Western Refining

GALLUP REFINERY

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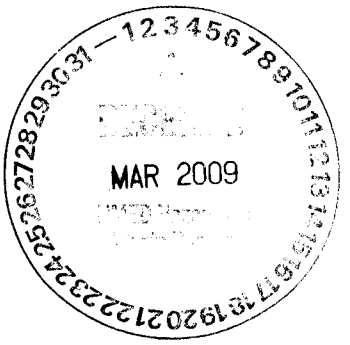

February 27, 2009

Brad Jones
Oil Conservation Division
Environmental Bureau
1220 S. St. Francis Dr.
Santa Fe, NM 87505

Hope Monzeglio
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Re: OCD Discharge Permit GW-032 Condition 16.D.

Dear Mr. Jones and Ms. Monzeglio:

This letter and submission addresses the OCD Discharge Permit GW-032 Condition 16.D. requirement. Specifically the below listed item addresses the OCD GW-032 revised schedule letter dated March 12, 2008, which granted a submission due date of March 1, 2009.

- **Condition 16.C.** – The following attachment: Closure Plan Aeration Lagoons Gallup Refinery is submitted to meet this condition requirement.

Please contact me at (505) 722-0217 if you have any comments or questions regarding this submittal.

Sincerely,

Ed Riege
Environmental Manager

C: Mark B. Turri
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Closure Plan
Aeration Lagoons
Gallup Refinery

Regulated Unit EPA ID# NMD000333211
HWB-GRCB-06-001

Western Refining Southwest, Inc.
Gallup, New Mexico

February 2009

Ed Riege
Environmental Manager

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RPS JDC

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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 is located on 810 acres.

The Gallup Refinery is a crude oil refinery currently owned by Western Refining Southwest, Inc., which is a wholly owned subsidiary of Western Refining Company, and it is operated by Western Refining Southwest – Gallup Refinery. The refinery was most recently owned by Giant Refining Company. The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck.

The Gallup Refinery has an approximate crude oil refining capacity of 23,000 barrels per day. 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.

This Closure Plan addresses the closure of the aeration lagoons, which consist of two separate manmade earthen lagoons connected in series. The two aeration lagoons were constructed in 1987 and have been in continuous operation since that time. The aeration lagoons cover an area approximately 275 feet by 150 feet and have an estimated holding capacity of 1 million gallons. Two benzene air strippers are located between the refinery's API separator and the aeration lagoons to prevent characteristically hazardous waste from being discharged to the aeration lagoons. In addition to being identified as a SWMU, the lagoons are subject to the jurisdiction of the New Mexico Oil Conservation Division (OCD), which regulates potential releases under the OCD Discharge Permit (GW-032).

Monitoring data of the effluent from the air strippers, which discharges into the inlet aeration lagoon, and flows into Aeration Lagoon #2 has indicated that concentrations of benzene suspected to be above the toxicity characteristic (TC) regulatory threshold of 0.5 milligrams per liter (mg/l) have entered these impoundments. Since Western Refining does not desire to operate these impoundments as hazardous waste surface impoundments the aeration lagoons

will be cleaned out to remove all hazardous waste, hazardous constituents, decomposition products, and leachate. The land-based aeration treatment units will be replaced with tank-based treatment units.

This Closure Plan is submitted pursuant to the requirements of Provision IV.B.9 of the Post Closure Care Order issued by the NMED on August 17, 2000 and the requirements of the OCD Discharge Permit issued August 23, 2007. The closure standard for Aeration Lagoon #1 and Aeration Lagoon #2 is based on 40 CFR §265.111 (Closure Performance Standard), which requires that the owner or operator must close the facility in a manner that:

> (a) Minimizes the need for further maintenance, and
>
> (b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.

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Section 2
Wastewater Treatment Unit Description and Operation

2.1 Environmental Regulatory Activities

All oil refineries produce process wastewater, which today must be managed in accordance with a variety of environmental requirements intended to assure adequate and appropriate protection of public health and the environment. Two federal regulatory programs [the Clean Water Act and the Resource Conservation and Recovery Act (RCRA)] have major significance for Gallup Refinery process wastewater. The State of New Mexico has primacy over the RCRA program. In addition, there are other state regulatory programs with varying applicability, including those administered by New Mexico Oil Conservation Division (OCD).

Initially, beginning in 1972 under the Clean Water Act regulatory program, EPA promulgated petroleum refinery wastewater management requirements pursuant to the NPDES permit program. The principal federal regulations implementing this CWA program as it applies to petroleum refineries are found at 40 C.F.R. Parts 122 and 419. The Gallup Refinery, like other oil refineries impacted by 40 C.F.R. Part 419, had implemented a series of process wastewater treatment operations, including primary treatment of wastewaters with an oil/water separator and secondary biological treatment in wastewater ponds to further reduce organics in the petroleum refinery wastewater. The two ponds where such biological degradation of organics occurs at the Gallup Refinery are referred to as Aeration Lagoon #1 (the inlet aeration lagoon) and Aeration Lagoon #2.

The RCRA regulations promulgated by EPA on November 19, 1980 identified hazardous wastewaters and sludges generated by petroleum refineries. Initially, these regulations applied only to certain sludges created by petroleum refinery wastewater management, such as API oil/water separator sludge which was listed as K051 hazardous waste. In 1990, a significant revision to these regulations identified most petroleum refinery process wastewater as benzene characteristic hazardous waste (D018). The listing of primary and secondary sludges (F037/F038) by EPA as hazardous (effective in 1991) effectively mandated a certain level of biological treatment and retention time in the biological treatment impoundments at the Gallup Refinery to exclude the sludges from the new listings. The compliance strategy employed aggressive biological treatment (ABT) of wastewaters in the aeration lagoons, followed by

management in evaporation ponds. As discussed in Section 3.0, additional upgrades to the wastewater treatment system are planned that will eliminate the need for the aeration lagoons.

2.2 Surface Impoundment Operations

The refinery process wastewater generated (approximately 100 gallons per minute (gpm)) as measured in March 2006) at the Gallup Refinery is managed first by physical treatment in an API separator, then the volatile components are removed via benzene air strippers and the final treatment (biological) occurs in two ABT lagoons. The ABT units are earthen surface impoundments with natural clay as a bottom liner.

An investigation of the aeration lagoons was conducted in April 2008 to characterize the volume and nature of sediments in each basin. A copy of the report of the investigation prepared by Trihydro Corporation is included in Appendix A. According to the report, the inlet aeration lagoon (Aeration Lagoon #1) had an average water depth of 2.1 feet. Based on an average water depth of 2.1 feet and a surface area of about 15,700 square feet the total volume is approximately 246,000 gallons. At 100 gpm, the holding time in the pond is 1.7 days. The impoundment is equipped with three, 15-horsepower aerators sized to prevent F037 waste generation through high rate aeration.

Wastewater from Aeration Lagoon #1, which has already been subject to aggressive biological treatment, is routed to Aeration Lagoon #2 through an overflow pipe. The second ABT unit is an earthen lined impoundment that is operated in the same manner as Aeration Lagoon #1. Aeration Lagoon #2 has an average water depth of 2.0 feet in depth with a surface area of approximately 24,400 square feet. The total volume is approximately 365,000 gallons. Aeration Lagoon #2 is equipped with two 15-horsepower aerators and has a wastewater retention time (at 100 gpm) is 2.5 days.

2.3 Assessment Activities

Soil sampling was conducted near the aeration lagoons during the RFI in the early 1990s. Based on the analytical results from the samples, the EPA concurred on January 7, 1994 with Giants' determination that no significant impact had occurred and thus no further action was required for SWMU #1. EPA requested that on-going soil sampling be conducted at the lagoons every two years, which was later reduced to a frequency of five years. The first "monitoring" event was completed in October, 1996. Soil samples were collected from depths of four feet to 20 feet below ground surface with some borings angled to allow collection of samples beneath

the lagoons. Neither volatile nor semi-volatile organics were detected in 25 of the samples. Two samples collected near the side wall of the inlet aeration lagoon at a depth of four feet had very low concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX). The highest concentration was 2.2 mg/kg of xylenes. Copies of EPA's letter dated January 7, 1994 and a subsequent facsimile dated March 15, 1996, which notes the changed monitoring frequency to five years, are included in Appendix B[1].

Two ground water monitoring wells (GWM-1 and GMW-2) were installed down-gradient of the aeration lagoons in 2004. Analyses of ground water samples collected at GWM-1 and GMW-2 have indicated only low concentrations of constituents such as BTEX and methyl tertiary butyl ether (MTBE) that would indicate a potential for historical releases from the lagoons. GWM-3 is also located nearby, adjacent to Evaporation Pond No. 1. Both GWM-2 and GMW-3 were dry during the 2007 annual sampling event.

The sludge/sediments that have accumulated in the two lagoons were recently characterized in preparation for closure and the report documenting these activities is included in Appendix A. Based on this investigation, there appears to be two distinct layers of sludge/sediment in the aeration lagoons. The upper layer ("soft sediment") is described as a soft, loose, and unconsolidated, as opposed to the lower layer ("hard pack sediment") that is more compact and dense.

The volumes of sediment were estimated based on multiple borings in each impoundment. Aeration Lagoon #1 has approximately 1,464 cubic yards of soft sediment and 229 cubic yards of hard pack sediment. Aeration Lagoon #2 was estimated to contain 3,404 cubic yards of soft sediment and 430 cubic yards of hard pack sediment.

1 Appendix B – historical EPA correspondence related to SWMU #1 closure status

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Section 3
Wastewater Treatment Unit Upgrades

Pursuant to the requirements of the OCD Discharge Permit (GW-032) approved on August 23, 2007, an engineering design and construction plan for replacement of the existing aeration lagoons with a tank-based system is being prepared by Western Refining. Closure of the existing aeration lagoons, which is the focus of this closure plan, is an integral part of the WWTU upgrades. The details of the planned upgrades are provided in a design and construction work plan for the new tank-based WWTU, which will be submitted separately to the OCD.

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Section 4
Proposed Closure Procedures

The proposed modified closure design includes removal and appropriate disposition of all hazardous wastes, hazardous constituents, decomposition products, and leachate above the natural clay liners of the aeration lagoons. "Modified closure" is defined as the process by which each aeration lagoon is removed from service, the existing water and sludge is removed and any impacts to the natural liner are removed while any potentially associated impacts to ground water will be addressed as part of the on-going corrective action process to address ground water in the area of the WWTU operations. The actual "modified closure" procedures are presented in more detail below.

Closure of the aeration lagoons will not begin until the new replacement tank-based ABT unit has been constructed and operated for sufficient time to ensure it is operating in accordance with the applicable regulatory and technical requirements. Flow of wastewater to the aeration lagoons will cease when the new tank-based treatment unit has demonstrated its ability to reliably meet the applicable treatment standards. Upon cessation of wastewater flow to the aeration lagoons, the wastewater remaining in the aeration lagoons will continue to be treated using the existing aeration units to reduce concentrations of organic constituents and minimize the volume of sludge in the aeration lagoons. After completion of the additional treatment, the wastewater will be pumped back to the WWTU to a location upstream of the API separator.

Following removal of the wastewater, the sludges present above the natural liner and any impacted underlying soils will be excavated from the impoundments. The excavated materials will then be sampled for hazardous characteristics in accordance with 40 CFR Part 261, Subpart C – Characteristics of Hazardous Waste. Samples of the sludge and soils will be collected for waste characterization at a minimum of one sample per each 100 cubic yards and in accordance with the requirements of the receiving waste disposal facility. If the sludges do not exhibit any hazardous characteristics, they will be removed by a vacuum truck for appropriate disposal. Additional wastes not amenable to vacuum removal may be removed using excavation equipment. It is anticipated that excavation will extend into the upper portion of the natural clay liner with a goal to remove all waste materials and impacted soil with concentrations of constituents exceeding the applicable industrial/occupational NMED Soil Screening Levels, which satisfies any "contained-in" concerns.

If wastes/soils removed exhibit one or more hazardous characteristics, the wastes/soils will be placed into appropriate RCRA tanks/containers for disposal offsite as hazardous waste. All hazardous waste and waste residues will be removed and properly disposed by conducting the modified closure process and there will be no potential for any post-closure escape of such wastes, thus meeting the modified closure performance standards in §§265.111(a) and (b) as specified by §265.110(c)(2). Alternatively, materials that meet the exclusion at 40 CFR 261.4(a)(12)(i) for oil-bearing hazardous secondary materials may be recycled at a petroleum refinery.

The confirmation samples from the underlying environmental media (e.g., natural clay liner - native soils) will be collected and analyzed for volatile and semi-volatile organics and RCRA metals to determine if concentrations of constituents exceed the applicable industrial/ occupational NMED Soil Screening Levels. Samples will be collected from all faces of the excavations with an approximate spacing of 50 feet between sample grid locations.

Upon successful removal of all impacted materials, equipment used, which came into contact with the waste materials will be decontaminated with a high pressure steam cleaner and the rinse waters will be collected and placed in the WWTU upstream of the API separator. The dikes surrounding the aeration lagoon will be leveled and clean fill material imported, as necessary, to bring the land surface to final grade.

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Section 5
Closure Schedule & Cost Estimate

The schedule for closure of the aeration lagoons is as follows:

Description	Duration
Start of closure *[within 90 days after cessation of flow of wastewater to aeration lagoons]*	
Additional treatment via aeration	26 - 52 weeks[1]
Removal of treated wastewater	2 weeks
Drying of residual solids	8 weeks
Testing of residual solids	2 weeks
Removal of residual solids/impacted soils	6 weeks
Confirmation sampling	2 weeks
Removal of additional impacted soils, as necessary	2 weeks
Final confirmation sampling, as necessary	2 weeks
Certification	8 weeks
Total time required	58 - 84 weeks

The cost estimate for the ABT unit closure is presented below::

Description	Cost Estimate
Vigorous aeration with diesel pump	
Operator: 168 hours @ $30/hr	$5,040
Fuel for Pump: 8 gph x $3.00/gal x 168 hrs	$4,032
Testing of residual solids	
TCLP: 94 samples @ $500/sample	$47,000
Removal of sludge & soils	
Labor & Equipment	$165,000
Disposal:	$142,000[2]
Confirmation samples	$13,000
Final report and certification	$8,000
Total Closure Cost (estimate)	**$385,000**

1 – time based on effectiveness of biodegradation
2 – based on non-hazardous disposal costs