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NEW MEXICO
ENVIRONMENT DEPARTMENT

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

July 10, 2019

John Moore
Environmental Superintendent
Western Refining Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

RE: APPROVAL WITH MODIFICATIONS
[REVISED] INVESTIGATION WORK PLAN
SANITARY LAGOON
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-18-004

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Investigation Work Plan Sanitary Lagoon* (Work Plan), dated May 2018 revised October 2018 and further revised June 2019, submitted on behalf of Marathon Petroleum Corporation dba Western Refining, Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Approval with Modifications. The Permittee must address the following comments.

Comment 1
The Permittee's response to NMED's January 31, 2019 Disapproval (Disapproval) Comment 1 states, "[w]e reviewed Figure 5 Sanitary Lagoon Proposed Soil Boring Locations Adjacent to Pipeline and it does show the excavated area south of the lagoon. Possibly the comment was meant to refer to Figure 2, which has now been expanded to the south to include all of the area that was previously excavated south of the lagoon." The location of the excavated area is not clear from the provided figures. The boundary of the area(s) where the pipeline was previously excavated or exposed must clearly be marked in a figure in the investigation report.

Comment 2
The Permittee's response to Disapproval Comment 2 states, "[a]s referenced in Comment 3 below, the concern was related to potential collapse of the trench while field personnel were present attempting to collect samples from beneath the pipeline. The Work Plan has been revised in Section 4.1 to include collection of samples from below the pipeline using a large number of trenches along the pipeline." Figure 5 (Sanitary Lagoon Proposed Soil Sample Locations Beneath the Pipeline) indicates that an installation of the trenches is proposed in the area where the pipeline was previously exposed. However, rather than excavating new trenches along the section where the pipe was already exposed, the Permittee may use a backhoe or trackhoe to remove soil from within the existing trench, re-expose the pipe and collect soil samples from below the pipe from the soils in the trackhoe bucket for laboratory analysis. See also Comment 3.

Comment 3
The Permittee's response to Disapproval Comment 3 states, "[t]he pipeline does not appear to be visible and this comment appears to be superseded by Comment 10 below, which directs Gallup to install new trenches every 50 feet instead of the proposed soil borings. The discussion to use a backhoe is included below pursuant to Comment 10." Disapproval Comment 10 does not supersede Disapproval Comment 3. If the trench is open but the pipeline is no longer visible, scrape the excavation sidewall to expose the pipe so that the trackhoe may be used to collect a sample below the pipe without excavating a trench (see Comment 2, above). The proposal for a collection of soil samples below the pipe with an increment of every 50 feet is still required; however, an installation of the trenches in the area where the pipeline was previously exposed need not be performed. The intent of Comment 3 is for the Permittee to collect samples from the open trench using a trackhoe bucket rather than to advance angled borings to collect samples. In the area where the pipeline was not previously exposed, excavate trenches perpendicular to the pipeline and collect soil samples below the pipe by backhoe or trackhoe as directed by Disapproval Comment 10.

Comment 4
In Section 4.1.3 (Drilling Activities) the Permittee states, "[t]he soil sampling will be conducted using a decontaminated hand auger, if possible, once the excavation reaches the target depth beneath the pipeline. If the sample cannot be directly obtained with a hand auger, then a discrete sample will be collected directly from the trackhoe bucket." Samples must be collected using the trackhoe bucket or if personnel can safely enter the trench then use an Encore sampler or equivalent, as appropriate.

Comment 5
In Section 4.1.3 (Drilling Activities) the Permittee states, "[k]nown site features and/or site survey grid markers will be used as references to locate each boring. The boring locations will be measured to the nearest foot and locations will be recorded on a scaled site map upon completion of each boring." RCRA Permit Section also requires that the Permittee collect information regarding "[s]ite attributes (e.g., soil sample locations, sediment sample locations, pertinent structures, as well as staked out sampling grids), shall be located by using the global positioning system (GPS), another the NMED-approved surveying system, or by using a registered New Mexico Registered Land Surveyor using the methods described in the paragraph above. If using

GPS, horizontal locations shall be measured to the nearest 0.5 ft." Ensure that this information is collected and reported in the investigation report.

Comment 6
In Section 4.1.4 (Groundwater Sample Collection) the Permittee states, "[t]he temporary well completions installed in the soil borings within the Sanitary Lagoon will be developed and then left to stabilize for at least two weeks to allow separate phase hydrocarbon (SPH) to enter the well casing." After further consideration the Permittee may leave boreholes with temporary wells installed open for 48 hours rather than two weeks.

Comment 7
In Section 4.1.9 (Chemical Analyses) the Permittee proposes analytical sampling using SW-846 Method 8260 and 8270 for Skinner List volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The use of the Skinner List in this case is inappropriate since the waste water entering the sewage lagoon potentially contained constituents such as solvents, which are not included in the Skinner List. Ensure that the chemical analyses for soil and groundwater include the full suite of VOCs and SVOCs.

This Approval with Modifications is based on the information presented in the document as it relates to the objectives of the work identified by NMED at the time of review. Approval of this document does not constitute agreement with all information or every statement presented in the document.

The Permittee must submit an Investigation Report that summarizes the results of the implementation of the Work Plan for NMED review no later than **February 28, 2020**.

If you have questions regarding this letter, please contact Kristen Van Horn of my staff at 505-476-6046.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: K. Van Horn, NMED HWB
D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, OCD
L. King, EPA Region 6

File: Reading File and WRG 2019 File
HWB-WRG-18-004

Marathon Petroleum Company LP

June 18, 2019

Mr. John E. Kieling, Chief
New Mexico Environment Department 2905
Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87SOS-6303

RE: Response to Disapproval
[Revised] Investigation Work Plan Sanitary Lagoon October 2018
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest Inc.)
EPA ID# NMD000333211
HWB-WRG-18-004

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Wester Refining Southwest, Inc.) Gallup Refinery is submitting the enclosed responses to New Mexico Environment Department (NMED) comments (dated January 31, 2019) on the referenced Investigation Work Plan. Enclosed you will find two copies of a revised Investigation Work Plan and CD with a redline document showing changes and a final electronic copy of the Work Plan. If there are any questions, please contact Brian Moore at 505-726-9745.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or 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,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks

Robert S. Hanks
Refinery General Manager

Enclosure

cc K. Van Horn NMED
C. Chavez NMOCD
B. Moore Marathon Gallup Refinery

92 Giant Crossing Road
Jamestown, NM 87347

RESPONSE TO COMMENTS

January 31, 2019 Disapproval – Investigation Work Plan Sanitary Lagoon (Oct. 2018)

NMED Comment 1:

The Permittee's response to NMED's *Disapproval* Comment 1 states "[m]uch of the pipeline immediately south of the lagoon has been excavated with the trench partially collapsed." The purpose of this trenching is not apparent. NMED cannot provide appropriate comments for the Work Plan without an adequate description of the current status of site conditions. In the revised Work Plan, provide a more comprehensive site history. The Permittee must identify the current status of the discharge. If the discharge ceased, explain what measures were implemented to eliminate the discharge and the dates the measures were implemented in the revised Work Plan.
Clarify the purpose of the trench. The revised Work Plan must provide the information regarding all activities performed at the site to date. Finally, Figure 5, *Sanitary Lagoon Proposed Soil Boring Locations Adjacent to Pipeline,* does not show the excavated area south of the lagoon. Provide a figure showing the excavated areas in the revised Work Plan.

MPC Response 1:

The pipeline that discharged into the Sanitary Lagoon was cut and then plugged with concrete on October 10, 2018. The NMED and OCD were notified of this activity in an email dated October 10, 2018. This email was addressed to Kristen VanHorn and Carl Chavez and included a photograph of the plugged line. The discussion in Section 2.1 (page 2-1) has been revised to reflect current site conditions and provide additional information, to the extent it is known, on the history of the area. We reviewed Figure 5 *Sanitary Lagoon Proposed Soil Boring Locations Adjacent to Pipeline* and it does show the excavated area south of the lagoon. Possibly the comment was meant to refer to Figure 2, which has now been expanded to the south to include all of the area that was previously excavated south of the lagoon.

NMED Comment 2:

The Permittee's response to NMED's *Disapproval* Comment 1 states "[t]he trench is deep, with depths possibly as great as 15 feet, thus it is a health and safety concern to collect samples from within this unshored excavation." Clarify whether the trench was installed to the maximum depth of 15 feet below ground surface (bgs) because the pipeline was buried to the depth of 15 feet bgs or the trench was previously installed for different purposes (e.g., hydrocarbon seep recovery). In addition, clarify whether a part of the pipeline was exposed and removed or the entire pipeline is visible and remains in the trench. Explain why a method to sample depths below four feet below ground surface could not be devised.

MPC Response 2:

Additional discussion has been included in Section 2.1 regarding the original excavation along the pipeline. The excavation was solely for the purpose of exposing the pipeline and was not installed for any other purposes (e.g., hydrocarbon recovery). The pipeline was initially exposed, but then no further action was conducted. The sidewalls of the trench have partially collapsed such that the pipeline is not readily visible in the trench. The last sentence of the comment discusses collection of samples “four feet below ground surface.” As referenced in Comment 3 below, the concern was related to potential collapse of the trench while field personnel were present attempting to collect samples from beneath the pipeline. The Work Plan has been revised in Section 4.1 to include collection of samples from below the pipeline using a large number of trenches along the pipeline.

NMED Comment 3

The Permittee's response to NMED's *Disapproval* Comment 1 states "[i]n our recent meeting (September 19, 2018), we discussed this concern [safety issue due to the trench] and a suggestion was made to attempt angled borings. We will attempt angled borings, but the rig will need to be placed a safe distance from the excavation and it likely will not be possible to actually collect soil samples from directly below the depth of the pipe from the Sanitary Lagoon." The use of angled borings is not proposed or discussed within the text of the Work Plan; however, an angled boring may not be appropriate at the locations where the trench was installed because it may not allow to collect soil samples directly below the depth of the pipeline. If the trench is open, and the pipeline is visible, propose to use a backhoe to collect samples along the trench wall beneath the pipeline. Include the sampling protocol in the revised Work Plan.

MPC Response 3:

The pipeline does not appear to be visible and this comment appears to be superseded by Comment 10 below, which directs Gallup to install new trenches every 50 feet instead of the proposed soil borings. The discussion to use a backhoe is included below pursuant to Comment 10.

NMED Comment 4

NMED's *Disapproval* Comment 3 states, "[t]he Permittee must advance the soil borings to the water table and collect samples at 2.5-feet intervals to depths that cross the water table." The Permittee's response to NMED's *Disapproval* Comment 3 states "[p]erhaps the comment is anticipating the additional borings being added along the pipeline to the southeast." To clarify, the referenced soil borings are those to be installed within the boundary of the Sanitary Lagoon. The Permittee also states, "[t]he Work Plan calls for all borings completed with a hand auger to reach the depth of refusal or saturation, whichever occurs first." Since the surface soils are likely saturated within the boundary of the Sanitary Lagoon, "saturation" does not provide clear criteria to determine the depths of soil borings. The Permittee must install the soil borings to the water table and collect samples at 2.5-feet intervals to depths that cross the water table. Revise the Work Plan accordingly.

MPC Response 4:

The revised discussion in Section 4.1.2 explains the soil cores will be collected and logged continuously, and soil samples will be collected and screened on 2.0-feet intervals. The text in Section 4.1 has been revised to require that all soil borings be drilled to at least five feet below the water table.

NMED Comment 5:

The Permittee's response to NMED's *Disapproval* Comment 5 states, "[t]hird, the sample bottles used for the VOC analyses come from the laboratory with an acid preservative. It is very important to not flush the preservative from the sample bottle and placing the small bottle directly under the discharge, if still active, could greatly increase the chance of compromising the sample preservation." To clarify, Comment 5 did not direct the Permittee to flush the sample bottle. Comment 5 rather directs the Permittee to collect samples directly from the outfall. The Permittee's

Sanitary Lagoon Investigation, dated February 1, 2018, states that the flowrate into the lagoon varies from less than one gallon per minute to approximately three gallons per minute. The observed flowrate likely allows the Permittee to collect wastewater samples directly from the outfall without flushing the preservative in the bottles. If the outfall is removed or plugged at this time, this comment will not be applicable; however, acknowledge the direction for the sampling protocol in the Work Plan.

MPC Response 5:

The outfall is now plugged and this comment is no longer applicable. The related text in the Executive Summary and Sections 4.1, 4.1.1 and 4.1.9 has been revised to remove the reference to collecting a sample of the discharge. Although no longer relevant, the text in Section 4.1.1 acknowledges NMED's specified sampling protocol for discharge samples.

NMED Comment 6:

The Permittee's response to NMED's *Disapproval* Comment 5 states, "[l]astly, requiring someone to attempt to walk into the lagoon far enough to reach the end of the discharge pipe could subject them sinking into a very soft bottom of the lagoon and greatly increase their risk of exposure to pathogens likely present in the septic discharge." Section 4.1.1, *Discharge Water and Surface Water Sampling,* states, "[t]he water samples will be collected in a decontaminated water scoop... The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory." The Permittee proposes to use a water scoop to collect the water samples; however, the sampling method still requires a field personnel to walk to the outfall within the Sanitary Lagoon. The exposure risk does not appear to be eliminated by the Permittee's proposed sampling method. If the outfall is removed or plugged at this time, this comment will not be applicable; however, explain how the proposed sampling method is safer in comparison to the sampling method required by Comment 5 in the revised Work Plan.

MPC Response 6:

For clarification purposes only, we note the proposed methodology of using a scoop does not require the field personnel to walk into the Sanitary Lagoon. This is commonly done using a pole of appropriate length and attaching the scoop to the end of the pole so the field personnel do not physically enter the receiving water body. The references to collection of discharge samples in the Executive Summary and Section 4.1 have been deleted.

NMED Comment 7:

The Permittee's response to NMED's *Disapproval* Comment 6 states, "[a]s we have no experience dealing with microbial impacts and cannot find any obviously relevant regulatory standards for New Mexico, we are uncertain what the appropriate microbial analyses are for soils. Can you please specify the required [microbiological] analyses [for soils] and the relevant regulatory standards in your approval letter so that we can add these analyses?" The Permittee did not find any relevant standards for pathogens in soils; therefore, the Permittee is not required to compare the site concentrations to the standards. However, the Permittee is still required to propose an investigation to determine the source of pathogens within the Sanitary Lagoon. Soil may act as a reservoir for pathogens (e.g., e. coli); therefore, hot spots must be identified to minimize soil contamination and potential for soil-to-groundwater migration. One way to investigate hot spots is to inoculate coliforms from soil samples collected from the Sanitary Lagoon and compare the coliform levels among the samples. Propose to conduct

microbiological analyses in the revised Work Plan.

MPC Response 7:
We have revised the Work Plan in Section 4.1.9 to include the analysis of water and soil samples for total coliform and e. coli.

NMED Comment 8:
The Permittee's response to NMED's *Disapproval* Comment 7 states, "[t]he immediate health and safety concern was simply getting stuck in the mud and not being able to get out of the lagoon." The ground surface may be more stable since the discharge ceased. Examine the stability of the ground surface at the Sanitary Lagoon and report the current status of the ground surface in the Sanitary Lagoon in the revised Work Plan. If the ground surface is stable enough, all soil borings within the Sanitary Lagoon must be installed via mechanical means rather than by hand auger.

MPC Response 8:
Although the discharge into the lagoon has ceased, the area remains wet in some areas and very soft, as would be expected after having received wastewater flows since the late 1950s. While evapotranspiration rates were relatively low over the past winter months, conditions may be more favorable in the future, but we really have no way to know how long it may take for this area to support sample collection via direct mechanical means such as a drilling rig. Section 4.1.3 has been revised to remove the use of hand augers and instead, if possible, the locations will be accessed using a small rig capable of either direct push or hollow-stem augers. If that is not possible, then a long-reach trackhoe will be used to collect the soil samples.

NMED Comment 9:
The Permittee's response to NMED's *Disapproval* Comment 10 states, "[g]roundwater samples are already collected on a quarterly basis at all of the subject monitoring wells and analyzed for the additional analyses requested above [VOCs, SVOCs, TPH-GRO, DRO and ORO, metals, chloride, fluoride and sulfate]. We believe that the information that is already available, and that is continually being collected, will be sufficient to clearly establish concentrations of contaminants in the area." The Permittee may limit the groundwater analyses for nitrate, nitrite, COD, BOD, total coliform and e-coli analyses for the groundwater monitoring wells (MKTF-24, MKTF-25, MKTF-26, MKTF-29, MKTF-30, MKTF-31, MKTF-40, and OAPIS-1). However, the Permittee must include VOCs, SVOCs, TPH-GRO, DRO and ORO, metals, chloride, fluoride and sulfate analyses in addition to nitrate, nitrite, COD, BOD, total coliform and e-coli analyses for the groundwater samples collected from the soil borings. Include the provision in the revised Work Plan.

MPC Response 9:
Section 4.1.9 has been revised to include the requested additional analyses for the groundwater samples collected from soil borings and limit the analyses of groundwater samples collected from existing monitoring wells.

NMED Comment 10:
In Section 4.1.3, *Drilling Activities,* the Permittee states, "[a] minimum of two exploratory trenches will be dug using a trackhoe to determine the depth of the pipeline." Figure 5 depicts the location of the proposed exploratory trenches approximately 500 feet to 700 feet southeast of the Sanitary Lagoon. The location and depth where the pipeline was buried northwest of the proposed exploratory trenches is speculative based on the extrapolated data since exploratory trenches are not proposed along the northwest section of the pipeline. Although installation of soil borings is proposed along the projected location of the pipeline, the proposed borings may not be located close enough to collect representative soil samples adjacent to the pipeline. The sampling must be more accurate. The exploratory trenches must be excavated from the outfall at the Sanitary Lagoon (or the southern end of the existing excavated trench, if the pipeline is exposed) to proposed boring location PL-6, every 50 feet. A maximum of 13 exploratory trenches must be excavated along the pipeline. In addition, propose to use a backhoe to collect soil samples along the exploratory trench wall beneath the pipeline, rather than to collect samples using soil borings. Furthermore, if the pipeline is damaged during the installation of the trenches, plug the outlet of the undamaged pipeline that is closest to the release points. Revise the Work Plan accordingly.

MPC Response 10:
Section 4.1.3 has been revised to remove the installation of soil borings along the pipeline, increase the number of trenches along the pipeline, and include collection of soil samples from the trenches beneath the pipeline. If the pipeline is damaged, then the pipeline will be repaired or plugged upstream of the damaged section.

NMED Comment 11:
Since the outfall or the end of the pipeline has been already plugged, the Permittee must investigate any indications that the discharge may still be occurring at the plugged location and seeping from the pipeline upgradient of the blocked portion. Any indication of seeping at the upgradient location of the blocked portion of the pipe must be examined during the excavation of the exploratory trenches. All trenching must include observations of pipe conditions and soil saturation levels. In addition, if the pipeline is damaged during the excavation of the trenches, the outlet of the pipeline closest to the release points must be blocked and the trench must be left open for at a minimum of one month to ensure that no future discharge occurs from the blocked section. Include the provision in the revised Work Plan.

MPC Response 11:
Section 4.1.3 has been revised to include recording observations of pipe conditions and soil saturation levels. If damaged, the pipeline will be repaired or plugged up-stream of the damaged section and the trenches will be left open for a minimum of one month.

NMED Comment 12:
In Section 4.1, *Investigation,* the Permittee states, "[o]ne discharge water sample will be collected from the lagoon prior to commencement of the oil sampling." The text of the Work Plan suggests that the discharge samples may still be collected. Explain whether there is still a

possibility of the discharge samples being collected from the pipeline at this time. If the discharge samples are no longer available, revise the Work Plan to reflect the change in current status of the site.

MPC Response 12:
The last version of the Work Plan was revised prior to final plugging of the discharge line. There is no longer any discharge from the pipeline into the Sanitary Lagoon. The Work Plan has been accordingly revised to remove references to collection of a discharge sample in the Executive Summary and Sections 4.1, 4.1.1, and 4.1.9.

NMED Comment 13:
In Section 4.1.9, *Chemical Analyses,* the Permittee states, "[t]he discharge and surface water samples will also be analyzed for chloride, fluoride, nitrate, nitrite, sulfate, COD, BOD, total coliform, and E. coli bacteria." The listed anions are not included in the table titled as Inorganic Analytical Methods (page 4-8). Explain why these inorganic constituents are not included in the table or revise the table to include all inorganic constituents proposed for analysis in the revised Work Plan.

NMED Response 13:
The Work Plan text in Section 4.1.9 notes that the table includes the Skinner List metals and iron and manganese, which were added to the table pursuant to NMED's earlier comments on this same table in previously prepared work plans. The table is now revised to also include other target analytes as requested by NMED and the related text is also revised.

INVESTIGATION WORK PLAN
Sanitary Lagoon

Marathon Petroleum Company LP

Gallup Refinery
Andeavor
Gallup, New Mexico
EPA ID# NMD000333211

May 2018
(Revised October 2018)
(Revised June 2019)

Scott T. Crouch, Senior Geologist
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Appendices

Appendix A Photographs

Appendix B Investigation Derived Waste Management Plan

List of Acronyms

areas of concern (AOCs)

below ground surface (bgs)

Biological oxygen demand (BOD)

Code of Federal Regulations (CFR)

Contract Laboratory Program (CLP)

Chemical oxygen demand (COD)

Data quality objective (DQO)

Environmental Protection Agency (EPA)

Hazardous and Solid Waste Act (HSWA)

Investigation derived waste (IDW)

mean sea level (msl)

New Mexico Administrative Code (NMAC)

New Mexico Environment Department (NMED)

photoionization detector (PID)

quality assurance/quality control (QA/QC)

Resource Conservation and Recovery Act (RCRA)

RCRA Facility Investigation (RFI)

semi-volatile organic compound (SVOC)

Solid Waste Management Units (SWMUs)

Separate phase hydrocarbon (SPH)

volatile organic constituent (VOC)

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. A sanitary sewer lagoon is located in the northwest portion of the refinery. This Investigation Work Plan proposes to collect samples of soil and groundwater to determine the current concentrations of constituents in the area of the sanitary sewer lagoon. A sample of the surface water in the Sanitary Lagoon, if present, will also be collected. Soil samples are proposed to be collected from eight locations within the lagoon and up to 13 trench locations southeast of the lagoon, beneath the pipeline. Groundwater samples will be collected from eight existing monitoring wells in the area of the lagoon and soil borings that encounter groundwater. The soil samples, groundwater samples collected from new soil borings, and surface water will be analyzed for Skinner List metals, VOCs, SVOCs, nitrite, nitrate, chemical oxygen demand (COD), biological oxygen demand (BOD), total coliform, and E-coli bacteria and total petroleum hydrocarbons. In addition, the groundwater samples collected from existing nearby monitoring wells will be analyzed for nitrite, nitrate, chemical oxygen demand (COD), biological oxygen demand (BOD), total coliform, and E-coli bacteria.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery property covers approximately 810 acres. Figure 1 presents the refinery location and the regional vicinity, which is characterized as high desert plain comprised primarily of public lands used for grazing by cattle and sheep.

The Gallup Refinery is a crude oil refinery currently owned and operated by Andeavor. The Gallup Refinery, was previously operated by Western Refining Southwest, Inc. ("Western"), formerly known as Giant Industries Arizona, Inc. and formerly doing business as Giant Refining Company Ciniza Refinery, an Arizona corporation. The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck.

Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, isomerization, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

A sanitary sewer lagoon is located in the northwest portion of the refinery. The location of the sanitary sewer lagoon is shown on Figure 2. Photographs of the lagoon and the surrounding area are included in Appendix A. The purpose of the site investigation is to determine the current concentrations of constituents in soil/sediments and groundwater in the area of the sanitary lagoon.

Section 2
Background

This section presents background information for the sanitary lagoon including a review of historical waste management activities to identify the following:

- Type and characteristics of all waste and all contaminants handled in the lagoon;
- Known and possible sources of contamination;
- History of releases; and
- Known extent of contamination.

2.1 Sanitary Lagoon

The sanitary lagoon is a two-cell lagoon that was installed when the facility opened in 1957. The two cells are separated by an earthen berm. In the past (see aerial photo - Figure 2) both cells of the lagoon were used to store wastewater. Currently, the western cell is dry and used for storage and the eastern lagoon holds raw sewage and other discharge. It is noted that the pipeline that discharged to the lagoon was cut in two and the up-stream portion plugged with concrete on October 11 ,2018. The location where the pipeline was cut and plugged is shown on Figure 2. The only water entering the lagoon at this time is rainfall. The eastern cell is approximately 145 feet x 115 feet. Based on reviews of sewer pipeline maps and recent dye-trace tests, the lab sanitary facilities, change house, warehouse, and the truck rack drivers lounge have sanitary sewer lines that discharged to the sanitary lagoon.

A portion of the pipeline to the south of the lagoon, which did transmit sanitary flows into the lagoon, was excavated between January 2014 and March 2016. The excavation extends for approximately 130 feet along a section north the dirt road that transverses the area and for another 50 on the south side of the road (Figure 2). It is believed the pipeline was excavated with the intent to possibly replace this section of pipeline, but the project was never completed. The pipeline was cut and plugged at the south end of the excavation in October 2018, thus terminating flow into the lagoon.

Section 3
Site Conditions

The conditions at the site, including surface and subsurface conditions that could affect the fate and transport of any contaminants, are discussed below. This information is based on recent visual observations and historical subsurface investigations.

3.1 Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to lowland fluvial plain in the northwest. Elevations on the refinery property range from 7,040 feet to 6,860 feet. The area of the site near the lagoon is at an approximate elevation of 6,913 feet above mean sea level (msl). The pictures in Appendix A show the land surface in the immediate area.

The McKinley County soil survey identifies the soil in the area of the lagoon as the Simitarq-Celavar sandy loams (USDA, 2005). The Simitarq-Celavar soils are well drained with a conservative permeability of 0.20 in/hr and minimal salinity. Simitarq soils have nearly neutral pH values ranging from 7.2 to 7.4 standard units.

Regional surface water features include the refinery evaporation ponds and aeration lagoons and a number of small ponds. The site is located in the Rio Puerco valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Rio Puerco. The Rio Puerco continues to the east to the confluence with the Rio Grande. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

3.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. Very low permeability bedrock (e.g., claystones and siltstones) underlie the surface soils and effectively form an aquitard. The Chinle Formation, which is Upper Triassic, crops out over a large area on the southern margin of the San Juan Basin. The uppermost recognized local member is the Petrified Forest and the Sonsela Sandstone Bed is the uppermost recognized regional aquifer. Aquifer test of the Sonsela Bed northeast of Prewitt indicated a transmissivity of greater than 100 ft^2/day (Stone and others, 1983). The Sonsela Sandstone's highest point occurs southeast of the site and slopes downward to the northwest as it passes under

the refinery. The Sonsela Sandstone forms a water-bearing reservoir with artesian conditions throughout the central and western portions of the refinery property. Groundwater within the Sonsela Sandstone flows downdip to the northwest.

The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravely sands immediately overlying the Chinle Formation to 10^{-8} cm/sec in the clay soils located near the surface (Western Refining, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Chinle Formation with prevailing flow from the southeast to the northwest, with some flow to the northeast on the northeastern portion of the refinery property.

Section 4
Scope of Activities

The site investigation of soils and groundwater will be conducted to define the nature and extent of impacts to the environment and facilitate remedy selection, as necessary. The investigation will commence upon approval of this investigation work plan by NMED.

4.1 Investigation

A focused investigation of soils/sediments within the sanitary lagoon will be conducted to characterize current concentrations of constituents and define the extent (as possible) of any such impacts. The following text summarizes the proposed sampling to be conducted at the sanitary lagoon.

- If any stagnant water is present, one surface water sample will be collected prior to commencement of the soil sampling;
- Eight soil borings will be located within the lagoon where standing water is not present. One of the soil borings will be located directly below the prior location of the sewage outfall. All soil borings will be drilled to a depth at least five feet below the water table. If the soil borings cannot be completed using either direct push or hollow-stem augers, alternative mechanical means will be used to collect the samples;
- Soil/sediment samples will be collected from locations that are not accessible to a drilling rig by alternative mechanical means (e.g., long-reach trackhoe). The trackhoe (or similar equipment) will be located outside the lagoon and used to reach inside the lagoon to retrieve a volume of soil/sediment from the target depth. A discrete soil/sediment will be collected for analysis from the volume of soil obtained by the mechanical device,
- Groundwater samples will be collected from eight existing monitor wells in the area of the sanitary lagoon; and
- Up to 13 trenches will be completed southeast of the lagoon adjacent to the sanitary pipeline to allow for collection of soil samples beneath the pipeline.

The proposed locations for soil samples are shown on Figure 3. The proposed wells locations to be sampled are shown on Figure 4. The proposed locations beneath the sanitary pipeline are shown on Figure 5.

4.1.1 Surface Water Sampling

If any stagnant water is present on the surface of the lagoon, then a surface water sample will be collected prior to the commencement of the soil sampling.

The surface water samples will be collected in a decontaminated water scoop. Sample collection methods will be documented in the field monitoring reports. It is noted that the NMED's sampling protocol for collection of discharge samples from pipelines requires that the water be collected directly from the end of the pipeline. The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as presented in Section 4.1.4.

4.1.2 Soil Sample Field Screening and Logging

All soil borings will be continuously logged and samples field screened. Samples obtained from the soil borings will be screened in the field on 2.0-foot intervals for evidence of contaminants. Field screening results will be recorded on the exploratory boring logs. Field screening results will be used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits may be conducted where appropriate.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container will be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container will be allowed to rest for a minimum of 5 minutes while vapors equilibrate. Vapors present within the sample bag's headspace will then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature will be recorded on the field boring log for each sample.

The monitoring instruments will be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp or a combustible gas indicator will be used for VOC field screening. Field screening results may be site- and boring-specific and the results may vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant, therefore, all conditions capable of influencing the results of field screening will be recorded on the field logs.

Discrete soil samples will be retained for laboratory analyses from within the following intervals:

- 0.0-0.5 feet at sample locations within the Sanitary Lagoon;
- 2.0-2.5 feet at sample locations within the Sanitary Lagoon;
- >2.5 feet at sample locations within the Sanitary Lagoon (from the interval in each soil boring with the greatest apparent degree of contamination, based on field observations and field screening);
- 2.0-4.0 feet below the depth of the pipeline at trenches south of the Sanitary Lagoon;
- 0.5 feet interval at the top of saturation (applicable only to those borings and trenches that reach saturation);
- From the bottom of each borehole located within the Sanitary Lagoon; and
- Any additional intervals as determined based on field screening results.

The physical characteristics of the samples (such as mineralogy, ASTM soil classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations will be recorded in the field log by a qualified geologist or engineer. Detailed logs of each boring will be completed in the field by a qualified geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling, will be recorded on the logs.

Quality Assurance/Quality Control (QA/QC) samples will be collected to monitor the validity of the soil sample collection procedures as follows:

- Field duplicates will be collected at a rate of 10 percent; and
- Equipment blanks will be collected from all sampling apparatus at a frequency of one per day.

4.1.3 Drilling Activities

Soil borings within the Sanitary Lagoon will be drilled using direct push or hollow-stem augers to a depth of 5 feet below the water table. The equipment will be properly decontaminated before drilling each boring. The NMED will be notified as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the specified depths or at planned sampling locations. Where it is not possible to complete soil borings due to physical limitations accessing the area with a drilling rig, other mechanical means will be utilized (e.g., a long-reach track- hoe). The trackhoe (or similar equipment) will be used to collect an aliquot of soil/sediment, from which a discrete sample will be collected for analysis.

Starting approximately 50 feet south of the Sanitary Lagoon maximum of 13 exploratory trenches will be dug using a trackhoe to determine the depth of the pipeline and collect a soil sample from 2 feet to 4 feet beneath the pipeline. The trenches will be spaced approximately every 50 feet along the length of the pipeline as shown in Figure 5. The equipment will be properly decontaminated before starting each trench. The soil sampling will be conducted using a decontaminated hand auger, if possible, once the excavation reaches the target depth beneath the pipeline. If the sample cannot be directly obtained with a hand auger, then a discrete sample will be collected directly from the trackhoe bucket.

During excavation of the trenches, the condition of the pipeline and any evidence of seeping (e.g., soil saturation levels) from the up-stream location where the pipeline was plugged will be recorded. If the pipeline is damaged, then the pipeline will be repaired or plugged upstream of the damaged section.

Known site features and/or site survey grid markers will be used as references to locate each boring. The boring locations will be measured to the nearest foot and locations will be recorded on a scaled site map upon completion of each boring.

4.1.4 Groundwater Sample Collection

Groundwater samples will be collected and analyzed for the constituents identified in Section 4.1.9. The temporary well completions installed in the soil borings within the Sanitary Lagoon will be developed and then left to stabilize for at least two weeks to allow separate phase hydrocarbon (SPH) to enter the well casing. After the stabilization period, fluid levels will be recorded and if SPH is not present in the well casing, then groundwater samples will be collected within 24 hours of the

completion of well purging using disposable bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated). 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. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as follows:

- Field duplicate water samples will be obtained at a frequency of ten percent, with a minimum, of one duplicate sample per sampling event;
- Equipment rinsate blanks will be obtained for chemical analysis at the rate of ten percent or a minimum of one rinsate blank per sampling day. Equipment rinsate blanks will be collected at a rate of one per sampling day if disposable sampling equipment is used. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses; and
- 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 prepared by the laboratory and placed in an appropriate sample container. The trip blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of groundwater samples to be analyzed for VOCs.

4.1.5 Sample Handling

At a minimum, the following procedures will be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample;

2. All samples collected of each medium for chemical analysis will be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in Encore® samplers. 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; and
3. Sample labels and documentation will be completed for each sample following procedures discussed below. 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 below, will be followed for all samples collected. All samples will be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times.

Chain-of-custody and shipment procedures will include the following:

1. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site or prior to the transportation of samples to the lab.
2. Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA 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. Temperature blanks will be included with each shipping container.
3. Each cooler or other container will be delivered directly to the analytical laboratory.
4. Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
5. Plastic containers will be protected from possible puncture during shipping using cushioning material.
6. The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
7. Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.
8. Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.

9. 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 copies will be returned to the relinquishing party.
10. Copies of all chain-of-custody forms generated as part of sampling activities will be maintained on-site.

4.1.6 Collection and Management of Investigation Derived Waste

The soils produced from the two pipeline location trenches will be temporarily placed beside the trenches. The vast majority of this material will be removed from above the pipeline and there is no currently available information to indicate these soils are contaminated. If any of the soil indicates potential impacts, then this soil will be managed separately as described below for drill cuttings. Otherwise, non-impacted soil will be returned to the trench after the pipeline is located.

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings will be contained and characterized using methods based on the boring location, boring depth, drilling method, and type of contaminants suspected or encountered. All purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator. An IDW management plan is included as Appendix B.

4.1.7 Field Equipment Calibration

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks will be conducted daily, or at other intervals approved by the Department, 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. In the interim, a properly calibrated replacement instrument will be used.

4.1.8 Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded in a field log book. Copies of the completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink will be used to record all field activities. Photographic

documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;
6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log, as appropriate;
10. Field monitoring data, including health and safety monitoring;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

4.1.9 Chemical Analyses

All samples collected for laboratory analysis will be submitted to an accredited laboratory. The laboratory will use the most recent standard EPA and industry-accepted analytical methods for target analytes as the testing methods for each medium sampled. Chemical analyses will be performed in accordance with the most recent EPA standard analytical methodologies and extraction methods.

Soil/sediment, groundwater samples collected from soil borings and surface water samples will be analyzed for the constituents listed in the table below and by the following methods:

- SW-846 Method 8260 for Skinner List volatile organic compounds;
- SW-846 Method 8270 for Skinner List semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline range (C5-C10), diesel range (>C10-C28), and motor oil range (>C28-C36) organics.

The groundwater samples collected from soil borings and surface water samples will also be analyzed for COD, BOD, total coliform, and E. coli bacteria.

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Chromium VI	SW-846 method 3060A
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020
Chloride	EPA Method 300.0
Fluoride	EPA Method 300.0
Nitrate	EPA Method 300.0
Nitrite	EPA Method 300.3
Sulfate	EPA Method 300.3
Total coliform	SM9223B
E. coli	SM9223B

Groundwater samples collected at existing monitoring wells (MKTF-24, MKTF-25, MKTF-26, MKTF-29, MKTF-30, MKTF-31, MKTF-40, and OAPIS-1) will be analyzed for nitrite, nitrate, COD, BOD, total coliform, and E. coli bacteria.

As discussed previously, groundwater field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, turbidity and temperature.

4.1.10 Data Quality Objectives

The Data Quality Objectives (DQOs) were developed to ensure that newly collected data are of sufficient quality and quantity to address the project goals, including Quality Assurance/Quality Control (QA/QC) issues (EPA, 2006). The project goals are established to determine and evaluate the presence, nature, and extent of releases of contaminants at the lagoon. The type of data required to meet the project goals includes chemical analyses of soil and groundwater to determine if there has been a release of contaminants at the lagoon.

The quantity of data is specific to the lagoon and is based on the historical operations at lagoon. Method detection limits should be 20% or less of the applicable background levels, cleanup standards and screening levels.

Additional DQOs include precision, accuracy, representativeness, completeness, and comparability. Precision is a measurement of the reproducibility of measurements under a given set of circumstances and is commonly stated in terms of standard deviation or coefficient of variation (EPA, 1987). Precision is also specific to sampling activities and analytical performance. Sampling precision will be evaluated through the analyses of duplicate field samples and laboratory replicates will be utilized to assess laboratory precision.

Accuracy is a measurement in the bias of a measurement system and may include many sources of potential error, including the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques (EPA, 1987). An evaluation of the accuracy will be performed by reviewing the results of field/trip blanks, matrix spikes, and laboratory QC samples.

Representativeness is an expression of the degree to which the data accurately and precisely represent the true environmental conditions. Sample locations and the number of samples have been selected to ensure the data is representative of actual environmental conditions. Based on SWMU specific conditions, this may include either biased (i.e., judgmental) locations/depths or unbiased (systematic grid samples) locations. In addition, sample collection techniques (e.g., field monitoring and decontamination of sampling equipment) will be utilized to help ensure representative results.

Completeness is defined as the percentage of measurements taken that are actually valid measurements, considering field QA and laboratory QC problems. EPA Contract Laboratory Program (CLP) data has been found to be 80-85% complete on a nationwide basis and this has been extrapolated to indicate that Level III, IV, and V analytical techniques will generate data that are approximately 80% complete (EPA, 1987). As an overall project goal, the completeness goal is 85%; however, some samples may be critical based on location or field screening results and thus a sample–by-sample evaluation will be performed to determine if the completeness goals have been obtained.

Comparability is a qualitative parameter, which expresses the confidence with which one data set can be compared to another. Industry standard sample collection techniques and routine EPA analytical methods will be utilized to help ensure data are comparable to historical and future data. Analytical results will be reported in appropriate units for comparison to historical data and cleanup levels.

Section 5
References

EPA, 1987, Data Quality Objectives for Remedial Response Activities; United States Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, OSWER Directive 9355.0-7B, 85p

EPA, 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December, 1989, p. 247.

EPA, 2006, Guidance on Systematic Planning Using the Data Quality Objectives Process, United States Environmental Protection Agency, Office of Environmental Information; EPA/240/B-06/001, p. 111.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizel, N.H., and Padgett, E.T., 1983, *Hydrogeology and Water Resources of San Juan Basin, New Mexico*; Hydrogeologic Report 6, New Mexico Bureau of Mines and Mineral Resources, p. 70.

USDA, 2005, Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties, p. 683.

Western Refining, 2009, Annual Ground Water Monitoring Report Gallup Refinery – 2009.

Figures

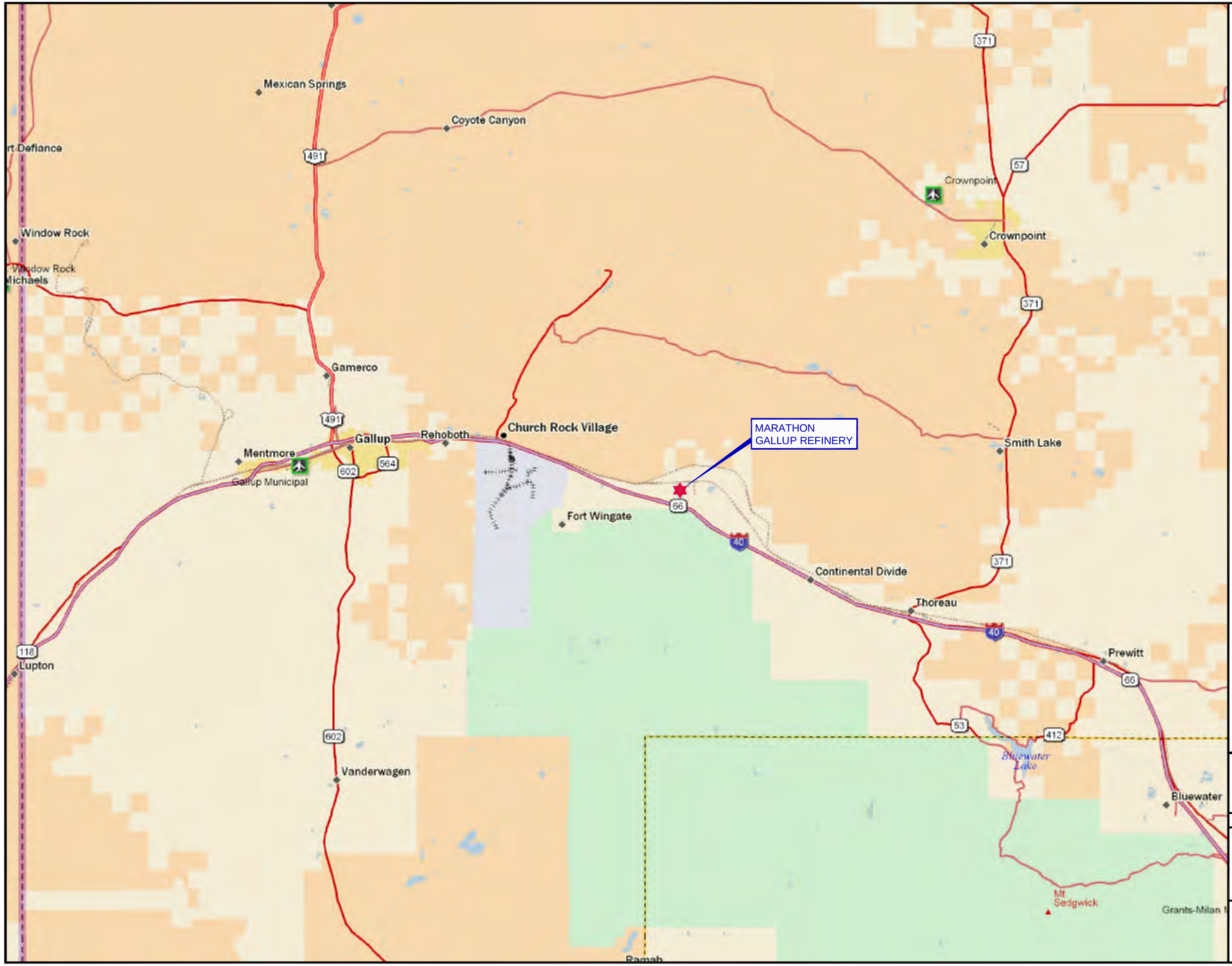
Figure 1 Site Location Map

Figure 2 Sanitary Lagoon Location Map

Figure 3 Sanitary Lagoon Proposed Soil Sample Locations

Figure 4 Proposed Well Sampling Locations

Figure 5 Proposed Soil Sample Locations Beneath Pipeline



Map Source: DeLorme Street Atlas USA 2007 Plus.

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SCALE IN MILES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 12/09/18 | FILE: Mathon-dB206

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

0 80
SCALE IN FEET

LEGEND

ESTIMATED LOCATION OF THE SANITARY PIPELINE

GALLUP SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 05/31/19 | FILE: Mathon-dB217

FIGURE 2
SANITARY LAGOON
LOCATION MAP

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

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SCALE IN FEET

GALLUP SITE LOCATION

LEGEND

SOIL SAMPLE LOCATION VIA MECHANICAL MEANS

APPROXIMATE EXTENT OF SURFACE WATER PRIOR TO TERMINATION OF DISCHARGE IN OCT. 2018

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 05/31/19	FILE: Mathon-dB166

FIGURE 3
SANITARY LAGOON
PROPOSED SOIL SAMPLE LOCATIONS

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Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

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SCALE IN FEET

LEGEND

MKTF-24 PROPOSED WELL SAMPLING LOCATION AND IDENTIFICATION NUMBER

NEW MEXICO

GALLUP SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 05/31/19	FILE: Mathon-dB167

FIGURE 4
SANITARY LAGOON
PROPOSED WELL SAMPLING LOCATIONS

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8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Map Source: Google Aerial, 03/18/2016.

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SCALE IN FEET

LEGEND

ESTIMATED LOCATION OF THE SANITARY PIPELINE

MKTF-14 EXISTING MONITOR WELL LOCATION AND IDENTIFICATION NUMBER

ESTIMATED LOCATION OF TRENCHES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 05/31/19	FILE: Mathon-dA149

FIGURE 5
SANITARY LAGOON
PROPOSED SOIL SAMPLE LOCATIONS
BENEATH PIPELINE

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Appendix A
Photographs


SOUTH SIDE OF LAGOON LOOKING NORTH
2018/03/09


Western
Refining
WEST SIDE OF LAGOON LOOKING EAST
2018/03/09


NORTH SIDE OF LAGOON LOOKING SOUTH
2018/03/09

EAST SIDE OF LAGOON LOOKING WEST

2018/03/09

Appendix B

Investigation Derived Waste Management Plan

Investigation Derived Waste (IDW) Management Plan

All IDW will be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste.

A dedicated decontamination area will be setup prior to any sample collection activities. The decontamination pad will be constructed so as to capture and contain all decontamination fluids (e.g., wash water and rinse water) and foreign materials washed off the sampling equipment. The fluids will be pumped directly into suitable storage containers (e.g., labeled 55-gallon drums), which will be located at satellite accumulation areas until the fluids are disposed in the refinery wastewater treatment system upstream of the API separator. The solids captured in the decontamination pad will be shoveled into 55-gallon drums and stored at the designated satellite accumulation area pending proper waste characterization for off-site disposal.

Drill cuttings generated during installation of soil borings will be placed directly into 55-gallon drums and staged in the satellite accumulation area pending results of the waste characterization sampling. The portion of soil cores, which are not retained for analytical testing, will be placed into the same 55-gallon drums used to store the associated drill cuttings.

The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials are not characteristically hazardous, then further testing will be performed pursuant to the requirements of the facility to which the materials will be transported. Depending upon the results of analyses for individual investigation soil samples, additional analyses may include TPH and polynuclear aromatic hydrocarbons (PAHs).

Figures

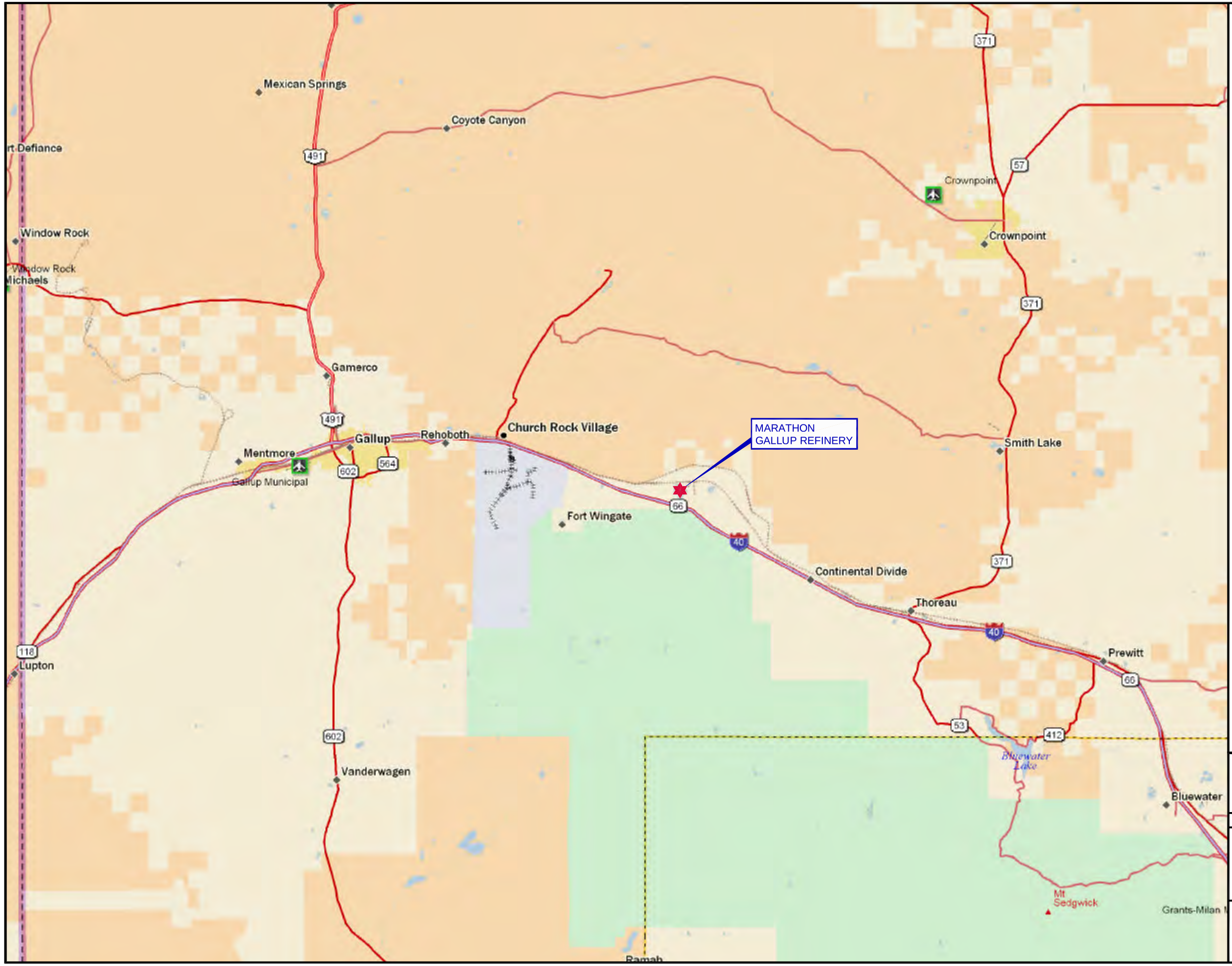
Figure 1 Site Location Map

Figure 2 Sanitary Lagoon Location Map

Figure 3 Sanitary Lagoon Proposed Soil Sample Locations

Figure 4 Proposed Well Sampling Locations

Figure 5 Proposed Soil Sample Locations Beneath Pipeline



Map Source: DeLorme Street Atlas USA 2007 Plus.

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SCALE IN MILES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 12/09/18 | FILE: Mathon-dB206

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

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Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

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SCALE IN FEET

LEGEND

ESTIMATED LOCATION OF THE SANITARY PIPELINE

GALLUP SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 05/31/19 | FILE: Mathon-dB217

FIGURE 2
SANITARY LAGOON
LOCATION MAP

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

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SCALE IN FEET

GALLUP SITE LOCATION

LEGEND

SOIL SAMPLE LOCATION VIA MECHANICAL MEANS

APPROXIMATE EXTENT OF SURFACE WATER PRIOR TO TERMINATION OF DISCHARGE IN OCT. 2018

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 05/31/19	FILE: Mathon-dB166

FIGURE 3
SANITARY LAGOON
PROPOSED SOIL SAMPLE LOCATIONS

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

0 100
SCALE IN FEET

LEGEND

MKTF-24 PROPOSED WELL SAMPLING LOCATION AND IDENTIFICATION NUMBER

NEW MEXICO

GALLUP SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 05/31/19	FILE: Mathon-dB167

FIGURE 4
SANITARY LAGOON
PROPOSED WELL SAMPLING LOCATIONS

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Map Source: Google Aerial, 03/18/2016.

N

0 100
SCALE IN FEET

LEGEND

ESTIMATED LOCATION OF THE SANITARY PIPELINE

MKTF-14 EXISTING MONITOR WELL LOCATION AND IDENTIFICATION NUMBER

ESTIMATED LOCATION OF TRENCHES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 05/31/19	FILE: Mathon-dA149

FIGURE 5
SANITARY LAGOON
PROPOSED SOIL SAMPLE LOCATIONS
BENEATH PIPELINE

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Appendix A
Photographs


SOUTH SIDE OF LAGOON LOOKING NORTH
2018/03/09


Western
Refining
WEST SIDE OF LAGOON LOOKING EAST
2018/03/09


NORTH SIDE OF LAGOON LOOKING SOUTH
2018/03/09

EAST SIDE OF LAGOON LOOKING WEST

2018/03/09

Appendix B

Investigation Derived Waste Management Plan

Investigation Derived Waste (IDW) Management Plan

All IDW will be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste.

A dedicated decontamination area will be setup prior to any sample collection activities. The decontamination pad will be constructed so as to capture and contain all decontamination fluids (e.g., wash water and rinse water) and foreign materials washed off the sampling equipment. The fluids will be pumped directly into suitable storage containers (e.g., labeled 55-gallon drums), which will be located at satellite accumulation areas until the fluids are disposed in the refinery wastewater treatment system upstream of the API separator. The solids captured in the decontamination pad will be shoveled into 55-gallon drums and stored at the designated satellite accumulation area pending proper waste characterization for off-site disposal.

Drill cuttings generated during installation of soil borings will be placed directly into 55-gallon drums and staged in the satellite accumulation area pending results of the waste characterization sampling. The portion of soil cores, which are not retained for analytical testing, will be placed into the same 55-gallon drums used to store the associated drill cuttings.

The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials are not characteristically hazardous, then further testing will be performed pursuant to the requirements of the facility to which the materials will be transported. Depending upon the results of analyses for individual investigation soil samples, additional analyses may include TPH and polynuclear aromatic hydrocarbons (PAHs).

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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MICHELLE LUJAN GRISHAM
Governor

HOWIE C. MORALES
Lt. Governor

JAMES C. KENNEY
Cabinet Secretary Designate

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

January 31, 2019

John Moore
Environmental Superintendent
Western Refining, Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

RE: DISAPPROVAL
[REVISED] INVESTIGATION WORK PLAN SANITARY LAGOON
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-18-004

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *[Revised] Investigation Work Plan Sanitary Lagoon* (Work Plan), dated October 2018, submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Disapproval. The Permittee must address the following comments provided by both NMED and the New Mexico Energy Minerals and Natural Resources Department Oil Conservation Division (OCD):

Comment 1

The Permittee's response to NMED's *Disapproval* Comment 1 states "[m]uch of the pipeline immediately south of the lagoon has been excavated with the trench partially collapsed." The purpose of this trenching is not apparent. NMED cannot provide appropriate comments for the Work Plan without an adequate description of the current status of site conditions. In the revised Work Plan, provide a more comprehensive site history. The Permittee must identify the current status of the discharge. If the discharge ceased, explain what measures were implemented to eliminate the discharge and the dates the measures were implemented in the revised Work Plan. Clarify the purpose of the trench. The revised Work Plan must provide the information

regarding all activities performed at the site to date. Finally, Figure 5, *Sanitary Lagoon Proposed Soil Boring Locations Adjacent to Pipeline,* does not show the excavated area south of the lagoon. Provide a figure showing the excavated areas in the revised Work Plan.

Comment 2

The Permittee's response to NMED's *Disapproval* Comment 1 states "[t]he trench is deep, with depths possibly as great as 15 feet, thus it is a health and safety concern to collect samples from within this unshored excavation." Clarify whether the trench was installed to the maximum depth of 15 feet below ground surface (bgs) because the pipeline was buried to the depth of 15 feet bgs or the trench was previously installed for different purposes (e.g., hydrocarbon seep recovery). In addition, clarify whether a part of the pipeline was exposed and removed or the entire pipeline is visible and remains in the trench. Explain why a method to sample depths below four feet below ground surface could not be devised.

Comment 3

The Permittee's response to NMED's *Disapproval* Comment 1 states "[i]n our recent meeting (September 19, 2018), we discussed this concern [safety issue due to the trench] and a suggestion was made to attempt angled borings. We will attempt angled borings, but the rig will need to be placed a safe distance from the excavation and it likely will not be possible to actually collect soil samples from directly below the depth of the pipe from the Sanitary Lagoon." The use of angled borings is not proposed or discussed within the text of the Work Plan; however, an angled boring may not be appropriate at the locations where the trench was installed because it may not allow to collect soil samples directly below the depth of the pipeline. If the trench is open, and the pipeline is visible, propose to use a backhoe to collect samples along the trench wall beneath the pipeline. Include the sampling protocol in the revised Work Plan.

Comment 4

NMED's *Disapproval* Comment 3 states, "[t]he Permittee must advance the soil borings to the water table and collect samples at 2.5-feet intervals to depths that cross the water table." The Permittee's response to NMED's *Disapproval* Comment 3 states "[p]erhaps the comment is anticipating the additional borings being added along the pipeline to the southeast." To clarify, the referenced soil borings are those to be installed within the boundary of the Sanitary Lagoon. The Permittee also states, "[t]he Work Plan calls for all borings completed with a hand auger to reach the depth of refusal or saturation, whichever occurs first." Since the surface soils are likely saturated within the boundary of the Sanitary Lagoon, "saturation" does not provide clear criteria to determine the depths of soil borings. The Permittee must install the soil borings to the water table and collect samples at 2.5-feet intervals to depths that cross the water table. Revise the Work Plan accordingly.

Comment 5

The Permittee's response to NMED's *Disapproval* Comment 5 states, "[t]hird, the sample bottles used for the VOC analyses come from the laboratory with an acid preservative. It is very important to not flush the preservative from the sample bottle and placing the small bottle

directly under the discharge, if still active, could greatly increase the chance of compromising the sample preservation." To clarify, Comment 5 did not direct the Permittee to flush the sample bottle. Comment 5 rather directs the Permittee to collect samples directly from the outfall. The Permittee's *Sanitary Lagoon Investigation,* dated February 1, 2018, states that the flowrate into the lagoon varies from less than one gallon per minute to approximately three gallons per minute. The observed flowrate likely allows the Permittee to collect wastewater samples directly from the outfall without flushing the preservative in the bottles. If the outfall is removed or plugged at this time, this comment will not be applicable; however, acknowledge the direction for the sampling protocol in the Work Plan.

Comment 6

The Permittee's response to NMED's *Disapproval* Comment 5 states, "[l]astly, requiring someone to attempt to walk into the lagoon far enough to reach the end of the discharge pipe could subject them sinking into a very soft bottom of the lagoon and greatly increase their risk of exposure to pathogens likely present in the septic discharge." Section 4.1.1, *Discharge Water and Surface Water Sampling,* states, "[t]he water samples will be collected in a decontaminated water scoop… The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory." The Permittee proposes to use a water scoop to collect the water samples; however, the sampling method still requires a field personnel to walk to the outfall within the Sanitary Lagoon. The exposure risk does not appear to be eliminated by the Permittee's proposed sampling method. If the outfall is removed or plugged at this time, this comment will not be applicable; however, explain how the proposed sampling method is safer in comparison to the sampling method required by Comment 5 in the revised Work Plan.

Comment 7

The Permittee's response to NMED's *Disapproval* Comment 6 states, "[a]s we have no experience dealing with microbial impacts and cannot find any obviously relevant regulatory standards for New Mexico, we are uncertain what the appropriate microbial analyses are for soils. Can you please specify the required [microbiological] analyses [for soils] and the relevant regulatory standards in your approval letter so that we can add these analyses?" The Permittee did not find any relevant standards for pathogens in soils; therefore, the Permittee is not required to compare the site concentrations to the standards. However, the Permittee is still required to propose an investigation to determine the source of pathogens within the Sanitary Lagoon. Soil may act as a reservoir for pathogens (e.g., e. coli); therefore, hot spots must be identified to minimize soil contamination and potential for soil-to-groundwater migration. One way to investigate hot spots is to inoculate coliforms from soil samples collected from the Sanitary Lagoon and compare the coliform levels among the samples. Propose to conduct microbiological analyses in the revised Work Plan.

Comment 8

The Permittee's response to NMED's *Disapproval* Comment 7 states, "[t]he immediate health and safety concern was simply getting stuck in the mud and not being able to get out of the lagoon." The ground surface may be more stable since the discharge ceased. Examine the stability of the ground surface at the Sanitary Lagoon and report the current status of the ground surface in the Sanitary Lagoon in the revised Work Plan. If the ground surface is stable enough, all soil borings within the Sanitary Lagoon must be installed via mechanical means rather than by hand auger.

Comment 9

The Permittee's response to NMED's *Disapproval* Comment 10 states, "[g]roundwater samples are already collected on a quarterly basis at all of the subject monitoring wells and analyzed for the additional analyses requested above [VOCs, SVOCs, TPH-GRO, DRO and ORO, metals, chloride, fluoride and sulfate]. We believe that the information that is already available, and that is continually being collected, will be sufficient to clearly establish concentrations of contaminants in the area." The Permittee may limit the groundwater analyses for nitrate, nitrite, COD, BOD, total coliform and e-coli analyses for the groundwater monitoring wells (MKTF-24, MKTF-25, MKTF-26, MKTF-29, MKTF-30, MKTF-31, MKTF-40, and OAPIS-1). However, the Permittee must include VOCs, SVOCs, TPH-GRO, DRO and ORO, metals, chloride, fluoride and sulfate analyses in addition to nitrate, nitrite, COD, BOD, total coliform and e-coli analyses for the groundwater samples collected from the soil borings. Include the provision in the revised Work Plan.

Comment 10

In Section 4.1.3, *Drilling Activities,* the Permittee states, "[a] minimum of two exploratory trenches will be dug using a trackhoe to determine the depth of the pipeline." Figure 5 depicts the location of the proposed exploratory trenches approximately 500 feet to 700 feet southeast of the Sanitary Lagoon. The location and depth where the pipeline was buried northwest of the proposed exploratory trenches is speculative based on the extrapolated data since exploratory trenches are not proposed along the northwest section of the pipeline. Although installation of soil borings is proposed along the projected location of the pipeline, the proposed borings may not be located close enough to collect representative soil samples adjacent to the pipeline. The sampling must be more accurate. The exploratory trenches must be excavated from the outfall at the Sanitary Lagoon (or the southern end of the existing excavated trench, if the pipeline is exposed) to proposed boring location PL-6, every 50 feet. A maximum of 13 exploratory trenches must be excavated along the pipeline. In addition, propose to use a backhoe to collect soil samples along the exploratory trench wall beneath the pipeline, rather than to collect samples using soil borings. Furthermore, if the pipeline is damaged during the installation of the trenches, plug the outlet of the undamaged pipeline that is closest to the release points. Revise the Work Plan accordingly.

Comment 11
Since the outfall or the end of the pipeline has been already plugged, the Permittee must investigate any indications that the discharge may still be occurring at the plugged location and seeping from the pipeline upgradient of the blocked portion. Any indication of seeping at the upgradient location of the blocked portion of the pipe must be examined during the excavation of the exploratory trenches. All trenching must include observations of pipe conditions and soil saturation levels. In addition, if the pipeline is damaged during the excavation of the trenches, the outlet of the pipeline closest to the release points must be blocked and the trench must be left open for at a minimum of one month to ensure that no future discharge occurs from the blocked section. Include the provision in the revised Work Plan.

Comment 12
In Section 4.1, *Investigation,* the Permittee states, "[o]ne discharge water sample will be collected from the lagoon prior to commencement of the oil sampling." The text of the Work Plan suggests that the discharge samples may still be collected. Explain whether there is still a possibility of the discharge samples being collected from the pipeline at this time. If the discharge samples are no longer available, revise the Work Plan to reflect the change in current status of the site.

Comment 13
In Section 4.1.9, *Chemical Analyses,* the Permittee states, "[t]he discharge and surface water samples will also be analyzed for chloride, fluoride, nitrate, nitrite, sulfate, COD, BOD, total coliform, and E. coli bacteria." The listed anions are not included in the table titled as Inorganic Analytical Methods (page 4-8). Explain why these inorganic constituents are not included in the table or revise the table to include all inorganic constituents proposed for analysis in the revised Work Plan.

The Permittee must address all comments in this Disapproval and submit a revised Work Plan. Two bound hard copies and an electronic version of the revised Work Plan must be submitted to NMED. In addition, include a red-line strikeout version in electronic format showing where all revisions to the Work Plan have been made. The revised Work Plan must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. The revised Work Plan must be submitted to NMED no later than **May 3, 2019**.

If you have questions regarding this Disapproval, please contact Michiya Suzuki of my staff at 505-476-6059.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: K. Van Horn, NMED HWB
D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, OCD
L. King, EPA Region 6
B. Moore, WRG

File: Reading File and WRG 2019 File
HWB-WRG-18-004

Chavez, Carl J, EMNRD

From: VanHorn, Kristen, NMENV
Sent: Thursday, November 8, 2018 1:23 PM
To: Moore, John
Cc: Moore, Brian; Suzuki, Michiya, NMENV; Chavez, Carl J, EMNRD; 'king.laurie@epa.gov'
Subject: Sewage Lagoon Work Plan
Attachments: Rejection_WRG18-004 SewageLagoon (November 2018).pdf

John,
Attached is a rejection letter regarding the work plan submitted regarding the sewage lagoon. I called yesterday and left you a message regarding this. A hard copy will also be mailed to the facility.

As I said in the voicemail I left, if you would like to discuss this, please contact either me or John Kieling.

Thank you,
Kristen

Kristen Van Horn
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505
Phone: 505-476-6046
Kristen.VanHorn@state.nm.us

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lt. Governor

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BUTCH TONGATE
Cabinet Secretary

BRUCE YURDIN
Acting Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

November 8, 2018

John Moore
Environmental Superintendent
Western Refining, Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

RE: REJECTION
REVISED INVESTIGATION WORK PLAN
SANITARY LAGOON
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-18-004

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has received the *Investigation Work Plan Sanitary Lagoon* (Work Plan), dated May 2018 (Revised October 2018), submitted on behalf of Western Refining, Southwest Inc., Gallup Refinery (the Permittee). There are multiple administrative problems with the submittal; therefore, NMED hereby issues this Rejection of the revised Work Plan in accordance with RCRA Permit Section I.J.11. The Permittee must re-submit the document.

In a letter dated September 7, 2018 titled *Document Submittal Requirements*, NMED provided clarification regarding document submittals to the agency. The Permittee did not follow the guidelines outlined in the letter for the revised Work Plan submittal. Below are the deficiencies that must be addressed by the re-submittal that must also be addressed for all future submittals:

a) The cover letter arrived October 9, 2018 while the document arrived October 11, 2018. In the future, ensure that the cover letter arrives with the submittal so that documents can be properly tracked by NMED.

b) The document is more than twenty (20) pages and was received unbound. All documents with more than 20 pages must be bound.

c) A disc was included; however, the disc was not labeled. Ensure that all enclosures are properly labeled.

Other occurrences regarding submittal issues were discussed in an email dated October 3, 2018 when NMED notified the Permittee regarding issues related to submittal of the revised 2015 and 2016 Facility-wide Groundwater Monitoring Reports and the 4th Quarter Interim Measures Report. Another email from NMED, dated August 9, 2018, required that the Permittee send the second copies of the 2018 Groundwater Monitoring Work Plan and the Work Plan for OW-58 twin-well installation to comply with Permit Section II.C.7.

In the future, please ensure that all submittals are checked for completeness, that two bound hard copies are included (if the document is greater than 20 pages), include discs with electronic versions of all components of the submittal and ensure that the disc(s) is labeled, and ensure that the cover letter or transmittal letter is included with the submittal.

The Permittee must re-submit the revised Work Plan. Two bound hard copies and an electronic version must be submitted to NMED. Include a red-line strikeout version in electronic format showing where all revisions to the Work Plan have been made. The revised Work Plan must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. The revised Work Plan must be submitted to NMED no later than **December 3, 2018.**

If you have questions regarding this letter, please contact Kristen Van Horn of my staff at 505-476-6046.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: K. Van Horn, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, OCD
L. King, EPA Region 6

File: Reading File and WRG 2018 File
HWB-WRG-18-004

Chavez, Carl J, EMNRD

From: Moore, John <John.Moore@andeavor.com>
Sent: Monday, October 15, 2018 11:39 AM
To: Chavez, Carl J, EMNRD
Cc: VanHorn, Kristen, NMENV
Subject: [EXT] Sanitary Sewer
Attachments: Sanitary Sewer.jpg

Carl,

We were able to complete the grouting of the sanitary sewer on October 11, 2018. The work consisted of pumping approximately five cubic yards of cement into the pipe and placing a plug at the end. I have attached a picture that was taken early Friday morning to show some of the work. Upon completion of the work there was no further evidence of any water entering the old location. I have not received the lab data yet, but I will forward that as soon as I have it available. If you have any questions, or would like to discuss this work, please let me know.

John Moore, P.E.
Environmental Superintendent
MPC – Gallup Refinery
92 Giant Crossing Road
Gallup, NM 87301
Phone: (505) 722-0205
Mobile: (307) 337-7642
Fax: (505) 722-0268
John.Moore@andeavor.com

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Monday, October 15, 2018 11:25 AM
To: 'Moore, John'
Subject: Gallup Refinery (Marathon Petroleum Co.) SANITARY LAGOON DISCHARGE

John:

FYI.

- Carl on 10/15 at ~ 10:35 received a voice mail from John Moore (Environmental Superintendent) with Marathon indicating as of Thursday, 10/11 the sanitary lagoon end-of-pipe was cemented with 5 yds. concrete and there is no discharge occurring. He took photos and will send once his e-mail is restored (his e-mail was down). Carl shared phone msg. with Jim and Bill Brancard. Carl forwarded e-mail to Kristen van Horn (NMED). Carl sent an e-mail acknowledgement of receipt by OCD to John.

Thank you for the communication.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

Chavez, Carl J, EMNRD

From: VanHorn, Kristen, NMENV
Sent: Tuesday, October 9, 2018 8:50 AM
To: Chavez, Carl J, EMNRD
Subject: FW: Sanitary Lagoon Submittal
Attachments: Response to NMED Disapproval Letter Oct 5 2018.pdf; Oct 2018 Revised Sanitary Lagoon IWP - final.pdf; Oct 2018 Redline Strikeout Revised Sanitary Lagoon IWP - redline.pdf

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From: Moore, Brian <Brian.Moore@andeavor.com>
Sent: Monday, October 8, 2018 2:14 PM
To: VanHorn, Kristen, NMENV <Kristen.VanHorn@state.nm.us>; carlj.chavev@state.nm.us
Subject: [EXT] Sanitary Lagoon Submittal

Attached please find electronic copies of the revised sanitary lagoon IWP, the response to disapproval letter, and the redline strikeout of changes made to the report.

The hard copies (2 hard copies and 2 CDs to NMED and 1 hard copy and one CD to OCD) will be sent out this afternoon via certified mail.

Feel free to contact me if you have questions.

Brian Moore
(mobile) 281-734-1572

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October 4, 2018

Mr. John E. Kieling, Chief

New Mexico Environmental Department 2905
Rodeo Park Drive East, Bldg. 1

Santa Fe, NM 87SOS-6303

RE: RESPONSE TO DISAPPROVAL
INVESTIGATION WORK PLAN
SANITARY LAGOON
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-18-004

Dear Mr. Kieling:

Gallup Refinery is in receipt of your letter of August 10, 2018, which provided comments on the referenced Work Plan, dated May 31, 2018. The following responses address each of your comments.

NMED Comment 1

Comment 10 in NMED's March 15, 2018 *Disapproval* states, "[t]he Permittee must propose to collect soil samples from within the sanitary lagoon and along the pipe where the holes were discovered." The proposed locations of soil boring are all depicted within the boundary of the Sanitary Lagoon in Figure 3, *Sanitary Lagoon Proposed Soil Sample Locations.* As stated in the comment, the Permittee must also propose to collect multiple soil samples along the pipeline from depths directly below the depth of the pipe from the Sanitary Lagoon back to the potential source area identified as Area A in the *Response to NMED Disapproval Sanitary Lagoon Investigation,* dated May 31, 2018. Provide a figure showing the proposed sampling locations along the pipeline.

Gallup Refinery Response: Much of the pipeline immediately south of the lagoon has been excavated with the trench partially collapsed. The trench is deep, with depths possibly as great as 15 feet, thus it is a health and safety concern to collect samples from within this unshored excavation. In our recent meeting (September 19, 2018), we discussed this concern and a suggestion was made to attempt angled borings. The Work Plan has been revised to include additional locations along the pipeline south of the lagoon. We will attempt angled borings, but the rig will need to be placed a safe distance from the excavation and it likely will not be possible to actually collect soil samples from "directly below the depth of the pipe from the Sanitary Lagoon". The latest comment refers to collecting samples all the way back to "Area A." We recently submitted an Investigation Work Plan for Area of Concern (AOC) 35, which includes borings along

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the sanitary piping through the northern portion of the truck loading rack, back towards the area previously identified as "Area A." Therefore, this Investigation Work Plan is focused on the length of pipeline extending south from the lagoon to the northwestern portion of AOC 35 (i.e., the area northwest of the additive tanks).

Section 4.1 is revised to add six additional soil borings along the pipeline and Section 4.1.3 is revised to explain the process that will be used to locate the pipeline prior to installing borings in areas where the exact location and depth is unknown.

NMED Comment 2

In its May 31, 2018 letter, the Permittee proposes to hydro-excavate the pipeline. The Agencies do not approve hydro-excavation of the pipeline at this time. By hydro-excavating the pipelines, the facility may generate a large volume of hazardous waste and obscure source areas, which may make it difficult to conduct corrective action effectively. Although the discussion regarding excavation of the pipeline was not included in the Work Plan, the discussion is relevant to the investigation. The investigation required by Comment 1 will help to identify the areas of potential soil contamination along the pipeline where discharge water escaped through leaks or where contaminants potentially entered the pipeline. Once the pipeline is hydro-excavated, the areas of soil contamination will likely be impossible to locate. The pipeline may be removed by hydro-excavation after the investigation is completed.

Gallup Refinery Response: The hydroexcavation will not be conducted prior to the investigation.

NMED Comment 3

Section 2.1, *Sanitary Lagoon,* page 2-1, briefly discusses background information for the Sanitary Lagoon; however, the discussion lacks information pertinent to the investigation. For example, the Permittee proposes soil borings to be installed at depths greater than 2.5 feet below ground surface (bgs) in Section 4.1.2. However, if the bottom of the Sanitary Lagoon is deeper than 2.5 feet bgs, the Permittee must indicate that borings will be advanced to a greater depth taking into consideration the depth of the Sanitary Lagoon in the Work Plan. Provide information relevant to the investigation such as the lagoon dimensions in the revised Work Plan. In addition, the Permittee must advance the soil borings to the water table and collect samples at 2.5-feet intervals to depths that cross the water table.

Gallup Refinery Response: The lagoon dimensions have been added in Section 2.1.

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The Work Plan initially only included borings within the lagoon, thus the bottom of the lagoon is not and cannot be deeper than the land surface at these locations. Perhaps the comment is anticipating the additional borings being added along the pipeline to the southeast. The Work Plan calls for all borings completed with a hand auger to reach the depth of refusal or saturation, whichever occurs first. The borings completed with hollow-stem augers will be drilled to the depth of saturation. As the land surface rises significantly to the southeast, it is not practical or necessary to extend soil borings to depths that may be below the elevation of the bottom of the lagoon. We believe that extending borings to the depth of saturation will be more than adequate to evaluate any potential releases along the pipeline. In addition, the borings southeast of the lagoon will be a sufficient distance and up-gradient from the lagoon so as not to have been subject to impacts from the lagoon itself.

NMED Comment 4

Section 4.1, *Investigation,* page 4-1, bullet point two states, "[t]he drilling at each location will cease if saturated soil conditions are encountered that prevent sample collection with the hand auger." If saturation or water is encountered, the Permittee must collect a water sample. The analytical parameters of the water sample must be consistent with ones for a discharge water sample. Address the sampling requirement in the revised Work Plan. Also, it is not clear how saturation would prevent sampling using a hand auger. Section 3.2, *Subsurface Conditions,* states that much of the shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers; therefore, even if soil is saturated, collection of soil samples is likely feasible with a hand auger. Therefore, please retain all soil samples for chemical analysis, and either revise the statement or provide further explanation in the revised Work Plan.

Gallup Refinery Response: The discussion in Section 4.1.2 is revised to specifically include collection of soil samples at the top of saturation, if encountered. Section 4.1.4 has been revised to include the collection of groundwater samples that will be analyzed for chemical oxygen demand, biological oxygen demand, total coliform, and E. coli bacteria, if saturation is encountered. See the response to Comment 10 regarding not analyzing these groundwater samples for all constituents, as there are many existing monitoring wells all along the sanitary pipeline.

NMED Comment 5

In Section 4.1.1, *Discharge Water Sampling,* page 4-2, the Permittee states, "[t]he sample will be collected in a decontaminated water scoop. 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." The discharge water sample must be analyzed for volatile organic compounds (VOCs). However, the proposed sample collection method may result in loss of VOCs. Propose to collect the samples directly from the outfall to provide a more representative sample in the revised Work Plan.

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Gallup Refinery Response: First, we would note that the water is flowing through an open pipe and thus collection of the sample in the manner proposed in the Work Plan will not result in any additional loss of volatiles than may be occurring throughout the length of flow through the pipeline. Second, the New Mexico Oil Conservation Division (OCD) has directed that all discharge be stopped and the Gallup Refinery is making every effort to stop the discharge, thus there will likely not be any discharge to be sampled. Third, the sample bottles used for the VOC analyses come from the laboratory with an acid preservative. It is very important to not flush the preservative from the sample bottle and placing the small bottle directly under the discharge, if still active, could greatly increase the chance of compromising the sample preservation. Lastly, requiring someone to attempt to walk into the lagoon far enough to reach the end of the discharge pipe could subject them to sinking into a very soft bottom of the lagoon and greatly increase their risk of exposure to pathogens likely present in the septic discharge. This seems to be at odds with Comment 7 below, which recognizes the dangers the Agencies are subjecting the site investigation personnel to that conduct the requested sample collection. For all of these reasons, we request that the Agencies please reconsider this request.

NMED Comment 6

Section 4.1.2, *Soil Sample Field Screening and Logging,* page 4-2, proposes a screening method that is appropriate for the detection of petroleum hydrocarbons. The project goals are established to determine and evaluate the presence, nature, and extent of releases of contaminants at the Sanitary Lagoon. However, the contents of the release are not limited to petroleum hydrocarbons; untreated sewage may be the primary contaminant of concern at the Sanitary Lagoon. The Permittee must also investigate the presence of untreated sewage in the soils. Untreated sewage contains disease-causing organisms such as bacteria, viruses and parasites. The growth of such microorganisms is sustained as long as water is present in the soils. Propose appropriate microbiological analyses for the soils in the Sanitary Lagoon in the revised Work Plan. Additionally, the nitrate and nitrite concentrations in the areas where soils were exposed to untreated sewage will likely be elevated. Propose to include nitrate and nitrite analyses for the soil samples collected within the Sanitary Lagoon in the revised Work Plan.

Gallup Refinery Response: The analyses for nitrate and nitrite have been added to the list of analytes in Section 4.1.9. In addition, a request is made to add "appropriate microbiological analyses" for soils. As we have no experience dealing with microbial impacts and cannot find any obviously relevant regulatory standards for New Mexico, we are uncertain what the appropriate microbiological analyses are for soils. Can you please specify the required analyses and the relevant regulatory standards in your approval letter so that we can add these analyses?

NMED Comment 7

In Section 4.1.3, *Drilling Activities,* page 4-3, the Permittee states, "[w]here is not possible to complete soil borings due to health and safety concerns gaining access for sample collection, other mechanical means will be utilized (e.g., a long-reach track hoe)." Provide an explanation for how the Permittee determines the conditions where it would not be possible to complete soil borings due to health and safety concerns.

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Disease-causing organisms may not exhibit any obvious signs of presence in the soil or water. If any stagnant water (e.g., as shown on a photograph "Northside of Lagoon Looking South" in Appendix A, *Photographs)* is present on the surface of the Sanitary Lagoon, collect the water for screening microbiological activity (e.g., total coliform bacteria concentrations). If the results indicate that potential health hazard exists in the area, suspend the investigation and contact NMED.

Gallup Refinery Response: The immediate health and safety concern was simply getting stuck in the mud and not being able to get out of the lagoon. Certainly the risk of exposure to pathogens is greatly increased if the sampler cannot safely walk into and exit the lagoon. Section 4.1.1 has been revised to include collection of a surface water sample.

NMED Comment 8

In Section 4.1.6, *Collection and Management of Investigation Derived Waste,* page 4-6, the Permittee states, "[a]ll purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator." During a May 2, 2018 meeting, the Permittee indicated to NMED and OCD that the API Separator was repaired and the documentation demonstrating the completion of repairs was submitted on July 16, 2018. The repairs were satisfactory and NMED hereby approves the practice; however, the Permittee must continue to monitor all leak detection units (LDUs) in accordance with the monitoring schedule in the *2018 Facility Wide Ground Water Monitoring Work Plan,* dated March 31, 2018 and continue to evaluate the effectiveness of the repairs to the API Separator.

Gallup Refinery Response: None required.

NMED Comment 9

Section 4.1.9, *Chemical Analyses,* page 4-8, proposes that discharge water samples will be analyzed for VOCs, semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), gasoline range organics (GRO), diesel range organics (DRO), motor oil range organics (ORO), metals, chloride, fluoride, sulfate, COD, BOD, total coliform, and E. coli bacteria. The discharge water sample may contain elevated nitrate and nitrite concentrations; therefore, propose revise the Work Plan to also analyze the samples for nitrate and nitrite

Gallup Refinery Response: The list of analyses in Section 4.1.9 has been revised to include nitrate and nitrite.

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NMED Comment 10

In Section 4.1.9, *Chemical Analyses,* page 4-9, the Permittee states, "[g]roundwater samples will be analyzed for COD, BOD, total coliform, and E. coli bacteria." The groundwater sampling parameters must be consistent with discharge water sampling parameters so that the extent of groundwater contamination due to the discharge may be evaluated. In addition to the analyses for COD, BOD, total eoliform and e-coli, the groundwater samplcs must be analyzed for VOCs, SVOCs, TPH-GRO, DRO and ORO, metals, nitrate, nitrite, chloride, fluoride and sulfate. Revise the Work Plan accordingly.

Gallup Refinery Response: Groundwater samples are already collected on a quarterly basis at all of the subject monitoring wells and analyzed for the additional analyses requested above. We believe that the information that is already available, and that is continually being collected, will be sufficient to clearly establish concentrations of contaminants in the area.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or 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,

Daniel J Statile

VP Gallup Refinery

cc K. Van Horn NMED
C. Chavez NMOCD
L. King, EPA Region 6
S. Pullen, NMED GWQB
B. Moore Andeavor Gallup Refinery

INVESTIGATION WORK PLAN
Sanitary Lagoon

Western Refining

Gallup Refinery
Andeavor
Gallup, New Mexico
EPA ID# NMD000333211

May 2018
(Revised October 2018)

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Appendix A Photographs
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List of Acronyms

areas of concern (AOCs)

below ground surface (bgs)

Biological oxygen demand (BOD)

Code of Federal Regulations (CFR)

Contract Laboratory Program (CLP)

Chemical oxygen demand (COD)

Data quality objective (DQO)

Environmental Protection Agency (EPA)

Hazardous and Solid Waste Act (HSWA)

Investigation derived waste (IDW)

mean sea level (msl)

New Mexico Administrative Code (NMAC)

New Mexico Environment Department (NMED)

photoionization detector (PID)

quality assurance/quality control (QA/QC)

Resource Conservation and Recovery Act (RCRA)

RCRA Facility Investigation (RFI)

semi-volatile organic compound (SVOC)

Solid Waste Management Units (SWMUs)

volatile organic constituent (VOC)

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. A sanitary sewer lagoon is located in the northwest portion of the refinery. This Investigation Work Plan proposes to collect samples of soil and groundwater to determine the current concentrations of constituents in the area of the sanitary sewer lagoon. A sample of the discharge and surface water will also be collected. Soil samples are proposed to be collected from eight locations within the lagoon and six soil borings southeast of the lagoon, adjacent to the pipeline. Groundwater samples will be collected from eight existing monitoring wells in the area of the lagoon and soil borings that encounter groundwater. The soil samples, discharge water, and surface water will be analyzed for Skinner List metals, VOCs, SVOCs, and total petroleum hydrocarbons. In addition, the discharge and surface water samples and the groundwater samples will be analyzed for chemical oxygen demand (COD), biological oxygen demand (BOD), total coliform, and E-coli bacteria.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery property covers approximately 810 acres. Figure 1 presents the refinery location and the regional vicinity, which is characterized as high desert plain comprised primarily of public lands used for grazing by cattle and sheep.

The Gallup Refinery is a crude oil refinery currently owned and operated by Andeavor. The Gallup Refinery, was previously operated by Western Refining Southwest, Inc. ("Western"), formerly known as Giant Industries Arizona, Inc. and formerly doing business as Giant Refining Company Ciniza Refinery, an Arizona corporation. The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck.

Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, isomerization, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

A sanitary sewer lagoon is located in the northwest portion of the refinery. The location of the sanitary sewer lagoon is shown on Figure 2. Photographs of the lagoon and the surrounding area are included in Appendix A. The purpose of the site investigation is to determine the current concentrations of constituents in soil/sediments and groundwater in the area of the sanitary lagoon.

Section 2
Background

This section presents background information for the sanitary lagoon including a review of historical waste management activities to identify the following:

- Type and characteristics of all waste and all contaminants handled in the lagoon;
- Known and possible sources of contamination;
- History of releases; and
- Known extent of contamination.

2.1 Sanitary Lagoon

The sanitary lagoon is a two-cell lagoon that was installed when the facility opened in 1957. The two cells are separated by an earthen berm. In the past (see aerial photo - Figure 2) both cells of the lagoon were used to store wastewater. Currently, the western cell is dry and used for storage and the eastern lagoon holds raw sewage and other discharge. The eastern cell is approximately 145 feet x 115 feet. Based on reviews of sewer pipeline maps and recent dye-trace tests, the lab sanitary facilities, change house, warehouse, and the truck rack drivers lounge have sanitary sewer lines that discharge to the sanitary lagoon.

Section 3
Site Conditions

The conditions at the site, including surface and subsurface conditions that could affect the fate and transport of any contaminants, are discussed below. This information is based on recent visual observations and historical subsurface investigations.

3.1 Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to lowland fluvial plain in the northwest. Elevations on the refinery property range from 7,040 feet to 6,860 feet. The area of the site near the lagoon is at an approximate elevation of 6,913 feet above mean sea level (msl). The pictures in Appendix A show the land surface in the immediate area.

The McKinley County soil survey identifies the soil in the area of the lagoon as the Simitarq-Celavar sandy loams (USDA, 2005). The Simitarq-Celavar soils are well drained with a conservative permeability of 0.20 in/hr and minimal salinity. Simitarq soils have nearly neutral pH values ranging from 7.2 to 7.4 standard units.

Regional surface water features include the refinery evaporation ponds and aeration lagoons and a number of small ponds. The site is located in the Rio Puerco valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Rio Puerco. The Rio Puerco continues to the east to the confluence with the Rio Grande. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

3.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. Very low permeability bedrock (e.g., claystones and siltstones) underlie the surface soils and effectively form an aquitard. The Chinle Formation, which is Upper Triassic, crops out over a large area on the southern margin of the San Juan Basin. The uppermost recognized local member is the Petrified Forest and the Sonsela Sandstone Bed is the uppermost recognized regional aquifer. Aquifer test of the Sonsela Bed northeast of Prewitt indicated a transmissivity of greater than 100 ft^2/day (Stone and others, 1983). The Sonsela Sandstone's highest point occurs southeast of the site and slopes downward to the northwest as it passes under

the refinery. The Sonsela Sandstone forms a water-bearing reservoir with artesian conditions throughout the central and western portions of the refinery property. Groundwater within the Sonsela Sandstone flows downdip to the northwest.

The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravely sands immediately overlying the Chinle Formation to 10^{-8} cm/sec in the clay soils located near the surface (Western Refining, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Chinle Formation with prevailing flow from the southeast to the northwest, with some flow to the northeast on the northeastern portion of the refinery property.

Section 4
Scope of Activities

The site investigation of soils and groundwater will be conducted to define the nature and extent of impacts to the environment and facilitate remedy selection, as necessary. The investigation will commence upon approval of this investigation work plan by NMED.

4.1 Investigation

A focused investigation of soils/sediments within the sanitary lagoon will be conducted to characterize current concentrations of constituents and define the extent (as possible) of any such impacts. The following text summarizes the proposed sampling to be conducted at the sanitary lagoon.

- One discharge water sample will be collected from the lagoon prior to commencement of the soil sampling;
- If any stagnant water is present, one surface water sample will be collected prior to commencement of the soil sampling;
- Four soil borings will be located within the lagoon where standing water is not present. One of the four soil borings will be located directly below the sewage outfall. All soil borings will be drilled with a hand auger to the maximum depth possible. The drilling at each location will cease if refusal is met or if saturated soil conditions are encountered that prevent sample collection with the hand auger;
- Soil/sediment samples will be collected from up to four locations within the area that has recently had standing water by mechanical means (e.g., long-reach trackhoe). The trackhoe (or similar equipment) will be located outside the lagoon and used to reach inside the lagoon to retrieve a volume of soil/sediment from the target depth. A discrete soil/sediment will be collected for analysis from the volume of soil obtained by the mechanical device,
- Groundwater samples will be collected from eight existing monitor wells in the area of the sanitary lagoon; and
- Six soil borings will be located southeast of the lagoon adjacent to the sanitary pipeline.

The proposed locations for soil samples are shown on Figure 3. The proposed wells locations to be sampled are shown on Figure 4. The proposed locations adjacent to the sanitary pipeline are shown on Figure 5.

4.1.1 Discharge Water and Surface Water Sampling

One discharge water sample will be collected from the sanitary lagoon prior to the commencement of the soil sampling. If any stagnant water is present on the surface of the lagoon, then a surface water sample will be collected prior to the commencement of the soil sampling.

The water samples will be collected in a decontaminated water scoop. 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. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as presented in Section 4.1.4.

4.1.2 Soil Sample Field Screening and Logging

All soil borings will be continuously logged and samples field screened. Samples obtained from the soil borings will be screened in the field on 1.0 foot intervals for evidence of contaminants. Field screening results will be recorded on the exploratory boring logs. Field screening results will be used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits may be conducted where appropriate.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container will be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container will be allowed to rest for a minimum of 5 minutes while vapors equilibrate. Vapors present within the sample bag's headspace will then be measured

by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature will be recorded on the field boring log for each sample.

The monitoring instruments will be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp or a combustible gas indicator will be used for VOC field screening. Field screening results may be site- and boring-specific and the results may vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant, therefore, all conditions capable of influencing the results of field screening will be recorded on the field logs.

Discrete soil samples will be retained for laboratory analyses from within the following intervals:

- 0.0-0.5 feet;
- 2.0-2.5 feet;
- >2.5 feet (from the interval in each soil boring with the greatest apparent degree of contamination, based on field observations and field screening);
- 2.0-4.0 feet below the estimated depth of the pipeline;
- 0.5 feet interval at the top of saturation (applicable only to those borings that reach saturation);
- From the bottom of each borehole (all soil borings); and
- Any additional intervals as determined based on field screening results.

The physical characteristics of the samples (such as mineralogy, ASTM soil classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations will be recorded in the field log by a qualified geologist or engineer. Detailed logs of each boring will be completed in the field by a qualified geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling, will be recorded on the logs.

Quality Assurance/Quality Control (QA/QC) samples will be collected to monitor the validity of the soil sample collection procedures as follows:

- Field duplicates will be collected at a rate of 10 percent; and
- Equipment blanks will be collected from all sampling apparatus at a frequency of one per day.

4.1.3 Drilling Activities

Soil borings will be drilled using a hand auger, or advanced by hand driving a section of 2" PVC pipe, as necessary to help retain samples for collection. The equipment will be properly decontaminated before drilling each boring. The NMED will be notified as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the specified depths or at planned sampling locations. Where it is not possible to complete soil borings due to health and safety concerns gaining access for sample collection, other mechanical means will be utilized (e.g., a long-reach track- hoe). The trackhoe (or similar equipment) will be used to collect an aliquot of soil/sediment, from which a discrete sample will be collected for analysis.

A minimum of two exploratory trenches will be dug using a trackhoe to determine the depth of the pipeline. Six borings will be advanced along the pipeline using either a truck-mounted drilling rig or a smaller all terrain drilling rig. The soil sampling will be conducted using hollow-stem augers and split-spoon samplers.

Known site features and/or site survey grid markers will be used as references to locate each boring. The boring locations will be measured to the nearest foot and locations will be recorded on a scaled site map upon completion of each boring.

4.1.4 Groundwater Sample Collection

Groundwater samples will be collected and analyzed for COD, BOD, total coliform and E. Coli bacteria from soil borings encountering groundwater and from existing monitor wells located in close proximity of the lagoon (MKTF-24, MKTF-25, MKTF-26, MKTF-29, MKTF-30, MKTF-31, MKTF-40, OAPIS-1). Groundwater samples will be collected within 24 hours of the completion of well purging using disposable bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated). 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. Sample handling and

chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as follows:

- Field duplicate water samples will be obtained at a frequency of ten percent, with a minimum, of one duplicate sample per sampling event;
- Equipment rinsate blanks will be obtained for chemical analysis at the rate of ten percent or a minimum of one rinsate blank per sampling day. Equipment rinsate blanks will be collected at a rate of one per sampling day if disposable sampling equipment is used. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses; and
- 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 prepared by the laboratory and placed in an appropriate sample container. The trip blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of groundwater samples to be analyzed for VOCs.

4.1.5 Sample Handling

At a minimum, the following procedures will be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample;
2. All samples collected of each medium for chemical analysis will be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in Encore® samplers. 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; and

3. Sample labels and documentation will be completed for each sample following procedures discussed below. 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 below, will be followed for all samples collected. All samples will be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times.

Chain-of-custody and shipment procedures will include the following:

1. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site or prior to the transportation of samples to the lab.
2. Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA 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. Temperature blanks will be included with each shipping container.
3. Each cooler or other container will be delivered directly to the analytical laboratory.
4. Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
5. Plastic containers will be protected from possible puncture during shipping using cushioning material.
6. The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
7. Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.
8. Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.
9. 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 copies will be returned to the relinquishing party.
10. Copies of all chain-of-custody forms generated as part of sampling activities will be maintained on-site.

4.1.6 Collection and Management of Investigation Derived Waste

The soils produced from the two pipeline location trenches will be temporarily placed beside the trenches. The vast majority of this material will be removed from above the pipeline and there is no currently available information to indicate these soils are contaminated. If any of the soil indicates potential impacts, then this soil will be managed separately as described below for drill cuttings. Otherwise, non-impacted soil will be returned to the trench after the pipeline is located.

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings will be contained and characterized using methods based on the boring location, boring depth, drilling method, and type of contaminants suspected or encountered. All purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator. An IDW management plan is included as Appendix B.

4.1.7 Field Equipment Calibration

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks will be conducted daily, or at other intervals approved by the Department, 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. In the interim, a properly calibrated replacement instrument will be used.

4.1.8 Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded in a field log book. Copies of the completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink will be used to record all field activities. Photographic documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;

6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log, as appropriate;
10. Field monitoring data, including health and safety monitoring;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

4.1.9 Chemical Analyses

All samples collected for laboratory analysis will be submitted to an accredited laboratory. The laboratory will use the most recent standard EPA and industry-accepted analytical methods for target analytes as the testing methods for each medium sampled. Chemical analyses will be performed in accordance with the most recent EPA standard analytical methodologies and extraction methods.

Soil/sediment, discharge and surface water samples will be analyzed by the following methods:

- SW-846 Method 8260 for Skinner List volatile organic compounds;
- SW-846 Method 8270 for Skinner List semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline range (C5-C10), diesel range (>C10-C28), and motor oil range (>C28-C36) organics.

Soil/sediment, discharge and surface water samples will also be analyzed for the following Skinner List metals and iron and manganese using the indicated analytical methods shown below. The soil/sediment samples will also be analyzed for nitrate and nitrite. The discharge and surface water samples will also be analyzed for chloride, fluoride, nitrate, nitrite, sulfate, COD, BOD, total coliform, and E. coli bacteria.

Inorganic Analytical Methods

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020

Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Chromium VI	SW-846 method 3060A
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

Groundwater samples will be analyzed for COD, BOD, total coliform, and E. coli bacteria.

As discussed previously, groundwater field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature.

4.1.10 Data Quality Objectives

The Data Quality Objectives (DQOs) were developed to ensure that newly collected data are of sufficient quality and quantity to address the project goals, including Quality Assurance/Quality Control (QA/QC) issues (EPA, 2006). The project goals are established to determine and evaluate the presence, nature, and extent of releases of contaminants at the lagoon. The type of data required to meet the project goals includes chemical analyses of soil and groundwater to determine if there has been a release of contaminants at the lagoon.

The quantity of data is specific to the lagoon and is based on the historical operations at lagoon. Method detection limits should be 20% or less of the applicable background levels, cleanup standards and screening levels.

Additional DQOs include precision, accuracy, representativeness, completeness, and comparability. Precision is a measurement of the reproducibility of measurements under a given set of

circumstances and is commonly stated in terms of standard deviation or coefficient of variation (EPA, 1987). Precision is also specific to sampling activities and analytical performance. Sampling precision will be evaluated through the analyses of duplicate field samples and laboratory replicates will be utilized to assess laboratory precision.

Accuracy is a measurement in the bias of a measurement system and may include many sources of potential error, including the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques (EPA, 1987). An evaluation of the accuracy will be performed by reviewing the results of field/trip blanks, matrix spikes, and laboratory QC samples.

Representativeness is an expression of the degree to which the data accurately and precisely represent the true environmental conditions. Sample locations and the number of samples have been selected to ensure the data is representative of actual environmental conditions. Based on SWMU specific conditions, this may include either biased (i.e., judgmental) locations/depths or unbiased (systematic grid samples) locations. In addition, sample collection techniques (e.g., field monitoring and decontamination of sampling equipment) will be utilized to help ensure representative results.

Completeness is defined as the percentage of measurements taken that are actually valid measurements, considering field QA and laboratory QC problems. EPA Contract Laboratory Program (CLP) data has been found to be 80-85% complete on a nationwide basis and this has been extrapolated to indicate that Level III, IV, and V analytical techniques will generate data that are approximately 80% complete (EPA, 1987). As an overall project goal, the completeness goal is 85%; however, some samples may be critical based on location or field screening results and thus a sample–by-sample evaluation will be performed to determine if the completeness goals have been obtained.

Comparability is a qualitative parameter, which expresses the confidence with which one data set can be compared to another. Industry standard sample collection techniques and routine EPA analytical methods will be utilized to help ensure data are comparable to historical and future data. Analytical results will be reported in appropriate units for comparison to historical data and cleanup levels.

Section 5
References

EPA, 1987, Data Quality Objectives for Remedial Response Activities; United States Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, OSWER Directive 9355.0-7B, 85p

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EPA, 2006, Guidance on Systematic Planning Using the Data Quality Objectives Process, United States Environmental Protection Agency, Office of Environmental Information; EPA/240/B-06/001, p. 111.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizel, N.H., and Padgett, E.T., 1983, *Hydrogeology and Water Resources of San Juan Basin, New Mexico*; Hydrogeologic Report 6, New Mexico Bureau of Mines and Mineral Resources, p. 70.

USDA, 2005, Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties, p. 683.

Western Refining, 2009, Annual Ground Water Monitoring Report Gallup Refinery – 2009.

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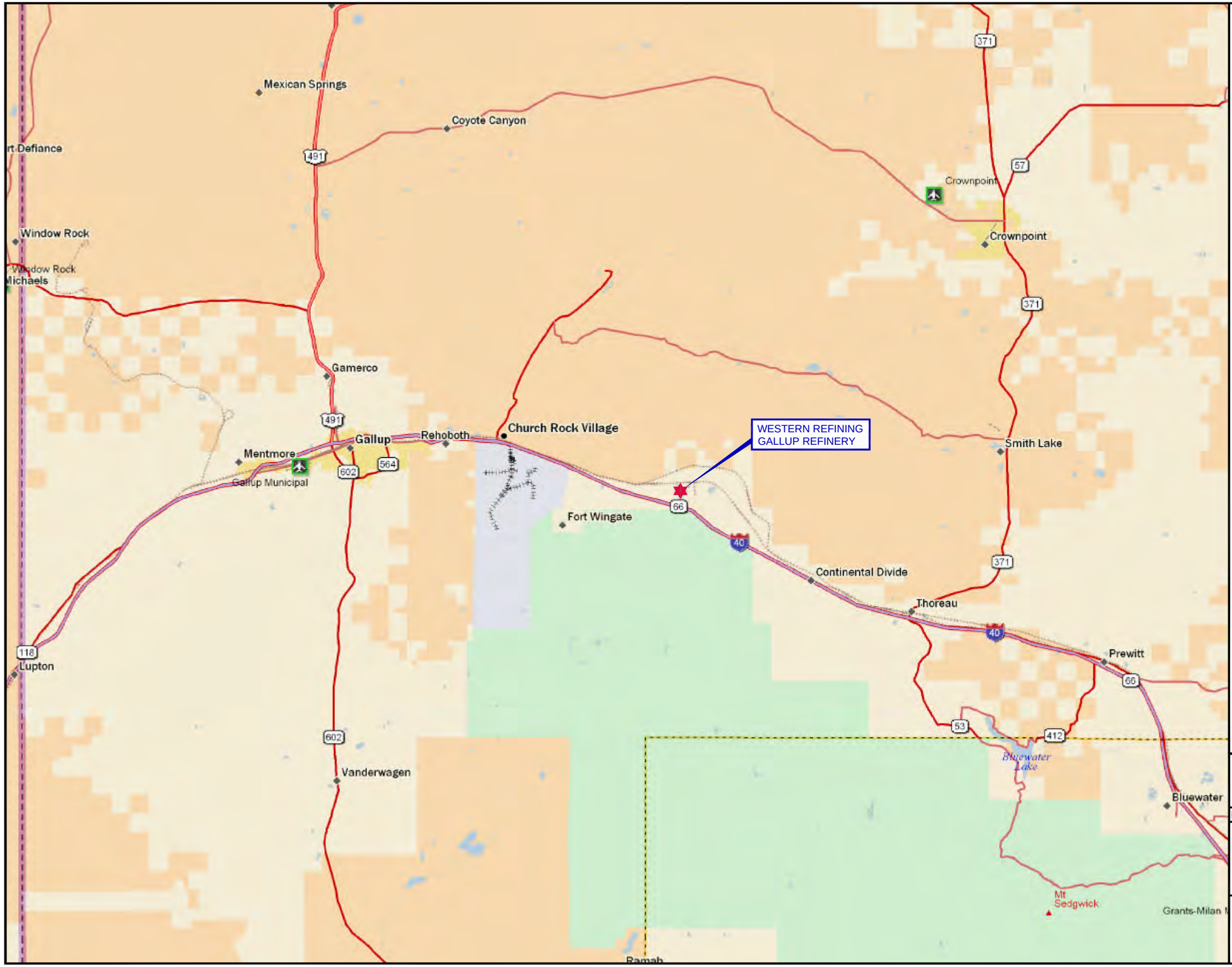
Figure 1 Site Location Map

Figure 2 Sanitary Lagoon Location Map

Figure 3 Sanitary Lagoon Proposed Soil Boring Locations

Figure 4 Sanitary Lagoon Proposed Well Sampling Locations

Figure 5 Sanitary Lagoon Proposed Soil Boring Locations Adjacent to Pipeline



Map Source: DeLorme Street Atlas USA 2007 Plus.

N

0 5
SCALE IN MILES

Western Refining
GALLUP REFINERY

PROJ. NO.:Western Refining | DATE:04/17/18 | FILE:WestRef-dB164

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 07/24/2011.

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SCALE IN FEET

GALLUP SITE LOCATION

Western Refining
GALLUP REFINERY

PROJ. NO.: Western Refining	DATE: 04/17/18	FILE: WestRef-dB165

FIGURE 2
SANITARY LAGOON
LOCATION MAP

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Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

0 20
SCALE IN FEET

GALLUP SITE LOCATION

LEGEND

- SOIL BORING LOCATION ADVANCED WITH HAND AUGER
- SOIL SAMPLE LOCATION VIA MECHANICAL MEANS
- APPROXIMATE EXTENT OF SURFACE WATER

Western Refining
GALLUP REFINERY

PROJ. NO.: Western Refining | DATE: 04/18/18 | FILE: WestRef-dB166

FIGURE 3
SANITARY LAGOON
PROPOSED SOIL SAMPLE
LOCATIONS

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Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

0 100
SCALE IN FEET

LEGEND

MKTF-24 PROPOSED WELL SAMPLING LOCATION AND IDENTIFICATION NUMBER

NEW MEXICO

GALLUP SITE LOCATION

Western Refining
GALLUP REFINERY

PROJ. NO.: Western Refining | DATE: 04/18/18 | FILE: WestRef-dB167

FIGURE 4
SANITARY LAGOON
PROPOSED WELL SAMPLING LOCATIONS

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Suite 300
Austin, Texas 78759

Map Source: Google Aerial, 03/18/2016.

LEGEND

- ESTIMATED LOCATION OF THE SANITARY PIPELINE
- PL-1 — PROPOSED SOIL BORING LOCATION AND IDENTIFICATION NUMBER
- MKTF-14 — EXISTING MONITOR WELL LOCATION AND IDENTIFICATION NUMBER
- ESTIMATED LOCATION OF EXPLORATORY TRENCHES

N

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SCALE IN FEET

Western Refining
GALLUP REFINERY

PROJ. NO.:Western Refining	DATE:10/07/18	FILE:WestRef-dA149

FIGURE 5
SANITARY LAGOON
PROPOSED SOIL BORING LOCATIONS
ADJACENT TO PIPELINE

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Suite 300
Austin, Texas 78759

Appendix A

Photographs


SOUTH SIDE OF LAGOON LOOKING NORTH
2018/03/09


Western
Refining
WEST SIDE OF LAGOON LOOKING EAST
2018/03/09


NORTH SIDE OF LAGOON LOOKING SOUTH
2018/03/09


EAST SIDE OF LAGOON LOOKING WEST
2018/03/09

Appendix B

Investigation Derived Waste Management Plan

Investigation Derived Waste (IDW) Management Plan

All IDW will be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste.

A dedicated decontamination area will be setup prior to any sample collection activities. The decontamination pad will be constructed so as to capture and contain all decontamination fluids (e.g., wash water and rinse water) and foreign materials washed off the sampling equipment. The fluids will be pumped directly into suitable storage containers (e.g., labeled 55-gallon drums), which will be located at satellite accumulation areas until the fluids are disposed in the refinery wastewater treatment system upstream of the API separator. The solids captured in the decontamination pad will be shoveled into 55-gallon drums and stored at the designated satellite accumulation area pending proper waste characterization for off-site disposal.

Drill cuttings generated during installation of soil borings will be placed directly into 55-gallon drums and staged in the satellite accumulation area pending results of the waste characterization sampling. The portion of soil cores, which are not retained for analytical testing, will be placed into the same 55-gallon drums used to store the associated drill cuttings.

The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials are not characteristically hazardous, then further testing will be performed pursuant to the requirements of the facility to which the materials will be transported. Depending upon the results of analyses for individual investigation soil samples, additional analyses may include TPH and polynuclear aromatic hydrocarbons (PAHs).

INVESTIGATION WORK PLAN
Sanitary Lagoon

Gallup Refinery
Andeavor
Gallup, New Mexico
EPA ID# NMD000333211

May 2018

(Revised October 2018)

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Appendices

Appendix A Photographs

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List of Acronyms

areas of concern (AOCs)

below ground surface (bgs)

Biological oxygen demand (BOD)

Code of Federal Regulations (CFR)

Contract Laboratory Program (CLP)

Chemical oxygen demand (COD)

Data quality objective (DQO)

Environmental Protection Agency (EPA)

Hazardous and Solid Waste Act (HSWA)

Investigation derived waste (IDW)

mean sea level (msl)

New Mexico Administrative Code (NMAC)

New Mexico Environment Department (NMED)

photoionization detector (PID)

quality assurance/quality control (QA/QC)

Resource Conservation and Recovery Act (RCRA)

RCRA Facility Investigation (RFI)

semi-volatile organic compound (SVOC)

Solid Waste Management Units (SWMUs)

volatile organic constituent (VOC)

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. A sanitary sewer lagoon is located in the northwest portion of the refinery. This Investigation Work Plan proposes to collect samples of soil and groundwater to determine the current concentrations of constituents in the area of the sanitary sewer lagoon. A sample of the discharge and surface water ~~water~~ will also be collected. Soil samples are proposed to be collected from eight locations within the lagoon and six soil borings southeast of the lagoon, adjacent to the pipeline. ~~and~~ gGroundwater samples will be collected from eight existing monitoring wells in the area of the lagoon and soil borings that encounter groundwater. The soil samples, discharge water, and surface water will be analyzed for Skinner List metals, VOCs, SVOCs, and total petroleum hydrocarbons. In addition, the discharge and surface water samples and the groundwater samples will be analyzed for chemical oxygen demand (COD), biological oxygen demand (BOD), total coliform, and E-coli bacteria.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery property covers approximately 810 acres. Figure 1 presents the refinery location and the regional vicinity, which is characterized as high desert plain comprised primarily of public lands used for grazing by cattle and sheep.

The Gallup Refinery is a crude oil refinery currently owned and operated by Andeavor. The Gallup Refinery, was previously operated by Western Refining Southwest, Inc. ("Western"), formerly known as Giant Industries Arizona, Inc. and formerly doing business as Giant Refining Company Ciniza Refinery, an Arizona corporation. The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck.

Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, isomerization, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

A sanitary sewer lagoon is located in the northwest portion of the refinery. The location of the sanitary sewer lagoon is shown on Figure 2. Photographs of the lagoon and the surrounding area are included in Appendix A. The purpose of the site investigation is to determine the current concentrations of constituents in soil/sediments and groundwater in the area of the sanitary lagoon.

Section 2
Background

This section presents background information for the sanitary lagoon including a review of historical waste management activities to identify the following:

- Type and characteristics of all waste and all contaminants handled in the lagoon;
- Known and possible sources of contamination;
- History of releases; and
- Known extent of contamination.

2.1 Sanitary Lagoon

The sanitary lagoon is a two-cell lagoon that was installed when the facility opened in 1957. The two cells are separated by an earthen berm. In the past (see aerial photo - Figure 2) both cells of the lagoon were used to store wastewater. Currently, the western cell is dry and used for storage and the eastern lagoon holds raw sewage and other discharge. The eastern cell~~lagoon~~ is approximately 145 feet x 115 feet. Based on reviews of sewer pipeline maps and recent dye-trace tests, the lab sanitary facilities, change house, warehouse, and the truck rack drivers lounge have sanitary sewer lines that discharge to the sanitary lagoon.

Section 3
Site Conditions

The conditions at the site, including surface and subsurface conditions that could affect the fate and transport of any contaminants, are discussed below. This information is based on recent visual observations and historical subsurface investigations.

3.1 Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to lowland fluvial plain in the northwest. Elevations on the refinery property range from 7,040 feet to 6,860 feet. The area of the site near the lagoon is at an approximate elevation of 6,913 feet above mean sea level (msl). The pictures in Appendix A show the land surface in the immediate area.

The McKinley County soil survey identifies the soil in the area of the lagoon as the Simitarq-Celavar sandy loams (USDA, 2005). The Simitarq-Celavar soils are well drained with a conservative permeability of 0.20 in/hr and minimal salinity. Simitarq soils have nearly neutral pH values ranging from 7.2 to 7.4 standard units.

Regional surface water features include the refinery evaporation ponds and aeration lagoons and a number of small ponds. The site is located in the Rio Puerco valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Rio Puerco. The Rio Puerco continues to the east to the confluence with the Rio Grande. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

3.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. Very low permeability bedrock (e.g., claystones and siltstones) underlie the surface soils and effectively form an aquitard. The Chinle Formation, which is Upper Triassic, crops out over a large area on the southern margin of the San Juan Basin. The uppermost recognized local member is the Petrified Forest and the Sonsela Sandstone Bed is the uppermost recognized regional aquifer. Aquifer test of the Sonsela Bed northeast of Prewitt indicated a transmissivity of greater than 100 ft^2/day (Stone and others, 1983). The Sonsela Sandstone's highest point occurs southeast of the site and slopes downward to the northwest as it passes under

the refinery. The Sonsela Sandstone forms a water-bearing reservoir with artesian conditions throughout the central and western portions of the refinery property. Groundwater within the Sonsela Sandstone flows downdip to the northwest.

The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravely sands immediately overlying the Chinle Formation to 10^{-8} cm/sec in the clay soils located near the surface (Western Refining, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Chinle Formation with prevailing flow from the southeast to the northwest, with some flow to the northeast on the northeastern portion of the refinery property.

Section 4
Scope of Activities

The site investigation of soils and groundwater will be conducted to define the nature and extent of impacts to the environment and facilitate remedy selection, as necessary. The investigation will commence upon approval of this investigation work plan by NMED.

4.1 Investigation

A focused investigation of soils/sediments within the sanitary lagoon will be conducted to characterize current concentrations of constituents and define the extent (as possible) of any such impacts. The following text summarizes the proposed sampling to be conducted at the sanitary lagoon.

- One discharge water sample will be collected from the lagoon prior to commencement of the soil sampling;
- If any stagnant water is present, one surface water sample will be collected prior to commencement of the soil sampling;
- Four soil borings will be located within the lagoon where standing water is not present. One of the four soil borings will be located directly below the sewage outfall. All soil borings will be drilled with a hand auger to the maximum depth possible. The drilling at each location will cease if refusal is met or if saturated soil conditions are encountered that prevent sample collection with the hand auger;
- Soil/sediment samples will be collected from up to four locations within the area that has recently had standing water by mechanical means (e.g., long-reach trackhoe). The trackhoe (or similar equipment) will be located outside the lagoon and used to reach inside the lagoon to retrieve a volume of soil/sediment from the target depth. A discrete soil/sediment will be collected for analysis from the volume of soil obtained by the mechanical device; and
- Groundwater samples will be collected from eight existing monitor wells in the area of the sanitary lagoon.
- Six soil borings will be located southeast of the lagoon adjacent to the sanitary pipeline.

The proposed locations for soil samples are shown on Figure 3. The proposed wells locations to be sampled are shown on Figure 4. The proposed locations adjacent to the sanitary pipeline are shown on Figure 5.

4.1.1 Discharge Water and Surface Water Sampling

One discharge water sample will be collected from the sanitary lagoon prior to the commencement of the soil sampling. If any stagnant water is present on the surface of the lagoon, then a surface water sample will be collected prior to the commencement of the soil sampling.

The water samples will be collected in a decontaminated water scoop. 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. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as presented in Section 4.1.4.

4.1.2 Soil Sample Field Screening and Logging

All soil borings will be continuously logged and samples field screened. Samples obtained from the soil borings will be screened in the field on 1.0 foot intervals for evidence of contaminants. Field screening results will be recorded on the exploratory boring logs. Field screening results will be used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits may be conducted where appropriate.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container will be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container will be allowed to rest for a minimum of 5 minutes while vapors equilibrate. Vapors present within the sample bag's headspace will then be

measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature will be recorded on the field boring log for each sample.

The monitoring instruments will be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp or a combustible gas indicator will be used for VOC field screening. Field screening results may be site- and boring-specific and the results may vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant, therefore, all conditions capable of influencing the results of field screening will be recorded on the field logs.

Discrete soil samples will be retained for laboratory analyses from within the following intervals:

- 0.0-0.5 feet;
- 2.0-2.5 feet;
- >2.5 feet (from the interval in each soil boring with the greatest apparent degree of contamination, based on field observations and field screening);
- 2.0-4.0 feet below the estimated depth of the pipeline;
- 0.5 feet interval at the top of saturation (applicable only to those borings that reach saturation);
- From the bottom of each borehole (all soil borings); and
- Any additional intervals as determined based on field screening results.

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The physical characteristics of the samples (such as mineralogy, ASTM soil classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations will be recorded in the field log by a qualified geologist or engineer. Detailed logs of each boring will be completed in the field by a qualified geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling, will be recorded on the logs.

Quality Assurance/Quality Control (QA/QC) samples will be collected to monitor the validity of the soil sample collection procedures as follows:

- Field duplicates will be collected at a rate of 10 percent; and

- Equipment blanks will be collected from all sampling apparatus at a frequency of one per day.

4.1.3 Drilling Activities

Soil borings will be drilled using a hand auger, or advanced by hand driving a section of 2" PVC pipe, as necessary to help retain samples for collection. The equipment will be properly decontaminated before drilling each boring. The NMED will be notified as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the specified depths or at planned sampling locations. Where is not possible to complete soil borings due to health and safety concerns gaining access for sample collection, other mechanical means will be utilized (e.g., a long-reach track- hoe). The track-hoe (or similar equipment) will be used to collect an aliquot of soil/sediment, from which a discrete sample will be collected for analysis.

A minimum of two exploratory trenches will be dug using a trackhoe to determine the depth of the pipeline. Six borings will be advanced along the pipeline using either a truck-mounted drilling rig or a smaller all terrain drilling rig. The soil sampling will be conducted using hollow-stem augers and split-spoon samplers.

Known site features and/or site survey grid markers will be used as references to locate each boring. The boring locations will be measured to the nearest foot and locations will be recorded on a scaled site map upon completion of each boring.

4.1.4 Groundwater Sample Collection

Groundwater samples will be collected and analyzed for COD, BOD, total coliform and E. Coli bacteria from soil borings encountering groundwater and from existing monitor wells located in close proximity of the lagoon (MKTF-24, MKTF-25, MKTF-26, MKTF-29, MKTF-30, MKTF-31, MKTF-40, OAPIS-1). Groundwater samples will be collected within 24 hours of the completion of well purging using disposable bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated). 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. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as follows:

- Field duplicate water samples will be obtained at a frequency of ten percent, with a minimum, of one duplicate sample per sampling event;
- Equipment rinsate blanks will be obtained for chemical analysis at the rate of ten percent or a minimum of one rinsate blank per sampling day. Equipment rinsate blanks will be collected at a rate of one per sampling day if disposable sampling equipment is used. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses; and
- 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 prepared by the laboratory and placed in an appropriate sample container. The trip blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of groundwater samples to be analyzed for VOCs.

4.1.5 Sample Handling

At a minimum, the following procedures will be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample;
2. All samples collected of each medium for chemical analysis will be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in Encore® samplers. 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; and

3. Sample labels and documentation will be completed for each sample following procedures discussed below. 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 below, will be followed for all samples collected. All samples will be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times.

Chain-of-custody and shipment procedures will include the following:

1. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site or prior to the transportation of samples to the lab.
2. Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA 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. Temperature blanks will be included with each shipping container.
3. Each cooler or other container will be delivered directly to the analytical laboratory.
4. Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
5. Plastic containers will be protected from possible puncture during shipping using cushioning material.
6. The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
7. Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.
8. Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.
9. 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 copies will be returned to the relinquishing party.
10. Copies of all chain-of-custody forms generated as part of sampling activities will be maintained on-site.

4.1.6 Collection and Management of Investigation Derived Waste

The soils produced from the two pipeline location trenches will be temporarily placed beside the trenches. The vast majority of this material will be removed from above the pipeline and there is no currently available information to indicate these soils are contaminated. If any of the soil indicates potential impacts, then this soil will be managed separately as described below for drill cuttings. Otherwise, non-impacted soil will be returned to the trench after the pipeline is located.

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings will be contained and characterized using methods based on the boring location, boring depth, drilling method, and type of contaminants suspected or encountered. All purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator. An IDW management plan is included as Appendix B.

4.1.7 Field Equipment Calibration

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks will be conducted daily, or at other intervals approved by the Department, 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. In the interim, a properly calibrated replacement instrument will be used.

4.1.8 Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded in a field log book. Copies of the completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink will be used to record all field activities. Photographic documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;

6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log, as appropriate;
10. Field monitoring data, including health and safety monitoring;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

4.1.9 Chemical Analyses

All samples collected for laboratory analysis will be submitted to an accredited laboratory. The laboratory will use the most recent standard EPA and industry-accepted analytical methods for target analytes as the testing methods for each medium sampled. Chemical analyses will be performed in accordance with the most recent EPA standard analytical methodologies and extraction methods.

Soil/sediment, ~~and~~ discharge and surface water samples will be analyzed by the following methods:

- SW-846 Method 8260 for Skinner List volatile organic compounds;
- SW-846 Method 8270 for Skinner List semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline range (C5-C10), diesel range (>C10-C28), and motor oil range (>C28-C36) organics.

Soil/sediment, ~~and~~ discharge and surface water samples will also be analyzed for the following Skinner List metals and iron and manganese using the indicated analytical methods shown below. The soil/sediment samples will also be analyzed for nitrate and nitrite. The discharge and surface water samples will also be analyzed for chloride, fluoride, nitrate, nitrite, sulfate, COD, BOD, total coliform, and E. coli bacteria.

Inorganic Analytical Methods

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020

Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Chromium VI	SW-846 method 3060A
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

Groundwater samples will be analyzed for COD, BOD, total coliform, and E. coli bacteria.

As discussed previously, groundwater field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature.

4.1.10 Data Quality Objectives

The Data Quality Objectives (DQOs) were developed to ensure that newly collected data are of sufficient quality and quantity to address the projects goals, including Quality Assurance/Quality Control (QA/QC) issues (EPA, 2006). The project goals are established to determine and evaluate the presence, nature, and extent of releases of contaminants at the lagoon. The type of data required to meet the project goals includes chemical analyses of soil and groundwater to determine if there has been a release of contaminants at the lagoon.

The quantity of data is specific to the lagoon and is based on the historical operations at lagoon. Method detection limits should be 20% or less of the applicable background levels, cleanup standards and screening levels.

Additional DQOs include precision, accuracy, representativeness, completeness, and comparability. Precision is a measurement of the reproducibility of measurements under a given set of circumstances and is commonly stated in terms of standard deviation or coefficient of variation (EPA, 1987). Precision is also specific to sampling activities and analytical performance. Sampling precision will be evaluated through the analyses of duplicate field samples and laboratory replicates will be utilized to assess laboratory precision.

Accuracy is a measurement in the bias of a measurement system and may include many sources of potential error, including the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques (EPA, 1987). An evaluation of the accuracy will be performed by reviewing the results of field/trip blanks, matrix spikes, and laboratory QC samples.

Representativeness is an expression of the degree to which the data accurately and precisely represent the true environmental conditions. Sample locations and the number of samples have been selected to ensure the data is representative of actual environmental conditions. Based on SWMU specific conditions, this may include either biased (i.e., judgmental) locations/depths or unbiased (systematic grid samples) locations. In addition, sample collection techniques (e.g., field monitoring and decontamination of sampling equipment) will be utilized to help ensure representative results.

Completeness is defined as the percentage of measurements taken that are actually valid measurements, considering field QA and laboratory QC problems. EPA Contract Laboratory Program (CLP) data has been found to be 80-85% complete on a nationwide basis and this has been extrapolated to indicate that Level III, IV, and V analytical techniques will generate data that are approximately 80% complete (EPA, 1987). As an overall project goal, the completeness goal is 85%; however, some samples may be critical based on location or field screening results and thus a sample–by-sample evaluation will be performed to determine if the completeness goals have been obtained.

Comparability is a qualitative parameter, which expresses the confidence with which one data set can be compared to another. Industry standard sample collection techniques and routine EPA analytical methods will be utilized to help ensure data are comparable to historical and future data. Analytical results will be reported in appropriate units for comparison to historical data and cleanup levels.

Section 5
References

EPA, 1987, Data Quality Objectives for Remedial Response Activities; United States Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, OSWER Directive 9355.0-7B, 85p

EPA, 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December, 1989, p. 247.

EPA, 2006, Guidance on Systematic Planning Using the Data Quality Objectives Process, United States Environmental Protection Agency, Office of Environmental Information; EPA/240/B-06/001, p. 111.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizel, N.H., and Padgett, E.T., 1983, *Hydrogeology and Water Resources of San Juan Basin, New Mexico*; Hydrogeologic Report 6, New Mexico Bureau of Mines and Mineral Resources, p. 70.

USDA, 2005, Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties, p. 683.

Western Refining, 2009, Annual Ground Water Monitoring Report Gallup Refinery – 2009.

Figures

Figure 1 Site Location Map

Figure 2 Sanitary Lagoon Location Map

Figure 3 Sanitary Lagoon Proposed Soil Boring Locations

Figure 4 Sanitary Lagoon Proposed Well Sampling Locations

Figure 5 Sanitary Lagoon Proposed Soil Boring Locations Adjacent to Pipeline

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Appendix A
Photographs

Appendix B

Investigation Derived Waste Management Plan

NMED - Drinking Water Bureau
Sanitary Survey Form

Source Information

Note: Shaded fields are required for data entry

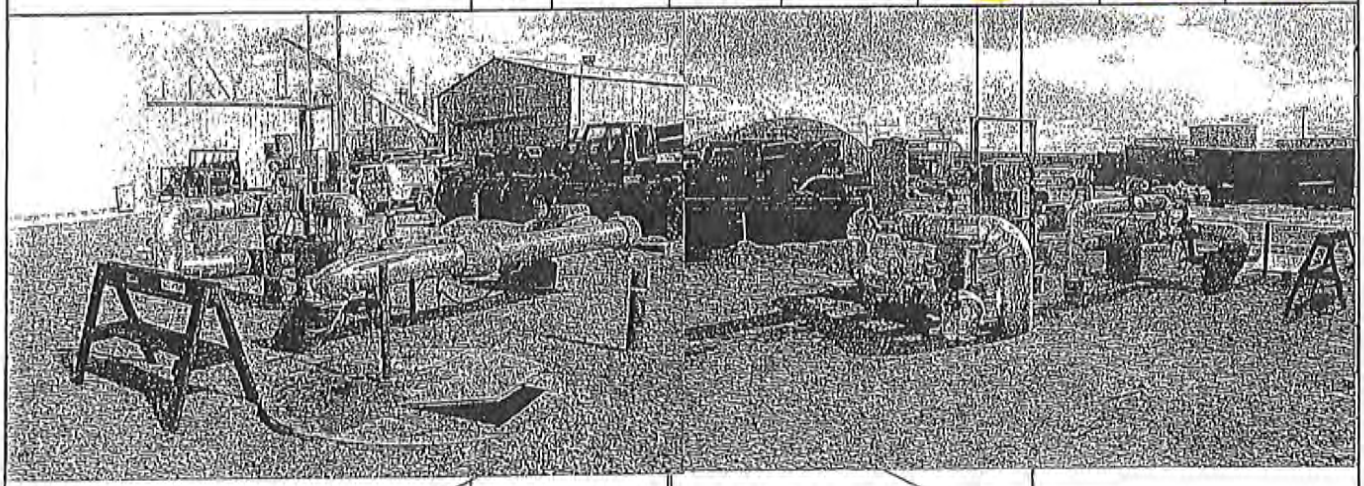
PWSS# :	602-17	Water Supply System Name:	Giant Refining Company	DATE:	05/01/06

Source Codes		Facility=	Well # 3 Domestic Use	Basic Well Information			
Water Type Code:	GW	SEO Well #:	G 00003-s-2	Screen Depth: (ft.)	unk	Gravel Pack Depth: (ft.)	unk
Wellhead Elevation:	6952	Date Equipped:	na	Casing Type:	Steel	Type of Pump:	No Pump
Activity Code: (I,A)	A	Well Depth: (ft)	1030	Casing Diameter: (in.)	8"	Pump Setting: (ft.)	na
Availability Code: (P,A,E, etc.)	P	Static Water Level: (f	243	Casing Depth: (ft.)	1030	Capacity: (gal/min)	278
Date Constructed:	4/1/1979	Drawdown: (ft)	Artesian	Depth of Grout: (ft.)	unk	Pump Horsepower:	No Pump

Well Conditions

Is site security adequate? (p 4-5)	Yes	Does the casing extend at least 18" above ground level? (3-19)	Yes
Is well house or pump subject to flooding? (p 4-5)	na	Is the well vent height at least 18" above ground level? (3-19)	na
Is pump protected from the elements? (p 4-5)	na	Is a sanitary seal present and intact?	Yes
Is general housekeeping of well house or pump house adequate?	na	Is turbine pump leaking water? (p 4-11)	na
Does all equipment have adequate access for repair or replacement?	Yes	Is turbine pump lubricant approved, clean and properly filled?	na
Is the overall condition of the pump good?	na	Is a concrete pad around the well head?	Yes
Is lightning protection available for pump? (4-16)	unk	Are any cross-connections present? (p 4-14)	No
Is electrical equipment secured against the elements, insects and animals?	Yes	Has well been tested as a GWUDI?	No
Type of alarm present for pump failure? (p 4-16)	No	Does the well need a GWUDI test?	No

Is the pumping system equipped with the following?	Check Valve	Isolation Valve	Pressure Gauge	Air Relief Valve	Flow Meter	Sampling Tap	Disinfection System
	Yes	Yes	Yes	na	No	No	No



Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, September 25, 2018 10:21 AM
To: Moore, John
Subject: RE: Sanitary lagoon

Thanks John.

From: Moore, John <John.Moore@andeavor.com>
Sent: Tuesday, September 25, 2018 10:11 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: Sanitary lagoon

Carl,

I agree and have a team to begin monitoring that starting today. I'll keep you updated if we see anything unusual.

John Moore, P.E.
Environmental Superintendent
Phone: (505) 722-0205
Mobile: (505)
John.Moore@andeavor.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, September 25, 2018 9:31 AM
To: Moore, John <John.Moore@andeavor.com>; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: Sanitary lagoon

John:

Good morning. Thanks for the update.

Since there may still be discharges occurring at end of pipe, it may be a good idea to monitor any/all discharges while the system is disconnected to verify there is no leakage, etc. still occurring.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us

"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Moore, John <John.Moore@andeavor.com>
Sent: Tuesday, September 25, 2018 6:44 AM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: FW: Sanitary lagoon

Carl/Jim,

I just wanted to drop you a note and let you know that yesterday at 10:58 am we disconnected the water at the change house and it will remain disconnected until the plumbing issue can be resolved. We will operate that building on temporary facilities until that time. If you have any questions, please let me know.

John Moore, P.E.
Environmental Superintendent
Phone: (505) 722-0205
Mobile: (505)
John.Moore@andeavor.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, September 20, 2018 4:20 PM
To: Moore, John <John.Moore@andeavor.com>
Subject: RE: Sanitary lagoon

John:

Received. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Moore, John <John.Moore@andeavor.com>
Sent: Thursday, September 20, 2018 4:17 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Subject: Sanitary lagoon

Carl,

As we discussed, we have decided to halt all water flow to the change house that appears to be the source of water into the sanitary lagoon that is a point of concern for the Oil Conservation Division. We will be renting a trailer shower/ bathroom to place at the change house and will utilize this until the appropriate plumbing connections can be made to route the flow from the change house to the correct location. It is anticipated that the portable unit will be onsite in the next couple of days and at that time we will shut off the water to the change house. I appreciate you letting me know the divisions concerns with this issue and I will strive to help in any way I can. If you have any questions, or would like any further information, please let me know.

John Moore, P.E.
Environmental Superintendent
Andeavor – Gallup Refining
92 Giant Crossing Road
Gallup, NM 87301
Phone: (505) 722-0205
Mobile: (505)
Fax: (505) 722-0268
John.Moore@andeavor.com

Chavez, Carl J, EMNRD

From: O'Brien, Jessica L <Jessica.L.OBrien@andeavor.com>
Sent: Thursday, May 31, 2018 7:27 PM
To: VanHorn, Kristen, NMENV; Chavez, Carl J, EMNRD
Cc: Pruner, Dave
Subject: Western Response to NMED Disapproval of Sanitary Lagoon Investigation
Attachments: Sanitary Lagoon Inv Work Plan.docx; Figures 1 -4.pdf; Appendix A - Photographs.pdf; Appendix B - Investigation Derived Waste.pdf; Gallup Sanitary Lagoon Investigation - Removal Plan.pdf; Attachment B - Sewer Maps.pdf

Kristen/Carl,
Please accept the attached correspondence in accordance with the above referenced subject. This information is also being submitted to you via USPS. Let me know if you have any questions or encounter issues accessing the attachments.

Sincerely,

Jessica O'Brien
Gallup Refinery – Environmental Supervisor
Jessica.L.Obrien@andeavor.com

Andeavor
92 Giant Crossing Road
Gallup, NM 87301
o: 505 722 0287
c: 409 454 3777
andeavor.com

Andeavor
I-40 Exit 39
Jamestown, NM 87347

505 722 3833
andeavor.com

May 31, 2018

New Mexico Environment Department (NMED)
Hazardous Waste Bureau
Attn: Mr. John E. Kieling, Chief
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, NM 87505-6303

New Mexico Oil Conservation Division (OCD)
Energy Minerals and Natural Resources Department
Attn: Carl Chavez
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490

RE: SECOND RESPONSE TO NMED DISAPPROVAL SANITARY LAGOON INVESTIGATION
WESTERN REFINING SOUTHWEST INC, GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-15-006

Dear Sir:

On April 30, 2018, Western Refining Southwest – Gallup Refinery (Permittee) submitted a response to the above referenced NMED Disapproval dated February 2, 2018. In accordance with Permittee's response and related requests received from NMED and OCD, Permittee is pleased to submit additional responses to Comment 9 and 10:

NMED Comment 9:

NMED was under the impression that most effluent, both sanitary and process-related, were discharged, historically, to the Aeration Basin or, currently, to pond STP-1. NMED was previously aware of the sewage lagoon, because in2005, a letter datedAugust3l, 2005 stated that the sewage lagoon "still receives small amounts of sewage from the refinery." Notwithstanding, the Pennittee did not present the flow rate or other information regarding the pond or effluent, and it was not clear whether it was raw sewage. Raw sewage is not regulated under the hazardous waste regulations. However, 20.6.2.3104 NMAC (Discharge Permit Required) of the ground and surface water protection regulations requires that, "[u]nless otherwise provided by this Part, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless he is discharging pursuant to a discharge permit issued by the Secretary." Regulations require a permit for domestic wastewater discharges of greater than 5,000 gallons per day (gpd) from septage disposal through the NMED's Groundwater Quality Bureau. Domestic wastewater discharges of less than 5,000 gpd are permitted through the NMED's Environmental Health Bureau Liquid Waste Program. NMED is not aware of a permit issued by either Bureau to the Permittee to discharge effluent to the sanitary lagoon. Even though the Permillee proposes that "Western will begin to develop plans for this project and intends to communicate the proposed plan for re-routing the sanitary discharge to you no later than March 1, 2018," the Pennittee must contact the appropriate Bureau to report the discharge and obtain any required permits. Additionally, the Permittee communicated to OCD in an email dated March 2, 2078 that due a turnaround at the facility, the plan to re-route discharge will now be submitted no later than May 31, 2018.

Permittee Response: As previously indicated, the Permittee has reviewed several drawings of the site's sanitary sewer and has included such for reference in Attachment A. According to the Master Plan drawing, the site appeared to have sewer discharge connections associated with the lab, change house, and warehouse that were routed to discharge into the Sanitary Lagoon. While Permittee had already conducted dye testing to help identify sources of sanitary sewer discharges, additional dye testing was conducted to validate sources from within the lab, change house, and warehouse. The Master Plan indicate sewer connections from areas labeled "MKT OFF", "WHSE", and "LUBRICATION" that discharge into the Sanitary Lagoon. Dye testing was conducted in all areas of our current site operations that would be associated with those buildings and such sanitary sources were determined not to be discharging to the Sanitary Lagoon. In addition, dye testing was conducted at all of the sinks located within the lab and confirmed information illustrated by the attached drawings in that the sinks are not routed to discharge into the Sanitary Lagoon. Based upon the aforementioned information, it appears that Area A shown on an enlarged version of the Master Plan is the only location that is currently discharging to the Sanitary Lagoon. Permittee reviewed a second map with updated sewer connection information, also provided in Attachment A for reference (See color map). After reviewing both maps, it appears that sewer connections are illustrated in similar locations, with the exception of the second map depicting the sanitary sewer line ending well before the Sanitary Lagoon, no connection coming from Area A, and a sewer connection at the truck drivers' lounge. Contrary to initial dye testing results previously reported, a second dye test was performed at the truck drivers' lounge and was determined not to be discharging to the Sanitary Lagoon. In effort to eliminate all discharges to the Sanitary Lagoon based upon the above information, Permittee proposes the following:

- Hydroexcavate sewer connection at Area A
- Install piping to connect Area A discharge into sewer connection at Lab/Office (formerly "MKT OFF") which is routed through a series of lift stations that ultimately discharge into Santitary Treatment Pond 1 (STP-1)
- Hydroexcavate sewer connection at Area B in effort to determine presence of a plug that has failed; complete necessary repairs to ensure no future discharge into the Sanitary Lagoon
- Evaluate conditions at the Sanitary Lagoon a period of time sufficient to determine that no sources of sanitary discharge are present

The aforementioned excavation and sewer piping work is currently awaiting contractor bidding and will be scheduled as soon as possible.

NMED Comment 10:

The analytical results for the sanitary effluent identified the following constituents:

Constituent	Analytical Result	MDL	Tap water standard	EPA Max Toxicity	WQCC standard
1,1-dichloroethane (DCA)	1.1 ug/L	0.40	27.5 ug/L (c)		25 ug/L
vinyl chloride	0.81 ug/L	0.18	0.324 ug/L(c)	200 ug/L	1 ug/L
DRO	1.8 mg/L	0.36			
GRO	4.8 mg/L	0.25			
benzene	310 ug/L	1.2	4.22 ug/L(c)	500 ug/L	10 ug/L
naphthalene	33 ug/L	29	1.65 ug/L(c)		
ethylbenzene	52 ug/L	0.093	15 ug/L(c)		750 ug/L
toluene	960 ug/L	1.3	1090 ug/L (nc)		750 ug/L
Methyl tert-butyl ether (MTBE)	26 ug/L	0.24	143 ug/L(c)		
Xylenes	210 ug/L	0.32	193 ug/L (nc)		620 ug/L

The table above includes the constituent, analytical results, the laboratory's method detection limits, and comparisons to standards in Risk Assessment Guidance for Investigations and Remediation Volume I, March 2017 Table A-1 for NM Tap Water standards (both for cancer (c) and non-cancer (nc)), the EPA Maximum Concentration of Contaminants for Toxicity Characteristic, and the NM Water Quality Control Commission's standards for protection of groundwater. Several constituents exceed one or more of the standards as highlighted in the table (yellow highlight indicating the constituent was detected over a standard and orange indicating which

standard). Over time, the effluent may have affected groundwater and soils in the vicinity of the sanitary lagoon. The Permittee must propose to collect soil samples from within the sanitary lagoon and along the pipe where the holes were discovered. Samples must be analyzed for TPH-DRO, TPH-GRO, VOCs, and SVOCs. At least one sample must be collected from directly below the sewage outfall. Please submit a work plan to propose such soil sampling.

Permittee Response: Permittee hereby submits an Investigative Work plan provided in Attachment B.

Should you have any questions regarding this information, please do not hesitate to contact me by telephone at (505) 722-0287 or by email at Jessica.L.Obrien@andeavor.com .

Sincerely,

Jessica L O'Brien
Western Refining Southwest, Inc. – Gallup Refinery

Enclosure

cc: K. VanHorn, NMED (via e-mail)
C. Chavez, OCD (via e-mail)
D. Pruner, Gallup Refinery (via e-mail)

INVESTIGATION WORK PLAN
Sanitary Lagoon

Western Refining

Gallup Refinery
Andeavor
Gallup, New Mexico

EPA ID# NMD000333211

May 2018

Scott T. Crouch, Senior Geologist
DiSorbo Consulting, LLC

DiSorbo
Environmental Consulting Firm

8501 North Mopac Expy | Suite 300 | Austin, TX 78759
512.693.4190 (P) | 512.279.3118 (F) | www.disorboconsult.com

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Appendix A Photographs

Appendix B Investigation Derived Waste Management Plan

List of Acronyms

areas of concern (AOCs)

below ground surface (bgs)

Biological oxygen demand (BOD)

Code of Federal Regulations (CFR)

Contract Laboratory Program (CLP)

Chemical oxygen demand (COD)

Data quality objective (DQO)

Environmental Protection Agency (EPA)

Hazardous and Solid Waste Act (HSWA)

Investigation derived waste (IDW)

mean sea level (msl)

New Mexico Administrative Code (NMAC)

New Mexico Environment Department (NMED)

photoionization detector (PID)

quality assurance/quality control (QA/QC)

Resource Conservation and Recovery Act (RCRA)

RCRA Facility Investigation (RFI)

semi-volatile organic compound (SVOC)

Solid Waste Management Units (SWMUs)

volatile organic constituent (VOC)

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. A sanitary sewer lagoon is located in the northwest portion of the refinery. This Investigation Work Plan proposes to collect samples of soil and groundwater to determine the current concentrations of constituents in the area of the sanitary sewer lagoon. A sample of the discharge water will also be collected. Soil samples are proposed to be collected from eight locations within the lagoon and groundwater samples collected from eight existing monitoring wells in the area of the lagoon. The soil samples will be analyzed for Skinner List metals, VOCs, SVOCs, and total petroleum hydrocarbons. In addition, the discharge sample and the groundwater samples will be analyzed for chemical oxygen demand (COD), biological oxygen demand (BOD), total coliform, and E-coli.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery property covers approximately 810 acres. Figure 1 presents the refinery location and the regional vicinity, which is characterized as high desert plain comprised primarily of public lands used for grazing by cattle and sheep.

The Gallup Refinery is a crude oil refinery currently owned and operated by Andeavor. The Gallup Refinery, was previously operated by Western Refining Southwest, Inc. ("Western"), formerly known as Giant Industries Arizona, Inc. and formerly doing business as Giant Refining Company Ciniza Refinery, an Arizona corporation. The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck.

Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, isomerization, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

A sanitary sewer lagoon is located in the northwest portion of the refinery. The location of the sanitary sewer lagoon is shown on Figure 2. Photographs of the lagoon and the surrounding area are included in Appendix A. The purpose of the site investigation is to determine the current concentrations of constituents in soil/sediments and groundwater in the area of the sanitary lagoon.

Section 2
Background

This section presents background information for the sanitary lagoon including a review of historical waste management activities to identify the following:

- Type and characteristics of all waste and all contaminants handled in the lagoon;
- Known and possible sources of contamination;
- History of releases; and
- Known extent of contamination.

2.1 Sanitary Lagoon

The sanitary lagoon is a two-cell lagoon that was installed when the facility opened in 1957. The two cells are separated by an earthen berm. In the past (see aerial photo - Figure 2) both cells of the lagoon were used to store wastewater. Currently, the western cell is dry and used for storage and the eastern lagoon holds raw sewage and other discharge. Based on reviews of sewer pipeline maps and recent dye-trace tests, the lab sanitary facilities, change house, warehouse, and the truck rack drivers lounge have sanitary sewer lines that discharge to the sanitary lagoon.

Section 3
Site Conditions

The conditions at the site, including surface and subsurface conditions that could affect the fate and transport of any contaminants, are discussed below. This information is based on recent visual observations and historical subsurface investigations.

3.1 Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to lowland fluvial plain in the northwest. Elevations on the refinery property range from 7,040 feet to 6,860 feet. The area of the site near the lagoon is at an approximate elevation of 6,913 feet above mean sea level (msl). The pictures in Appendix A show the land surface in the immediate area.

The McKinley County soil survey identifies the soil in the area of the lagoon as the Simitarq-Celavar sandy loams (USDA, 2005). The Simitarq-Celavar soils are well drained with a conservative permeability of 0.20 in/hr and minimal salinity. Simitarq soils have nearly neutral pH values ranging from 7.2 to 7.4 standard units.

Regional surface water features include the refinery evaporation ponds and aeration lagoons and a number of small ponds. The site is located in the Rio Puerco valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Rio Puerco. The Rio Puerco continues to the east to the confluence with the Rio Grande. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

3.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. Very low permeability bedrock (e.g., claystones and siltstones) underlie the surface soils and effectively form an aquitard. The Chinle Formation, which is Upper Triassic, crops out over a large area on the southern margin of the San Juan Basin. The uppermost recognized local member is the Petrified Forest and the Sonsela Sandstone Bed is the uppermost recognized regional aquifer. Aquifer test of the Sonsela Bed northeast of Prewitt indicated a transmissivity of greater than 100 ft^2/day (Stone and others, 1983). The Sonsela Sandstone's highest point occurs southeast of the site and slopes downward to the northwest as it passes under

the refinery. The Sonsela Sandstone forms a water-bearing reservoir with artesian conditions throughout the central and western portions of the refinery property. Groundwater within the Sonsela Sandstone flows downdip to the northwest.

The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravely sands immediately overlying the Chinle Formation to 10^{-8} cm/sec in the clay soils located near the surface (Western Refining, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Chinle Formation with prevailing flow from the southeast to the northwest, with some flow to the northeast on the northeastern portion of the refinery property.

Section 4
Scope of Activities

The site investigation of soils and groundwater will be conducted to define the nature and extent of impacts to the environment and facilitate remedy selection, as necessary. The investigation will commence upon approval of this investigation work plan by NMED.

4.1 Investigation

A focused investigation of soils/sediments within the sanitary lagoon will be conducted to characterize current concentrations of constituents and define the extent (as possible) of any such impacts. The following text summarizes the proposed sampling to be conducted at the sanitary lagoon.

- One discharge water sample will be collected from the lagoon prior to commencement of the soil sampling;
- Four soil borings will be located within the lagoon where standing water is not present. One of the four soil borings will be located directly below the sewage outfall. All soil borings will be drilled with a hand auger to the maximum depth possible. The drilling at each location will cease if refusal is met or if saturated soil conditions are encountered that prevent sample collection with the hand auger;
- Soil/sediment samples will be collected from up to four locations within the area that has recently had standing water by mechanical means (e.g., long-reach trackhoe). The trackhoe (or similar equipment) will be located outside the lagoon and used to reach inside the lagoon to retrieve a volume of soil/sediment from the target depth. A discrete soil/sediment will be collected for analysis from the volume of soil obtained by the mechanical device; and
- Groundwater samples will be collected from eight existing monitor wells in the area of the sanitary lagoon.

The proposed locations for soil samples are shown on Figure 3. The proposed wells locations to be sampled are shown on Figure 4.

4.1.1 Discharge Water Sampling

One discharge water sample will be collected from the sanitary lagoon prior to the commencement of the soil sampling. The sample will be collected in a decontaminated water scoop. 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. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as presented in Section 4.1.4.

4.1.2 Soil Sample Field Screening and Logging

All soil borings will be continuously logged and samples field screened. Samples obtained from the soil borings will be screened in the field on 1.0 foot intervals for evidence of contaminants. Field screening results will be recorded on the exploratory boring logs. Field screening results will be used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits may be conducted where appropriate.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container will be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container will be allowed to rest for a minimum of 5 minutes while vapors equilibrate. Vapors present within the sample bag's headspace will then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature will be recorded on the field boring log for each sample.

The monitoring instruments will be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp or

a combustible gas indicator will be used for VOC field screening. Field screening results may be site- and boring-specific and the results may vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant, therefore, all conditions capable of influencing the results of field screening will be recorded on the field logs.

Discrete soil samples will be retained for laboratory analyses from within the following intervals:

- 0.0-0.5 feet;
- 2.0-2.5 feet;
- >2.5 feet (from the interval in each soil boring with the greatest apparent degree of contamination, based on field observations and field screening);
- From the bottom of each borehole (all soil borings); and
- Any additional intervals as determined based on field screening results.

The physical characteristics of the samples (such as mineralogy, ASTM soil classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations will be recorded in the field log by a qualified geologist or engineer. Detailed logs of each boring will be completed in the field by a qualified geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling, will be recorded on the logs.

Quality Assurance/Quality Control (QA/QC) samples will be collected to monitor the validity of the soil sample collection procedures as follows:

- Field duplicates will be collected at a rate of 10 percent; and
- Equipment blanks will be collected from all sampling apparatus at a frequency of one per day.

4.1.3 Drilling Activities

Soil borings will be drilled using a hand auger, or advanced by hand driving a section of 2" PVC pipe, as necessary to help retain samples for collection. The equipment will be properly decontaminated before drilling each boring. The NMED will be notified as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the specified depths or at planned sampling locations. Where is not possible to complete soil borings due to health and safety concerns gaining access for sample collection, other mechanical means will be utilized (e.g., a long-reach track

hoe). The track hoe (or similar equipment) will be used to collect an aliquot of soil/sediment, from which a discrete sample will be collected for analysis.

Known site features and/or site survey grid markers will be used as references to locate each boring. The boring locations will be measured to the nearest foot and locations will be recorded on a scaled site map upon completion of each boring.

4.1.4 Groundwater Sample Collection

Groundwater samples will be collected and analyzed from existing monitor wells located in close proximity of the lagoon (MKTF-24, MKTF-25, MKTF-26, MKTF-29, MKTF-30, MKTF-31, MKTF-40, OAPIS-1). Groundwater samples will be collected within 24 hours of the completion of well purging using disposable bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated). 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. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.5.

Water samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as follows:

- Field duplicate water samples will be obtained at a frequency of ten percent, with a minimum, of one duplicate sample per sampling event;
- Equipment rinsate blanks will be obtained for chemical analysis at the rate of ten percent or a minimum of one rinsate blank per sampling day. Equipment rinsate blanks will be collected at a rate of one per sampling day if disposable sampling equipment is used. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses; and
- 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 prepared by the laboratory and placed in an appropriate sample container. The trip

blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of groundwater samples to be analyzed for VOCs.

4.1.5 Sample Handling

At a minimum, the following procedures will be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample;
2. All samples collected of each medium for chemical analysis will be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in Encore® samplers. 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; and
3. Sample labels and documentation will be completed for each sample following procedures discussed below. 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 below, will be followed for all samples collected. All samples will be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times.

Chain-of-custody and shipment procedures will include the following:

1. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site or prior to the transportation of samples to the lab.
2. Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA 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. Temperature blanks will be included with each shipping container.
3. Each cooler or other container will be delivered directly to the analytical laboratory.

4. Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
5. Plastic containers will be protected from possible puncture during shipping using cushioning material.
6. The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
7. Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.
8. Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.
9. 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 copies will be returned to the relinquishing party.
10. Copies of all chain-of-custody forms generated as part of sampling activities will be maintained on-site.

4.1.6 Collection and Management of Investigation Derived Waste

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings will be contained and characterized using methods based on the boring location, boring depth, drilling method, and type of contaminants suspected or encountered. All purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator. An IDW management plan is included as Appendix B.

4.1.7 Field Equipment Calibration

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks will be conducted daily, or at other intervals approved by the Department, 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. In the interim, a properly calibrated replacement instrument will be used.

4.1.8 Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded in a field log book. Copies of the completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink will be used to record all field activities. Photographic documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;
6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log, as appropriate;
10. Field monitoring data, including health and safety monitoring;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

4.1.9 Chemical Analyses

All samples collected for laboratory analysis will be submitted to an accredited laboratory. The laboratory will use the most recent standard EPA and industry-accepted analytical methods for target analytes as the testing methods for each medium sampled. Chemical analyses will be performed in accordance with the most recent EPA standard analytical methodologies and extraction methods.

Soil/sediment and discharge water samples will be analyzed by the following methods:

- SW-846 Method 8260 for Skinner List volatile organic compounds;
- SW-846 Method 8270 for Skinner List semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline range (C5-C10), diesel range (>C10-C28), and motor oil range (>C28-C36) organics.

Soil/sediment and discharge water samples will also be analyzed for the following Skinner List metals and iron and manganese using the indicated analytical methods shown below. The discharge water sample will also be analyzed for chloride, fluoride, sulfate, COD, BOD, total coliform, and E. coli bacteria.

Inorganic Analytical Methods

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Chromium VI	SW-846 method 3060A
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

Groundwater samples will be analyzed for COD, BOD, total coliform, and E. coli bacteria.

As discussed previously, groundwater field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature.

4.1.10 Data Quality Objectives

The Data Quality Objectives (DQOs) were developed to ensure that newly collected data are of sufficient quality and quantity to address the projects goals, including Quality Assurance/Quality

Control (QA/QC) issues (EPA, 2006). The project goals are established to determine and evaluate the presence, nature, and extent of releases of contaminants at the lagoon. The type of data required to meet the project goals includes chemical analyses of soil and groundwater to determine if there has been a release of contaminants at the lagoon.

The quantity of data is specific to the lagoon and is based on the historical operations at lagoon. Method detection limits should be 20% or less of the applicable background levels, cleanup standards and screening levels.

Additional DQOs include precision, accuracy, representativeness, completeness, and comparability. Precision is a measurement of the reproducibility of measurements under a given set of circumstances and is commonly stated in terms of standard deviation or coefficient of variation (EPA, 1987). Precision is also specific to sampling activities and analytical performance. Sampling precision will be evaluated through the analyses of duplicate field samples and laboratory replicates will be utilized to assess laboratory precision.

Accuracy is a measurement in the bias of a measurement system and may include many sources of potential error, including the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques (EPA, 1987). An evaluation of the accuracy will be performed by reviewing the results of field/trip blanks, matrix spikes, and laboratory QC samples.

Representativeness is an expression of the degree to which the data accurately and precisely represent the true environmental conditions. Sample locations and the number of samples have been selected to ensure the data is representative of actual environmental conditions. Based on SWMU specific conditions, this may include either biased (i.e., judgmental) locations/depths or unbiased (systematic grid samples) locations. In addition, sample collection techniques (e.g., field monitoring and decontamination of sampling equipment) will be utilized to help ensure representative results.

Completeness is defined as the percentage of measurements taken that are actually valid measurements, considering field QA and laboratory QC problems. EPA Contract Laboratory Program (CLP) data has been found to be 80-85% complete on a nationwide basis and this has been extrapolated to indicate that Level III, IV, and V analytical techniques will generate data that are approximately 80% complete (EPA, 1987). As an overall project goal, the completeness goal is 85%; however, some samples may be critical based on location or field screening results and thus a

sample–by-sample evaluation will be performed to determine if the completeness goals have been obtained.

Comparability is a qualitative parameter, which expresses the confidence with which one data set can be compared to another. Industry standard sample collection techniques and routine EPA analytical methods will be utilized to help ensure data are comparable to historical and future data. Analytical results will be reported in appropriate units for comparison to historical data and cleanup levels.

Section 5
References

EPA, 1987, Data Quality Objectives for Remedial Response Activities; United States Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, OSWER Directive 9355.0-7B, 85p

EPA, 1989, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December, 1989, p. 247.

EPA, 2006, Guidance on Systematic Planning Using the Data Quality Objectives Process, United States Environmental Protection Agency, Office of Environmental Information; EPA/240/B-06/001, p. 111.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizel, N.H., and Padgett, E.T., 1983, *Hydrogeology and Water Resources of San Juan Basin, New Mexico*; Hydrogeologic Report 6, New Mexico Bureau of Mines and Mineral Resources, p. 70.

USDA, 2005, Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties, p. 683.

Western Refining, 2009, Annual Ground Water Monitoring Report Gallup Refinery – 2009.

Figures

Figure 1 **Site Location Map**

Figure 2 **Sanitary Lagoon Location Map**

Figure 3 **Sanitary Lagoon Proposed Soil Boring Locations**

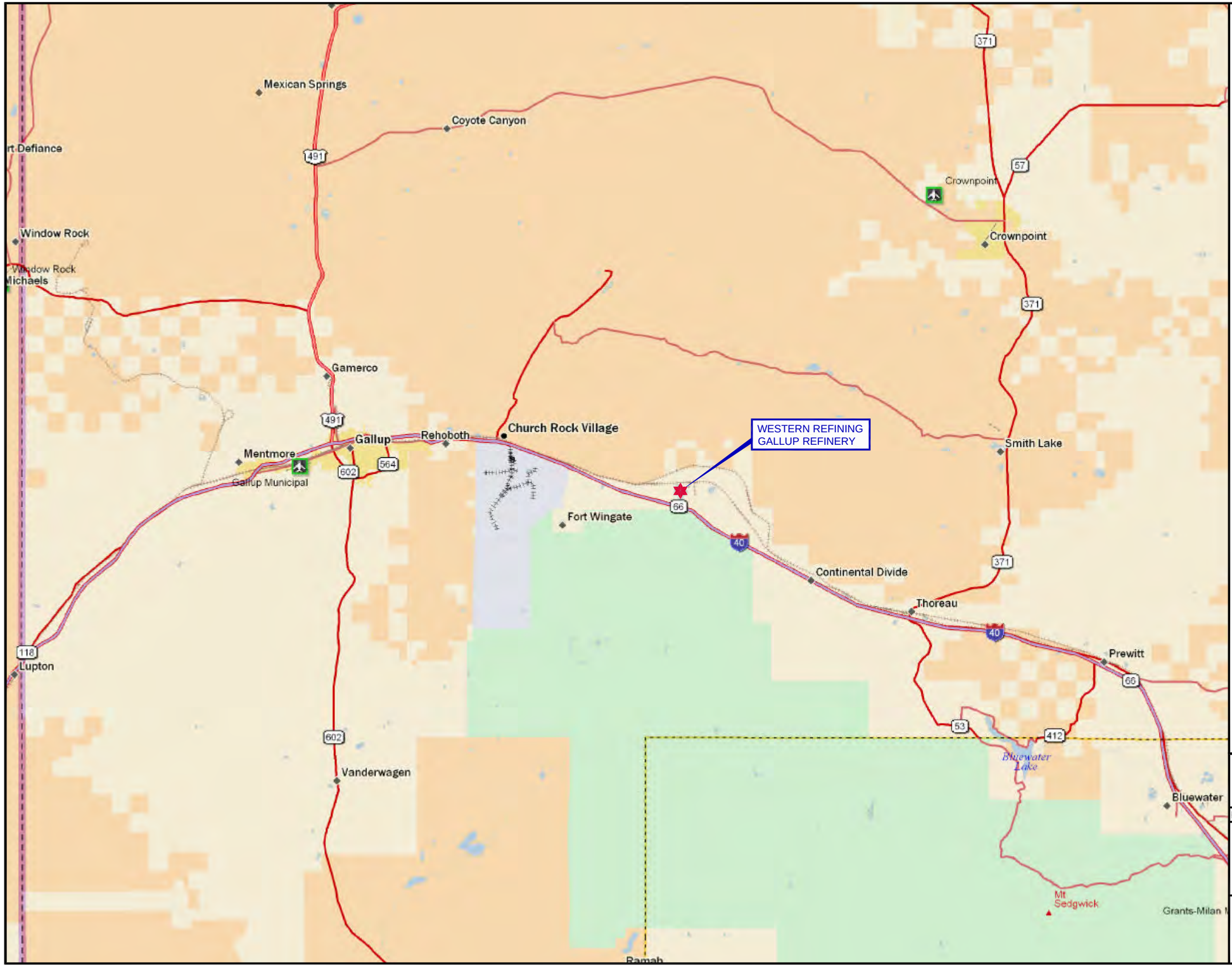
Figure 4 **Sanitary Lagoon Proposed Well Sampling Locations**

Appendix A

Photographs

Appendix B

Investigation Derived Waste Management Plan



Map Source: DeLorme Street Atlas USA 2007 Plus.

N

0 5
SCALE IN MILES

Western Refining
GALLUP REFINERY

PROJ. NO.:Western Refining | DATE:04/17/18 | FILE:WestRef-dB164

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 07/24/2011.

0 100
SCALE IN FEET

GALLUP SITE LOCATION

Western Refining
GALLUP REFINERY

PROJ. NO.: Western Refining	DATE: 04/17/18	FILE: WestRef-dB165

FIGURE 2
SANITARY LAGOON
LOCATION MAP

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

0 20
SCALE IN FEET

GALLUP SITE LOCATION

LEGEND

- SOIL BORING LOCATION ADVANCED WITH HAND AUGER
- SOIL SAMPLE LOCATION VIA MECHANICAL MEANS
- APPROXIMATE EXTENT OF SURFACE WATER

Western Refining
GALLUP REFINERY

PROJ. NO.: Western Refining | DATE: 04/18/18 | FILE: WestRef-dB166

FIGURE 3
SANITARY LAGOON
PROPOSED SOIL SAMPLE
LOCATIONS

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Aerial Map Source: Google Map, 03/18/2016.

0 100
SCALE IN FEET

LEGEND

MKTF-24 PROPOSED WELL SAMPLING LOCATION AND IDENTIFICATION NUMBER

NEW MEXICO

GALLUP SITE LOCATION

Western Refining
GALLUP REFINERY

PROJ. NO.: Western Refining | DATE: 04/18/18 | FILE: WestRef-dB167

FIGURE 4
SANITARY LAGOON
PROPOSED WELL SAMPLING LOCATIONS

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759


SOUTH SIDE OF LAGOON LOOKING NORTH
2018/03/09


Western
Refining
WEST SIDE OF LAGOON LOOKING EAST
2018/03/09


NORTH SIDE OF LAGOON LOOKING SOUTH
2018/03/09


EAST SIDE OF LAGOON LOOKING WEST
2018/03/09

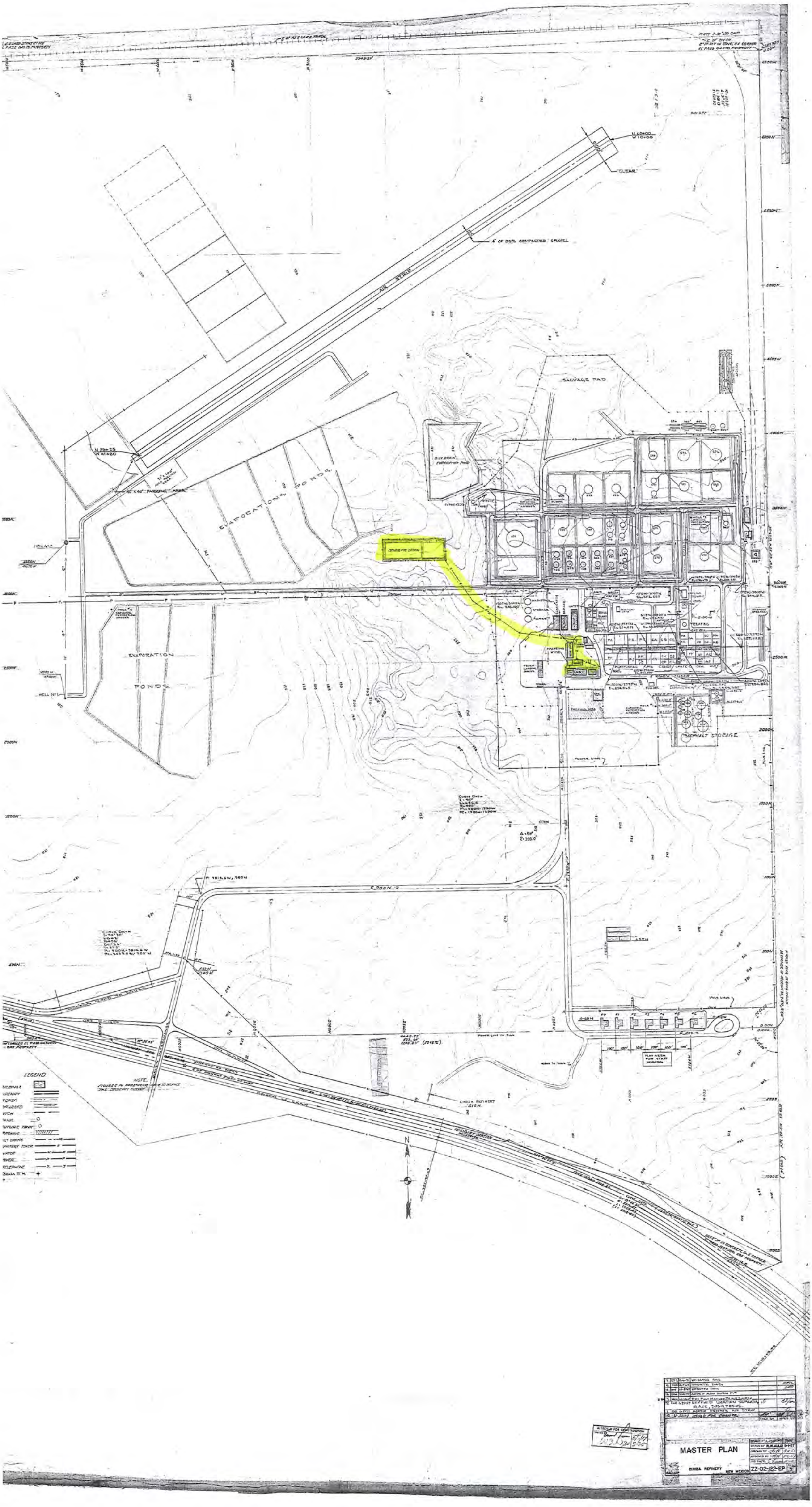
Investigation Derived Waste (IDW) Management Plan

All IDW will be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste.

A dedicated decontamination area will be setup prior to any sample collection activities. The decontamination pad will be constructed so as to capture and contain all decontamination fluids (e.g., wash water and rinse water) and foreign materials washed off the sampling equipment. The fluids will be pumped directly into suitable storage containers (e.g., labeled 55-gallon drums), which will be located at satellite accumulation areas until the fluids are disposed in the refinery wastewater treatment system upstream of the API separator. The solids captured in the decontamination pad will be shoveled into 55-gallon drums and stored at the designated satellite accumulation area pending proper waste characterization for off-site disposal.

Drill cuttings generated during installation of soil borings will be placed directly into 55-gallon drums and staged in the satellite accumulation area pending results of the waste characterization sampling. The portion of soil cores, which are not retained for analytical testing, will be placed into the same 55-gallon drums used to store the associated drill cuttings.

The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials are not characteristically hazardous, then further testing will be performed pursuant to the requirements of the facility to which the materials will be transported. Depending upon the results of analyses for individual investigation soil samples, additional analyses may include TPH and polynuclear aromatic hydrocarbons (PAHs).


AIR STRIP
CLEAR
4" OF 95% COMPACTED GRAVEL
SALVAGE PAD
OILY DRAIN EVAPORATION POND
EVAPORATION PONDS
EVAPORATION
PONDS
40' X 40' PARKING AREA
N 39+25
W 41+80
WELL NO 1
STORAGE
TANKS
LAB
ASPHALT STORAGE
POWER LINE
PARKING AREA
PLAY AREA FOR STAFF HOUSING
CINIZA REFINERY SIGN
LEGEND
BUILDINGS
HIGHWAY
ROADS
RAILROAD
DITCH
TANK
FUTURE TANK
PARKING
OILY DRAINS
SANITARY SEWER
WATER
POWER
TELEPHONE
BRASS B.M.
NOTE.
FIGURES IN PARENTHESIS REFER TO DEPICT THE ORIGINAL SURVEY
N
APPROVED FOR CONSTRUCTION
UPDATED DWG
ADDED ASH BURN PIT
REVISED LOCATION SERIAL PLATE
ADDED PRIVATE AIR STRIP
ISSUED FOR CONSTR.
MASTER PLAN
CINIZA REFINERY
NEW MEXICO
DRAWN BY R.W. AULD
ZZ-02-122-EP
7

SEWERAGE LAGOON

S

S

W 8"

P 2950N P P P

308 STA.

1505W, 3005N
EL. 246.160'

MARKETING

STORAGE TANKS

B

ROAD

285 106 231 232 107 108 342 343

OD OD

LUBE

GARAGE

W. SHOP

W SHOP

INST

WATER

Z-86-T1

BHF

BIG

BAT.

BOIL PLAN

81J

81K

81C 81D 81

S

S

S

MAIN WHSE

FIRE HOUSE

A

MARKETING WHSE

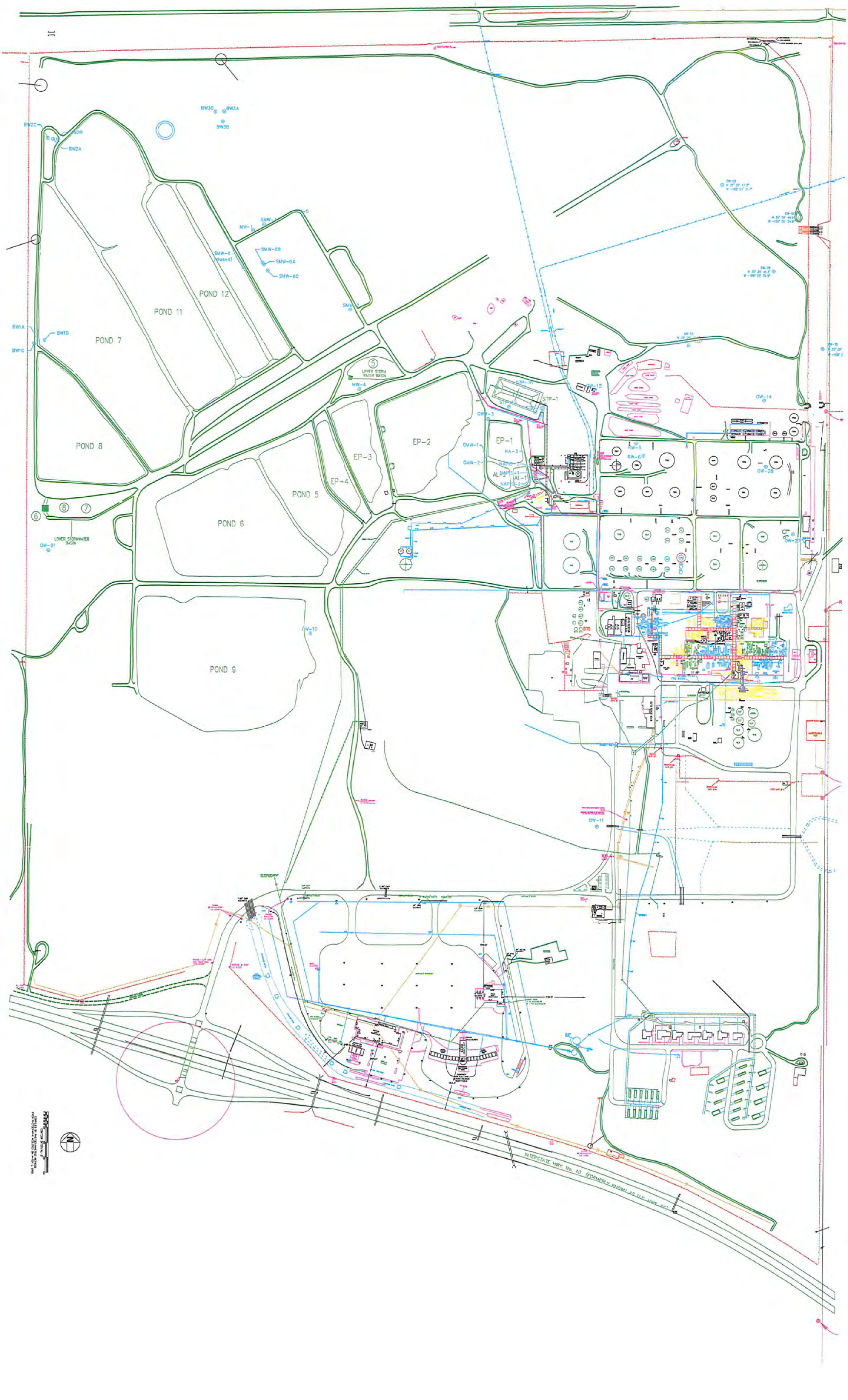
WHSE

MKT OFF. LAB

TRUCK LOADING RACKS

245

240



BW3C
BW3A
BW3B
BW2C
BW2B
BW2A
POND 7
POND 11
POND 12
POND 8
MW-1
SMW-6B
SMW-6A
SMW-6C
BW1A
BW1B
BW1C
UPPER STORM WATER BASIN
MW-4
EP-1
EP-2
EP-3
EP-4
STP-1
POND 5
POND 6
POND 9
LOWER STORMWATER BASIN
OW-01
OW-10
OW-11
OW-14
INTERSTATE HWY. No. 40 (FORMERLY KNOWN AS U.S. HWY 66)

Hydro Excavate to ensure plug did not fail

TRUCK-LOADING

DRIVERS LOUNGE

VEHICLE GATE #1

Install new piping from the change house to the lab sewer line.

LAB

WAREHOUSE

WAREHOUSE

WAREHOUSE YARD

CHANGE HOUSE

I & E SHOP

MECH. SHOP

LUNCH

PIPE FITTERS & WELDERS SHOP

State of New Mexico
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary

J. C. BORREGO
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

March 15, 2018

Mr. William Bailey
Environmental Supervisor
Western Refining, Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

RE: DISAPPROVAL
SANITARY LAGOON INVESTIGATION
REVISED INTERIM MEASURES REPORT HYDROCARBON SEEP AREA
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-15-002

Dear Mr. Bailey:

On February 2, 2018, Western Refining Southwest Inc., Gallup Refinery (Permittee) submitted a response to an October 13, 2017 email inquiry from the Energy, Minerals, and Natural Resources Department (EMNRD) Oil Conservation Division (OCD) regarding a sanitary lagoon. The Permittee's response is titled *Sanitary Lagoon Investigation* (Investigation).

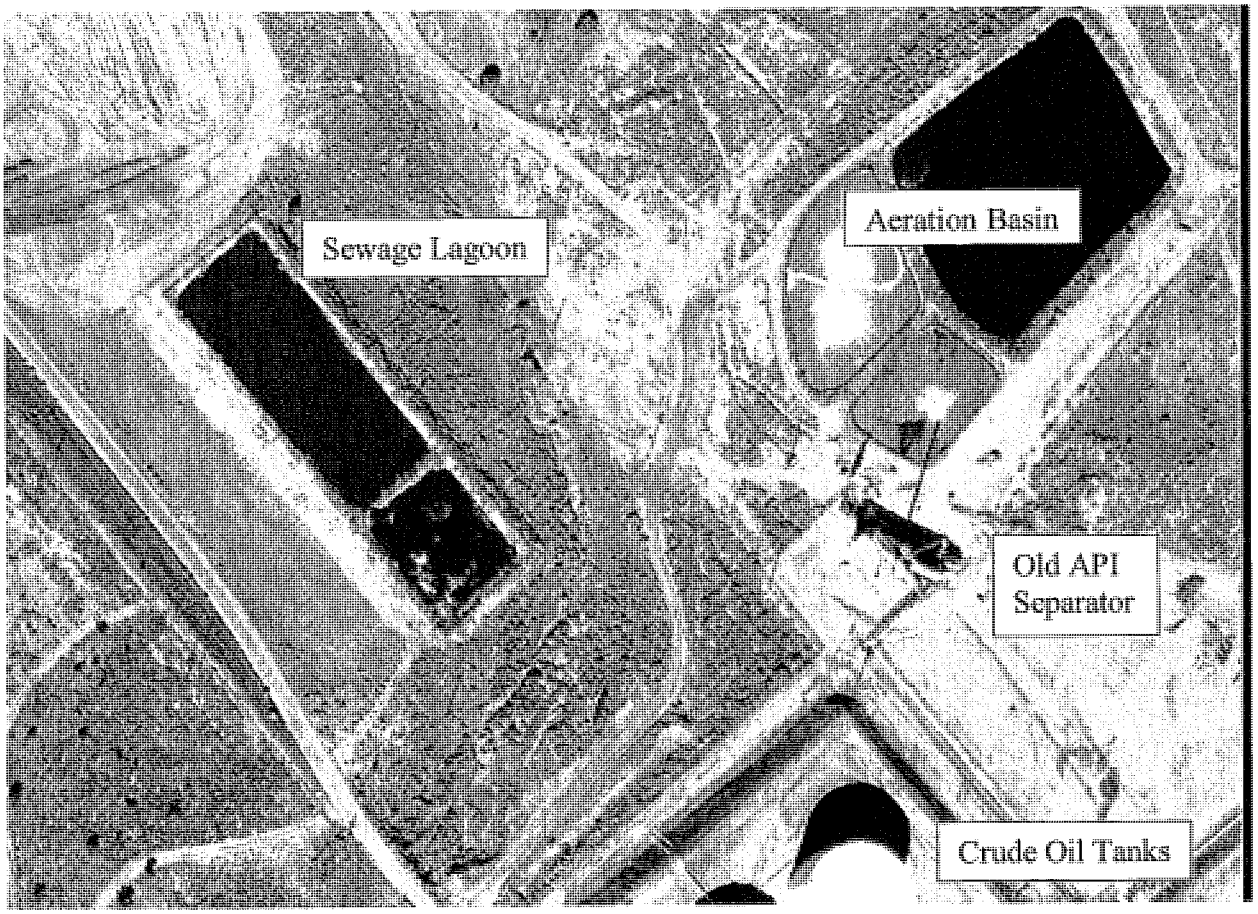
The OCD inquiry stemmed from a review of the Permittee's *Revised Interim Measures Report Hydrocarbon Seep Area* (Hydrocarbon Seep Report), submitted in July 2016. Page 2-10 of the Hydrocarbon Seep Report noted that, "[b]ased on well development and sampling efforts, many of the wells do not produce significant volumes of water with the exception of wells located near the sanitary lagoon, which is located approximately 400 feet directly west of the crude oil storage tanks." The New Mexico Environment Department's (NMED) Disapproval Comment 18, which was part of a disapproval letter dated February 1, 2018, stated, "[t]he discharge may be a source of groundwater recharge allowing sufficient water production for well development and

sampling in some wells. Examine this potential pathway and include a discussion in the revised Report." In addition, OCD requested information regarding the sanitary lagoon, including whether there is active flow to the lagoon, the discharge rate, the time intervals that the discharge was occurring, chemicals of concern in the discharge, and whether constituents of concern from the discharge have been detected in monitoring wells located in the vicinity of the sewage lagoon.

OCD replied to the Permittee's Investigation in a letter dated February 7, 2018. NMED also reviewed the Permittee's Investigation and provides the following comments and requests additional information. The Permittee may respond to both agencies in one correspondence.

History of Sewage Lagoon

The sewage lagoon is a two-cell lagoon that was installed when the facility opened in 1957. The two cells are separated by an earthen berm. In the past (see aerial photo from 1994 below) both cells of the lagoon were used to store wastewater. Currently, one cell is dry and used for storage and the other half holds raw sewage and other discharge.



In 2005, the Permittee proposed to use one of the lagoon cells for storage of Reverse Osmosis (RO) reject water for a firewater pond. The Permittee abandoned plans for turning the lagoon into a firewater storage pond, but in an email, from the Permittee to NMED dated August 31,

2005, the Permittee noted that, "sewage effluent has not been tested. The pond receives very little effluent, the vast majority of our raw sewage goes into our sewage lagoons located east from the refinery. Numerous visual inspections of the area did not indicate any standing water in the pond, moist soil is present with hydrophytic vegetation." Photos from 2005 however demonstrate that there was green vegetation covering the area in contrast to the surrounding area. In addition, in 2009 the Permittee proposed routing sanitary wastewater streams from the facility to the Pilot Lift Station, modifying the sewer system so that sanitary wastewater lines in the facility that discharged to septic systems or surface sewage lagoons would be rerouted to the new Pilot Lift Station with the effluent to be discharged to Aeration Lagoon 1 and the old sewer lines to be closed. The plans included closure of two existing surface sewage lagoons and older septic systems (email to OCD from Permittee dated April 1, 2009). It appears that some aspects of the plans were not implemented. A small amount of discharge to the sanitary lagoon continues to the present day.

Comment 1
In response to OCD's October 13, 2017 Comment 4 regarding the chemicals of concern (COCs) in the discharge, the Permittee states, "[l]ow concentrations of DRO and GRO and some VOCs/SVOCs were detected in the discharge, which are believed to be the result of impacted groundwater in the area entering the pipeline. These chemicals would be unlikely to be present in the flows from restrooms and showering areas." Provide information regarding the depth of the pipeline below the ground surface. To support the Permittee's hypothesis, the pipeline would have to be at a depth below the water table. Also provide information regarding the depth to water along where the sewer pipeline is located.

Comment 2
In the second paragraph of the first page, the Permittee states that, "[b]ased on sewer maps reviewed, it appears that the lab, change house, warehouse, and potentially the truck rack drivers lounge have sanitary sewer lines that discharge to the sanitary lagoon." Discharge water samples must be collected for BOD, COD, total coliform and e. coli bacteria analyses. Groundwater samples must be collected from monitoring wells MKTF 29, MKTF-24, MKTF-25, MKTF-26, MKTF-31, MKTF-40, OAPIS-1 and other monitoring wells downgradient from the sewage lagoon and analyzed for the same constituents. Provide groundwater elevations for those monitoring wells as well. Provide the analytical data for the additional sampling and groundwater levels in the response letter.

Comment 3
The Permittee conducted dye tracer tests to determine where the sanitary lagoon effluent was coming from. The Permittee states in the second bullet regarding the dye testing that, "[t]he lack of fluorescent color in the sanitary lagoon is considered confirmation that the lab chemical sink does not discharge to the lagoon." The appearance of dye in the sanitary lagoon depends on the flow rate from the origination of the discharge. For example, high efficiency toilets require 1.3 gallons of water per flush whereas the volume of water drained from the laboratory sink is presumably much less. The flowrate from the restrooms may be significantly higher than the flow rate from the laboratory sinks. Please provide additional information regarding the dye testing procedures. Additionally, a sufficient volume of water must have been flushed after the

dye was released from the sink for the dye to reach a discharge point. Therefore, discuss the volume of water used to flush the dye through the laboratory sinks. If testing was conducted without consideration of the volume of water used, then repeat the testing from laboratory sinks with a known volume of water to see if the dye can be traced to either the sanitary lagoon or STP-1. This is necessary as the concentrations of DRO, GRO, VOCs, and SVOCs detected at the outfall may indicate that the laboratory sink is possibly connected to the sanitary lagoon or if the discharge pipe is connected to another source rather than the hypothesis of contaminated groundwater entering the pipe through the holes in the pipe. See Comment 1.

Comment 4
On page 2, third paragraph, regarding the presence of TPH, VOCs, and SVOCs in the analytical results for the effluent sample, the Permittee states,

> "The chemicals detected are consistent with those detected in groundwater monitoring wells closest to the sanitary lagoon and along the discharge pipeline path (but at lower concentrations than those typically detected in the groundwater). This, coupled with the fact that multiple holes were observed in the pipeline when it was uncovered in 2013 for an unrelated project, indicates that there may be impacted groundwater entering the effluent pipe through the holes. The presence of low concentrations of Methyl tert-butyl ether (MTBE), which has not been used at the refinery for several years, indicates that the chemicals detected are coming from a historic source and not from the current sanitary discharge."

It is unlikely that groundwater contaminants could enter and flow through holes in the sewer pipeline (which should have been replaced or decommissioned after discovery of the holes in 2013). See Comments 1 and 3. However, the presence of MTBE (not used at the facility since 2006), TPH, and solvents in the discharge necessitates further investigation of potential source(s). For example, solvents may have entered the sanitary sewer through the laboratory or maintenance/warehouse areas. OCD is requiring the Permittee to conduct a Mechanical Integrity Test (MIT) on the sewer lines leading to the sewage lagoon, and NMED concurs.

Comment 5
On the first page, second paragraph, the Permittee states, "[b]ased on sewer maps reviewed, it appears that the lab, change house, warehouse, and potentially the truck rack drivers lounge have sanitary sewer lines that discharge to the sanitary lagoon," and "[y]es, sanitary effluent from the lab, change house, warehouse, and truck rack drivers lounge discharges to the area referred to as the sanitary lagoon." In the dye test discussion dye testing for the warehouse was not mentioned. Provide the information regarding dye testing for the warehouse.

Comment 6
On page two, paragraph 2, the Permittee states, "[t]he water discharging into the pond was consistently clear, with no color or solid matter, and a slight sanitary odor." Provide information regarding how the sanitary wastewater from toilets is treated and how the facility prevents exposure to personnel.

Comment 7
On page 2, second paragraph, the Permittee states, "[t]he flowrate into the sanitary lagoon varies from less than one gallon per minute to approximately three gallons per minute." Discuss the reasons for the variation in the flow rate to the lagoon (e.g., high use times for restrooms). Also discuss whether there is a record of historic flow rates.

Comment 8
The Permittee must investigate how the discharge has affected the groundwater levels and groundwater flow downgradient from the sanitary lagoon. The lagoon has been in use since the late 1950s and may have affected both groundwater levels and constituents contained in groundwater. See Comment 2. Additionally, cessation of the sewage discharge may affect groundwater levels. The Permittee must evaluate whether groundwater monitoring wells are screened at appropriate intervals once groundwater levels cease to be influenced by the discharge.

Comment 9
NMED was under the impression that most effluent, both sanitary and process-related, were discharged, historically, to the Aeration Basin or, currently, to pond STP-1. NMED was previously aware of the sewage lagoon, because in 2005, a letter dated August 31, 2005 stated that the sewage lagoon "still receives small amounts of sewage from the refinery." Notwithstanding, the Permittee did not present the flow rate or other information regarding the pond or effluent, and it was not clear whether it was raw sewage. Raw sewage is not regulated under the hazardous waste regulations. However, 20.6.2.3104 NMAC (Discharge Permit Required) of the ground and surface water protection regulations requires that, "[u]nless otherwise provided by this Part, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless he is discharging pursuant to a discharge permit issued by the Secretary." Regulations require a permit for domestic wastewater discharges of greater than 5,000 gallons per day (gpd) from septage disposal through the NMED's Groundwater Quality Bureau. Domestic wastewater discharges of less than 5,000 gpd are permitted through the NMED's Environmental Health Bureau Liquid Waste Program. NMED is not aware of a permit issued by either Bureau to the Permittee to discharge effluent to the sanitary lagoon. Even though the Permittee proposes that "Western will begin to develop plans for this project and intends to communicate the proposed plan for re-routing the sanitary discharge to you no later than March 1, 2018," the Permittee must contact the appropriate Bureau to report the discharge and obtain any required permits. After submittal of the Investigation, the Permittee communicated to OCD in an email dated March 2, 2018 that due a turnaround at the facility, the plan to re-route discharge will now be submitted no later than May 31, 2018.

Comment 10
The analytical results for the sanitary effluent identified the following constituents:

Constituent	Analytical Result	MDL	Tap water standard	EPA Max Toxicity	WQCC standard
1,1-dichloroethane (DCA)	1.1 ug/L	0.40	27.5 ug/L (c)		25 ug/L
vinyl chloride	0.81 ug/L	0.18	0.324 ug/L(c)	200 ug/L	1 ug/L
DRO	1.8 mg/L	0.36			
GRO	4.8 mg/L	0.25			
benzene	310 ug/L	1.2	4.22 ug/L(c)	500 ug/L	10 ug/L
naphthalene	33 ug/L	29	1.65 ug/L(c)		
ethylbenzene	52 ug/L	0.093	15 ug/L(c)		750 ug/L
toluene	960 ug/L	1.3	1090 ug/L (nc)		750 ug/L
Methyl tert-butyl ether (MTBE)	26 ug/L	0.24	143 ug/L(c)		
Xylenes	210 ug/L	0.32	193 ug/L (nc)		620 ug/L

The table above includes the constituent, analytical results, the laboratory's method detection limits, and comparisons to standards in *Risk Assessment Guidance for Investigations and Remediation Volume I*, March 2017 Table A-1 for NM Tap Water standards (both for cancer (c) and non-cancer (nc)), the EPA Maximum Concentration of Contaminants for Toxicity Characteristic, and the NM Water Quality Control Commission's standards for protection of groundwater. Several constituents exceed one or more of the standards as highlighted in the table (yellow highlight indicating the constituent was detected over a standard and orange indicating which standard). Over time, the effluent may have affected groundwater and soils in the vicinity of the sanitary lagoon. The Permittee must propose to collect soil samples from within the sanitary lagoon and along the pipe where the holes were discovered. Samples must be analyzed for TPH-DRO, TPH-GRO, VOCs, and SVOCs. At least one soil sample must be collected from directly below the sewage outfall. Submit a work plan to propose such soil sampling.

Comment 11
The Permittee's response to OCD's question regarding whether monitoring wells detect COCs from the discharges states, "[t]he chemicals detected in monitoring wells near the sanitary lagoon and along the pipeline path are typically at higher concentrations than those detected in the discharge." Identify the monitoring wells and the associated COCs.

Comment 12
In response to OCD's question regarding the period of time for the discharge, the Permittee states, "[t]he discharge has been occurring since at least 1957 (the date of the attached sewerage map)." The discharge was likely a continuous source of groundwater recharge, as well as a source for potential soil and groundwater contamination. The discharge to the sewage lagoon represents a routine and systematic release of hazardous constituents to the environment, which meets the definition of a solid waste management unit (SWMU); however, at this time NMED

will not add the pond to the RCRA Permit as a SWMU.

The Permittee must address all comments in this letter and submit a response by no later than **April 30, 2018**.

The Permittee must submit a work plan to propose to collect soil samples and, if necessary, install groundwater monitoring wells (per OCD Comment 7) to NMED by no later than **May 31, 2018**. Additionally, please keep both OCD and NMED updated on further plans and actions regarding the sanitary lagoon.

If you have questions regarding this Disapproval, please contact Kristen Van Horn of my staff at 505-476-6046.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: K. Van Horn NMED HWB
M. Suzuki NMED HWB
S. Pullen, NMED GWQB
C. Chavez OCD
J. O'Brien, Andeavor
L. King EPA Region 6

File: Reading File and WRG 2018 File
HWB-WRG-15-002

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division

FEBRUARY 7, 2018

Ms. Jessica L O'Brien
Andeavor
I-40 Exit 39
Jamestown, NM 87347

Re: SANITARY LAGOON INVESTIGATION
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY

Ms. O'Brien,

The New Mexico Oil Conservation Division (OCD) has completed its review of the Western Refining Southwest, Inc. (Western) Sanitary Lagoon Investigation letter dated February 1, 2018.

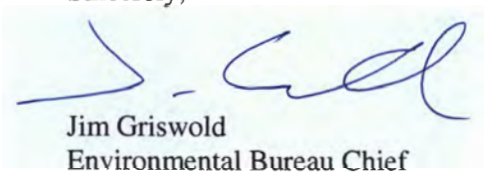
Western investigated the source of effluent discharging to the area referred to as the "sanitary lagoon" in the July 2016 Revised Interim Measures for the Hydrocarbon Seep Report. Based on sewer maps reviewed, it appeared the lab, change house, warehouse, and potentially the truck rack drivers lounge sanitary sewer lines that discharge to the sanitary lagoon.

OCD comments are:

1) Dye appears to have confirmed effluent from the lab, change house, warehouse, and truck rack drivers lounge discharges to the area referred to as the sanitary lagoon. Where dye did not appear, it was not clear where effluent flowed.
2) Page 2: Western indicates the "fact that multiple holes were observed in the pipeline when it was uncovered in 2013 for an unrelated project, indicates that there may be impacted groundwater entering the effluent pipe through the holes." Why did Western not replace or repair the effluent pipe in 2013 and complete an MIT on the pipeline to ensure it had integrity?
3) The sampling indicates the presence of volatile and semi-volatile organic compounds in effluent discharging into the sanitary lagoon.
4) Page 3: OCD concurs with Western's review of the information provided in the letter your proposal to eliminate the sanitary discharges to the sanitary lagoon. OCD concurs with the development of plans for re-routing the sanitary discharge to STP-1 no later than March 1, 2018.
5) Where dye did not appear in the sanitary lagoon, verify where the effluent actually discharges.
6) Test then remove and/or replace the effluent pipe to confirm the condition of the effluent pipe described in the letter.
7) Additional groundwater monitoring to determine if a point source exists in the sanitary lagoon is required. The plan in Item 4 above below shall include monitoring or further investigation to determine whether the sanitary lagoon is a point source for contamination.

If you have any questions, please contact Carl Chavez at (505) 476-3490 or by email at Carl J.Chavez@state.nm.us.

Sincerely,



Jim Griswold
Environmental Bureau Chief

JG/cc

Chavez, Carl J, EMNRD

From: O'Brien, Jessica L <Jessica.L.OBrien@andeavor.com>
Sent: Thursday, February 1, 2018 5:50 PM
To: Chavez, Carl J, EMNRD
Cc: Vestal, Janelle; Peterson, Theresa R; VanHorn, Kristen, NMENV; Pruner, Dave; Hains, Allen S; Bailey, William M
Subject: RE: Gallup Refinery Sanitary Effluent
Attachments: Gallup Sanitary Lagoon Investigation.pdf

Good evening Carl,
I've attached our response that was due today. Let me know if you have any additional questions. My contact information is provided below.

Sincerely,

Jessica O'Brien | **Andeavor** | o: 505 722 0287 | m: 409 454 3777

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, February 01, 2018 4:57 PM
To: O'Brien, Jessica L <Jessica.L.OBrien@andeavor.com>
Cc: Vestal, Janelle <Janelle.Vestal@andeavor.com>
Subject: Gallup Refinery Sanitary Effluent

Jessica:

Hi. I seem to recall you sent me something on this? It was due today. May Janelle Vestal is working on this?

Do you know?

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

Andeavor
I-40 Exit 39
Jamestown, NM 87347

505 722 3833
andeavor.com

Sent via Electronic Correspondence

February 1, 2018

New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
Attn: Carl Chavez
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us

RE: SANITARY LAGOON INVESTIGATION
WESTERN REFINING SOUTHWEST INC, GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-15-006

Dear Mr. Chavez:

As requested in your October 13, 2017 email, Western Refining Southwest – Gallup Refinery (Western) has investigated the source of effluent discharging to the area referred to as the "sanitary lagoon" in the July 2016 Revised Interim Measures for the Hydrocarbon Seep Report ("Hydrocarbon Seep Report").

Based on sewer maps reviewed, it appears that the lab, change house, warehouse, and potentially the truck rack drivers lounge have sanitary sewer lines that discharge to the sanitary lagoon. Copies of two maps are attached. As indicated on the un-numbered map, and supported by employee interviews, the lab sinks have a separate line that discharges to the wastewater treatment system and STP-1. However, based on slight inconsistencies in the maps, and the belief by some long-term employees that these sanitary lines had been rerouted to discharge to STP-1, we conducted dye testing to confirm flowpaths.

The dye testing was performed by placing a small amount of Kingscote Chemicals Bright Dyes Fluorescent FLT dye at the locations described below, and watching for signs of the dye (using visual and UV light for observation) at the sanitary lagoon, Lift Station #1 and STP-1. The following locations were dye tested:

- On January 8, 2018, prior to inserting the dye, at 13:40 a sample was taken at the effluent of the pipe to serve as a control. At 14:00, Fluorescent FLT yellow/green dye was placed in toilets in the change house. At approximately 15:15 a sample was taken at the effluent from the pipe into the sanitary lagoon and analyzed with the UV light in a dark room; a fluorescent green tint was observed in the sample.

- On January 9, 2018, prior to inserting the dye, at 19:00 a sample was taken at the effluent of the pipe to serve as a control. At 19:37, Fluorescent FLT orange dye was placed in the lab chemical sink. The discharge pipe and surrounding area at the sanitary lagoon was later observed with UV light during after-dark conditions beginning at 19:45 and periodically thereafter; No fluorescent orange tint was observed. Similar observations with UV light were conducted at Lift Station #1; No orange tint was observed. Additionally, no tint was observed at STP-1; however, this is most likely due to the long residence time in the wastewater holding tanks and the dilution from all other refinery effluent flows. The lack of fluorescent color in the sanitary lagoon is considered confirmation that the lab chemical sink does not discharge to the lagoon.

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- On January 11, 2018, at 20:00 a sample was taken at the effluent of the pipe to serve as a control. Fluorescent FLT yellow/green dye was placed in the toilet and sink located in the truck rack drivers lounge. The discharge pipe and surrounding area at the sanitary lagoon was later observed with UV light during after-dark conditions at approximately 20:35 and periodically thereafter; a fluorescent green tint was observed in the effluent from the pipe into the sanitary lagoon.

The water discharging from the pipe into the sanitary lagoon was observed, and flowrate measured, multiple times on different days and at different times of day. The flowrate varied from three gallons per minute to less than one gallon per minute, but there was always at least a small amount of water discharging. The water discharging into the pond was consistently clear, with no color or solid matter, and a slight sanitary odor.

A sample of the discharge was collected on December 1, 2017 and sent to Hall Environmental Analysis Laboratory. Nitrate + nitrite as N was below the detection limit of 0.13 milligrams per liter (mg/L). A sample was also analyzed for diesel, motor oil, and gasoline range organics (DRO, MRO, and GRO) and volatile and semi-volatile organics (VOCs and SVOCs). The analysis showed low concentrations of DRO and GRO and some VOCs/SVOCs. The chemicals detected are consistent with those detected in groundwater monitoring wells closest to the sanitary lagoon and along the discharge pipeline path (but at lower concentrations than those typically detected in the groundwater). This, coupled with the fact that multiple holes were observed in the pipeline when it was uncovered in 2013 for an unrelated project, indicates that there may be impacted groundwater entering the effluent pipe through the holes. The presence of low concentrations of Methyl tert-butyl ether (MTBE), which has not been used at the refinery for several years, indicates that the chemicals detected are coming from a historic source and not from the current sanitary discharge. Copies of the laboratory reports and excerpts of groundwater monitoring results from the Hydrocarbon Seep Report are attached.

The responses to your emailed questions are as follows:

1) Is there any active sanitary effluent discharge(s) occurring at the facility with the exception of STP-1 associated with the current wastewater treatment system?

Response: Yes, sanitary effluent from the lab, change house, warehouse, and truck rack drivers lounge discharges to the area referred to as the sanitary lagoon.

2) If so, where and what is the associated discharge flow rate(s)?

Response: The flowrate into the sanitary lagoon varies from less than one gallon per minute to approximately three gallons per minute.

3) How long and/or for what period of time has the discharge(s) been occurring?

Response: The discharge has been occurring since at least 1957 (the date of the attached sewerage map).

4) What are the chemicals of concern (COC) from the discharge(s)?

Response: Low concentrations of DRO and GRO and some VOCs/SVOCs were detected in the discharge, which are believed to be the result of impacted groundwater in the area entering the pipeline. These chemicals would be unlikely to be present in the flows from restrooms and showering areas.

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5) Do any nearby facility monitoring wells detect COCs from the discharge(s)?

Response: The chemicals detected in monitoring wells near the sanitary lagoon and along the pipeline path are typically at higher concentrations than those detected in the discharge. This, coupled with the fact that multiple holes were observed in the pipeline when it was uncovered in 2013 for an unrelated project, indicates that there may be impacted groundwater entering the effluent pipe through the holes. The presence of low concentrations of Methyl tert-butyl ether (MTBE), which has not been used at the refinery for several years, indicates that the chemicals detected are coming from a historic source and not from the current sanitary discharge.

Western has reviewed the information provided herein and proposes to eliminate the sanitary discharges to the sanitary lagoon. Western will begin to develop plans for this project and intends to communicate the proposed plan for re-routing the sanitary discharge to you no later than March 1, 2018.

Sincerely,

Jessica L O'Brien
Western Refining Southwest, Inc. – Gallup Refinery

Enclosure

cc: K. VanHorn, NMED (via e-mail)
C. Chavez, OCD (via e-mail)
D. Pruner, Gallup Refinery (via e-mail)
A. Hains, Andeavor (via e-mail)
T. Peterson, Andeavor (via e-mail)

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, November 1, 2017 12:28 PM
To: 'Bailey, William M'
Cc: Pruner, Dave; 'Cheryl.Johnson@wnr.com'; VanHorn, Kristen, NMENV; Griswold, Jim, EMNRD; Perrin, Charlie, EMNRD
Subject: RE: Gallup Refinery (AP-111) Sanitary Effluent Discharge Locations Inquiry

Mr. Bailey:

The New Mexico Oil Conservation Division (OCD) is in receipt of Western Refining Southwest, Gallup Refinery's (Western) request for an extension to the above subject suspected sanitary effluent discharge location based on the OCD's e-mail communiqué of October 13, 2017.

While OCD believes Western's plan outlined below will work for an overall evaluation and response for auditing and determining current non-wastewater treatment system related sanitary effluent discharges, i.e., STP-1, at its facility, Western does not appear to propose a timely investigation of the location identified in OCD's communiqué.

Therefore, Western shall immediately begin an investigation into the suspected discharge location identified in the photo sent to Western on October 13, 2017. OCD requires an investigation report with water and soil media sampling for Nitrates, assessing the suspected end-of-pipe, pipeline leak or subsurface drain or conveyance breach of sanitary effluent discharge into the environment illustrated in the photo by COB on February 1, 2018. Western shall undertake all actions needed to redirect any discovered sanitary effluent discharge situation outside of STP-1 immediately.

OCD approves the overall evaluation for all other areas of the refinery except the above.

Please contact me if you have questions.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

From: Bailey, William M [mailto:William.M.Bailey@andeavor.com]
Sent: Friday, October 27, 2017 2:06 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Pruner, Dave <Dave.Pruner@wnr.com>; 'Cheryl.Johnson@wnr.com' <Cheryl.Johnson@wnr.com>; VanHorn, Kristen, NMENV <Kristen.VanHorn@state.nm.us>; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>; Perrin, Charlie, EMNRD

<charlie.perrin@state.nm.us>
Subject: RE: Gallup Refinery (AP-111) Sanitary Effluent Discharge Locations Inquiry
Importance: High

Dear Carl,

Since we first talked on October 13, I have been questioning several people within the refinery while looking for various data such as plot plans, reports, etc. In the meantime, I have inserted a brief listing of my plan to investigate this matter and make sure I give you up to date and accurate data. As I develop the scope of this project and to make sure I deliver the most accurate information to you, I'm requesting that we have until January 26, 2018 to deliver a full report to you.

A brief outline of my plan is:

- Review drawings and historic project information
- Open up manholes/visual observations to determine sanitary flow directions (with dye testing, if warranted)
- Sample and analyze discharge into sanitary pond
- Measure flowrate into sanitary pond
- Review available data from groundwater monitoring wells in the area of the sanitary pond

I want to thank you for your working with me on this. Let me know if this is agreeable to you.

Thank again.

Bill Bailey
Andeavor Gallup Refinery
Environmental Supervisor
92 Giant Crossing Road
Jamestown, NM 87347
Office: (505) 726-9743
Extension: 3743
www.andeavor.com

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Friday, October 13, 2017 11:44 AM
To: 'Bailey, William' <William.Bailey@wnr.com>
Cc: Pruner, Dave <Dave.Pruner@wnr.com>; 'Cheryl.Johnson@wnr.com' <Cheryl.Johnson@wnr.com>; VanHorn, Kristen, NMENV <Kristen.VanHorn@state.nm.us>; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>; Perrin, Charlie, EMNRD <charlie.perrin@state.nm.us>
Subject: Gallup Refinery (AP-111) Sanitary Effluent Discharge Locations Inquiry

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Mr. Bailey:

The New Mexico Oil Conservation Division (OCD) is writing to request information based on a review of the recent Interim Measures for the Hydrocarbon Seep Report (report), which references a "sanitary lagoon" (lagoon) where a potential sanitary discharge may be or very recently occurred.

The report appears to indicate, "[b]ased on well development and sampling efforts, many of the wells do not produce significant volumes of water with the exception of wells located near the sanitary lagoon, which is located approximately 400 feet directly west of the crude oil storage tanks". The lagoon appears to receive a small flow of sanitary wastewater from the warehouse, lab building and firehouse. A photograph (see photo below) of the lagoon was taken on March 18, 2016 (Google Earth).

Consequently, OCD requests a response from Western Refining Southwest, Inc. to the following questions:

1) Is there any active sanitary effluent discharge(s) occurring at the facility with the exception of STP-1 associated with the current wastewater treatment system?
2) If so, where and what is the associated discharge flow rate(s)?
3) How long and/or for what period of time has the discharge(s) been occurring?
4) What are the chemicals of concern (COC) from the discharge(s)?
5) Do any nearby facility MWs detect COCs from the discharge(s)?

OCD requests a response to the above questions by COB October 27, 2017.

Please contact me if you have questions. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**