy of the equipment decontamination procedures and the possibility of cross-contamination caused by decontamination of sampling equipment. The analytical results of trip blanks will be reviewed to evaluate the possibility for contamination resulting from the laboratory-prepared sample containers or the sample transport containers. The analytical results of laboratory blanks will be reviewed to evaluate the possibility of contamination caused by the analytical procedures. If constituents are detected in field or laboratory blanks, the sample data will be qualified or rejected, as appropriate. Methods and reasoning for the decision to qualify or reject sample data will be discussed in the annual groundwater report. Furthermore, any impact to data quality and/or need to adjust methods will be addressed in the report.

Field Duplicates

Field duplicates will consist of two samples either split from the same sample device or collected sequentially. The analytical data quality objectives for precision shall be used for water duplicates.

Method Reporting Limits

Method reporting limits for sample analyses will be established at the lowest level practicable for the method and analyte concentrations and will not exceed groundwater or surface water cleanup standards and screening levels. Detection limits that exceed established standards or screening levels and are reported as “not detected” will be considered data quality exceptions and an explanation for its acceptability for use will be provided.

Holding Times

Per USEPA protocol the sampling, extraction, and analysis dates will be reviewed to confirm that extraction and analyses were completed within the recommended holding times. Appropriate data qualifiers will be noted if holding times are exceeded.

Representativeness and Comparability

Representativeness

Representativeness is a qualitative parameter related to the degree to which the sample data represent the relevant specific characteristics of the media sampled. Procedures will be implemented to assure representative samples are collected and analyzed, such as repeated measurements of the same parameter at the same location over several distinct sampling events. Any procedures or variations that may affect the collection or analysis of representative samples will be noted and the data will be qualified.

Comparability

Comparability is a qualitative parameter related to whether similar sample data can be compared. To assure comparability, analytical results will be reported in appropriate units for comparison with other data (past studies, comparable sites, screening levels, and cleanup standards), and standard collection and analytical procedures will be implemented. Any procedure or variation that may affect comparability will be noted and the data will be qualified.

Laboratory Reporting, Documentation, Data Reduction, and Corrective Action

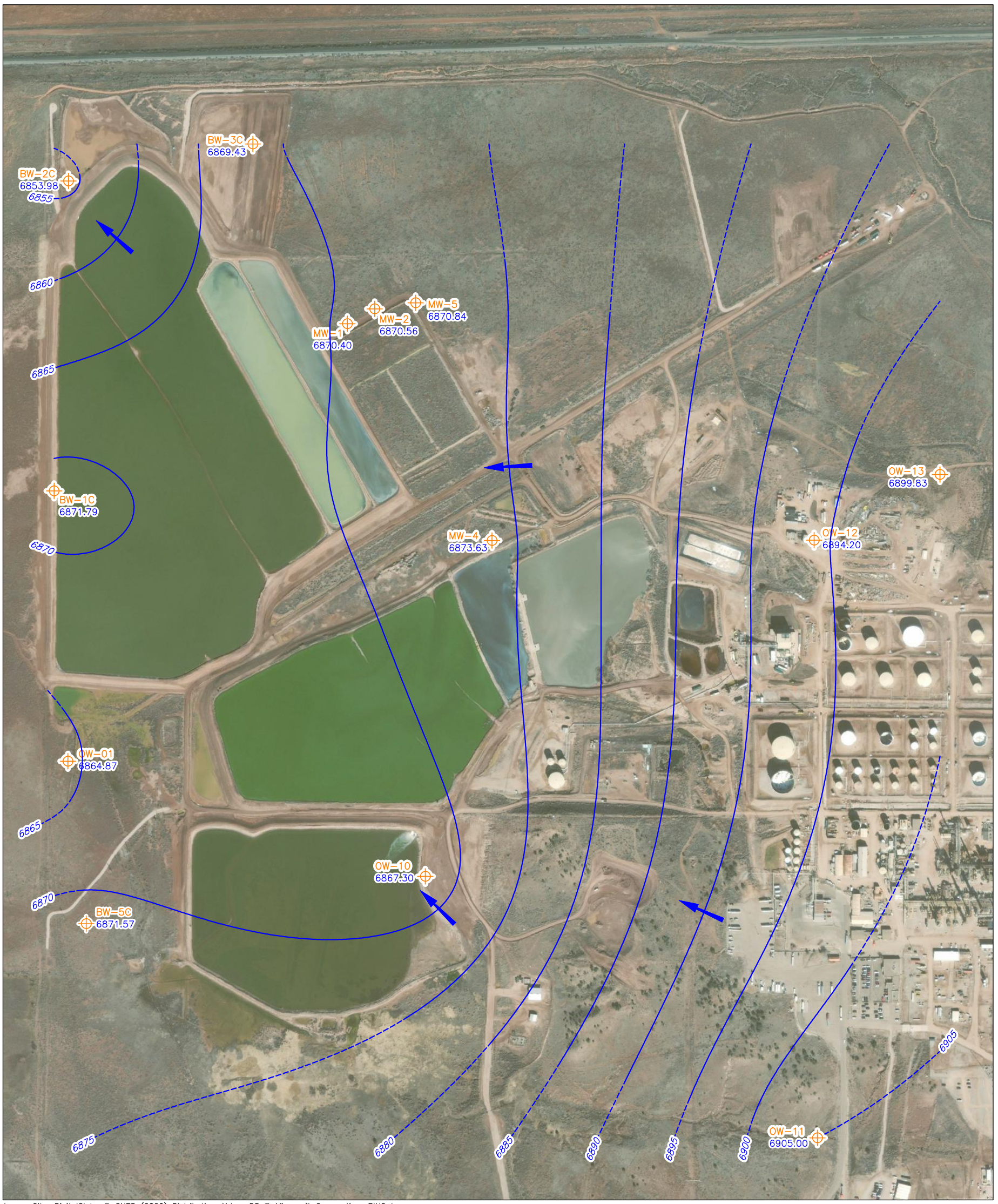
Upon receipt of each laboratory data package, data will be evaluated against the criteria outlined in the previous sections. Any deviation from the established criteria will be noted and the data will be qualified. A full review and discussion of analytical data QA/QC and all data qualifiers will be submitted as appendices or attachments to the groundwater monitoring reports. Data validation procedures for all samples will include checking the following, when appropriate:

- Holding times
- Detection limits
- Field equipment rinsate blanks
- Field blanks
- Field duplicates
- Trip blanks
- Reagent blanks
- Laboratory duplicates
- Laboratory blanks
- Laboratory MS/MSD

- Laboratory BS/BSD
- Surrogate recoveries

If significant quality assurance problems are encountered, appropriate corrective action will be implemented. All corrective action will be reported, and the corrected data will be qualified.

FIGURES



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EXPLANATION

OW-10 6867.30 — SONSELA WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, SEPTEMBER AND DECEMBER 2020)

6880 — LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FT AMSL, DASHED WHERE INFERRED)

ESTIMATED GROUNDWATER FLOW DIRECTION

FT AMSL — FEET ABOVE MEAN SEA LEVEL

N

0 500'

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

FIGURE 1

SONSELA WATER ELEVATION MAP 2020

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 500'	Date: 1/8/21	File: 697-GW-S-WTRELEVMAP-2020

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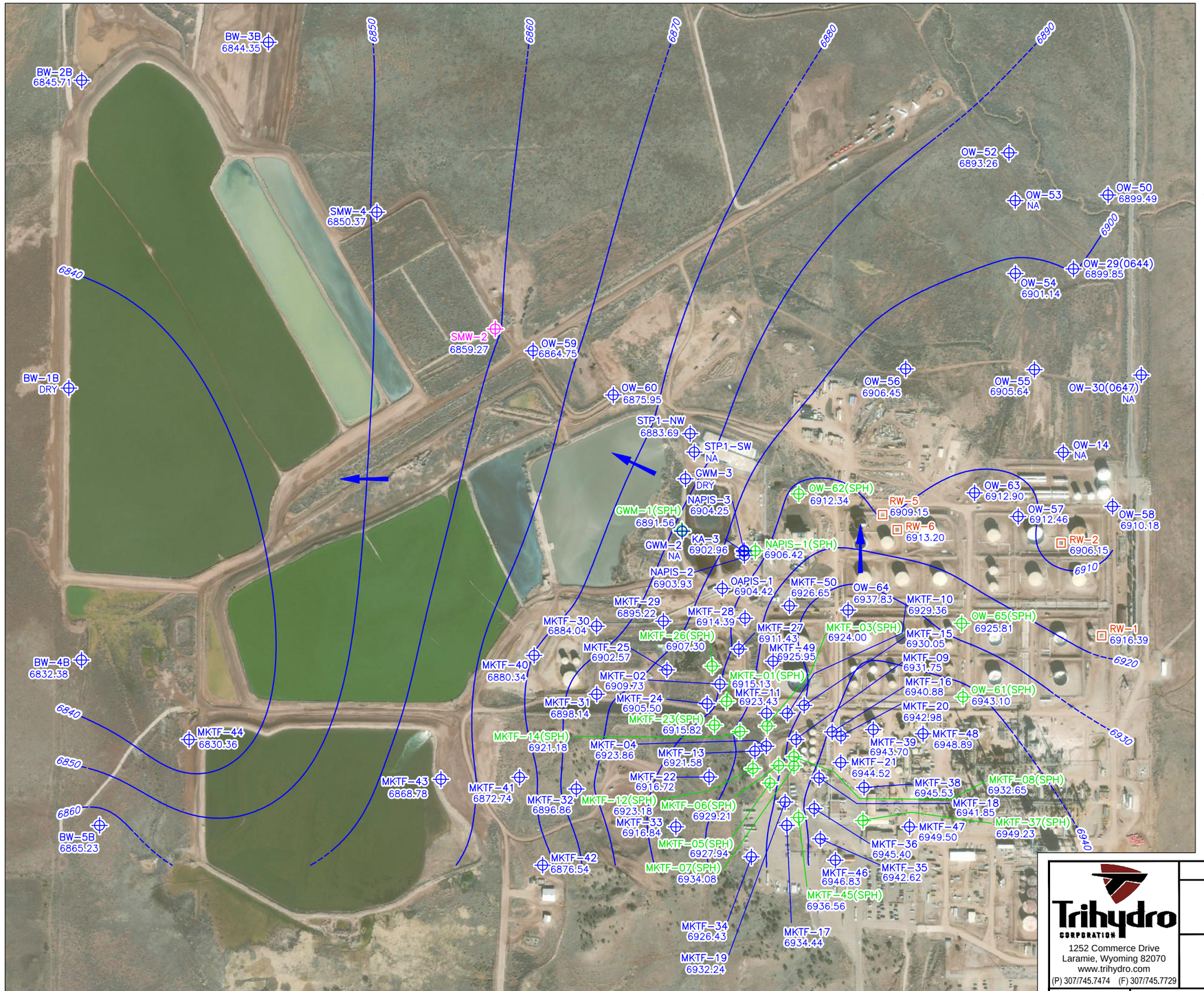

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EXPLANATION

OW-52 6893.26	CHINLE/ALLUVIUM INTERFACE WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, DECEMBER 2020)
SMW-2 6859.27	UPPER SAND WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, DECEMBER 2020)
OW-62(SPH) 6912.34	SPH MONITORING WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL,DECEMBER 2020)
RW-5 6909.15	RECOVERY WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, DECEMBER 2020)
6900	LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FT AMSL, DASHED WHERE INFERRED)
	ESTIMATED GROUNDWATER FLOW DIRECTION
FT AMSL	FEET ABOVE MEAN SEA LEVEL
SPH	SINGLE-PHASE HYDROCARBON

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

FIGURE 2

ALLUVIUM / CHINLE GROUP INTERFACE WATER ELEVATION MAP 2020

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 500'	Date: 1/8/21	File: 697-GW-AC-WTRELEVMAP-2020

ATTACHMENTS

Attachment A
Gallup Refinery Field Sampling Collection and Handling Standard Procedures

Field Data Collection: Elevation and Purging

All facility monitoring and recovery wells are gauged as required throughout the year. The Gallup Refinery (Refinery) does not have any recovery well pumps that need to be shut off and removed prior to water elevation measurements. There are groundwater recovery pumps installed in wells RW-1, RW-2, RW-5, RW-6, OW-14, OW-58, OW-30, and OW-55, but they are inactive at this time. If Marathon Petroleum Company resumes recovery operations with these pumps, they must halt the pumping operation at least 48 hours prior to conducting depth measurements in these wells.

Each well is field verified with the well number on the well casing or adjacent to the well to ensure that samples are collected from the correct well location. Wells also have a permanent marked reference point on the well casing from which ground water levels and well depths are measured. The portable pump intake is lowered to the midpoint of the listed screened interval for each specific well using the markings identified on the pump hose, which are set at 1-foot (ft) intervals. In wells with dedicated pumps, the pumps have been installed at the midpoint of the screened interval.

All water/product levels are measured to an accuracy of the nearest 0.01 ft using an oil/water interface meter. Water levels and well depths in the deeper wells are gauged with an electric water depth meter. After determining water levels, well volumes are calculated using the appropriate conversion factors for a given well based on its internal diameter. Volume is equal to the height of the liquid column times the internal cross-sectional area of the well.

Generally, at least three well volumes (or a minimum of two if the well has low recharge) are purged from each well prior to sampling. Field water quality parameters measured during purging are pH, electrical conductivity, temperature, dissolved oxygen (DO), and oxidation-reduction potential (ORP). One or more parameters must stabilize to within 10% for a minimum of three consecutive measurements before collection of ground water samples utilizing low-flow sampling techniques. When purging wells using a bailer, bailing will be considered complete when 3 well volumes have been removed from the wells. Field

parameters will be measured and recorded while bailing, with the understanding that the process of hand-bailing may prevent stabilization of field parameters.

Before sample collection can begin, the water collected from each well must be fresh aquifer water. Well evacuation replaces stagnant well water with fresh aquifer water. The water level in the well, total depth of well and thickness of floating product (if any) will be measured using an oil/water interface meter. If any product is present, regardless of thickness, a groundwater sample will not be obtained.

If a well is pumped or bailed dry before two or three well volumes can be evacuated, it requires only that sufficient time elapse for an adequate volume of water to accumulate for the sampling event. The first sample will be tested for pH, temperature, specific conductivity and DO. The well will be retested for pH, temperature, specific conductivity and DO after sampling as a measure of purging efficiency and as a check on the stability of the water samples over time. All well evacuation information will be recorded in a log-book.

Wells MW-1, MW-2, MW-4, MW-5, BW-1C, BW-2A, BW-2B, BW-3B, BW-4B, BW-5B, BW-5C, SMW-4, OW-1, OW-10, OW-13, OW-14, OW-29, and OW-30 are each equipped with a dedicated electrical pump. Wells SMW-2, OW-11, OW-12, OW-50, and OW-52 are purged and sampled using a portable Grundfos pump. The remaining wells are hand-bailed if the presence of water is detected. If SPH is detected in any of these wells, no samples will be collected.

Purged well water from wells is collected in 55-gallon drums, buckets, or totes and drained to the process sewer upstream of the NAPIS. The water is treated in the refinery's wastewater treatment system.

Sampling Equipment at Refinery

The following sampling equipment is maintained at the Refinery and used by the sampling personnel:

- Heron Instruments 100 ft. DipperT electric water depth tape complying with US GGG-T-106E, EEC Class II.
- Pall Corporation Acro 50A 0.45-micron disposable filter used with 60 ml disposable syringes for filtering water in the field.

- YSI pH/Conductivity meter Model 63, calibrated with a one-point, two-point, or three-point calibration procedure using pH standards of 7, 4 and 10 (measures pH, temperature, conductivity, TDS, salinity, DO, and ORP)
- IQ Scientific Instruments (measures pH, temperature, conductivity, TDS, salinity, DO, and ORP), Model IQ1806LP.
- Grundfos 2-in pumps with Grundfos 115-volt AC–to-DC converter.
- WaterMark Oil Water Interface Meter (100 ft), Model 101L/SMOIL, S/N 01-5509.

Calibration and maintenance procedures will be performed according to the manufacturer's specifications. In the event an instrument becomes inoperable, a similar instrument will be used.

Order of Collection

Samples will be collected in the order listed below:

Parameter	Bottle Type
VOC	40 milliliter (mL) VOA vials (HCl)
TPH	40 mL VOA vials (HCl)
TPH	250 mL glass amber bottles
EDB AND EDC	40 mL VOA vials ($Na_2S_2O_3$)
SVOC	1 liter glass amber bottle
Total Metals	250 mL plastic bottle (HNO_3)
Dissolved Metals	125 mL plastic bottle (HNO_3)
Major Cations/Anions	125 mL plastic bottle (HNO_3)
Major Cations/Anions	125 mL plastic bottle (HNO_3)
Major Cations/Anions	125 mL plastic bottle (HNO_3)
BOD	1 liter plastic bottle
TDS	500 mL plastic bottle
COD	500 mL plastic bottle (H_2SO_4)
Cyanide	500 mL plastic bottle (NaOH)
Pesticides	1 liter glass amber bottle
E-Coli	100 mL plastic bottle

*Pre-filtration bottle for dissolved metals which is subsequently filtered in the field and transferred to a pint plastic bottle with nitric acid (HNO_3) preservative.

Filtration

Ground water samples are filtered prior to dissolve metals analysis. For dissolved metals, sample water is poured into a jar and then extracted with a syringe. The syringe is then used to force the sample water through a 0.45-micron pore filter into the proper sample bottle to collect dissolved metals samples. Filtration must be performed within 2 hours of sample collection. Pour the filtrate into a sample bottle containing HNO_3 preservative.

For samples destined for total metals analysis, do not filter the sample, and preserve with HNO_3 to pH <2 in the field.

Sampling personnel will carry a cell phone when gathering ground water and other water samples. While sampling procedures are generally well known and the appropriate sample bottles are ordered to match each sampling event, occasional questions do arise from unforeseen circumstances which may develop during sampling. At such times, sampling personnel contact Hall Environmental Analytical Laboratory to verify that sampling is correctly performed. Examples would be if a well were to run dry short of filling the last sample bottle or to determine if there is enough water for sample analysis.

Sample Handling Procedures

At a minimum, the following procedures will be used when collecting samples:

- Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample.
- All samples collected for chemical analysis will be transferred into clean sample containers supplied by the analytical laboratory. The sample container will be clearly marked. Sample container volumes and preservation methods will be in accordance with the most recent standard EPA and industry accepted practices for use by accredited analytical laboratories. Sufficient sample volume will be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis.
- Sample labels and documentation will be completed for each sample.

Immediately after the samples are collected, they will be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described in Section 4.2.1 of this Plan, will be followed for all samples collected. All samples

will be submitted to the laboratory to allow the laboratory to conduct the analyses within the method holding times.

General Well Sampling Procedures

For safety, protection, and sampling purity, rubber gloves or disposable nitrile gloves will be worn and changed between each activity.

Sample bottles and labels will be separated into plastic bags for each well to be sampled. The plastic bags holding the sample bottles, will be placed in an ice chest to take into the field. A field notebook and sample log will be used to document weather conditions and sample date and time. The label will be completed with location, date, time, analysis, preservative, and the name of the sampler. For low-flow sampling, converter speed will be adjusted prior to filling bottles. Sample labels will be affixed and bottles will be filled according to lab instructions. Bottles with septa lids will be used for samples intended for VOC analysis. VOC bottles will be filled to the neck and a final amount of water will be added using the cap to form meniscus before screwing the lid onto the sample bottle. To ensure a proper sample has been collected, the bottles will be turned upside down and examined for bubbles, if bubbles are detected in the vial, the collection procedure will be repeated. If no bubbles are present, the lid will be secured, and the bottles will be packed in bubble wrap and placed in the cooler until sampling is completed.

Any reusable equipment that is not dedicated to a specific well will be decontaminated. Completed samples will be refrigerated until they are shipped to the laboratory. Appropriate shipping methods will be arranged to accommodate holding times. Sampling equipment and supplies will be checked, and proper inventory verified prior to sampling. Before departing, QA/QC requirements will be checked to ensure that there are equipment and supplies to fulfil the additional requirements.

Surface Water Sample Collection

At the evaporation ponds, samples will be collected as a grab sample at the pond edge near the inlets. This location will be noted in the field notebooks. The sampler will avoid disturbing sediment and gently allow the sample container to fill, making sure that undue disturbance does not allow volatile contaminants to be lost. The sample bottle will be used for the sample collection in a shallow location near the bank. If a separate bottle and/or bailer are used to refill the sample container, this will be noted

in the field log books. The decision to use a separate bottle/bailer will be made, if at all, by the sampler and the reasons for doing so will be noted in the field log book.

Upon arrival at the field site, the sampler will set out safety equipment such as traffic cones and signs (if required). The vehicle will be parked at a sufficient distance away so as to prevent sample contamination from emissions. Appropriate sample containers and gloves must be used for the type of analyses to be performed.

Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. Most field equipment used for ground water sampling will be disposable and, therefore, not require decontamination. To prevent cross-contamination, field equipment that comes into contact with water or soil will be decontaminated between each sampling location. The decontamination procedure will consist of washing the equipment with a non-phosphate detergent solution (e.g., Fantastik™, Liqui-Nox®), followed by two rinses of distilled water, and air dried.

Decontamination water and rinsate will be contained and disposed of the same way as purge water, as described in Section 4.2. Decontamination procedures and the cleaning agents used will be documented in the daily field log.

Field Equipment Calibration Procedures

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. Calibration checks will be conducted daily, and the instruments will be recalibrated if necessary. Calibration measurements will be recorded in the daily field logs.

If field equipment becomes inoperable, its use will be discontinued until the necessary repairs are made. A properly calibrated replacement instrument will be used in the interim. Instrumentation used during sampling events will be recorded in the daily field logs.

Collection and Management of Investigation Derived Waste

Investigation derived waste generated during each groundwater sampling event may include purge water, decontamination water, excess sample material, and disposable sampling equipment. All water

from all wells generated during sampling and decontamination activities will be temporarily stored in labeled 55-gallon drums until placed in the refinery wastewater treatment system upstream of the API separator. All other solid waste generated during sampling activities (sampling gloves, tubing, etc.) will be disposed of with the refinery's general municipal waste.

Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded using indelible ink on field sampling forms. The original field forms will be maintained at the Refinery. Completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. The daily record of field activities will include the following information:

- Well ID/evaporation pond location/outfall
- Date
- Start and finish sampling time
- Field team members, including visitors
- Weather conditions
- Daily activities and times conducted
- Observations
- Record of samples collected with sample designations
- Photo log (if needed)
- Field monitoring data, including health and safety monitoring (if needed)
- Equipment used and calibration records, if appropriate
- List of additional data sheets and maps completed
- An inventory of the waste generated and the method of storage or disposal
- Signature of personnel completing the field record

Sample Custody

All samples collected for analysis will be recorded in the field report or data sheets. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site, and will accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the conditions of

the samples will be recorded on the form. The original chain-of-custody form will remain with the laboratory and a copy sent to the refinery. The Refinery will maintain copies of all chain-of-custody forms generated as part of sampling activities. Copies of the chain-of-custody records will be included with all draft and final laboratory reports submitted to NMED and OCD.

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
BW-1A	9/14/2020	6885.12	NA	Dry	Dry	ND
BW-1B	9/14/2020	6885.78	NA	Dry	Dry	ND
BW-1C	9/14/2020	6885.68	NA	6871.79	13.89	ND
BW-2A	9/14/2020	6874.69	NA	6841.76	32.93	ND
BW-2B	9/14/2020	6874.5	NA	6845.71	28.79	ND
BW-2C	9/14/2020	6875.3	NA	6853.98	21.32	ND
BW-3A	9/14/2020	6878.39	NA	Dry	Dry	ND
BW-3B	9/14/2020	6878.59	NA	6844.35	34.24	ND
BW-3C	9/14/2020	6877.95	NA	6869.43	8.52	ND
BW-4A	3/9/2020	6873.18	NA	6834.84	38.34	ND
BW-4A	6/30/2020	6873.18	NA	Dry	Dry	ND
BW-4A	9/14/2020	6873.18	NA	Dry	Dry	ND
BW-4A	12/7/2020	6873.18	NA	Dry	Dry	ND
BW-4B	3/9/2020	6873.23	NA	6832.88	40.35	ND
BW-4B	6/26/2020	6873.23	NA	NA	NA	NA
BW-4B	6/30/2020	6873.23	NA	6828.48	44.75	ND
BW-4B	9/14/2020	6873.23	6833.38	6833.37	39.86	39.85
BW-4B	12/7/2020	6873.23	NA	6837.37	35.86	ND
BW-5A	3/5/2020	6877.00	NA	Dry	Dry	ND
BW-5A	6/26/2020	6877.00	NA	6853.79	23.21	ND
BW-5A	9/14/2020	6877.00	NA	Dry	Dry	ND
BW-5A	12/7/2020	6877.00	NA	6853.73	23.27	ND
BW-5B	3/5/2020	6876.82	NA	6866.88	9.94	ND
BW-5B	6/26/2020	6876.82	NA	6866.61	10.21	ND
BW-5B	9/14/2020	6876.82	NA	6866.21	10.61	ND
BW-5B	12/7/2020	6876.82	NA	6866.29	10.53	ND
BW-5C	3/5/2020	6876.85	NA	6874.05	2.8	ND
BW-5C	6/26/2020	6876.85	NA	6873.47	3.38	ND
BW-5C	9/14/2020	6876.85	NA	6872.49	4.36	ND
BW-5C	12/7/2020	6876.85	NA	6872.58	4.27	ND
GWM-1	3/3/2020	6912.61	6891.21	6891.13	21.48	21.4
GWM-1	7/1/2020	6912.61	6891.79	6892.24	20.37	20.82
GWM-1	9/15/2020	6912.61	6891.88	6891.21	21.4	20.73
GWM-1	11/9/2020	6912.61	6891.73	6890.89	21.72	20.88
GWM-1	12/7/2020	6912.61	6891.7	6890.76	21.85	20.91
GWM-2	3/3/2020	6913.09	NA	Dry	Dry	ND
GWM-2	7/1/2020	6913.09	NA	Dry	Dry	ND
GWM-2	9/15/2020	6913.09	NA	Dry	Dry	ND
GWM-2	11/10/2020	6913.09	NA	Dry	Dry	ND
GWM-2	12/7/2020	6913.09	NA	Dry	Dry	ND
GWM-3	3/3/2020	6910.25	NA	Dry	Dry	ND
GWM-3	7/1/2020	6910.25	NA	Dry	Dry	ND
GWM-3	9/15/2020	6910.25	NA	Dry	Dry	ND
GWM-3	10/11/2020	6910.25	NA	Dry	Dry	ND
GWM-3	12/7/2020	6910.25	NA	Dry	Dry	ND
KA-3	3/3/2020	6912.52	NA	6903.22	9.3	ND

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
KA-3	7/1/2020	6912.52	NA	6903.77	8.75	ND
KA-3	12/7/2020	6912.52	NA	6902.96	9.56	ND
MW-1	6/30/2020	6878.12	NA	6870.87	7.25	ND
MW-1	9/14/2020	6878.12	NA	6870.4	7.72	ND
MW-2	6/30/2020	6880.30	NA	6871.01	9.29	ND
MW-2	9/14/2020	6880.30	NA	6870.56	9.74	ND
MW-4	6/30/2020	6881.63	NA	6874.13	7.5	ND
MW-4	9/14/2020	6881.63	NA	6873.63	8	ND
MW-5	6/30/2020	6882.83	NA	6871.37	11.46	ND
MW-5	9/14/2020	6882.83	NA	6870.84	11.99	ND
NAPIS-1	3/4/2020	6913.86	6906.17	6906.12	7.74	7.69
NAPIS-1	7/1/2020	6913.86	6906.48	6906.44	7.42	7.38
NAPIS-1	9/15/2020	6913.86	6907.16	6907.15	6.71	6.7
NAPIS-1	11/10/2020	6913.86	6906.67	6906.66	7.2	7.19
NAPIS-1	12/7/2020	6913.86	NA	6906.42	7.44	ND
NAPIS-2	3/3/2020	6912.65	NA	6903.19	9.46	ND
NAPIS-2	7/1/2020	6912.65	NA	6903.53	9.12	ND
NAPIS-2	9/15/2020	6912.65	NA	6904.53	8.12	ND
NAPIS-2	11/10/2020	6912.65	NA	6904.14	8.51	ND
NAPIS-2	12/7/2020	6912.65	NA	6903.93	8.72	ND
NAPIS-3	7/1/2020	6912.76	NA	6902.66	10.1	ND
NAPIS-3	9/15/2020	6912.76	NA	6903.51	9.25	ND
NAPIS-3	11/10/2020	6912.76	NA	6903.29	9.47	ND
NAPIS-3	12/7/2020	6912.76	NA	6904.25	8.51	ND
OAPIS-1	3/3/2020	6916.73	NA	6904.27	12.46	ND
OAPIS-1	7/1/2020	6916.73	NA	6904.13	12.6	ND
OAPIS-1	9/15/2020	6916.73	NA	6904.83	11.9	ND
OAPIS-1	11/10/2020	6916.73	NA	6904.71	12.02	ND
OAPIS-1	12/7/2020	6916.73	NA	6904.42	12.31	ND
OW-01	3/9/2020	6866.62	NA	6864.92	1.7	ND
OW-01	6/30/2020	6866.62	NA	6865.02	1.6	ND
OW-01	9/15/2020	6866.62	NA	6865.17	1.45	ND
OW-01	12/7/2020	6866.62	NA	6864.87	1.75	ND
OW-10	3/4/2020	6874.91	NA	6869.48	5.43	ND
OW-10	6/30/2020	6874.91	NA	6868.16	6.75	ND
OW-10	9/20/2020	6874.91	NA	6867.21	7.7	ND
OW-10	10/9/2020	6874.91	NA	6867.21	7.7	ND
OW-10	12/7/2020	6874.91	NA	6867.3	7.61	ND
OW-11	9/15/2020	6923.51	NA	6905	18.51	ND
OW-12	6/30/2020	6940.69	NA	Dry	Dry	ND
OW-12	9/14/2020	6940.69	NA	6894.24	46.45	ND
OW-12	11/9/2020	6940.69	NA	6894.2	46.49	ND
OW-13	3/2/2020	6920.07	NA	6900.16	19.91	ND
OW-13	6/30/2020	6920.07	NA	6897.91	22.16	ND
OW-13	9/14/2020	6920.07	NA	6899.08	20.99	ND
OW-13	11/9/2020	6920.07	NA	6899.69	20.38	ND

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
OW-13	12/7/2020	6920.07	NA	6899.83	20.24	ND
OW-14	3/2/2020	6926.65	NA	NA	NA	NA
OW-14	6/30/2020	6926.65	NA	6903.9	22.75	ND
OW-14	9/14/2020	6926.65	NA	NA	NA	NA
OW-14	12/7/2020	6926.65	NA	6902.25	24.4	NA
OW-29	2/24/2020	6917.00	NA	6900.52	16.48	ND
OW-29	6/30/2020	6917.00	NA	6899.58	17.42	ND
OW-29	9/14/2020	6917.00	NA	6902.43	14.57	ND
OW-29	11/9/2020	6917.00	NA	6899.77	17.23	ND
OW-29	12/7/2020	6917.00	NA	6899.85	17.15	ND
OW-30	3/2/2020	6924.69	NA	NA	NA	NA
OW-30	6/30/2020	6924.69	NA	6902.36	22.33	ND
OW-30	9/15/2020	6924.69	NA	NA	NA	ND
OW-30	12/7/2020	6924.69	NA	6902.47	22.22	ND
OW-50	3/2/2020	6914.21	NA	6900.16	14.05	ND
OW-50	6/30/2020	6914.21	NA	6899.6	14.61	ND
OW-50	9/14/2020	6914.21	NA	6899.1	15.11	ND
OW-50	11/9/2020	6914.21	NA	6899.34	14.87	ND
OW-50	12/7/2020	6914.21	NA	6899.49	14.72	ND
OW-52	3/2/2020	6907.68	NA	6893.97	13.71	ND
OW-52	6/30/2020	6907.68	NA	6893.48	14.2	ND
OW-52	9/14/2020	6907.68	NA	6893.12	14.56	ND
OW-52	10/9/2020	6907.68	NA	6893.16	14.52	ND
OW-52	12/7/2020	6907.68	NA	6893.26	14.42	ND
OW-53	3/2/2020	6914.38	NA	Dry	Dry	ND
OW-53	6/30/2020	6914.38	NA	Dry	Dry	ND
OW-53	9/14/2020	6914.38	NA	Dry	Dry	ND
OW-53	11/9/2020	6914.38	NA	Dry	Dry	ND
OW-53	12/7/2020	6914.38	NA	Dry	Dry	ND
OW-54	3/2/2020	6918.92	NA	6901.74	17.18	ND
OW-54	6/30/2020	6918.92	NA	6901.17	17.75	ND
OW-54	9/14/2020	6918.92	NA	6900.75	18.17	ND
OW-54	10/9/2020	6918.92	NA	6901	17.92	ND
OW-54	12/7/2020	6918.92	NA	6901.14	17.78	ND
OW-55	3/2/2020	6923.25	NA	6906.29	16.96	ND
OW-55	6/30/2020	6923.25	NA	6905.83	17.42	ND
OW-55	9/14/2020	6923.25	NA	6905.29	17.96	ND
OW-55	10/9/2020	6923.25	NA	6905.55	17.7	ND
OW-55	12/7/2020	6923.25	NA	6905.64	17.61	ND
OW-56	3/2/2020	6920.18	NA	6907.16	13.02	ND
OW-56	6/30/2020	6920.18	NA	6905.85	14.33	ND
OW-56	9/14/2020	6920.18	NA	6905.82	14.36	ND
OW-56	11/9/2020	6920.18	NA	6905.97	14.21	ND
OW-56	12/7/2020	6920.18	NA	6906.45	13.73	ND
OW-57	3/4/2020	6933.10	NA	6913.13	19.97	ND
OW-57	6/30/2020	6933.10	NA	6912.88	20.22	ND

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
OW-57	9/14/2020	6933.10	NA	6912.6	20.5	ND
OW-57	11/9/2020	6933.10	NA	6912.57	20.53	ND
OW-57	12/7/2020	6933.10	NA	6912.46	20.64	ND
OW-58	6/30/2020	6934.50	NA	6910.38	24.12	ND
OW-58	9/14/2020	6934.50	NA	6910.95	23.55	ND
OW-58	11/9/2020	6934.50	NA	6911.19	23.31	ND
OW-58	12/8/2020	6934.50	NA	6910.18	24.32	ND
OW-58A	3/5/2020	6935.88	NA	6909.75	26.13	ND
OW-58A	6/30/2020	6935.88	NA	6909.38	26.5	ND
OW-58A	9/15/2020	6935.88	NA	6909.01	26.87	ND
OW-58A	11/9/2020	6935.88	NA	6911.57	24.31	ND
OW-58A	12/8/2020	6935.88	NA	6909.17	26.71	ND
OW-59	6/30/2020	6889.73	NA	6866.06	23.67	ND
OW-59	9/14/2020	6889.73	NA	6865.67	24.06	ND
OW-59	12/7/2020	6889.73	NA	6865.82	23.91	ND
OW-60	3/3/2020	6893.51	NA	6877.37	16.14	ND
OW-60	6/30/2020	6893.51	NA	6877.01	16.5	ND
OW-60	9/14/2020	6893.51	NA	6876.94	16.57	ND
OW-60	11/9/2020	6893.51	NA	6877.16	16.35	ND
OW-60	12/7/2020	6893.51	NA	6876.96	16.55	ND
OW-61	3/4/2020	6963.57	6945.29	6942.48	21.09	18.28
OW-61	6/29/2020	6963.57	6946.4	6945.53	18.04	17.17
OW-61	9/15/2020	6963.57	6946.69	6944.17	19.4	16.88
OW-61	11/9/2020	6963.57	6945.35	6943.99	19.58	18.22
OW-61	12/8/2020	6963.57	6945.17	6943.27	20.3	18.4
OW-62	3/10/2020	6937.36	6913.78	6913.2	24.16	23.58
OW-62	6/30/2020	6937.36	6913.74	6913.45	23.91	23.62
OW-62	9/15/2020	6937.36	6913.74	6913.49	23.87	23.62
OW-62	11/9/2020	6937.36	6913.66	6913.36	24	23.7
OW-62	12/8/2020	6937.36	6913.67	6913.38	23.98	23.69
OW-63	3/4/2020	6935.06	NA	6914.65	20.41	ND
OW-63	6/29/2020	6935.06	NA	6914.6	20.46	ND
OW-63	9/14/2020	6935.06	NA	6914.33	20.73	ND
OW-63	11/9/2020	6935.06	NA	6914.21	20.85	ND
OW-63	12/8/2020	6935.06	NA	6914.09	20.97	ND
OW-64	3/4/2020	6947.40	NA	6939.9	7.5	ND
OW-64	6/30/2020	6947.40	NA	6939.05	8.35	ND
OW-64	9/14/2020	6947.40	NA	6939.45	7.95	ND
OW-64	11/9/2020	6947.40	NA	6939.22	8.18	ND
OW-64	12/7/2020	6947.40	NA	6939.14	8.26	ND
OW-65	3/4/2020	6954.05	6930.22	6923.97	30.08	23.83
OW-65	6/29/2020	6954.05	6929.97	6922.64	31.41	24.08
OW-65	9/14/2020	6954.05	6929.35	6923.29	30.76	24.7
OW-65	11/9/2020	6954.05	6929	6921.7	32.35	25.05
OW-65	12/8/2020	6954.05	6928.26	6922.1	31.95	25.79
RW-1	3/4/2020	6946.06	NA	NA	NA	NA

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
RW-1	6/30/2020	6946.06	6917.81	6916.56	29.5	28.25
RW-1	9/19/2020	6946.06	6917.99	6915.86	30.2	28.07
RW-1	11/10/2020	6946.06	6916.56	6915.73	30.33	29.5
RW-1	12/8/2020	6946.06	6916.56	6915.73	30.33	29.5
RW-2	3/4/2020	6928.53	NA	NA	NA	NA
RW-2	6/30/2020	6928.53	6907.87	6907.53	21	20.66
RW-2	9/19/2020	6928.53	6906.43	6906.3	22.23	22.1
RW-2	11/9/2020	6928.53	6906.44	6906.25	22.28	22.09
RW-2	12/8/2020	6928.53	6906.33	6906.15	22.38	22.2
RW-5	3/4/2020	6943.57	NA	NA	NA	NA
RW-5	6/30/2020	6943.57	6914.92	6911.52	32.05	28.65
RW-5	9/19/2020	6943.57	6913.98	6910.76	32.81	29.59
RW-5	11/9/2020	6943.57	6913.71	6910.54	33.03	29.86
RW-5	12/8/2020	6943.57	6910.42	6904.06	39.51	33.15
RW-6	3/4/2020	6944.01	NA	NA	NA	NA
RW-6	6/30/2020	6944.01	6915.14	6913.51	30.5	28.87
RW-6	9/19/2020	6944.01	6914.29	6911.37	32.64	29.72
RW-6	11/9/2020	6944.01	6914.03	6910.96	33.05	29.98
RW-6	12/8/2020	6944.01	6913.83	6910.7	33.31	30.18
SMW-2	6/30/2020	6883.97	NA	6859.72	24.25	ND
SMW-2	9/14/2020	6883.97	NA	6859.27	24.7	ND
SMW-4	6/30/2020	6879.52	NA	6850.35	29.17	ND
SMW-4	9/14/2020	6879.52	NA	6850.37	29.15	ND
STP1-NW	3/3/2020	6904.47	NA	6884.2	20.27	ND
STP1-NW	6/30/2020	6904.47	NA	6883.8	20.67	ND
STP1-NW	12/8/2020	6904.47	NA	6883.69	20.78	ND
STP1-SW	3/3/2020	6912.38	NA	NA	NA	NA
STP1-SW	12/8/2020	6912.38	NA	6883.15	29.23	NA

Definitions:
DRY = no water detected
NA = no data
ND = not detected
Monitoring wells were not monitored during the second quarter due to the COVID-19 pandemic and state shutdowns.

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-01	2/24/2020	6920.67	6915.80	6915.51	5.16	4.87
MKTF-01	6/26/2020	6920.67	6915.17	6914.96	5.71	5.50
MKTF-01	9/15/2020	6920.67	6915.06	6915.05	5.62	5.61
MKTF-01	11/10/2020	6920.67	6915.06	6914.78	5.89	5.61
MKTF-01	12/3/2020	6920.67	6914.93	6914.65	6.02	5.74
MKTF-02	2/24/2020	6917.45	NA	6910.93	6.52	ND
MKTF-02	6/26/2020	6917.45	NA	6909.75	7.70	ND
MKTF-02	9/15/2020	6917.45	NA	6909.57	7.88	ND
MKTF-02	11/10/2020	6917.45	NA	6910.02	7.43	ND
MKTF-02	12/3/2020	6917.45	NA	6909.73	7.72	ND
MKTF-03	3/5/2020	6931.69	6925.22	6923.85	7.84	6.47
MKTF-03	6/26/2020	6931.69	6924.33	6923.06	8.63	7.36
MKTF-03	9/15/2020	6931.69	6924.61	6924.60	7.09	7.08
MKTF-03	11/10/2020	6931.69	6924.56	6923.26	8.43	7.13
MKTF-03	12/3/2020	6931.69	6924.23	6923.07	8.62	7.46
MKTF-04	3/2/2020	6933.57	NA	6925.10	8.47	ND
MKTF-04	6/26/2020	6933.57	NA	6923.82	9.75	ND
MKTF-04	9/15/2020	6933.57	6924.18	6924.17	9.40	9.39
MKTF-04	11/10/2020	6933.57	NA	6924.37	9.20	ND
MKTF-04	12/3/2020	6933.57	6923.87	6923.86	9.71	9.70
MKTF-05	3/5/2020	6942.22	6928.64	6928.50	13.72	13.58
MKTF-05	6/25/2020	6942.22	6928.16	6927.42	14.80	14.06
MKTF-05	9/15/2020	6942.22	6928.57	6927.54	14.68	13.65
MKTF-05	11/10/2020	6942.22	6928.20	6927.32	14.90	14.02
MKTF-05	12/3/2020	6942.22	6928.10	6927.29	14.93	14.12
MKTF-06	3/5/2020	6946.81	6929.92	6928.21	18.60	16.89
MKTF-06	6/25/2020	6946.81	6932.76	6927.91	18.90	14.05
MKTF-06	9/15/2020	6946.81	6930.03	6928.10	18.71	16.78
MKTF-06	11/10/2020	6946.81	6929.61	6928.22	18.59	17.20
MKTF-06	12/3/2020	6946.81	6929.43	6928.32	18.49	17.38
MKTF-07	3/5/2020	6947.18	6934.68	6933.46	13.72	12.50
MKTF-07	6/25/2020	6947.18	6934.95	6933.42	13.76	12.23
MKTF-07	9/18/2020	6947.18	6935.76	6933.41	13.77	11.42
MKTF-07	11/10/2020	6947.18	6934.62	6933.42	13.76	12.56
MKTF-07	12/3/2020	6947.18	6934.25	6933.38	13.80	12.93
MKTF-08	3/5/2020	6947.09	6933.06	6932.72	14.37	14.03

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-08	6/25/2020	6947.09	6933.09	6932.69	14.40	14.00
MKTF-08	9/18/2020	6947.09	6933.33	6932.94	14.15	13.76
MKTF-08	11/10/2020	6947.09	6932.86	6932.40	14.69	14.23
MKTF-08	12/3/2020	6947.09	6932.73	6932.33	14.76	14.36
MKTF-09	3/2/2020	6946.50	NA	6932.27	14.23	ND
MKTF-09	6/25/2020	6946.50	NA	6931.95	14.55	ND
MKTF-09	9/18/2020	6946.50	6932.31	6932.30	14.20	14.19
MKTF-09	11/10/2020	6946.50	6931.89	6931.88	14.62	14.61
MKTF-09	12/3/2020	6946.50	6931.75	6931.74	14.76	14.75
MKTF-10	3/2/2020	6937.16	NA	6929.49	7.67	ND
MKTF-10	6/25/2020	6937.16	NA	6930.09	7.07	ND
MKTF-10	9/18/2020	6937.16	6929.64	6929.63	7.53	7.52
MKTF-10	11/10/2020	6937.16	NA	6929.37	7.79	ND
MKTF-10	12/3/2020	6937.16	NA	6929.36	7.80	ND
MKTF-11	3/2/2020	6931.34	NA	6923.45	7.89	ND
MKTF-11	6/26/2020	6931.34	6923.67	6923.66	7.68	7.67
MKTF-11	9/18/2020	6931.34	6923.75	6923.74	7.60	7.59
MKTF-11	11/10/2020	6931.34	NA	6923.73	7.61	ND
MKTF-11	12/3/2020	6931.34	6923.45	6923.43	7.91	7.89
MKTF-12	2/27/2020	6942.11	6924.27	6924.19	17.92	17.84
MKTF-12	6/29/2020	6942.11	6922.98	6922.86	19.25	19.13
MKTF-12	9/18/2020	6942.11	6923.47	6923.46	18.65	18.64
MKTF-12	11/10/2020	6942.11	6924.14	6924.11	18.00	17.97
MKTF-12	12/3/2020	6942.11	6923.21	6923.05	19.06	18.90
MKTF-13	2/27/2020	6935.18	6924.05	6917.87	17.31	11.13
MKTF-13	6/29/2020	6935.18	6922.51	6916.97	18.21	12.67
MKTF-13	9/18/2020	6935.18	6922.63	6918.26	16.92	12.55
MKTF-13	11/10/2020	6935.18	6923.20	6918.82	16.36	11.98
MKTF-13	12/3/2020	6935.18	6922.34	6918.53	16.65	12.84
MKTF-14	2/27/2020	6928.02	6922.67	6922.37	5.65	5.35
MKTF-14	6/29/2020	6928.02	6921.64	6919.44	8.58	6.38
MKTF-14	9/18/2020	6928.02	6921.84	6919.86	8.16	6.18
MKTF-14	11/10/2020	6928.02	6922.04	6921.74	6.28	5.98
MKTF-14	12/3/2020	6928.02	6921.23	6920.96	7.06	6.79
MKTF-15	2/3/2020	6943.48	6930.46	6930.37	13.11	13.02
MKTF-15	6/26/2020	6943.48	6930.37	6930.31	13.17	13.11

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-15	9/18/2020	6943.48	6930.48	6930.45	13.03	13.00
MKTF-15	11/10/2020	6943.48	6930.09	6929.88	13.60	13.39
MKTF-16	2/5/2020	6950.58	NA	6940.90	9.68	ND
MKTF-16	6/26/2020	6950.58	NA	6941.04	9.54	ND
MKTF-16	9/18/2020	6950.58	6941.40	6941.39	9.19	9.18
MKTF-16	11/10/2020	6950.58	NA	6943.38	7.20	ND
MKTF-16	12/8/2020	6950.58	NA	6940.88	9.70	ND
MKTF-17	2/3/2020	6945.76	6934.32	6928.91	16.85	11.44
MKTF-17	6/29/2020	6945.76	6935.57	6930.26	15.50	10.19
MKTF-17	9/14/2020	6945.76	6935.76	6930.39	15.37	10
MKTF-17	11/10/2020	6945.76	6934.37	6934.17	11.59	11.39
MKTF-17	12/4/2020	6945.76	6934.48	6934.29	11.47	11.28
MKTF-18	2/5/2020	6950.65	NA	6941.55	9.10	ND
MKTF-18	6/30/2020	6950.65	NA	6941.67	8.98	ND
MKTF-18	9/18/2020	6950.65	6942.16	6942.15	8.50	8.49
MKTF-18	11/10/2020	6950.65	NA	6941.91	8.74	ND
MKTF-18	12/4/2020	6950.65	NA	6941.85	8.80	ND
MKTF-19	2/3/2020	6944.67	6933.32	6932.27	12.40	11.35
MKTF-19	6/29/2020	6944.67	6932.59	6931.38	13.29	12.08
MKTF-19	9/14/2020	6944.67	6932.72	6932.70	11.97	11.95
MKTF-19	11/10/2020	6944.67	6932.45	6931.12	13.55	12.22
MKTF-19	12/4/2020	6944.67	6932.49	6931.25	13.42	12.18
MKTF-20	2/5/2020	6951.78	NA	6942.76	9.02	ND
MKTF-20	6/26/2020	6951.78	NA	6943.11	8.67	ND
MKTF-20	9/15/2020	6951.78	6943.24	6942.43	9.35	8.54
MKTF-20	11/10/2020	6951.78	6943.68	6942.88	8.90	8.10
MKTF-20	12/8/2020	6951.78	6943.02	6942.83	8.95	8.76
MKTF-21	2/5/2020	6952.57	NA	6944.32	8.25	ND
MKTF-21	6/26/2020	6952.57	6944.40	6944.37	8.20	8.17
MKTF-21	9/15/2020	6952.57	6945.49	6945.48	7.09	7.08
MKTF-21	11/10/2020	6952.57	NA	6946.16	6.41	ND
MKTF-21	12/4/2020	6952.57	6944.53	6944.52	8.05	8.04
MKTF-22	2/27/2020	6942.31	6917.83	6916.78	25.53	24.48
MKTF-22	6/29/2020	6942.31	6917.74	6914.60	27.71	24.57
MKTF-22	9/14/2020	6942.31	6917.33	6914.63	27.68	24.98
MKTF-22	11/10/2020	6942.31	6917.37	6915.02	27.29	24.94

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-22	12/4/2020	6942.31	6917.21	6914.76	27.55	25.10
MKTF-23	2/27/2020	6929.98	NA	6916.56	13.42	ND
MKTF-23	6/29/2020	6929.98	NA	6916.73	13.25	ND
MKTF-23	9/19/2020	6929.98	6914.56	6914.54	15.44	15.42
MKTF-23	11/10/2020	6929.98	NA	6915.75	14.23	ND
MKTF-23	12/4/2020	6929.98	6915.83	6915.82	14.16	14.15
MKTF-24	2/24/2020	6928.72	NA	6906.55	22.17	ND
MKTF-24	6/26/2020	6928.72	NA	6905.92	22.80	ND
MKTF-24	9/15/2020	6928.72	NA	6905.37	23.35	ND
MKTF-24	11/10/2020	6928.72	NA	6905.40	23.32	ND
MKTF-24	12/4/2020	6928.72	NA	6905.50	23.22	ND
MKTF-25	2/26/2020	6916.19	NA	6903.25	12.94	ND
MKTF-25	6/26/2020	6916.19	NA	6902.86	13.33	ND
MKTF-25	9/15/2020	6916.19	NA	6902.29	13.90	ND
MKTF-25	11/10/2020	6916.19	NA	6902.44	13.75	ND
MKTF-25	12/4/2020	6916.19	NA	6902.57	13.62	ND
MKTF-26	2/26/2020	6915.31	6906.96	6906.20	9.11	8.35
MKTF-26	6/26/2020	6915.31	6906.70	6905.81	9.50	8.61
MKTF-26	9/15/2020	6915.31	6906.50	6905.75	9.56	8.81
MKTF-26	11/10/2020	6915.31	6906.66	6905.95	9.36	8.65
MKTF-26	12/4/2020	6915.31	6907.64	6905.92	9.39	7.67
MKTF-27	2/24/2020	6917.90	NA	6914.29	3.61	ND
MKTF-27	6/30/2020	6917.90	NA	6911.20	6.70	ND
MKTF-27	9/15/2020	6917.90	NA	6911.69	6.21	ND
MKTF-27	11/10/2020	6917.90	NA	6911.18	6.72	ND
MKTF-27	12/4/2020	6917.90	NA	6911.43	6.47	ND
MKTF-28	2/24/2020	6921.52	NA	6916.99	4.53	ND
MKTF-28	6/30/2020	6921.52	NA	6916.68	4.84	ND
MKTF-28	9/15/2020	6921.52	NA	6916.93	4.59	ND
MKTF-28	11/10/2020	6921.52	NA	6912.71	8.81	ND
MKTF-28	12/4/2020	6921.52	NA	6914.39	7.13	ND
MKTF-29	2/24/2020	6901.62	NA	6897.13	4.49	ND
MKTF-29	6/26/2020	6901.62	NA	6895.20	6.42	ND
MKTF-29	9/15/2020	6901.62	NA	6893.61	8.01	ND
MKTF-29	11/10/2020	6901.62	NA	6894.64	6.98	ND
MKTF-29	12/4/2020	6901.62	NA	6895.22	6.40	ND

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-30	2/26/2020	6900.80	NA	6885.49	15.31	ND
MKTF-30	6/26/2020	6900.80	NA	6884.61	16.19	ND
MKTF-30	9/15/2020	6900.80	NA	6884.14	16.66	ND
MKTF-30	11/10/2020	6900.80	NA	6883.93	16.87	ND
MKTF-30	12/4/2020	6900.80	NA	6884.04	16.76	ND
MKTF-31	2/24/2020	6906.87	NA	6898.77	8.10	ND
MKTF-31	6/26/2020	6906.87	NA	6898.62	8.25	ND
MKTF-31	9/15/2020	6906.87	NA	6898.12	8.75	ND
MKTF-31	11/10/2020	6906.87	NA	6898.08	8.79	ND
MKTF-31	12/4/2020	6906.87	NA	6898.14	8.73	ND
MKTF-32	2/26/2020	6911.11	NA	6897.33	13.78	ND
MKTF-32	6/29/2020	6911.11	NA	6896.86	14.25	ND
MKTF-32	9/14/2020	6911.11	NA	6896.53	14.58	ND
MKTF-32	11/10/2020	6911.11	NA	6896.80	14.31	ND
MKTF-32	12/4/2020	6911.11	NA	6896.86	14.25	ND
MKTF-33	2/27/2020	6939.75	NA	6917.04	22.71	ND
MKTF-33	6/29/2020	6939.75	NA	6918.58	21.17	ND
MKTF-33	9/14/2020	6939.75	6918.14	6911.73	28.02	21.61
MKTF-33	11/10/2020	6939.75	6918.10	6911.94	27.81	21.65
MKTF-33	12/4/2020	6939.75	6918.06	6911.98	27.77	21.69
MKTF-34	2/5/2020	6945.35	NA	6927.57	17.78	ND
MKTF-34	6/29/2020	6945.35	6926.31	6926.29	19.06	19.04
MKTF-34	9/14/2020	6945.35	NA	6926.26	19.09	ND
MKTF-34	11/10/2020	6945.35	NA	6926.27	19.08	ND
MKTF-34	12/4/2020	6945.35	6926.44	6926.43	18.92	18.91
MKTF-35	2/5/2020	6951.65	NA	6942.37	9.28	ND
MKTF-35	6/30/2020	6951.65	NA	6942.40	9.25	ND
MKTF-35	9/14/2020	6951.65	NA	6943.06	8.59	ND
MKTF-35	11/10/2020	6951.65	NA	6942.79	8.86	ND
MKTF-35	12/4/2020	6951.65	6942.63	6942.62	9.03	9.02
MKTF-36	2/3/2020	6950.12	6942.23	6941.68	8.44	7.89
MKTF-36	6/30/2020	6950.12	6942.08	6941.87	8.25	8.04
MKTF-36	9/14/2020	6950.12	NA	6942.25	7.87	ND
MKTF-36	11/10/2020	6950.12	6942.14	6942.09	8.03	7.98
MKTF-36	12/4/2020	6950.12	6942.02	6941.95	8.17	8.1
MKTF-37	2/3/2020	6958.87	6949.10	6948.98	9.89	9.77

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-37	6/30/2020	6958.87	6949.26	6949.24	9.63	9.61
MKTF-37	9/14/2020	6958.87	NA	6950.11	8.76	ND
MKTF-37	11/10/2020	6958.87	6949.51	6949.50	9.37	9.36
MKTF-37	12/4/2020	6958.87	6949.23	6949.22	9.65	9.64
MKTF-38	3/4/2020	6954.89	NA	6945.28	9.61	ND
MKTF-38	6/26/2020	6954.89	NA	6945.51	9.38	ND
MKTF-38	9/14/2020	6954.89	NA	6946.34	8.55	ND
MKTF-38	11/10/2020	6954.89	NA	6945.77	9.12	ND
MKTF-38	12/4/2020	6954.89	6945.54	6945.53	9.36	9.35
MKTF-39	2/3/2020	6953.75	NA	6943.65	10.10	ND
MKTF-39	6/26/2020	6953.75	NA	6944.12	9.63	ND
MKTF-39	9/15/2020	6953.75	NA	6944.17	9.58	ND
MKTF-39	11/10/2020	6953.75	NA	6943.70	10.05	ND
MKTF-39	12/4/2020	6953.75	NA	6943.60	10.15	ND
MKTF-40	2/27/2020	6894.33	NA	6881.10	13.23	ND
MKTF-40	6/26/2020	6894.33	NA	6881.58	12.75	ND
MKTF-40	9/15/2020	6894.33	NA	6880.94	13.39	ND
MKTF-40	11/10/2020	6894.33	NA	6880.62	13.71	ND
MKTF-40	12/4/2020	6894.33	NA	6880.34	13.99	ND
MKTF-41	2/26/2020	6893.64	NA	6873.49	20.15	ND
MKTF-41	6/29/2020	6893.64	NA	6873.87	19.77	ND
MKTF-41	9/14/2020	6893.64	NA	6872.92	20.72	ND
MKTF-41	11/10/2020	6893.64	NA	6872.63	21.01	ND
MKTF-41	12/4/2020	6893.64	NA	6872.74	20.90	ND
MKTF-42	2/26/2020	6892.95	NA	6876.16	16.79	ND
MKTF-42	6/30/2020	6892.95	NA	6876.70	16.25	ND
MKTF-42	9/14/2020	6892.95	NA	6876.60	16.35	ND
MKTF-42	11/10/2020	6892.95	NA	6877.65	15.30	ND
MKTF-42	12/4/2020	6892.95	NA	6876.54	16.41	ND
MKTF-43	2/26/2020	6876.90	NA	6870.57	6.33	ND
MKTF-43	6/30/2020	6876.90	NA	6871.40	5.50	ND
MKTF-43	9/14/2020	6876.90	NA	6870.45	6.45	ND
MKTF-43	11/10/2020	6876.90	NA	6869.42	7.48	ND
MKTF-43	12/4/2020	6876.90	NA	6868.78	8.12	ND
MKTF-44	3/4/2020	6869.95	NA	6839.61	30.34	ND
MKTF-44	6/26/2020	6869.95	NA	6836.87	33.08	ND

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-44	9/14/2020	6869.95	NA	6841.95	28.00	ND
MKTF-44	12/4/2020	6869.95	NA	6830.36	39.59	ND
MKTF-45	2/3/2020	6949.59	6939.99	6930.97	18.62	9.60
MKTF-45	6/30/2020	6949.59	6938.51	6930.51	19.08	11.08
MKTF-45	9/14/2020	6949.59	6936.45	6931.16	18.43	13.14
MKTF-45	11/10/2020	6949.59	6936.65	6934.83	14.76	12.94
MKTF-45	12/4/2020	6949.59	6936.93	6935.08	14.51	12.66
MKTF-46	3/5/2020	6957.60	NA	6946.67	10.93	ND
MKTF-46	6/30/2020	6957.60	NA	6946.52	11.08	ND
MKTF-46	9/14/2020	6957.60	NA	6947.42	10.18	ND
MKTF-46	11/10/2020	6957.60	NA	6947.03	10.57	ND
MKTF-46	12/4/2020	6957.60	NA	6946.83	10.77	ND
MKTF-47	3/5/2020	6959.09	NA	6949.20	9.89	ND
MKTF-47	6/29/2020	6959.09	NA	6949.59	9.50	ND
MKTF-47	9/15/2020	6959.09	6950.56	6950.55	8.54	8.53
MKTF-47	11/10/2020	6959.09	NA	6949.76	9.33	ND
MKTF-47	12/4/2020	6959.09	6949.51	6949.50	9.59	9.58
MKTF-48	3/3/2020	6961.73	6949.07	6948.91	12.82	12.66
MKTF-48	6/29/2020	6961.73	NA	6950.15	11.58	ND
MKTF-48	9/15/2020	6961.73	6949.88	6949.87	11.86	11.85
MKTF-48	11/10/2020	6961.73	6949.33	6949.22	12.51	12.40
MKTF-48	12/4/2020	6961.73	6948.96	6948.63	13.10	12.77
MKTF-49	3/4/2020	6946.76	NA	6926.49	20.27	ND
MKTF-49	6/30/2020	6946.76	NA	6926.11	20.65	ND
MKTF-49	9/15/2020	6946.76	NA	6926.43	20.33	ND
MKTF-49	11/10/2020	6946.76	NA	6926.01	20.75	ND
MKTF-49	12/4/2020	6946.76	NA	6925.95	20.81	ND
MKTF-50	3/4/2020	6942.82	NA	6926.95	15.87	ND
MKTF-50	6/30/2020	6942.82	NA	6926.82	16.00	ND
MKTF-50	9/15/2020	6942.82	6927.46	6927.45	15.37	15.36
MKTF-50	11/10/2020	6942.82	NA	6926.79	16.03	ND
MKTF-50	12/4/2020	6942.82	NA	6926.65	16.17	ND

Definitions:
NA = no data
ND = Not measured
Monitoring wells were not monitored during the second quarter due to the COVID-19 pandemic and state shutdowns.

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
BW-1A	09/14/20	11/10/03	2	6,883.17	6,885.12	1.95	6,847.50	43.70	ND	NA	DRY	DRY	NA	30 - 35	Upper Sand
BW-1B	09/14/20	10/28/03	2	6,883.17	6,885.78	2.61	6,818.33	73.38	ND	NA	DRY	DRY	NA	54.6 - 64.6	Chinle/Alluvial Interface
BW-1C	09/14/20	11/10/03	2	6,883.17	6,885.68	2.51	6,749.29	145.29	ND	NA	13.89	6,871.79	NA	125 -135	Sonsela Sandstone
BW-2A	09/14/20	11/10/03	2	6,871.88	6,874.69	2.81	6,807.12	67.21	ND	NA	32.93	6,841.76	NA	55 - 65	Upper Sand
BW-2B	09/14/20	10/28/03	2	6,871.66	6,874.50	2.84	6,782.24	92.26	ND	NA	28.79	6,845.71	NA	80 - 90	Chinle/Alluvial Interface
BW-2C	09/14/20	10/28/03	2	6,872.90	6,875.30	2.40	6,722.46	149.10	ND	NA	21.32	6,853.98	NA	139.5 - 149.5	Sonsela Sandstone
BW-3A	09/14/20	06/15/04	2	6,875.94	6,878.39	2.45	6,826.04	53.30	ND	NA	DRY	DRY	NA	39.5 - 49.5	Upper Sand
BW-3B	09/14/20	10/15/03	2	6,876.16	6,878.59	2.43	6,809.19	69.54	ND	NA	34.24	6,844.35	NA	63 - 73	Chinle/Alluvial Interface
BW-3C	09/14/20	07/20/04	2	6,875.72	6,877.95	2.23	6,723.40	150.20	ND	NA	8.52	6,869.43	NA	144.5 - 154.5	Sonsela Sandstone
BW-4A	09/14/20	06/29/17	2	6,869.28	6,872.20	2.92	6,908.18	38.90	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
BW-4A	12/07/20	06/29/17	2	6,869.28	6,872.20	2.92	6,908.18	38.90	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
BW-4B	09/14/20	06/29/17	2	6,869.45	6,872.24	2.79	6,932.95	63.50	39.85	0.01	39.86	6,832.38	NA	41 - 61	Chinle/Alluvial Interface
BW-4B	12/07/20	06/29/17	2	6,869.45	6,872.24	2.79	6,932.95	63.50	ND	NA	35.86	6,832.38	NA	41 - 61	Chinle/Alluvial Interface
BW-5A	09/14/20	06/29/17	2	6,873.18	6,876.06	2.88	6,896.58	23.40	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
BW-5A	12/07/20	06/29/17	2	6,873.18	6,876.06	2.88	6,896.58	23.40	ND	NA	23.27	DRY	NA	10 - 20	Upper Sand
BW-5B	09/14/20	06/29/17	2	6,873.30	6,875.84	2.54	6,934.75	61.45	ND	NA	10.61	6,865.23	NA	48 - 58	Chinle/Alluvial Interface
BW-5B	12/07/20	06/29/17	2	6,873.30	6,875.84	2.54	6,934.75	61.45	ND	NA	10.53	6,865.23	NA	48 - 58	Chinle/Alluvial Interface
BW-5C	09/14/20	06/29/17	2	6,872.92	6,875.93	3.01	6,949.27	76.35	ND	NA	4.36	6,871.57	NA	64.3-74.30	Sonsela Sandstone
BW-5C	12/07/20	06/29/17	2	6,872.92	6,875.93	3.01	6,949.27	76.35	ND	NA	4.27	6,871.57	NA	64.3-74.30	Sonsela Sandstone
GWM-1	09/15/20	07/08/04	2	6,910.22	6,912.61	2.39	6,886.41	26.65	20.73	0.67	21.40	6,891.21	6891.75	17.5 - 23.5	Chinle/Alluvial Interface
GWM-1	11/09/20	07/08/04	2	6,910.22	6,912.61	2.39	6,886.41	26.65	20.88	0.84	21.72	6,890.89	6891.56	17.5 - 23.5	Chinle/Alluvial Interface
GWM-1	12/07/20	07/08/04	2	6,910.22	6,912.61	2.39	6,886.41	26.45	20.91	0.94	21.85	6,890.89	6891.56	17.5 - 23.5	Chinle/Alluvial Interface
GWM-2	09/15/20	09/25/05	2	6,910.32	6,913.09	2.77	6,894.28	18.08	ND	NA	DRY	NA	NA	3.2 - 16.2	Chinle/Alluvial Interface
GWM-2	11/10/20	09/25/05	2	6,910.32	6,913.09	2.77	6,894.28	18.08	ND	NA	DRY	NA	NA	3.2 - 16.2	Chinle/Alluvial Interface
GWM-2	12/07/20	09/25/05	2	6,910.32	6,913.09	2.77	6,894.28	18.08	ND	NA	DRY	NA	NA	3.2 - 16.2	Chinle/Alluvial Interface
GWM-3	09/15/20	09/25/05	2	6,907.35	6,910.25	2.90	6,892.45	19.15	ND	NA	DRY	DRY	NA	3 - 15	Chinle/Alluvial Interface
GWM-3	10/11/20	09/25/05	2	6,907.35	6,910.25	2.90	6,892.45	19.15	ND	NA	DRY	DRY	NA	3 - 15	Chinle/Alluvial Interface
GWM-3	12/07/20	09/25/05	2	6,907.35	6,910.25	2.90	6,892.45	19.15	ND	NA	DRY	DRY	NA	3 - 15	Chinle/Alluvial Interface
KA-3	12/07/20	06/11/07	2	6,913.29	6,912.52	-0.77	6,889.32	23.20	ND	NA	9.56	6,902.96	NA	15 - 25	Chinle/Alluvial Interface
MW-1	09/14/20	10/14/81	5	6,876.63	6,878.12	1.49	6,747.29	135.30	ND	NA	7.72	6,870.40	NA	117.72 - 127.72	Sonsela Sandstone
MW-2	09/14/20	10/15/81	5	6,878.39	6,880.30	1.91	6,742.82	138.20	ND	NA	9.74	6,870.56	NA	112 - 122	Sonsela Sandstone
MW-4	09/14/20	10/16/81	5	6,879.89	6,881.63	1.74	6,759.91	125.90	ND	NA	8.00	6,873.63	NA	101 - 121	Sonsela Sandstone
MW-5	09/14/20	07/21/86	4	6,880.20	6,882.83	2.63	6,752.00	133.00	ND	NA	11.99	6,870.84	NA	115 - 125	Sonsela Sandstone
NAPIS-1	09/15/20	03/14/08	2	6,913.62	6,913.86	0.24	6,900.33	13.58	6.70	0.01	6.71	6,907.15	6907.158	3.7 - 13.7	Chinle/Alluvial Interface
NAPIS-1	11/10/20	03/14/08	2	6,913.62	6,913.86	0.24	6,900.33	13.58	7.19	0.01	7.20	6,906.66	6906.668	3.7 - 13.7	Chinle/Alluvial Interface
NAPIS-1	12/07/20	03/14/08	2	6,913.62	6,913.86	0.24	6,900.33	13.76	ND	NA	7.44	6,906.42	NA	3.7 - 13.7	Chinle/Alluvial Interface

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
NAPIS-2	09/15/20	03/14/08	2	6,913.40	6,912.65	-0.75	6,899.04	14.60	ND	NA	8.12	6,904.53	NA	4.2 - 14.2	Chinle/Alluvial Interface
NAPIS-2	11/10/20	03/14/08	2	6,913.40	6,912.65	-0.75	6,899.04	14.60	ND	NA	8.51	6,904.14	NA	4.2 - 14.2	Chinle/Alluvial Interface
NAPIS-2	12/07/20	03/14/08	2	6,913.40	6,912.65	-0.75	6,899.04	14.61	ND	NA	8.72	6,903.93	NA	4.2 - 14.2	Chinle/Alluvial Interface
NAPIS-3	09/15/20	03/14/08	2	6,913.38	6,912.76	-0.62	6,882.34	31.50	ND	NA	9.25	6,903.51	NA	25.4 - 30-4	Chinle/Alluvial Interface
NAPIS-3	11/10/20	03/14/08	2	6,913.38	6,912.76	-0.62	6,882.34	31.50	ND	NA	9.47	6,903.29	NA	25.4 - 30-4	Chinle/Alluvial Interface
NAPIS-3	12/07/20	03/14/08	2	6,913.38	6,912.76	-0.62	6,882.34	31.50	ND	NA	8.51	6,904.25	NA	25.4 - 30-4	Chinle/Alluvial Interface
OAPIS-1	09/15/20	07/17/12	2	6,914.37	6,916.73	2.36	6,888.37	28.00	ND	NA	11.90	6,904.83	NA	16 - 26	Chinle/Alluvial Interface
OAPIS-1	11/10/20	07/17/12	2	6,914.37	6,916.73	2.36	6,888.37	28.00	ND	NA	12.02	6,904.71	NA	16 - 26	Chinle/Alluvial Interface
OAPIS-1	12/07/20	07/17/12	2	6,914.37	6,916.73	2.36	6,888.37	28.00	ND	NA	12.31	6,904.42	NA	16 - 26	Chinle/Alluvial Interface
OW-1	09/15/20	01/05/81	4	6,866.32	6,866.62	0.30	6,772.07	99.39	ND	NA	1.45	6,865.17	NA	89.3 - 99.3	Sonsela Sandstone
OW-1	12/07/20	01/05/81	4	6,866.32	6,866.62	0.30	6,772.07	99.39	ND	NA	1.75	6,864.87	NA	89.3 - 99.3	Sonsela Sandstone
OW-10	10/09/20	11/25/80	4	6,873.67	6,874.91	1.24	6,814.58	66.30	ND	NA	7.70	6,867.21	NA	40 - 60	Sonsela Sandstone
OW-10	12/07/20	11/25/80	4	6,873.67	6,874.91	1.24	6,814.58	66.30	ND	NA	7.61	6,867.30	NA	40 - 60	Sonsela Sandstone
OW-11	09/15/20	09/25/81	4	6,922.05	6,923.51	1.46	6,857.72	65.83	ND	NA	18.51	6,905.00	NA	43 - 65	Sonsela Sandstone
OW-12	11/09/20	12/15/80	4	6,939.57	6,940.69	1.12	6,811.84	131.20	ND	NA	46.49	6,894.20	NA	117.8 - 137.8	Sonsela Sandstone
OW-13	09/14/20	12/10/80	4	6,918.95	6,920.07	1.12	6,820.92	91.65	ND	NA	20.99	6,899.08	NA	78.2 - 98.2	Sonsela Sandstone
OW-13	11/09/20	12/10/80	4	6,918.95	6,920.07	1.12	6,820.92	91.65	ND	NA	20.38	6,899.69	NA	78.2 - 98.2	Sonsela Sandstone
OW-13	12/07/20	12/10/80	4	6,918.95	6,920.07	1.12	6,820.92	91.65	ND	NA	20.24	6,899.83	NA	78.2 - 98.2	Sonsela Sandstone
OW-14	09/14/20	12/17/80	4	6,924.55	6,926.65	2.10	6,880.13	46.52	NM	NA	NM	NA	NA	35 - 45	Chinle/Alluvial Interface
OW-14	12/07/20	12/17/80	4	6,924.55	6,926.65	2.10	6,880.13	46.52	NM	NA	24.40	NA	NA	35 - 45	Chinle/Alluvial Interface
OW-29	09/14/20	08/23/96	4	6,913.89	6,917.00	3.11	6,865.92	51.05	ND	NA	14.57	6,902.43	NA	37.5 - 47.5	Chinle/Alluvial Interface
OW-29	11/09/20	08/23/96	4	6,913.89	6,917.00	3.11	6,865.92	51.05	ND	NA	17.23	6,899.77	NA	37.5 - 47.5	Chinle/Alluvial Interface
OW-29	12/07/20	08/23/96	4	6,913.89	6,917.00	3.11	6,865.92	51.05	ND	NA	17.15	6,899.85	NA	37.5 - 47.5	Chinle/Alluvial Interface
OW-30	09/15/20	08/28/96	4	6,921.81	6,924.69	2.88	6,874.79	49.90	ND	NA	NM	NA	NA	37.9 - 47.9	Chinle/Alluvial Interface
OW-30	12/07/20	08/28/96	4	6,921.81	6,924.69	2.88	6,874.79	49.90	ND	NA	22.22	NA	NA	37.9 - 47.9	Chinle/Alluvial Interface
OW-50	09/14/20	10/05/09	2	6,912.63	6,914.21	1.58	6,850.21	39.02	ND	NA	15.11	6,899.10	NA	48 - 63	Chinle/Alluvial Interface
OW-50	11/09/20	10/05/09	2	6,912.63	6,914.21	1.58	6,850.21	39.02	ND	NA	14.87	6,899.34	NA	48 - 63	Chinle/Alluvial Interface
OW-50	12/07/20	10/05/09	2	6,912.63	6,914.21	1.58	6,850.21	39.02	ND	NA	14.72	6,899.49	NA	48 - 63	Chinle/Alluvial Interface
OW-52	09/14/20	10/06/09	2	6,906.53	6,907.68	1.15	6,829.94	40.43	ND	NA	14.56	6,893.12	NA	64 - 79	Chinle/Alluvial Interface
OW-52	10/09/20	10/06/09	2	6,906.53	6,907.68	1.15	6,829.94	40.43	ND	NA	14.52	6,893.16	NA	64 - 79	Chinle/Alluvial Interface
OW-52	12/07/20	10/06/09	2	6,906.53	6,907.68	1.15	6,829.94	40.43	ND	NA	14.42	6,893.26	NA	64 - 79	Chinle/Alluvial Interface
OW-53	09/14/20	05/31/16	2	6,911.71	6,914.38	2.67	6,945.62	33.91	ND	NA	DRY	NA	NA	16 - 31	Chinle/Alluvial Interface
OW-53	11/09/20	05/31/16	2	6,911.71	6,914.38	2.67	6,945.62	33.91	ND	NA	DRY	NA	NA	16 - 31	Chinle/Alluvial Interface
OW-53	12/07/20	05/31/16	2	6,911.71	6,914.38	2.67	6,945.62	33.91	ND	NA	DRY	NA	NA	16 - 31	Chinle/Alluvial Interface
OW-54	09/14/20	06/01/16	2	6,916.27	6,918.92	2.65	6,940.85	24.58	ND	NA	18.17	6,900.75	NA	13 - 28	Chinle/Alluvial Interface
OW-54	10/09/20	06/01/16	2	6,916.27	6,918.92	2.65	6,940.85	24.58	ND	NA	17.92	6,901.00	NA	13 - 28	Chinle/Alluvial Interface

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
OW-54	12/07/20	06/01/16	2	6,916.27	6,918.92	2.65	6,940.85	24.58	ND	NA	17.78	6,901.14	NA	13 - 28	Chinle/Alluvial Interface
OW-55	09/14/20	06/01/16	2	6,921.02	6,923.25	2.23	6,945.50	24.48	ND	NA	17.96	6,905.29	NA	13 - 28	Chinle/Alluvial Interface
OW-55	10/09/20	06/01/16	2	6,921.02	6,923.25	2.23	6,945.50	24.48	ND	NA	17.70	6,905.55	NA	13 - 28	Chinle/Alluvial Interface
OW-55	12/07/20	06/01/16	2	6,921.02	6,923.25	2.23	6,945.50	24.48	ND	NA	17.61	6,905.64	NA	13 - 28	Chinle/Alluvial Interface
OW-56	09/14/20	06/01/16	2	6,917.61	6,920.18	2.57	6,936.19	18.58	ND	NA	14.36	6,905.82	NA	6 - 16	Chinle/Alluvial Interface
OW-56	11/09/20	06/01/16	2	6,917.61	6,920.18	2.57	6,936.19	18.58	ND	NA	14.21	6,905.97	NA	6 - 16	Chinle/Alluvial Interface
OW-56	12/07/20	06/01/16	2	6,917.61	6,920.18	2.57	6,936.19	18.58	ND	NA	13.73	6,906.45	NA	6 - 16	Chinle/Alluvial Interface
OW-57	09/14/20	10/05/16	2	6,930.64	6,933.10	2.46	6,958.73	28.09	ND	NA	20.50	6,912.60	NA	15 - 25	Chinle/Alluvial Interface
OW-57	11/09/20	10/05/16	2	6,930.64	6,933.10	2.46	6,958.73	28.09	ND	NA	20.53	6,912.57	NA	15 - 25	Chinle/Alluvial Interface
OW-57	12/07/20	10/05/16	2	6,930.64	6,933.10	2.46	6,959.03	28.39	ND	NA	20.64	6,912.46	NA	15 - 25	Chinle/Alluvial Interface
OW-58	09/14/20	10/03/16	2	6,934.71	6,934.50	-0.21	6,982.71	48.00	ND	NA	23.55	6,910.95	NA	38 - 48	Chinle/Alluvial Interface
OW-58	11/09/20	10/03/16	2	6,934.71	6,934.50	-0.21	6,982.71	48.00	ND	NA	23.31	6,911.19	NA	38 - 48	Chinle/Alluvial Interface
OW-58	12/08/20	10/03/16	2	6,934.71	6,934.50	-0.21	6,982.66	47.95	ND	NA	24.32	6,910.18	NA	38 - 48	Chinle/Alluvial Interface
OW-58A	09/15/20	10/17/19	4	6,933.39	6,936.29	2.90	6,969.39	36.00	ND	NA	26.87	6,909.42	NA	25 - 33	Chinle/Alluvial Interface
OW-58A	11/09/20	10/17/19	4	6,933.39	6,936.29	2.90	6,970.30	36.91	ND	NA	24.31	6,911.98	NA	25 - 33	Chinle/Alluvial Interface
OW-58A	12/08/20	10/17/19	4	6,933.39	6,936.29	2.90	6,969.77	36.38	ND	NA	26.71	6,909.58	NA	25 - 33	Chinle/Alluvial Interface
OW-59	09/14/20	06/29/17	2	6,886.40	6,888.66	2.26	6,924.92	38.52	ND	NA	24.06	6,864.60	NA	20 - 35	Chinle/Alluvial Interface
OW-59	12/07/20	06/29/17	2	6,886.40	6,888.66	2.26	6,924.95	38.55	ND	NA	23.91	6,864.75	NA	20 - 35	Chinle/Alluvial Interface
OW-60	9/14/2020	06/29/17	2	6,889.93	6,892.50	2.57	6,935.63	45.70	ND	NA	16.57	6,875.93	NA	25 - 45	Chinle/Alluvial Interface
OW-60	11/9/2020	06/29/17	2	6,889.93	6,892.50	2.57	6,935.63	45.70	ND	NA	16.35	6,876.15	NA	25 - 45	Chinle/Alluvial Interface
OW-60	12/7/2020	06/29/17	2	6,889.93	6,892.50	2.57	6,935.63	45.70	ND	NA	16.55	6,875.95	NA	25 - 45	Chinle/Alluvial Interface
OW-61	9/15/2020	03/14/18	4	6,959.29	6,961.88	2.59	6,991.14	31.85	16.88	2.52	19.40	6,942.48	6944.496	8 - 28	Chinle/Alluvial Interface
OW-61	11/9/2020	03/14/18	4	6,959.29	6,961.88	2.59	6,991.14	31.85	18.22	1.36	19.58	6,942.30	6943.388	8 - 28	Chinle/Alluvial Interface
OW-61	12/8/2020	03/14/18	4	6,959.29	6,961.88	2.59	6,990.62	31.33	18.40	1.90	20.30	6,941.58	6943.1	8 - 28	Chinle/Alluvial Interface
OW-62	9/15/2020	03/15/18	4	6,933.21	6,936.09	2.88	6,965.26	32.05	23.62	0.25	23.87	6,912.22	6912.42	8 - 28	Chinle/Alluvial Interface
OW-62	11/9/2020	03/15/18	4	6,933.21	6,936.09	2.88	6,965.26	32.05	23.70	0.30	24.00	6,912.09	6912.33	8 - 28	Chinle/Alluvial Interface
OW-62	12/8/2020	03/15/18	4	6,933.21	6,936.09	2.88	6,964.87	31.66	23.69	0.29	23.98	6,912.11	6912.34	8 - 28	Chinle/Alluvial Interface
OW-63	09/14/20	03/14/18	4	6,930.87	6,933.87	3.00	6,962.92	32.05	ND	NA	20.73	6,913.14	NA	9 - 29	Chinle/Alluvial Interface
OW-63	11/09/20	03/14/18	4	6,930.87	6,933.87	3.00	6,962.92	32.05	ND	NA	20.85	6,913.02	NA	9 - 29	Chinle/Alluvial Interface
OW-63	12/08/20	03/14/18	4	6,930.87	6,933.87	3.00	6,963.09	32.22	ND	NA	20.97	6,912.90	NA	9 - 29	Chinle/Alluvial Interface
OW-64	9/14/2020	03/16/18	4	6,943.32	6,946.09	2.77	6,970.67	27.35	ND	NA	7.95	6,938.14	NA	4 - 24	Chinle/Alluvial Interface
OW-64	11/9/2020	03/16/18	4	6,943.32	6,946.09	2.77	6,970.67	27.35	ND	NA	8.18	6,937.91	NA	4 - 24	Chinle/Alluvial Interface
OW-64	12/7/2020	03/16/18	4	6,943.32	6,946.09	2.77	6,970.67	27.35	ND	NA	8.26	6,937.83	NA	4 - 24	Chinle/Alluvial Interface
OW-65	9/14/2020	03/12/18	4	6,949.95	6,952.83	2.88	6,992.75	42.80	24.70	6.06	30.76	6,922.07	6926.918	17 - 37	Chinle/Alluvial Interface
OW-65	11/9/2020	03/12/18	4	6,949.95	6,952.83	2.88	6,992.75	42.80	25.05	7.30	32.35	6,920.48	6926.32	17 - 37	Chinle/Alluvial Interface
OW-65	12/8/2020	03/12/18	4	6,949.95	6,952.83	2.88	6,992.45	42.50	25.79	6.16	31.95	6,920.88	6925.808	17 - 37	Chinle/Alluvial Interface

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
RW-1	9/19/2020	03/28/95	4	6,942.86	6,946.06	3.20	6,903.02	43.45	28.07	2.13	30.20	6,915.86	6,917.56	25 - 40	Chinle/Alluvial Interface
RW-1	11/10/2020	03/28/95	4	6,942.86	6,946.06	3.20	6,903.02	43.45	29.50	0.83	30.33	6,915.73	6,916.39	25 - 40	Chinle/Alluvial Interface
RW-1	12/8/2020	03/28/95	4	6,942.86	6,946.06	3.20	6,903.02	43.45	29.50	0.83	30.33	6,915.73	6,916.39	25 - 40	Chinle/Alluvial Interface
RW-2	9/19/2020	03/29/95	4	6,926.40	6,928.53	2.13	6,888.73	40.00	22.10	0.13	22.23	6,906.30	NA	26.1 - 36.1	Chinle/Alluvial Interface
RW-2	11/9/2020	03/29/95	4	6,926.40	6,928.53	2.13	6,888.73	40.00	22.09	0.19	22.28	6,906.25	NA	26.1 - 36.1	Chinle/Alluvial Interface
RW-2	12/8/2020	03/29/95	4	6,926.40	6,928.53	2.13	6,888.73	40.00	22.20	0.18	22.38	6,906.15	NA	26.1 - 36.1	Chinle/Alluvial Interface
RW-5	9/19/2020	08/27/97	4	6,941.53	6,943.57	2.04	6,903.98	39.51	29.59	3.22	32.81	6,910.76	6,913.34	29.5 - 39.5	Chinle/Alluvial Interface
RW-5	11/9/2020	08/27/97	4	6,941.53	6,943.57	2.04	6,903.98	39.51	29.86	3.17	33.03	6,910.54	6,913.08	29.5 - 39.5	Chinle/Alluvial Interface
RW-5	12/8/2020	08/27/97	4	6,941.53	6,943.57	2.04	6,903.98	39.51	33.15	6.36	39.51	6,904.06	6,909.15	29.5 - 39.5	Chinle/Alluvial Interface
RW-6	9/19/2020	08/27/97	4	6,941.96	6,944.01	2.05	6,903.11	40.85	29.72	2.92	32.64	6,911.37	6,913.71	28.5 - 38.5	Chinle/Alluvial Interface
RW-6	11/9/2020	08/27/97	4	6,941.96	6,944.01	2.05	6,903.11	40.85	29.98	3.07	33.05	6,910.96	6,913.42	28.5 - 38.5	Chinle/Alluvial Interface
RW-6	12/8/2020	08/27/97	4	6,941.96	6,944.01	2.05	6,903.11	40.85	30.18	3.13	33.31	6,910.70	6,913.20	28.5 - 38.5	Chinle/Alluvial Interface
SMW-2	9/14/2020	09/26/85	2	6,881.63	6,883.97	2.34	6,831.17	53.11	ND	NA	24.70	6,859.27	NA	34.31 - 54.31	Chinle/Alluvial Interface and Upper Sand Well
SMW-4	9/14/2020	09/25/85	2	6,877.63	6,879.52	1.89	6,809.84	62.90	ND	NA	29.15	6,850.37	NA	51.7 - 71.7	Chinle/Alluvial Interface
STP1-NW	12/8/2020	05/06/14	2	6,904.50	6,904.47	-0.03	6,854.47	50.28	ND	NA	20.78	6,883.69	NA	20 - 50	Chinle/Alluvial Interface
STP1-SW	12/8/2020	05/06/14	2	6,912.40	6,912.38	-0.02	6,854.47	29.25	NM	NA	29.23	NA	NA	15 - 30	Chinle/Alluvial Interface

Definitions:

DRY = no water detected
DTW = depth to water
ft = feet
GW = groundwater
ID = identification
in = inch
NA = not applicable
NS = not surveyed
SPH = separate phase hydrocarbons
* Checked for Artesian flow conditions.
Negative number in Stick up Length column indicates well is flushmount and located at or below ground level.
Depth to Water Column - if 0.00 is indicated - means water is at top of casing (full) under artesian flow conditions.

Note:
1. Corrected Water Table Elevation applies only if SPH thickness column measurement exists. (0.8 X SPH thickness + Groundwater Elevation)

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	MKTF-01	02/24/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.42	4.87	0.29	5.16	6,915.51	6915.74	5 - 15	Chinle/Alluvium Interface
	MKTF-01	06/26/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.42	5.50	0.21	5.71	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
1	MKTF-01	09/15/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.19	17.48	5.61	0.01	5.62	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
	MKTF-01	11/10/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.48	5.61	0.28	5.89	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
	MKTF-01	12/03/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.43	5.74	0.28	6.02	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
	MKTF-02	02/24/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.48	ND	0.00	6.52	6,910.93	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-02	06/26/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.48	ND	0.00	7.70	6,909.75	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-02	09/15/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.91	20.54	ND	0.00	7.88	6,909.57	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-02	11/10/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.54	ND	0.00	7.43	6,910.02	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-02	12/03/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.54	ND	0.00	7.72	6,909.73	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-03	03/05/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.24	18.45	6.47	1.37	7.84	6,923.85	6924.95	3 - 18	Chinle/Alluvium Interface
	MKTF-03	06/26/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.24	18.45	7.36	1.27	8.63	6,923.06	6924.08	3 - 18	Chinle/Alluvium Interface
*	MKTF-03	09/15/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.10	18.59	7.08	0.01	7.09	6,924.60	6924.61	3 - 18	Chinle/Alluvium Interface
*	MKTF-03	11/10/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.10	18.59	7.13	1.30	8.43	6,923.26	6924.30	3 - 18	Chinle/Alluvium Interface
*	MKTF-03	12/03/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.11	18.58	7.46	1.16	8.62	6,923.07	6924.00	3 - 18	Chinle/Alluvium Interface
	MKTF-04	03/02/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,911.36	22.21	ND	0.00	8.47	6,925.10	NA	10 - 22	Chinle/Alluvium Interface
	MKTF-04	06/26/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,911.42	22.15	ND	0.00	9.75	6,923.82	NA	10 - 22	Chinle/Alluvium Interface
*	MKTF-04	09/15/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,910.85	22.72	9.39	0.01	9.40	6,924.17	NA	10 - 22	Chinle/Alluvium Interface
*	MKTF-04	11/10/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,910.85	22.72	ND	0.00	9.20	6,924.37	NA	10 - 22	Chinle/Alluvium Interface
*	MKTF-04	12/03/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,910.85	22.72	9.70	0.01	9.71	6,923.86	NA	10 - 22	Chinle/Alluvium Interface
	MKTF-05	03/05/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.47	17.75	13.58	0.14	13.72	6,928.50	6928.61	4 - 14	Chinle/Alluvium Interface
	MKTF-05	06/25/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.47	17.75	14.06	0.75	14.80	6,927.42	6928.02	4 - 14	Chinle/Alluvium Interface
*	MKTF-05	09/15/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.39	17.83	13.65	1.03	14.68	6,927.54	6928.36	4 - 14	Chinle/Alluvium Interface
*	MKTF-05	11/10/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.39	17.83	14.02	0.88	14.90	6,927.32	6928.02	4 - 14	Chinle/Alluvium Interface
*	MKTF-05	12/03/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.42	17.80	14.12	0.81	14.93	6,927.29	6927.94	4 - 14	Chinle/Alluvium Interface
	MKTF-06	03/05/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.04	23.77	16.89	1.71	18.60	6,928.21	6929.58	8 - 20	Chinle/Alluvium Interface
	MKTF-06	06/25/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.04	23.77	14.05	4.86	18.90	6,927.91	6931.79	8 - 20	Chinle/Alluvium Interface
*	MKTF-06	09/15/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.02	23.79	16.78	1.93	18.71	6,928.10	6929.64	8 - 20	Chinle/Alluvium Interface
*	MKTF-06	11/10/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.02	23.79	17.20	1.39	18.59	6,928.22	6929.33	8 - 20	Chinle/Alluvium Interface
*	MKTF-06	12/03/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.02	23.79	17.38	1.11	18.49	6,928.32	6929.21	8 - 20	Chinle/Alluvium Interface
	MKTF-07	03/05/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.56	17.62	12.50	1.22	13.72	6,933.46	6934.44	4 - 14	Chinle/Alluvium Interface
	MKTF-07	06/25/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.56	17.62	12.23	1.53	13.76	6,933.42	6934.64	4 - 14	Chinle/Alluvium Interface
*	MKTF-07	09/18/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.75	17.43	11.42	2.35	13.77	6,933.41	6935.29	4 - 14	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-07	11/10/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.75	17.43	12.56	1.20	13.76	6,933.42	6934.38	4 - 14	Chinle/Alluvium Interface
*	MKTF-07	12/03/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.52	17.66	12.93	0.87	13.80	6,933.38	6934.08	4 - 14	Chinle/Alluvium Interface
	MKTF-08	03/05/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.11	21.98	14.03	0.34	14.37	6,932.72	6932.99	8 - 18	Chinle/Alluvium Interface
	MKTF-08	06/25/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.11	21.98	14.00	0.40	14.40	6,932.69	6933.01	8 - 18	Chinle/Alluvium Interface
*	MKTF-08	09/18/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.09	22.00	13.76	0.39	14.15	6,932.94	6933.25	8 - 18	Chinle/Alluvium Interface
*	MKTF-08	11/10/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.09	22.00	14.23	0.46	14.69	6,932.40	6932.77	8 - 18	Chinle/Alluvium Interface
*	MKTF-08	12/03/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.08	22.01	14.36	0.40	14.76	6,932.33	6932.65	8 - 18	Chinle/Alluvium Interface
	MKTF-09	03/02/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,923.74	22.76	ND	0.00	14.23	6,932.27	NA	7 - 19	Chinle/Alluvium Interface
	MKTF-09	06/25/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,923.73	22.77	ND	0.00	14.55	6,931.95	NA	7 - 19	Chinle/Alluvium Interface
*	MKTF-09	09/18/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,924.09	22.41	14.19	0.01	14.20	6,932.30	6932.31	7 - 19	Chinle/Alluvium Interface
*	MKTF-09	11/10/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,924.09	22.41	14.61	0.01	14.62	6,931.88	6931.89	7 - 19	Chinle/Alluvium Interface
*	MKTF-09	12/03/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,923.72	22.78	14.75	0.01	14.76	6,931.74	6931.75	7 - 19	Chinle/Alluvium Interface
	MKTF-10	03/02/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,921.17	15.99	ND	0.00	7.67	6,929.49	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-10	06/25/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,921.17	15.99	ND	0.00	7.07	6,930.09	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-10	09/18/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,920.75	16.41	7.52	0.01	7.53	6,929.63	6929.64	7 - 17	Chinle/Alluvium Interface
*	MKTF-10	11/10/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,920.75	16.41	ND	0.00	7.79	6,929.37	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-10	12/03/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,920.66	16.50	ND	0.00	7.80	6,929.36	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-11	03/02/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,913.20	18.14	ND	0.00	7.89	6,923.45	NA	8 - 18	Chinle/Alluvium Interface
	MKTF-11	06/26/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,913.20	18.14	7.67	0.01	7.68	6,923.66	6923.67	8 - 18	Chinle/Alluvium Interface
*	MKTF-11	09/18/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,912.89	18.45	7.59	0.01	7.60	6,923.74	6923.75	8 - 18	Chinle/Alluvium Interface
*	MKTF-11	11/10/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,912.89	18.45	ND	0.00	7.61	6,923.73	NA	8 - 18	Chinle/Alluvium Interface
*	MKTF-11	12/03/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,912.89	18.45	7.89	0.02	7.91	6,923.43	NA	8 - 18	Chinle/Alluvium Interface
	MKTF-12	02/27/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.51	25.60	17.84	0.08	17.92	6,924.19	6924.25	12 - 22	Chinle/Alluvium Interface
	MKTF-12	06/29/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.51	25.60	19.13	0.12	19.25	6,922.86	6922.96	12 - 22	Chinle/Alluvium Interface
*	MKTF-12	09/18/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.29	25.82	18.64	0.01	18.65	6,923.46	6923.47	12 - 22	Chinle/Alluvium Interface
*	MKTF-12	11/10/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.29	25.82	17.97	0.03	18.00	6,924.11	6924.13	12 - 22	Chinle/Alluvium Interface
*	MKTF-12	12/03/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.22	25.89	18.90	0.16	19.06	6,923.05	6923.18	12 - 22	Chinle/Alluvium Interface
	MKTF-13	02/27/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.93	21.25	11.13	6.18	17.31	6,917.87	6922.81	8 - 18	Chinle/Alluvium Interface
	MKTF-13	06/29/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.93	21.25	12.67	5.54	18.21	6,916.97	6921.40	8 - 18	Chinle/Alluvium Interface
*	MKTF-13	09/18/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.05	22.13	12.55	4.37	16.92	6,918.26	6921.76	8 - 18	Chinle/Alluvium Interface
*	MKTF-13	11/10/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.05	22.13	11.98	4.38	16.36	6,918.82	6922.32	8 - 18	Chinle/Alluvium Interface
*	MKTF-13	12/03/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.26	21.92	12.84	3.81	16.65	6,918.53	6921.58	8 - 18	Chinle/Alluvium Interface
	MKTF-14	02/27/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.56	17.46	5.35	0.30	5.65	6,922.37	6922.61	4 - 14	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	MKTF-14	06/29/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.56	17.46	6.38	2.20	8.58	6,919.44	6921.20	4 - 14	Chinle/Alluvium Interface
*	MKTF-14	09/18/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.70	17.32	6.18	1.98	8.16	6,919.86	6921.44	4 - 14	Chinle/Alluvium Interface
*	MKTF-14	11/10/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.70	17.32	5.98	0.30	6.28	6,921.74	6921.98	4 - 14	Chinle/Alluvium Interface
*	MKTF-14	12/03/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.47	17.55	6.79	0.27	7.06	6,920.96	6921.18	4 - 14	Chinle/Alluvium Interface
	MKTF-15	02/03/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.00	19.48	13.02	0.09	13.11	6,930.37	6,930.44	9 - 19	Chinle/Alluvium Interface
	MKTF-15	06/26/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.00	19.48	13.11	0.06	13.17	6,930.31	6,930.36	9 - 19	Chinle/Alluvium Interface
*	MKTF-15	09/18/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.30	19.18	13.00	0.03	13.03	6,930.45	6,930.47	9 - 19	Chinle/Alluvium Interface
*	MKTF-15	11/10/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.30	19.18	13.25	0.25	13.50	6,929.98	6,930.18	9 - 19	Chinle/Alluvium Interface
*	MKTF-15	11/10/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,923.96	19.52	13.39	0.21	13.60	6,929.88	6,930.05	9 - 19	Chinle/Alluvium Interface
	MKTF-16	02/05/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,936.48	14.10	ND	0.00	9.68	6,940.90	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-16	06/26/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,936.48	14.10	ND	0.00	9.54	6,941.04	NA	4 - 14	Chinle/Alluvium Interface
*	MKTF-16	09/18/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,939.66	10.92	9.18	0.01	9.19	6,941.39	6,941.40	4 - 14	Chinle/Alluvium Interface
*	MKTF-16	11/10/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,939.66	10.92	ND	0.00	7.20	6,943.38	NA	4 - 14	Chinle/Alluvium Interface
*	MKTF-16	12/08/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,939.63	10.95	ND	0.00	9.70	6,940.88	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-17	02/03/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.65	24.11	11.44	5.41	16.85	6,928.91	6,933.24	14 - 24	Chinle/Alluvium Interface
	MKTF-17	06/29/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.65	24.11	10.19	5.31	15.50	6,930.26	6,934.51	14 - 24	Chinle/Alluvium Interface
*	MKTF-17	09/14/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.09	24.67	10.00	5.37	15.37	6,930.39	6,934.69	14 - 24	Chinle/Alluvium Interface
*	MKTF-17	11/10/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.09	24.67	11.39	0.20	11.59	6,934.17	6,934.33	14 - 24	Chinle/Alluvium Interface
*	MKTF-17	12/04/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.10	24.66	11.28	0.19	11.47	6,934.29	6,934.44	14 - 24	Chinle/Alluvium Interface
	MKTF-18	02/05/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,925.27	25.38	ND	0.00	9.10	6,941.55	NA	17 - 27	Chinle/Alluvium Interface
	MKTF-18	06/30/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,925.27	25.38	ND	0.00	8.98	6,941.67	NA	17 - 27	Chinle/Alluvium Interface
*	MKTF-18	09/18/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,928.92	21.73	8.49	0.01	8.50	6,942.15	6,942.16	17 - 27	Chinle/Alluvium Interface
*	MKTF-18	11/10/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,928.92	21.73	ND	0.00	8.74	6,941.91	NA	17 - 27	Chinle/Alluvium Interface
*	MKTF-18	12/04/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,925.15	25.50	ND	0.00	8.80	6,941.85	NA	17 - 27	Chinle/Alluvium Interface
	MKTF-19	02/03/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,927.20	17.47	11.35	1.05	12.40	6,932.27	6,933.11	10 - 20	Chinle/Alluvium Interface
	MKTF-19	06/29/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,927.20	17.47	12.08	1.21	13.29	6,931.38	6,932.35	10 - 20	Chinle/Alluvium Interface
*	MKTF-19	09/14/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,925.43	19.24	11.95	0.02	11.97	6,932.70	6,932.72	10 - 20	Chinle/Alluvium Interface
*	MKTF-19	11/10/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,925.43	19.24	12.22	1.33	13.55	6,931.12	6,932.18	10 - 20	Chinle/Alluvium Interface
*	MKTF-19	12/04/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,925.29	19.38	12.18	1.24	13.42	6,931.25	6,932.24	10 - 20	Chinle/Alluvium Interface
	MKTF-20	02/05/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.95	8.83	ND	0.00	9.02	6,942.76	NA	2 - 10	Chinle/Alluvium Interface
	MKTF-20	06/26/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.95	8.83	ND	0.00	8.67	6,943.11	NA	2 - 10	Chinle/Alluvium Interface
*	MKTF-20	09/15/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.16	9.62	8.54	0.81	9.35	6,942.43	6,943.08	2 - 10	Chinle/Alluvium Interface
*	MKTF-20	11/10/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.16	9.62	8.10	0.80	8.90	6,942.88	6,943.52	2 - 10	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-20	12/08/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.18	9.60	8.76	0.19	8.95	6,942.83	6,942.98	2 - 10	Chinle/Alluvium Interface
	MKTF-21	02/05/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.74	8.83	ND	0.00	8.25	6,944.32	NA	2 - 10	Chinle/Alluvium Interface
	MKTF-21	06/26/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.74	8.83	8.17	0.03	8.20	6,944.37	6944.39	2 - 10	Chinle/Alluvium Interface
*	MKTF-21	09/15/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.73	8.84	7.08	0.01	7.09	6,945.48	6945.49	2 - 10	Chinle/Alluvium Interface
*	MKTF-21	11/10/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.73	8.84	ND	0.00	6.41	6,946.16	NA	2 - 10	Chinle/Alluvium Interface
*	MKTF-21	12/04/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.77	8.80	8.04	0.01	8.05	6,944.52	NA	2 - 10	Chinle/Alluvium Interface
	MKTF-22	02/27/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.06	35.25	24.48	1.05	25.53	6,916.78	6917.62	22 - 32	Chinle/Alluvium Interface
	MKTF-22	06/29/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.06	35.25	24.57	3.14	27.71	6,914.60	6917.11	22 - 32	Chinle/Alluvium Interface
*	MKTF-22	09/14/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.22	35.09	24.98	2.70	27.68	6,914.63	6916.79	22 - 32	Chinle/Alluvium Interface
*	MKTF-22	11/10/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.22	35.09	24.94	2.35	27.29	6,915.02	6916.90	22 - 32	Chinle/Alluvium Interface
*	MKTF-22	12/04/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.22	35.09	25.10	2.45	27.55	6,914.76	6916.72	22 - 32	Chinle/Alluvium Interface
	MKTF-23	02/27/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.62	20.36	ND	0.00	13.42	6,916.56	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-23	06/29/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.62	20.36	ND	0.00	13.25	6,916.73	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-23	09/19/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.96	20.02	15.42	0.02	15.44	6,914.54	6,914.56	7 - 17	Chinle/Alluvium Interface
*	MKTF-23	11/10/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.96	20.02	ND	0.00	14.23	6,915.75	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-23	12/04/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.59	20.39	14.15	0.01	14.16	6,915.82	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-24	02/24/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,898.25	30.47	ND	0.00	22.17	6,906.55	NA	18 - 28	Chinle/Alluvium Interface
	MKTF-24	06/26/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,898.25	30.47	ND	0.00	22.80	6,905.92	NA	18 - 28	Chinle/Alluvium Interface
*	MKTF-24	09/15/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,897.59	31.13	ND	0.00	23.35	6,905.37	NA	18 - 28	Chinle/Alluvium Interface
*	MKTF-24	11/10/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,897.59	31.13	ND	0.00	23.32	6,905.40	NA	18 - 28	Chinle/Alluvium Interface
*	MKTF-24	12/04/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,897.54	31.18	ND	0.00	23.22	6,905.50	NA	18 - 28	Chinle/Alluvium Interface
	MKTF-25	02/26/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.76	19.43	ND	0.00	12.94	6,903.25	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-25	06/26/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.76	19.43	ND	0.00	13.33	6,902.86	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-25	09/15/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.10	20.09	ND	0.00	13.90	6,902.29	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-25	11/10/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.10	20.09	ND	0.00	13.75	6,902.44	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-25	12/04/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,895.81	20.38	ND	0.00	13.62	6,902.57	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-26	02/26/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	17.15	8.35	0.76	9.11	6,906.20	6906.81	4 - 14	Chinle/Alluvium Interface
	MKTF-26	06/26/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	17.15	8.61	0.89	9.50	6,905.81	6906.52	4 - 14	Chinle/Alluvium Interface
*	MKTF-26	09/15/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	16.85	8.81	0.75	9.56	6,905.75	6906.35	4 - 14	Chinle/Alluvium Interface
*	MKTF-26	11/10/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	16.85	8.65	0.71	9.36	6,905.95	6906.52	4 - 14	Chinle/Alluvium Interface
*	MKTF-26	12/04/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	17.16	7.67	1.72	9.39	6,905.92	6907.30	4 - 14	Chinle/Alluvium Interface
	MKTF-27	02/24/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	3.61	6,914.29	NA	1 - 12	Chinle/Alluvium Interface
	MKTF-27	06/30/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	6.70	6,911.20	NA	1 - 12	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-27	09/15/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	6.21	6,911.69	NA	1 - 12	Chinle/Alluvium Interface
*	MKTF-27	11/10/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	6.72	6,911.18	NA	1 - 12	Chinle/Alluvium Interface
*	MKTF-27	12/04/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.16	14.74	ND	0.00	6.47	6,911.43	NA	1 - 12	Chinle/Alluvium Interface
	MKTF-28	02/24/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.16	ND	0.00	4.53	6,916.99	NA	3 - 13	Chinle/Alluvium Interface
	MKTF-28	06/30/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.16	ND	0.00	4.84	6,916.68	NA	3 - 13	Chinle/Alluvium Interface
*	MKTF-28	09/15/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.17	ND	0.00	4.59	6,916.93	NA	3 - 13	Chinle/Alluvium Interface
*	MKTF-28	11/10/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.17	ND	0.00	8.81	6,912.71	NA	3 - 13	Chinle/Alluvium Interface
*	MKTF-28	12/04/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.16	ND	0.00	7.13	6,914.39	NA	3 - 13	Chinle/Alluvium Interface
	MKTF-29	02/24/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.78	22.84	ND	0.00	4.49	6,897.13	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-29	06/26/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.78	22.84	ND	0.00	6.42	6,895.20	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-29	09/15/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.84	22.78	ND	0.00	8.01	6,893.61	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-29	11/10/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.84	22.78	ND	0.00	6.98	6,894.64	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-29	12/04/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.77	22.85	ND	0.00	6.40	6,895.22	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-30	02/26/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.60	23.20	ND	0.00	15.31	6,885.49	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-30	06/26/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.60	23.20	ND	0.00	16.19	6,884.61	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-30	09/15/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.58	23.22	ND	0.00	16.66	6,884.14	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-30	11/10/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.58	23.22	ND	0.00	16.87	6,883.93	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-30	12/04/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.58	23.22	ND	0.00	16.76	6,884.04	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-31	02/24/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,884.06	22.81	ND	0.00	8.10	6,898.77	NA	6 - 21	Chinle/Alluvium Interface
	MKTF-31	06/26/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,884.06	22.81	ND	0.00	8.25	6,898.62	NA	6 - 21	Chinle/Alluvium Interface
*	MKTF-31	09/15/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,887.53	19.34	ND	0.00	8.75	6,898.12	NA	6 - 21	Chinle/Alluvium Interface
*	MKTF-31	11/10/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,887.53	19.34	ND	0.00	8.79	6,898.08	NA	6 - 21	Chinle/Alluvium Interface
*	MKTF-31	12/04/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,887.50	19.37	ND	0.00	8.73	6,898.14	NA	6 - 21	Chinle/Alluvium Interface
	MKTF-32	02/26/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.36	27.75	ND	0.00	13.78	6,897.33	NA	9- 25	Chinle/Alluvium Interface
	MKTF-32	06/29/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.36	27.75	ND	0.00	14.25	6,896.86	NA	10 - 24	Chinle/Alluvium Interface
*	MKTF-32	09/14/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.65	27.46	ND	0.00	14.58	6,896.53	NA	9- 26	Chinle/Alluvium Interface
*	MKTF-32	11/10/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.65	27.46	ND	0.00	14.31	6,896.80	NA	9- 26	Chinle/Alluvium Interface
*	MKTF-32	12/04/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.29	27.82	ND	0.00	14.25	6,896.86	NA	9- 26	Chinle/Alluvium Interface
	MKTF-33	02/27/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.55	33.20	ND	0.00	22.71	6,917.04	NA	20 - 30	Chinle/Alluvium Interface
	MKTF-33	06/29/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.55	33.20	ND	0.00	21.17	6,918.58	NA	20 - 30	Chinle/Alluvium Interface
	MKTF-33	09/14/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.60	33.15	21.61	6.41	28.02	6,911.73	6916.86	20 - 30	Chinle/Alluvium Interface
	MKTF-33	11/10/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.60	33.15	21.65	6.16	27.81	6,911.94	6916.87	20 - 30	Chinle/Alluvium Interface
	MKTF-33	12/04/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.18	33.57	21.69	6.08	27.77	6,911.98	6916.84	20 - 30	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	MKTF-34	02/05/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.65	27.70	ND	0.00	17.78	6,927.57	NA	9 - 24	Chinle/Alluvium Interface
	MKTF-34	06/29/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.65	27.70	19.04	0.02	19.06	6,926.29	6926.31	9 - 24	Chinle/Alluvium Interface
*	MKTF-34	09/14/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.59	27.76	ND	0.00	19.09	6,926.26	NA	9 - 24	Chinle/Alluvium Interface
*	MKTF-34	11/10/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.59	27.76	ND	0.00	19.08	6,926.27	NA	9 - 24	Chinle/Alluvium Interface
*	MKTF-34	12/04/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.57	27.78	18.91	0.01	18.92	6,926.43	NA	9 - 24	Chinle/Alluvium Interface
	MKTF-35	02/05/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.20	16.45	ND	0.00	9.28	6,942.37	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-35	06/30/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.20	16.45	ND	0.00	9.25	6,942.40	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-35	09/14/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.42	16.23	ND	0.00	8.59	6,943.06	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-35	11/10/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.42	16.23	ND	0.00	8.86	6,942.79	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-35	12/04/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.26	16.39	9.02	0.01	9.03	6,942.62	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-36	02/03/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.90	15.61	7.89	0.55	8.44	6,945.07	6945.51	5 - 15	Chinle/Alluvium Interface
	MKTF-36	06/30/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.90	15.61	8.04	0.21	8.25	6,945.26	6945.43	5 - 15	Chinle/Alluvium Interface
*	MKTF-36	09/14/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.93	15.58	ND	0.00	7.87	6,945.64	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-36	11/10/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.93	15.58	7.98	0.05	8.03	6,945.48	6945.52	5 - 15	Chinle/Alluvium Interface
*	MKTF-36	12/04/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.93	15.58	8.10	0.07	8.17	6,945.34	6945.40	5 - 15	Chinle/Alluvium Interface
	MKTF-37	02/03/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.27	24.60	9.77	0.12	9.89	6,948.98	6949.08	4 - 24	Chinle/Alluvium Interface
	MKTF-37	06/30/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.27	24.60	9.61	0.02	9.63	6,949.24	6949.26	4 - 24	Chinle/Alluvium Interface
*	MKTF-37	09/14/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.33	24.54	ND	0.00	8.76	6,950.11	NA	4 - 24	Chinle/Alluvium Interface
*	MKTF-37	11/10/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.33	24.54	9.36	0.01	9.37	6,949.50	6949.51	4 - 24	Chinle/Alluvium Interface
*	MKTF-37	12/04/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.26	24.61	9.64	0.01	9.65	6,949.22	6949.23	4 - 24	Chinle/Alluvium Interface
	MKTF-38	03/04/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.58	20.31	ND	0.00	9.61	6,945.28	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-38	06/26/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.56	20.33	ND	0.00	9.38	6,945.51	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-38	09/14/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.71	20.18	ND	0.00	8.55	6,946.34	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-38	11/10/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.71	20.18	ND	0.00	9.12	6,945.77	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-38	12/04/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,933.59	21.30	9.35	0.01	9.36	6,945.53	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-39	02/03/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,938.55	15.20	ND	0.00	10.10	6,943.65	NA	5 - 15	Chinle/Alluvium Interface
	MKTF-39	06/26/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,938.75	15.00	ND	0.00	9.63	6,944.12	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-39	09/15/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,939.56	14.19	ND	0.00	9.58	6,944.17	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-39	11/10/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,939.56	14.19	ND	0.00	10.05	6,943.70	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-39	12/04/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,939.56	15.19	ND	0.00	10.15	6,943.70	NA	5 - 15	Chinle/Alluvium Interface
	MKTF-40	02/27/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.69	23.64	ND	0.00	13.23	6,881.10	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-40	06/26/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.69	23.64	ND	0.00	12.75	6,881.58	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-40	09/15/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.67	23.66	ND	0.00	13.39	6,880.94	NA	5 - 20	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-40	11/10/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.67	23.66	ND	0.00	13.71	6,880.62	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-40	12/04/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.66	23.67	ND	0.00	13.99	6,880.34	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-41	02/26/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.54	40.10	ND	0.00	20.15	6,873.49	NA	22 - 37	Chinle/Alluvium Interface
	MKTF-41	06/29/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.54	40.10	ND	0.00	19.77	6,873.87	NA	22 - 37	Chinle/Alluvium Interface
*	MKTF-41	09/14/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.98	39.66	ND	0.00	20.72	6,872.92	NA	22 - 37	Chinle/Alluvium Interface
*	MKTF-41	11/10/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.98	39.66	ND	0.00	21.01	6,872.63	NA	22 - 37	Chinle/Alluvium Interface
*	MKTF-41	12/04/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.84	39.80	ND	0.00	20.90	6,872.74	NA	22 - 37	Chinle/Alluvium Interface
	MKTF-42	02/26/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.80	33.15	ND	0.00	16.79	6,876.16	NA	10 - 30	Chinle/Alluvium Interface
	MKTF-42	06/30/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.80	33.15	ND	0.00	16.25	6,876.70	NA	10 - 30	Chinle/Alluvium Interface
*	MKTF-42	09/14/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.85	33.10	ND	0.00	16.35	6,876.60	NA	10 - 30	Chinle/Alluvium Interface
*	MKTF-42	11/10/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.85	33.10	ND	0.00	15.30	6,877.65	NA	10 - 30	Chinle/Alluvium Interface
*	MKTF-42	12/04/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,860.00	32.95	ND	0.00	16.41	6,876.54	NA	10 - 30	Chinle/Alluvium Interface
	MKTF-43	02/26/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,861.47	15.43	ND	0.00	6.33	6,870.57	NA	2 - 12	Chinle/Alluvium Interface
	MKTF-43	06/30/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,861.47	15.43	ND	0.00	5.50	6,871.40	NA	2 - 12	Chinle/Alluvium Interface
*	MKTF-43	09/14/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,860.68	16.22	ND	0.00	6.45	6,870.45	NA	2 - 12	Chinle/Alluvium Interface
*	MKTF-43	11/10/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,860.68	16.22	ND	0.00	7.48	6,869.42	NA	2 - 12	Chinle/Alluvium Interface
*	MKTF-43	12/04/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,859.98	16.92	ND	0.00	8.12	6,868.78	NA	2 - 12	Chinle/Alluvium Interface
	MKTF-44	03/04/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.80	51.15	ND	0.00	30.34	6,839.61	NA	38 - 48	Chinle/Alluvium Interface
	MKTF-44	06/26/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.80	51.15	ND	0.00	33.08	6,836.87	NA	38 - 48	Chinle/Alluvium Interface
*	MKTF-44	09/14/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.00	51.95	ND	0.00	28.00	6,841.95	NA	38 - 48	Chinle/Alluvium Interface
*	MKTF-44	12/04/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.56	51.39	ND	0.00	39.59	6,830.36	NA	38 - 48	Chinle/Alluvium Interface
	MKTF-45	02/03/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,919.35	30.24	9.60	9.02	18.62	6,930.97	6938.19	Unknown	Chinle/Alluvium Interface
	MKTF-45	06/30/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,919.35	30.24	11.08	8.00	19.08	6,930.51	6936.91	Unknown	Chinle/Alluvium Interface
*	MKTF-45	09/14/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,912.14	37.45	13.14	5.29	18.43	6,931.16	6935.39	Unknown	Chinle/Alluvium Interface
*	MKTF-45	11/10/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,912.14	37.45	12.94	1.82	14.76	6,934.83	6936.29	Unknown	Chinle/Alluvium Interface
*	MKTF-45	12/04/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,919.14	30.45	12.66	1.85	14.51	6,935.08	6936.56	Unknown	Chinle/Alluvium Interface
	MKTF-46	03/05/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,939.60	18.00	ND	0.00	10.93	6,946.67	NA	3 - 18	Chinle/Alluvium Interface
	MKTF-46	06/30/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,939.60	18.00	ND	0.00	11.08	6,946.52	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-46	09/14/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,932.31	25.29	ND	0.00	10.18	6,947.42	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-46	11/10/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,932.31	25.29	ND	0.00	10.57	6,947.03	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-46	12/04/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,936.30	21.30	ND	0.00	10.77	6,946.83	NA	3 - 18	Chinle/Alluvium Interface
	MKTF-47	03/05/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.00	ND	0.00	9.89	6,949.20	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-47	06/29/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.00	ND	0.00	9.50	6,949.59	NA	4 - 14	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-47	09/15/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.31	8.53	0.01	8.54	6,950.55	6950.56	4 - 14	Chinle/Alluvium Interface
*	MKTF-47	11/10/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.31	ND	0.00	9.33	6,949.76	NA	4 - 14	Chinle/Alluvium Interface
*	MKTF-47	12/04/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.31	9.58	0.01	9.59	6,949.50	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-48	03/03/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	18.00	12.66	0.16	12.82	6,948.91	6949.04	2 - 17	Chinle/Alluvium Interface
	MKTF-48	06/29/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	18.00	ND	0.00	11.58	6,950.15	NA	2 - 17	Chinle/Alluvium Interface
*	MKTF-48	09/15/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	19.91	11.85	0.01	11.86	6,949.87	6949.88	2 - 17	Chinle/Alluvium Interface
*	MKTF-48	11/10/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	19.91	12.40	0.11	12.51	6,949.22	6949.31	2 - 17	Chinle/Alluvium Interface
*	MKTF-48	12/04/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	20.94	12.77	0.33	13.10	6,948.63	6948.89	2 - 17	Chinle/Alluvium Interface
	MKTF-49	03/04/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	28.00	ND	0.00	20.27	6,926.49	NA	5 - 25	Chinle/Alluvium Interface
	MKTF-49	06/30/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	28.00	ND	0.00	20.65	6,926.11	NA	5 - 25	Chinle/Alluvium Interface
*	MKTF-49	09/15/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	24.96	ND	0.00	20.33	6,926.43	NA	5 - 25	Chinle/Alluvium Interface
*	MKTF-49	11/10/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	24.96	ND	0.00	20.75	6,926.01	NA	5 - 25	Chinle/Alluvium Interface
*	MKTF-49	12/04/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	24.97	ND	0.00	20.81	6,925.95	NA	5 - 25	Chinle/Alluvium Interface
	MKTF-50	03/04/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	26.00	ND	0.00	15.87	6,926.95	NA	3 - 18	Chinle/Alluvium Interface
	MKTF-50	06/30/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	26.00	ND	0.00	16.00	6,926.82	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-50	09/15/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	22.64	15.36	0.01	15.37	6,927.45	6927.46	3 - 18	Chinle/Alluvium Interface
*	MKTF-50	11/10/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	22.64	ND	0.00	16.03	6,926.79	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-50	12/04/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	21.63	ND	0.00	16.17	6,926.65	NA	3 - 18	Chinle/Alluvium Interface

Definitions:
NA = not applicable
DTW = depth to water
SPH = separate phase hydrocarbons
NS = Not Surveyed
NM = Not Measured
DRY = no water detected
in = inch
ft = feet

Notes:
1. Corrected Water Table Elevation applies only if SPH thickness column measurement exists. (0.8 X SPH thickness + Groundwater Elevation)
Negative number in Stick up Length column indicates well is flushmount and located at or below ground level.
Depth to Water Column - if 0.00 is indicated - means water is at top of casing (full) under artesian flow conditions.

ATTACHMENT B-5. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
ARTESIAN WATER WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Date of Installation	Submersible pump depth (ft)	Casing Diameter (in)	Well Head Elevation Mark* (North) (ft)	Well Head Elevation Mark* (West) (ft)	Well Head Elevation Mark* (Z) (ft)	Measuring Point Discription	Total Well Depth (ft)
PW-2	9/24/1956	800	16.0	3300.40	4694.28	162.78	1st Discharge tee or elbow	1075.00
PW-3	4/1979	900	14.0	2932.83	1387.79	248.00	1st Discharge tee or elbow	1030.00
PW-4	11/12/1999	750	12.0	1895.73	2979.78	178.51	1st Discharge tee or elbow	1020.00

Well ID	Well Casing Bottom Elevation (ft)	Stratigraphic unit	Aquifer
PW-2	2225.40	Chinle	San Andreas/Yeso Aquifer
PW-3	1902.83	Chinle	San Andreas/Yeso Aquifer
PW-4	819.73	Chinle	San Andreas/Yeso Aquifer

Notes

ft = feet
ID = identification
in = inch
MSL = mean sea level
* Basis of survey Refinery Control Point at 1000W, 2575N, plant elevation = 254.87 ft and MSL elevation = 6959.41 ft

1) Well casing bottom elevation using Well Head Elevation Mark (North) as a reference point.
2) Actual well casing diameter is 12 inches. The 176 ft of 24 in steel casing is the actual cemented support for development of the well.
3) The actual total well depth is 1020 ft with additonal 56 ft x 7-7/8 in diameter open exploratory hole which was accounted for as total well depth of 1076 ft.

ATTACHMENT C

ELECTRONIC COPIES OF THE

FINAL FACILITY WIDE GROUND WATER MONITORING WORK PLAN

UPDATES FOR 2021

AND

REDLINE-STRIKEOUT TEXT

Western Refining Southwest LLC D/B/A Marathon Gallup Refinery Facility Wide Groundwater Monitoring Work Plan – Updates for 2021

Gallup Refinery
92 Giant Crossing Road
Gallup, NM 87301
(505) 722-3833

Submitted: March 31, 2021
Revised: September 30, 2021
Revision 2: January 31, 2022

Executive Summary

Western Refining Southwest LLC, Marathon Gallup Refinery (Refinery) conducts quarterly, semi-annual, and annual groundwater monitoring on a site wide basis. This Groundwater Monitoring Work Plan (Plan) documents ~~any~~ additions or revisions in groundwater monitoring and details the sampling procedures used.

This Plan divides the facility into six monitoring groups. Group A consists of the boundary wells situated along the northwest corner of the Refinery property and monitoring wells around the land treatment area (LTU). Group B consists of a cluster of wells at the aeration basin and at the sanitary treatment pond 1 (STP-1) near the Wastewater Treatment Unit. Group C consists of the observation wells (OW) on the northeast section of the Refinery, including four product recovery wells and OW-58A. Group D includes the process/production wells and the four OWs located on the south-southwest section of the property. Group E wells include 50 permanent monitoring wells installed to delineate the extent of a hydrocarbon plume associated with a seep discovered in 2013 directly west of the crude tanks (T-101 and T-102). Also included in this group is a pre-existing well located directly west of the truck loading terminal. Group F includes the sampling locations required for the evaporation ponds and effluent from the sanitary treatment pond (STP-1). Group locations are provided on Figure 1-3.

The Refinery will periodically review facility-wide monitoring data and assess the monitoring program presented in this Plan. Revisions to the Plan, as necessary, will be presented annually for agency review and approval. These revisions may include, but are not be limited to, a reduction or change in monitoring locations, monitoring frequency, and/or target chemicals to be analyzed. The proposed modifications to the Plan for 2021 and the rationale are presented in Section 5.0.

A timeline of the Plan is provided below:

- "Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on March 31, 2021.

- "Disapproval" was received from the New Mexico Environment Department (NMED) on May 25, 2021.
- "[Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on September 30, 2021.
- "Second Disapproval" was received from NMED on November 15, 2021.
- "[Second Revision] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" is represented with this document, submitted by the Refinery on January 31, 2022.

Because this document was not approved during the 2021 calendar year,

~~T~~the Refinery followed~~s~~ the most current approved sampling/monitoring schedule from the ~~New Mexico Environment Department (~~NMED~~)~~: ~~-~~"Approval with Modifications Revised Facility-Wide Ground Water Monitoring Work Plan, Gallup Refinery – Updates for 2020," HWB WRG 20-012, dated February 16, 2021. Changes proposed in this Plan [Second Revision] will be incorporated into the 2022 Plan update, as appropriate. The 2022 Plan update will be submitted by March 31, 2022.

The Refinery has created a monitoring work plan with quality assurance practices and controls as well as standard procedures for sampling, and a schedule of activities to monitor groundwater and surface water at select locations of the Refinery. The persons responsible for the implementation and oversight of this plan are:

Vice President

- Ruth Cade

Senior HSE Professional

- Kateri Luka

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List of Acronyms

%	percent
AL	aeration lagoon
AOC	area of concern
API	American Petroleum Institute
cm/s	centimeter per second
DRO	diesel range organics
EP	evaporation pond
ft	feet or foot
GAC	granular activated carbon
GPM	gallons per minute
GRO	gasoline range organics
HWB	Hazardous Waste Bureau
in	inch
in/hr	inches per hour
LDU	Leak Detection Unit
LTU	Land Treatment Unit
MKTF	Market Tank Farm
MPC	Marathon Petroleum Company
MTBE	methyl tert butyl ether
NAPIS	New American Petroleum Institute Separator
NM	New Mexico
NMED	New Mexico Environment Department
No.	number
OAPIS	Old American Petroleum Institute Separator
OW	observation well
OCD	Oil Conservation Division
ORP	oxidation-reduction potential

List of Acronyms – Continued

PVC	polyvinyl chloride
PW	process well
QC	quality control
RW	recovery well
RCRA	Resource Conservation and Recovery Act
SPH	separate phase hydrocarbon
STP	sanitary treatment pond
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WWTP	wastewater treatment plant

1.0 Introduction

This Facility-Wide Groundwater Monitoring Work Plan – Updates for 2021 (Plan) has been prepared for the implementation of the groundwater monitoring program at the Marathon Gallup Refinery (Refinery) owned and operated by Western Refining Southwest LLC. Figure 1-1 shows the regional location of the Gallup Refinery. A topographic map showing the general layout of the Refinery in comparison to the local topography is presented on Figure 1-2.

1.1 Scope of Activities

This Plan has been prepared to collect data that will be used to characterize the nature and extent of potential impacts to groundwater at the Refinery. The Plan is designed to assist in evaluating any levels of constituents that exceed compliance standards. This Plan divides the Facility into six groups for periodic monitoring, Group A through Group F.

Group A consists of the boundary wells situated along the northwest corner of the Refinery property and the monitoring wells around the land treatment unit (LTU). Group B consists of a cluster of monitoring wells and leak detection units for the New American Petroleum Institute (API) Separator (NAPIS) at the aeration basin and at the sanitary treatment pond. Group C includes the observation wells (OWs) located on the northeast section of the plant and recovery wells from which small quantities of free product have been continually removed. Group D includes the process/production wells and four OWs located on the south-southwest section of the Refinery property. Group E includes permanent monitoring wells installed to delineate a hydrocarbon plume associated with a seep discovered in 2013 west of the crude tanks (T-101 and T-102). Also included in this group is pre-existing well MKTF-45, located directly west of the truck loading terminal. Group F includes sampling locations for the evaporation ponds and for the effluent from the sanitary treatment pond. Designated wells and sample points identified are monitored on a quarterly, semi-annual, and annual basis following the procedures presented in this Plan (Figure 1-3).

The Refinery periodically reviews facility-wide monitoring data and evaluates the monitoring program presented in this Plan. Annual revisions to the Plan will be presented for agency review and approval. These revisions may include, but are not be limited to, a reduction or change in monitoring locations,

monitoring frequency, and/or target chemicals to be analyzed. The revisions proposed for 2021 are outlined in Section 5.0.

1.2 Facility Ownership and Operation

This Plan pertains to the Gallup Refinery located at Exit 39 on Interstate I-40 at Jamestown, New Mexico (NM), approximately 17 miles east of Gallup. Figure 1-1 shows the regional location of the Gallup Refinery.

Owner: Marathon Petroleum Company (Parent Corporation)
539 South Main Street
Findlay, OH 45840

Operator: Western Refining Southwest LLC (Postal Address)
Gallup Refinery
92 Giant Crossing Road
Gallup, NM

Western Refining Southwest LLC (Physical address)
Gallup Refinery
I-40, Exit 39 (17 Miles East of Gallup, NM)
Jamestown, NM 87347

The following regulatory identification and permit governs the Gallup Refinery:

- Standard Industrial Classification code 2911 (petroleum refining) and North American Industry Classification System code 32411
- Final Resource Conservation and Recovery Act Post-Closure Permit, United States Environmental Protection Agency (USEPA) ID Number NMD000333211
- NM Oil Conservation Division (OCD) Abatement Plan Number AP-111; and
- 2015 NPDES MSGP, ID #NMR053168.

The Facility status is corrective action/compliance. Quarterly, semi-annual, and annual groundwater sampling is conducted at the Facility to evaluate current groundwater conditions.

The Refinery is situated on an 810-acre irregular shaped tract of land that is 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 Prime Meridian. A small component of the property lies within the northeastern one quarter of Section 4 of Township 14 North, Range 15 West. A topographic map showing the general layout of the Refinery in comparison to the local topography is presented on Figure 1-2.

2.0 Background Information

Built in the 1950s, the Gallup Refinery is located 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 (Travel Center) refueling plaza, the Interstate 40 highway corridor, and a small cluster of residential homes located on the south side of Interstate 40 approximately 2 miles southwest of the Refinery (Jamestown). The Refinery is currently indefinitely idled.

2.1 Historical and Current Site Use

When the Refinery ~~is~~was operating, it primarily receive~~d~~ds ~~crude oil via a two 6-inch (in) diameter pipelines from the Four Corners Area, which entered the Refinery property from the north. In addition, the Refinery also received natural gasoline feed stock via a 4-in diameter pipeline that came in from the west along the Interstate 40 corridor from the Western Refining Southwest LLC, Marathon Wingate Facility, which is indefinitely idled. Crude oil and other products also arrived at the Facility via railroad cars. These feed stocks ~~are~~ were then stored in tanks until refined into products.

~~When operating~~Historically, the Gallup Refinery ~~i~~was a crude oil refining and petroleum products manufacturing Facility. There ~~are~~were no organic chemicals, plastics, or synthetic fibers manufactured that contributed to the process flow of wastewater. The Refinery ~~does~~ did not manufacture lubricating oils. As a result of the processing steps, the Refinery produce~~d~~ds a wide range of petroleum products including propane, butane, unleaded gasoline, diesel, residual fuel, and commercial products of fertilizer and solid elemental sulfur. ~~when operating.~~

~~When operating, a~~Above ground storage tanks ~~are~~were used throughout the Refinery to hold and store crude oil, natural gasoline, intermediate feed stocks, finished products, chemicals, and water. The tanks remain on site and the ~~C~~capacity of these tanks range~~s~~ ~~in size~~ from 80,000 barrels to less than 1,000 barrels. Pumps, valves, and piping systems ~~are~~were used throughout the Refinery to transfer various liquids among storage tanks and processing units. A railroad spur track and a railcar loading rack ~~are~~were used to transfer feed stocks and products from Refinery storage tanks into and out of railcars. Several

tank truck loading racks ~~are~~were used at the Refinery to load out finished products and received crude oil, other feed stocks, additives, and chemicals when operating.

~~When the Refinery iwas operating, gasoline and diesel are delivered to the Travel Center via tanker truck. Historically, an underground diesel pipeline existed between the Refinery and the Travel Center. In 2013, the underground diesel line from the Refinery to the Travel Center was replaced and an above ground replacement line put in service on February 3, 2014. Due to upgrades that the Travel Center made to its facility, MPC's pipeline was no longer compatible with the Travel Center and the diesel pipeline was blinded and taken out of service by the end of 2014. The unused replacement line runs from the marketing area of the Refinery for approximately 150 feet (ft) and continues underground to the Travel Center.~~

~~When operating, a~~A firefighting training Facility was used to conduct employee firefighting training. When training was conducted, wastewater from the Facility was pumped into a tank, which was then pumped out by a vacuum truck. The vacuum truck pumped the oily water into a process sewer upstream of the NAPIS.

Even though the Refinery is on an indefinite idle, the process wastewater system remains in operation. The system is a network of curbing, paving, stormwater catch basins, and underground piping used to collect wastewater from various processing areas within the Refinery. The wastewater effluent then flows into the equalization tanks and the NAPIS. Prior to Refinery idle, the skimmed slop was passed to a collection chamber where it is pumped back into the Refinery process. Currently, only remediation fluids are processed through the system. The clarified water is routed to a wastewater treatment plant (WWTP) where benzene is removed via granular activated carbon (GAC) canisters that are placed at the effluent of the dissolved gas flotation unit. WWTP operations alternate the configuration of these GAC canisters from a single setup to an in-series setup (i.e., primary and secondary canisters). To help monitor the breakthrough of these GAC canisters, several wastewater samples are taken at the effluent of the last GAC canister. Results from benzene analysis of the wastewater samples are monitored to manage the breakthrough from the GAC canisters. When benzene values exceed 0.4 parts per million, one or more of the following actions are taken: the GAC canister configuration is modified to an in-series set-up; the GAC canister is replaced with fresh carbon; and/or the GAC canister effluent is recirculated back through the

WWTP. The treated water flows from the GAC canisters into pond STP-1. STP-1 consists of two bays, north and south, and each bay is equipped with five aerators per bay. Effluent from STP-1 then flows into Evaporation Pond 2 and gravitated to the rest of the ponds.

During ~~episodes of unit upsets or~~ major storm events, the wastewater is held in one of the three equalization tanks, T-35, T-27, and T-28, to handle large process and storm water flows. By holding wastewater in the tanks, flow to the NAPIS ~~could~~can be controlled. These tanks are also used to store wastewater if problems are encountered with the downstream equipment, i.e., NAPIS or the WWTP.

The storm water system is a network of valves, gates, berms, embankments, culverts, trenches, ditches, natural arroyos, and retention ponds that collect, convey, control, and release storm water that falls within or passes through Refinery property. Storm water that falls within the processing areas is considered equivalent to process wastewater. Storm water is sent to tanks T-35, T-27, and T-28 when needed before it reaches the NAPIS, WWTP, STP-1, and into Evaporation Pond 2, where flow is gravitated to the rest of the ponds. Storm water discharge from the Refinery is very infrequent due to the arid, desert-like nature of the surrounding geographical areas.

No wastewater is currently discharged from the Refinery to surface waters of the state. At the evaporation ponds, wastewater is converted into vapor via solar and mechanical wind-effect evaporation via two 80 gallons per minute (GPM), electrically driven evaporation pond spraying snow machines located between ponds 4 and 5. Two additional 66 GPM evaporation pond sprayers were installed in October 2014 between ponds 3 and 4 for a total of four evaporators. ~~Historically, reverse osmosis reject water from the Boiler House area has discharged to Evaporation Pond 9.~~

In September 2015, the Refinery submitted a Notice of Intent requesting continued coverage under the 2015 National Pollutant Discharge Elimination System Multi-Sector General Permit, which was approved on October 8, 2015 (NMR053168). The Refinery maintains a Storm Water Pollution Prevention Plan that includes best management practices for effective storm water pollution prevention. The Refinery has constructed several new berms in various areas and improved outfalls (installed barrier dams equipped

with gate valves) to minimize the possibility of potentially impacted runoff leaving the Facility and also to minimize the stormwater run-on from the I-40 interchange and the Travel Center to the Facility.

2.2 Potential Receptors

Potential receptors at the Facility include those that occur from current land use and may arise from future land uses. Currently, these include on-site workers, nearby residents, wildlife, and livestock. The major route to exposure of humans would be from constituents reaching a drinking water well. Other routes could include using impacted groundwater for showering, cooking, raising crops and vegetables, fishing in surface water, or touching soils and/or plants that contacted impacted groundwater. Fluctuating groundwater elevations can smear inorganic and organic constituents into subsurface soil and rocks, and there is a possibility that plant roots could reach potentially impacted soils and bio-concentrate those constituents. This could create another route of exposure to potential receptors, such as birds and animals that eat the plants. No food crops are currently grown at the Facility.

At this time, the nearest drinking water wells are located on-site in the southwest areas of the Facility at depths of approximately 1,000 ft. These wells are identified as process or production (PW) wells and are designated as PW-2, PW-3, and PW-4 (Figure 2-1). These wells are operated by the Facility to provide process water for refinery operations and drinking water to nearby Refinery-owned houses, Refinery, and Travel Center. Currently, PW-2 is sampled every three years and PW-3 and PW-4 are sampled on a quarterly basis. The analytical results of these and the other water samples collected under this Plan are discussed in the annual facility-wide groundwater monitoring reports.

Other than the on-site wells, there are no known drinking water wells located within a 4-mile radius of the Refinery. The nearest drinking water wells that could be used by off-site residents are located to the northwest of the Refinery at a distance slightly greater than 4 miles, located within the Navajo community of Iyanbito. These wells are northwest of the South Fork of the Rio Puerco, which flows towards the southwest from immediately north of the Facility. The Cibola National Forest lies to the southeast and there are no wells or residents in this protected area.

No surface water at the Facility is used for human consumption, primary contact (such as immersion), or secondary contact (such as recreation). The man-made ponds at the Facility are routinely monitored and are a part of this Plan. Therefore, if they are in contact with shallow groundwater exhibiting elevated levels of constituents, the Plan will detect any commingling of groundwater and surface waters.

2.3 Waste Contaminant Types, Characteristics, and Possible Sources

The types of waste present at the Refinery include volatile and semi-volatile organic compounds (VOCs and SVOCs, respectively), primarily hydrocarbon constituents, but could include other industrial chemicals such as solvents, acids, spent caustic solutions, and heavy metals. These wastes could be in the form of wastewater, sludge, dry solids, or spent chemicals destined for off-site shipping and disposal packed in drums.

Most of the wastes and constituents that could possibly reach groundwater could biodegrade and naturally attenuate. However, any heavy metals present in soil or sludge could leach into groundwater and would not biodegrade. It is possible that certain long-lived chemicals would not biodegrade, or if they did it would be at a very slow rate. Possible sources include leaks from buried pipes, tanks, surface spills, and historical dumping of wastes on-site.

All above-ground large tanks have leak detection or equivalent systems, such as radar gauges and are within containment/bermed areas to contain spills. However, while the Refinery is indefinitely idled no hydrocarbon is stored on-site. The NAPIS has double walls and a leak detection system installed.

Similarly, surface impoundments can serve as a source of possible groundwater impacts. Historically, wastewater from the railroad loading rack flowed to a settling and separation lagoon north of the rack. Wastewater flow exited at the north end, where the water was distributed across a flat open site known as the fan-out area. The free flow of liquids led to subsurface soil impacts. This area is identified as Solid Waste Management Unit (SWMU) Number (No.) 8 and has been remediated and granted Corrective Action Complete with Controls status. Disposal of wastewater into open fields is not practiced at the Refinery.

There are 14 SWMUs identified at the Refinery and one closed LTU. On December 31, 2013, the Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit ("RCRA Permit") became effective under the New Mexico Administrative Code §20.4.1.901A(10). The RCRA Permit identified an additional 20 Areas of Concern (AOCs) requiring corrective action. These units are listed below.

RCRA Regulated Units

- LTU

SWMUs

- SWMU 1 – Aeration Basin
- SWMU 2 – Evaporation Ponds
- SWMU 3 – Empty Container Storage Area
- SWMU 4 – Old Burn Pit
- SWMU 5 – Landfill Areas
- SWMU 6 – Tank Farm
- SWMU 7 – Fire Training Area
- SWMU 8 – Railroad Rack Lagoon
- SWMU 9 – Drainage Ditch and the Inactive Land farm
- SWMU 10 – Sludge Pits
- SWMU 11 – Secondary Oil Skimmer
- SWMU 12 – Contact Wastewater Collection System
- SWMU 13 – Drainage Ditch between North and South Evaporation Ponds
- SWMU 14 –API Separator

AOCs

- AOC 15 – New API Separator
- AOC 16 – New API Separator Overflow Tanks
- AOC 17 – Railroad Loading/Unloading Facility
- AOC 18 – Asphalt Tank Farm (tanks 701-709, 713, 714)
- AOC 19 – East Fuel Oil Loading Rack

- AOC 20 – Crude Slop and Ethanol Unloading Facility
- AOC 21 – Main Loading Racks
- AOC 22 – Loading Rack Additive Tank Farm
- AOC 23 – Retail Fuel Tank Farm (tanks 1-7, 912, 913, 1001, 1002)
- AOC 24 – Crude Oil Tank Farm (tanks 101 and 102)
- AOC 25 – Tank 573 (Kerosene Tank)
- AOC 26 – Process Units
- AOC 27 – Boiler and Cooling Unit Area
- AOC 28 – Warehouse and Maintenance Shop Area
- AOC 29 – Equipment Yard and Drum Storage Area
- AOC 30 – Laboratory
- AOC 31 – Tanks 27 and 28
- AOC 32 – Flare and Ancillary Tanks (tanks Z85V2, Z85V3, Z84-T105)
- AOC 33 – Storm Water Collection System
- AOC 34 – Scrap Yard
- AOC 35 – Main Truck Loading Rack, Crude Slop and Ethanol Unloading Facility, Additive Tank Farm/Loading Rack, and Retail Tank Farm (tanks 1-7, 912, 913, 1001, and 1002)

Existing groundwater monitoring wells effectively surround the LTU, SWMUs, and AOCs. The RCRA Permit was subsequently modified in September 2017, with SWMU 8 and AOCs 19 and 25 granted Corrective Action Complete status. AOC 32 was combined with SWMU 14; AOC 33 was combined with SWMU 12. AOCs 20, 21, 22, and 23 were combined to make AOC 35. The schedule in the RCRA Permit Appendix E, Table E-1 was amended to reflect prior submittals and revised due dates and deferral of other units. A new Consent Order was executed in January 2017, which resulted in 11 AOCs (AOC 16, 17, 18, 24, 26, 27, 28, 29, 30, 31, and 34) being removed from the RCRA Permit and transferred to the Consent Order for further evaluation. The Refinery received correspondence from the New Mexico Environment Department (NMED) on August 19, 2021 that will restore the 11 AOCs back to the RCRA Permit. ~~This will be submitted no later than November 30, 2021~~The Permit modification was submitted by the Refinery to NMED on December 2, 2021.

2.4 Summary of Historical Impacts

Spills and leaks are known to have occurred from Facility operations and equipment. If a release occurs, immediate action is taken to address the cause and to limit impacts to the subsurface. Although the area is characterized as a semiarid climate with a low annual rainfall, there is a possibility that precipitation could leach into the subsurface.

2.4.1 Constituents of Concern

There are several categories of constituents that are observed at the Facility: general chemistry (e.g., total petroleum hydrocarbons, cations/anions), metals, VOCs, and SVOCs. In addition, separate phase hydrocarbon (SPH) has been found in multiple locations within the Refinery. In the following sections, information regarding two of the primary constituents of concern (SPH and methyl tert butyl ether [MTBE]) is presented. It should be noted that there are other constituents that have been detected above applicable screening levels.

Separate Phase Hydrocarbon

SPH has been observed in the Main Tank Farm, Hydrocarbon Seep Area, Aeration Basin, French Drain, Truck Loading Rack, and NAPIS Unit areas.

In the Main Tank Farm area, SPH was found floating on shallow groundwater in the mid-1990s. A series of recovery wells (RWs) were installed and SPH has been recovered since the initial discovery. Monitoring wells in the Main Tank Farm and the down-gradient area are RW-1, RW-2, RW-5, RW-6, OW-14, OW-30, OW-55, OW-58. In the Hydrocarbon Seep area, data regarding the liquid recovered from the sumps and retention ditch is available in the quarterly Hydrocarbon Seep Reports. In the Aeration Basin, SPH has been detected in GWM-1 since the third quarter sampling event in 2015 through December 2020. The~~,~~ thickness has ranged from a minimum of 0.13 ft in November 2019 to a maximum of 1.0 ft in December 2017. In the French Drain area, a mixture of hydrocarbon and water spilled in 2018. Five monitoring wells (OW-61 thru OW-65) were installed in an effort to delineate the hydrocarbon plume that had been discharging from the PVC pipe. During 2020 quarterly gauging, SPH was detected in OW-61, OW-62, and OW-65 during each event. In the Truck Loading Rack area, a gasoline release was observed in 2019. The source of the release was determined to be an underground transfer line on the north side of the Truck

Loading Rack. In the NAPIS unit area, SPH was detected in NAPIS-1 from 2017 to the third quarter of 2020. SPH was not detected in NAPIS-1 during the fourth quarter of 2020. ~~The source of the SPH is suspected to be an unspecified release from the Refinery~~.

Methyl Tert Butyl Ether

MTBE has not been used at the Refinery since April 2006. Several monitoring wells were installed at various depths to monitor SPH and MTBE contaminant constituent plumes from historical contamination impacts. Historical analytical data for the observation wells (OWs) (OW-14, 29, and 30) indicate the MTBE concentration has slowly been increasing over the years in these wells. Based on the information collected, NMED – Hazardous Waste Bureau (HWB) requested two Work Plans to further investigate the known MTBE plume at the Facility and investigate a suspected plume north of the main tank farm (SWMU No. 6). These OWs monitored for SPH and MTBE are located downstream on the northeast section of the plant and are OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, OW-56.

2.4.2 Areas of Interest

There are several areas of the refinery with documented impacts to soil and groundwater. In the following sections, information regarding four areas with known impacts is presented.

NAPIS Unit

The NAPIS is located at the southwest end of the Facility and is used to recover and recycle oil back into the process. The NAPIS has caused some MTBE and hydrocarbon impacts in shallow groundwater through leakage and spills. The NAPIS unit was put into service in October 2004. The NAPIS has one up-gradient well, NAPIS-1, located on the east side and three down-gradient shallow monitoring wells and NAPIS-2, NAPIS-3, and KA-3 which are located along the west side. The NAPIS unit is also equipped with three leak detection units (LDU) on the east and west bays, including the oil sump section on the east bay and are designated as East LDU, West LDU, and oil sump LDU. NMED requested an investigation of the NAPIS to determine if the secondary containment was leaking. The Refinery began an initial investigation of the NAPIS and provided a response in the 2019 Annual Groundwater Monitoring Report Response to Approval with Modifications Comment 2 (Western 2021). The evaluation was performed in May and June 2021, which included pulling the East Bay out of service for an extended period. ~~The new data collected during~~

~~the evaluation shows that there is no communication between the NAPIS/LDU and groundwater in the area. The NAPIS secondary containment is not leaking.~~

Aeration Basin

The aeration basin (SWMU No. 1) in the Facility's RCRA Permit, includes three cells known as aeration lagoon (AL)-1, AL-2 and holding pond 1 (currently referred to as EP-1). EP-1 is not an evaporation pond and is not part of the area covered by SWMU No. 2 – Evaporation Ponds. These three cells have not been in service since the startup of the WWTP in 2012. All Refinery wastewater flow was diverted to the WWTP bypassing AL-1, AL-2, and EP-1. The Refinery experienced intermittent discharges of oil and oily water into AL-1, AL-2, and EP-1, and spills to the ground surface while the aeration basin was in operation. Most of these occurrences were the result of unit upsets and/or large storm events affecting the old API Separator (OAPIS).

Wells around the aeration basin include GWM-1, GWM-2, GWM-3, and OAPIS-1. GWM-1 and GWM-2 were installed immediately down gradient of AL-1, AL-2, and EP-1 in 2004 and 2005 to detect potential leakage from the aeration basin.

Analysis of groundwater samples collected at GWM-1 and GWM-2 have indicated several organic constituents at concentrations above the screening levels in groundwater. NMED was notified of this finding and the Refinery was instructed to collect a hydrocarbon sample for fingerprint analysis (Diesel Range Organics/Gasoline Range Organics [DRO/GRO] and Motor Oil Range Organics). The Refinery was also instructed to purge and gauge the wells on a weekly basis to check the recharge rate. The initial measurement was made without the use of an oil/interface probe and the thickness of the hydrocarbon layer in the well was not immediately known. Measured SPH thickness ranged from 0.35 to 0.45 ft in September, October, and November 2015. On December 10, 2015, the Refinery sent a response to NMED–HWB concurring that the source of the hydrocarbons observed in GWM-1 was from the adjacent AL-1 and AL-2.

MPC submitted the "Solid Waste Management Unit 1 Investigation Report" on March 31, 2020, detailing a SWMU No. 1 sampling event that took place the week of January 13, 2020. The sampling was conducted for the purposes of soil and sediment volume determination and chemical characterization for future SWMU No. 1 excavation, disposal, and closure. In the response titled, "Disapproval SWMU-1 Investigation Report," dated August 31, 2020, NMED requested a revised report and an additional work plan to further delineate horizontal and vertical extents of contamination in the area of SWMU No 1. The revised report and response to comments were submitted on January 5, 2021. The Refinery submitted a response following an approval with modifications from NMED on January 26, 2021. A work plan was requested to be submitted no later than April 30, 2021. The Refinery requested that the work plan describing the removal of AL-1, AL-2, and EP-1 would be submitted at a later date. This work plan ~~will be~~was submitted to NMED ~~no later than~~ September 24~~30~~, 2021.

North Drainage Ditch

On April 22, 2015, the Refinery notified NMED-HWB of the discovery of SPH in a drainage ditch in the northern portion of the property. Surface water samples were collected from the standing water in the drainage ditch and concentrations of benzene, toluene, ethylbenzene, and xylenes were detected as well as MTBE, GRO and DRO. An investigation was conducted in May 2016 with installation of well OW-56. An additional investigation took place during July 2021. An investigation report detailing the results ~~will be~~ was submitted to NMED ~~no later than~~ on December ~~31~~15, 2021.

OW-14 Source Area

In correspondence dated May 11, 2015, NMED requested submittal of a work plan to investigate the source of constituents present in groundwater monitoring well OW-14. Subsequently, wells OW-57 and OW-58 were installed in 2016 pursuant to NMED's May 12, 2016 "Approval with Modifications, Revised OW-14 Source Area Investigation Work Plan" (NMED 2016). Well OW-58A was installed in 2019 adjacent to OW-58 to screen a higher interval than was screened in OW-58.

3.0 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 cattle and sheep grazing.

3.1 Current Site Topography and Location of Natural and Manmade Structures

Local topography consists of a gradually inclined down-slope from high ground in the southeast to a lowland fluvial plain in the northwest. The highest point on Refinery property is located at the southeast corner boundary (elevation approximately 7,040 ft) and the lowest point is located at the northwest corner boundary (elevation approximately 6,860 ft). The Refinery is located on a flat man-made terrace at an elevation of approximately 6,950 ft.

3.2 Drainages

Surface water in the region consists of the man-made evaporation ponds and the aeration basin located within the Refinery, a livestock watering pond (Jon Myer's Pond) located east of the Refinery, two small unnamed spring fed ponds located south of the Refinery, and the South Fork of the Rio Puerco and its tributary arroyos. The various ponds and catch basins typically contain water throughout the year. The South Fork of the Rio Puerco and its tributaries are intermittent and generally contain water only during and immediately after precipitation.

There are several storm water conveyance ditches located throughout the Refinery. These ditches are directed to discharge into contained catch basins where storm water is collected and recycled for use as process water, collected and allowed to evaporate, diverted around regulated industrial activity, or discharged into two designated outfalls located on the east and west section of the property, identified as Outfall 001 and Outfall 002 (Figure 3-1). Outfall 001 is located directly south of evaporation pond 8 on the western edge of the Refinery's property boundary and equipped with four separate small diameter overflow pipelines, each with a manual flow valve for independent control. Outfall 002 is located north of the railroad loading rack on the eastern section of the Facility. This outfall consists of a concrete barrier

with a valve to control discharges from a deep ditch that collects/ponds the runoff from the rail rack loading area.

Directly west of the crude tank area, there is a concrete barrier with a control valve that discharges from a culvert that carries storm water flow from the Truck Loading Rack area. This concrete barrier is located downstream of the "hydrocarbon seep area." The flow from this concrete barrier continues in a north-northwest direction alongside the southern bermed areas of evaporation ponds 3, 4, 5, and 6 and outward towards the Outfall 001 area. At the new WWTP, there are three storm drains located on the south, southwest, and west side of the WWTP. These drains are connected to an underground storm culvert that exits on the northwest section of STP-1 into a conveyance ditch along the northern edge of pond 2 and into a holding pond equipped with manual flow valves, located north of evaporation pond 3. The discharge from this holding pond then flows north-northwest towards the Outfall 001 area.

3.3 Vegetation Types

Surface vegetation consists of native xerophytic vegetation, including grasses, shrubs, small junipers, and prickly pear cacti. Average rainfall at the Refinery is less than 7-in per year, although it can vary to slightly higher levels elsewhere in the county depending on elevation.

In alluvial fans on valley sides and drainage ways, the existing vegetation is alkali sacaton, western wheatgrass, Indian rice grass, blue grama, bottlebrush squirreltail, broom snakeweed, fourwing saltbush, threeawn, winterfat, mat muhly, and spike muhly. On fan remnants on valley sides, blue grama, western wheatgrass, Indian ricegrass, big sagebrush, galleta, bottlebrush squirreltail, fourwing saltbrush, needle and thread, one seed juniper, sand dropseed, spineless horsebrush, rabbitbrush, and two-needle pinyon are found. Cattails have been observed in isolated areas and are generally associated with wetlands.

3.4 Erosion Features

The impacts of historic overgrazing are visible at the north-side of the Facility. Arroyos have formed when surface run-off eroded sediments that were not able to hold water due to ground cover loss by overgrazing. Now that the Facility is fenced and no livestock grazing occurs on the site, vegetation has

recovered in these areas. The formation and deepening of erosional features on its land has decreased with Refinery effort to recover vegetation in undeveloped areas.

3.5 Subsurface Conditions

The following subsections discuss the subsurface conditions found at the Refinery.

3.5.1 Soil Types and Associations

Most of the soils found at the surface of on-site wells consist of the Gish-Mentmore complex (USDA 2021). These soils occur in alluvial fans and fan remnants. The parent material for these soils is derived from sandstone and shale. The soils are well drained with moderately slow (0.2 inches per hour [in/hr]) to slow permeability (0.06 in/hr). In the Gish-Mentomore complex, the Gish and similar soils make up about 45 percent (%), the Mentmore and similar soils 35%, and minor components 20%. These minor components include Berryhill and similar soils at 10% and Anodize and similar soils at 10%. The typical profile for these soils is 0- to 2-in fine sandy loam and 2- to 72-in of various clay loam.

Drill logs for various wells have been provided electronically to the NMED-HWB. From the well logs, the soils in the subsurface are generally composed of clays starting at the immediate subsurface, interbedded with narrow sand and silt layers. At about 100 to 150 ft, layers of mudstone, sandstone (from the Chinle Group, Petrified Forest Formation), and siltstone start to appear. Figure 3-2 shows a generalized relationship of soils in and around the Refinery.

3.5.2 Stratigraphy

The 810-acre Refinery property is located on a layered geologic formation. Surface soils consist of fluvial and alluvial deposits, primarily clay and silt with minor inter-bedded sand layers. Below this is the Chinle Group, which consists of low permeability clay stones and siltstones. The Chinle Group (Petrified Forest Formation) effectively serves as an aquiclude. Inter-bedded within the Chinle Group is the Sonsela Sandstone bed, which represents the uppermost potential aquifer in the region.

The Sonsela Sandstone bed lies within and parallels the dip of the Chinle Group. Its high point is located southeast of the Refinery and slopes downward to the northwest as it passes under the Refinery. Due to

the confinement of the Petrified Forest Formation aquitard, the Sonsela Sandstone bed acts as a water-bearing reservoir and is artesian at its lower extremis. Artesian conditions exist through much of the central and western portions of the Refinery.

3.5.3 Presence and Flow Direction of Groundwater

Groundwater flow within the Petrified Forest Formation is extremely slow and typically averages less than 10^{-10} centimeters per second (cm/s) or less than 0.01 ft per year. Groundwater flow within the surface soil layer above the Petrified Forest Formation is highly variable due to the presence of complex and irregular stratigraphy, including sand stringers, cobble beds, and dense clay layers. Hydraulic conductivity may range from less than 10^{-2} cm/s in the gravelly sands immediately overlying the Petrified Forest Formation down to 10^{-8} cm/s in the clay soil layers located near the surface.

Shallow groundwater located under the Refinery generally flows along the upper contact of the Petrified Forest Formation. The prevailing flow direction is from the southeast and toward the northwest.

4.0 Monitoring and Sampling Program

The primary objective of groundwater monitoring is to provide data to assess groundwater quality at and near the Facility. Groundwater elevation data will be collected to evaluate groundwater flow conditions. The groundwater monitoring program for the Facility will consist of sample collection and analysis from a series of monitoring wells, recovery wells, outfalls, and evaporation pond locations.

Appendix A presents the procedures used for sample collection and analysis and includes the following activities:

- Well gauging (i.e., depth to groundwater and SPH, if present, and depth to the bottom of the well)
- Well purging and sampling methods, including equipment, groundwater stabilization criteria, and collection of field quality parameters
- Sample handling and waste management procedures
- Field and laboratory quality assurance procedures

The monitoring network is divided into six investigation areas (Groups A, B, C, D, E, and F). The sampling frequency, analyses, and target analytes will vary for each investigation area. The combined data from these investigation areas will be used to assess groundwater quality beneath and immediately down-gradient of the Facility and evaluate local groundwater flow conditions. Section 5 outlines the sampling locations and analyte list for 2021.

Groundwater ~~S~~samples will not be collected from monitoring wells that have measurable SPH. Prior to sampling, recovery system operation will be halted to allow the groundwater to equilibrate. If SPH recovery system wells (OW-13, OW-14, OW-29, OW-30, RW-1, RW-2, RW-5, and RW-6) do not have measurable SPH, the recovery system will be removed from the well and the well sampled. For wells that are purged dry, samples will be collected if recharge volume is sufficient for sample collection within 24 hours. Wells not sampled due to insufficient recharge will be documented in the field log. If samples cannot be collected from a location due to environmental concerns, such as elevated hydrogen sulfide, arrangements will be made to collect samples from the affected location(s) at a different time.

5.0 Monitoring Program Revisions

The proposed modifications to the Plan for 2021 and the rationale are presented in Tables 5-1 through 5-5 and discussed in the following sections.

A timeline of the Plan is provided below:

- "Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on March 31, 2021.
- "Disapproval" was received from the New Mexico Environment Department (NMED) on May 25, 2021.
- "[Revised] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" was submitted by the Refinery on September 30, 2021.
- "Second Disapproval" was received from NMED on November 15, 2021.
- "[Second Revision] Facility Wide Groundwater Monitoring Work Plan – Updates for 2021" is represented with this document, submitted by the Refinery on January 31, 2022.

Because this document was not approved during the 2021 calendar year, the Refinery followed the most current approved sampling/monitoring schedule from the NMED: "Approval with Modifications Revised Facility-Wide Ground Water Monitoring Work Plan, Gallup Refinery – Updates for 2020," HWB WRG 20-012, dated February 16, 2021. Changes proposed in this Plan [Second Revision] will be incorporated into the 2022 Plan update, as appropriate. The 2022 Plan update will be submitted by March 31, 2022.

5.1 Modifications in Monitoring Locations

The proposed monitoring locations are presented in Table 5-1. One sample location, Boiler Water Inlet to EP-9, has been removed because the Boiler is no longer in service.

Ten new monitoring wells were installed and added to the network in 2021 as shown on Figure 5-1. Four wells proposed for installation were not installed due to dry conditions in the borehole and off-site access. Descriptions of these 14 wells and the installation objectives are provided below.

Wells that were installed include:

- Well OW-66 was installed approximately halfway the distance between OW-29 and OW-13 to evaluate the potential migration of MTBE within the Sonsela aquifer (NMED 2018, Comment 18.3).
- Wells OW-67 and OW-68 were installed north of EP-2 to evaluate the source of elevated chloride and sulfate concentrations detected in well SMW-2 (NMED 2019a).
- Well OW-70 was installed between MKTF-32 and MKTF-33 and downgradient of the borrow pit seep area to serve as a sentinel well for SPH potentially migrating beyond the recovery sumps (NMED 2020, Comment 1).
- In addition, six wells were plugged and abandoned following NM state guidelines (New Mexico Administrative Code 19.24.4) and replaced because the well screens have been historically submerged (NMED 2018, Comment 40; NMED 2019b, Comment 4). Wells MKTF-01R, MKTF-02R, MKTF-04R, MKTF-17R, MKTF-18R, and RW-2R were installed adjacent to the original well locations.

Wells that were proposed but not installed include:

- Well OW-13A was proposed to be installed near OW-13 to address concerns that OW-13 may be a migration pathway for constituents (e.g., MTBE) to move vertically downward to the Sonsela aquifer (NMED 2018, Comments 18.4 and 39). Water was not observed in the boring and the well was not installed. However, soil samples were collected. Given that water was not observed in the shallow zone, it is not expected that there would be any downward migration of contaminants into the Sonsela. Well OW-13 will continue to be sampled.
- Well OW-69 was proposed to be installed between well GWM-1 and EP-2 to evaluate the extent of SPH in the shallow aquifer and to serve as a sentinel well for the eastern perimeter of EP-2 (NMED 2019a). Water was not observed in the boring and the well was not installed. However, soil samples were collected.

- Two proposed wells will be located off site. To delineate the down-gradient extent of the plume detected at OW-1, a new Sonsela well will be installed approximately 100 ft down-gradient of OW-1 to the west (NMED 2018, Comment 22). A new Chinle-Alluvial well will be located approximately 500 ft down-gradient of OW-30 to evaluate MTBE to the northeast of the Refinery (NMED 2018, Comment 18.2). Property access was not granted by the adjacent landowners prior to the field activities. These wells will be installed after access is obtained.

The new monitoring wells installed in 2021 have not been included in Table 5-1. MPC will submit a separate well completion report by October 13, 2021 documenting the final well completion detailing the ten new monitoring wells and two dry borings, the proposed sampling schedule, and the proposed analytical suites.

5.2 Modifications in Monitoring Frequency

The current monitoring frequency has been evaluated for the 2021 sampling events. The changes made to the monitoring frequency are presented in Table 5-2. In summary, sampling frequency for wells BW-4A, BW-4B, BW-5A, and PW-4 is proposed to be reduced from quarterly to annual sampling because concentrations have remained consistent since 2016.

5.3 Modifications in Target Analytes

The target analytes have been evaluated for the 2021 analyte list. Table 5-3 shows the 2020 analyte list. Table 5-4 presents the proposed changes to the target analyte list. The final analyte list for 2021 is in Table 5-5.

The list was evaluated for analyte modifications by well sets within each of the Refinery groups (A, B, C, D, E, and F). The modification criteria were based on several factors:

- Total and dissolved uranium were removed from all wells per NMED's "Disapproval Facility-Wide Annual Groundwater Report – 2019," (NMED 2020, Comment 21).
- PFAS was added to OW-63 per NMED's "Disapproval Facility-Wide Annual Groundwater Report - 2019," (NMED 2020, Comment 30).
- Pesticides were removed from EP-3, EP-12A, and EP-12B per NMED's "Disapproval Facility-Wide Annual Groundwater Report – 2019," (NMED 2020, Comment 26).

- 1,2-Dibromomethane and 1,4-dioxane was added to OW-11 per NMED's "Disapproval Facility-Wide Annual Groundwater Report -2019," (NMED 2020, Comment 22).
- 1,4-dioxane was added to MW-1, SWM-4, GWM-1, West LDU, OW-50, OW-52, OW-13, OW-14, OW-29, OW-30, PW-2, OW-1, OW-10, OW-11, MKTF-01, MKTF-03, MKTF-05 through MKTF-08, MKTF-12 through MKTF-17, MKTF-19 through MKTF23, MKTF-26, MKTF-33, MKTF-36, MKTF-37, MKTF-45 for two consecutive sampling events per NMED's "Disapproval Facility Wide Groundwater Monitoring Plan – Updates for 2019," (NMED 2019c, Comment 22).
- Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene are typically classified as SVOCs due to their vapor pressure (VP), which are less than the VOC cut off of 0.1 millimeter-mercury (mmHg) (Jia and Batterman 2010). Naphthalene has a VP of 0.087 mmHg, 1-methylnaphthalene has a VP of 0.054 mmHg, and 2-methylnaphthalene has a VP of 0.068 mmHg (ATSDR 2021). Therefore, these constituents will be included as SVOC in the sitewide analyte list.

6.0 References

Agency for Toxic Substances and Disease Registry (ATSDR). 2021. Chemical and Physical Information for Naphthalene, 1-Methylnapthalene, and 2-Methylnaphthalene. September 14. Available from: https://www.atsdr.cdc.gov/toxprofiles/tp67-c4.pdf.

Jia, Chunrong and Batterman, Stuart. 2010. A Critical Review of Naphthalene Sources and Exposures Relevant to Indoor and Outdoor Air, International Journal of Environmental Research and Public Health, ISSN 1660-4601. July 20. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2922736/.

New Mexico Environment Department (NMED). 2016. Approval with Modifications, Revised OW-14 Source Area Investigation Work Plan, OW Series Wells and Contaminant Plume Migration. May 12.

NMED. 2018. Disapproval, Annual Groundwater Monitoring Report, Gallup Refinery – 2015. January 31.

NMED. 2019a. Disapproval, Investigation Work Plan (SMW-2) and (GWM-1) Areas. February 20.

NMED. 2019b. Disapproval, Work Plan 2015 Annual Groundwater Report Comments, Western Refining Southwest, Inc., Gallup Refinery. January 28.

NMED. 2019c. Disapproval Facility Wide Groundwater Monitoring Plan – Update for 2019. July 12.

NMED. 2020. Disapproval Facility-Wide Annual Groundwater Report – 2019. November 23.

United States Department of Agriculture (USDA). 2021. Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties. March 15. Available from: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/new_mexico/NM692/0/McKinley.Area%20NM.pdf.

Western Refining (Western). 2021. Approval with Modifications, Annual Groundwater Monitoring Report, Gallup Refinery – 2019. Western Refining Southwest LLC, Marathon Gallup Refinery, Gallup, New Mexico, EPA ID #NMD000333211. HWB-WRG-20-013. July 31.

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CONDITIONS

Action 78658

CONDITIONS

Operator: Western Refining Southwest LLC 539 South Main Street Findlay, OH 45840	OGRID: 267595
	Action Number: 78658
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
jburdine	Accepted for Record Retention Purposes-Only	11/23/2022