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*State of New Mexico*
*ENVIRONMENT DEPARTMENT*

***Hazardous Waste Bureau***

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