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GIANT
REFINING COMPANY

CERTIFIED MAIL # 7006 0810 0003 7020 6479

December 18, 2007

Ms. Hope Monzeglio
State of New Mexico Environmental Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Re: CLOSURE PLAN FOR THE SURFACE IMPOUNDMENTS
GIANT REFINING COMPANY, BLOOMFIED REFINERY
HWB-GRCB-07-002

Dear Ms. Monzeglio:

Giant Refining Company, Bloomfield Refinery submits this modified Closure Plan for the Surface Impoundment to the New Mexico Environment Department's Hazardous Waste Bureau pursuant to the regulations at 265.110(d) and the July 27, 2007 Order No. HWB 07-34 (CO) issued by NMED. This closure by enforceable document, combined with the corrective action aspects of that July 27, 2007 Order, more than adequately assures proper protection of public health and the environment, and achieves the "enforceable document" closure performance standards of 265.111(a) and (b), while providing for continued and reliable operation of an oil refinery strategic to the economy and welfare of the state of New Mexico.

If you have any questions or would like to discuss any aspect of this plan, please contact me at (505) 632-4171.

Sincerely,

James R. Schmaltz
Environmental Manager

Cc: Todd Doyle
Allen Hains

RPS JDC

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Closure Plan
North and South Aeration Lagoons
Bloomfield Refinery

Regulated Unit EPA ID# NMD089416416
HWB-GRCB-07-002

Giant Refining Company
Bloomfield, New Mexico

December 2007

James R. Schmaltz
Environmental Manager

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1 Introduction

The Bloomfield Refinery is located immediately south of Bloomfield, New Mexico in San Juan County. The physical location address is #50 Road 4990, Bloomfield, New Mexico 87413. The Bloomfield Refinery is located on 285 acres (0.45 square miles). The site is located on a bluff approximately 100 feet above the south side of the San Juan River, a perennial river that flows to the west.

Bordering the facility is a combination of federal and private properties. Public property managed by the Bureau of Land Management lies to the south. The majority of undeveloped land in the vicinity of the facility is used extensively for oil and gas production and, in some instances, grazing. The town of Bloomfield is located to the north of the refinery, across the San Juan River. U.S. Highway 44 is located approximately one-half mile west of the facility. The topography of the site is generally flat with low-lying areas to the east of the process area.

The Bloomfield Refinery is a crude oil refinery currently owned by the San Juan Refining Company and operated by Giant Industries Arizona, Inc., which is a wholly owned subsidiary of Western Refining Company. The Bloomfield Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck and crude from West Texas transported by pipeline.

The Bloomfield Refinery has an approximate refining capacity of 18,000 barrels per day. Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, sulfur recovery, merox treater, catalytic polymerization and diesel hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, naphtha, residual fuel, fuel oils and LPG.

This Closure Plan addresses the "closure" of the North and South Aeration Lagoons. Monitoring data of the effluent from the API Separator, which discharges into the South Aeration Lagoon, has indicated that concentrations of benzene above the toxicity characteristic (TC) regulatory threshold of 0.5 milligrams per liter (mg/l) have entered the aeration lagoons. Western Refining does not desire to operate these lagoons as hazardous waste treatment units and thus the ponds will be cleaned out to remove all hazardous waste, hazardous constituents, decomposition products, and leachate. Closure of the aeration lagoons will be conducted in accordance with an Enforceable Document (July 27,

2007 NMED Order). Additional pretreatment in the form of benzene strippers and a 10,000 barrel surge tank are being installed to ensure that wastewater with hazardous levels of benzene does not enter the aeration lagoons in the future.

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. Three federal regulatory programs [the Clean Water Act, the Resource Conservation and Recovery Act (RCRA), and the Safe Drinking Water Act (SWDA)] have major significance for Bloomfield Refinery process wastewater. Two of these federal programs at Bloomfield are directly administered by the State of New Mexico, as it has primacy over the RCRA and SDWA UIC programs. In addition, there are additional 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 Clean Water Act 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 Bloomfield 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. These two ponds where such biological degradation of organics occurred were referred to at the time as the North Oily Water Pond and the South Oily Water Pond.

A second major regulatory program, the RCRA regulations, affecting hazardous wastewaters was promulgated by EPA on November 19, 1980. Initially, these 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 November, 1980, the Bloomfield Refinery operator applied for a Part A permit as a generator, and TSD as a protective filing for its so-called oily water ponds. It was later determined they were not disposing of listed hazardous waste on site and since D018 wastewater was not part of the 1980 EP toxicity test (it only became regulated after the 1990 TCLP toxicity test was adopted), in 1982 they petitioned for reclassification under a generator only status.[1] In

[1] On November 26, 1985, the Bloomfield Refinery agreed to take an on-site landfill [where some of the materials from the 1982 impoundment cleanout had been placed] through RCRA closure. During 1989, these materials were removed and eventually determined by EPA delisting to be non-hazardous for offsite disposal. *See*, Hazardous Waste Delisting Petition, Petroleum Contaminated Soil, dated April 15, 1991 (*ERM-Rocky Mountain, Inc.*)

1982/1983, the liquids and sludge were removed from the oily water ponds and disposed of offsite. Impacted soils were also excavated and the ponds were lined. This activity included the placement of a 33% bentonite composite liner equipped with a French drain system, with a 100 mill high density polyethylene (HDPE) liner on top.

In 1990, a significant revision to these regulations made most petroleum refinery process wastewater into D018 benzene characteristic hazardous waste, leading the Bloomfield Refinery to submit a Part B RCRA permit application[2] in the mid-1990s and to operate its biological treatment impoundments pursuant to RCRA interim status as a regulated unit. To comply with RCRA interim status, the Bloomfield Refinery upgraded and retrofitted the regulated unit with an additional set of RCRA double liners and leak detection/leachate collection system over and above what the Bloomfield Refinery had initially installed in 1982/1983.

The listing of F037/F038 sludges 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 Bloomfield Refinery.[3] Thereafter, the aeration-enhanced impoundments were called the North Aeration Lagoon (NAL) or the South Aeration Lagoon (NAL) [also referred to herein as the North Aggressive Biological Treatment (ABT) Units (two impoundments known as NABT-E and NABT-

[2]This Part B application submitted in the mid-1990s included a RCRA closure plan for the biological treatment impoundments, as discussed later in this document.

[3]Integral to the operation of the Bloomfield Refinery, as with any oil refinery in the United States, is the operation of an aggressive biological treatment (ABT) unit system for wastewater management, mandated by EPA regulations regarding the listing of certain petroleum refinery wastes (F037/F038) that became effective in May, 1991. EPA regulations, as adopted by NMED, effectively require each petroleum refinery to implement an ABT system to biological treat organics with regulatorily-specified ABT technology to remove organics and eliminate F037/F038 formation. The Bloomfield Refinery has had such advanced organic aeration in place as required since that time, and these EPA-required treatment systems operate as multi-lined ABT wastewater treatment units at Bloomfield, backed up with a double set of leak detection/leachate collection systems, over and above what has been technologically required under EPA regulations.

W) and the South ABT Unit]. The compliance strategy currently employed implements a "zero discharge" CWA system for process wastewater, relying on aggressive biological treatment of wastewaters to make them safe for the environment, followed by disposition through evaporation ponds and a Class I underground injection well permitted consistent with the Safe Drinking Water Act UIC program requirements.[4]

2.2 ABT Unit Operations

The refinery process wastewater currently generated (approx. 80 gallons per minute (gpm)) at the Bloomfield Refinery is managed first by treatment in an API oil/water separator and then by biological treatment in three ABT impoundments. The ABT units, from top to bottom, include:

- a 100-mil HDPE top liner;
- a geonet for collecting leaks that drain to a sump equipped with a 6" observation pipe;
- a 60-mil HDPE secondary liner;
- a composite geotextile/geonet with a 4" observation pipe;
- a cement amended sand that was compacted into a 1.5% slope;
- a 100-mil HDPE liner;
- a French drain system, which directs any collected fluids to a central sump; and
- a 6" layer of soil with 33% bentonite mixed into it.

The wastewater is currently discharged from the API separator into the South ABT unit, which averages 4.4 feet in depth and has a surface area of about 6,652 square feet. The total volume is approximately 216,000 gallons. At 80 gpm, the holding time in the pond is 1.9 days. The impoundment is equipped with two, 5-horsepower aerators sized to prevent F037/F038 waste generation through high rate aeration. The system was designed to reduce benzene concentrations from approximately 10 ppm to less than 0.5 ppm. When this closure plan is implemented, a benzene stripper ancillary equipment modification will have been implemented as part of the wastewater treatment system for Bloomfield. This will decharacterize wastewater below the benzene TC levels prior to discharge into this first (South) ABT unit. As a result, this unit will have received its final volume of hazardous wastewater and no longer will be required to treat hazardous wastewater.

[4]EPA promulgated regulatory requirements to assure that wastewater managed by UIC disposition not pose a risk to public health and the environment (40 C.F.R. Parts 144-146), but those did not apply at the Bloomfield Refinery until 1994 when Bloomfield installed a Class I UIC well for wastewater management to maintain zero discharge CWA NPDES status for process wastewater.

Wastewater from the first (South) ABT unit, which has already been reduced below TC levels by design, is routed to the North ABT unit through an overflow pipe from the South ABT unit. The second ABT unit is comprised of two impoundments that are operated together, and these are generally referred to as the North ABT unit. The first of the two impoundments in the North area (which can be referred to as North ABT-W as it is the westernmost of the two portions of the North ABT unit) is separated from the second of the two in the North area (the second can be referred to as North ABT-E) by a concrete divider. An overflow pipe from the North ABT-W connects to the North ABT-E. The outflow from North ABT-E goes to a sump, where the non-hazardous wastewater can be pumped for final disposition, either in CWA zero-discharge evaporation ponds or into an SDWA Class I permitted non-hazardous UIC well.

The North ABT-W averages 5.5 feet in depth with a surface area of 10,000 square feet. The total volume is approximately 411,500 gallons. The North ABT-W unit is equipped with two (each) 2-horsepower aerators and wastewater retention time (at 80 gpm) is 3.6 days

The North ABT-E (the second of the two in the North area) averages 5.7 feet in depth, with a surface area of 8,440 square feet and a volume of approximately 360,000 gallons. The North ABT-E is equipped with two 2-horsepower aerators and wastewater retention time (at 80 gpm) is 3.1 days

The North and South ABT units have been operated with a minimum freeboard of two feet under normal operating conditions. At the lowest points during operation, the South ABT, North ABT-W and North ABT-E have freeboards of 2.97, 2.54 and 3.08 feet respectively. Influent flow into the South ABT unit is limited by the size of the overflow pipe coming from the API separator/wastewater treatment unit system. Operating personnel monitor pond water levels on a daily basis. The only non-controlled inflow is direct rainfall onto the North and South unit areas.

To manage precipitation, outflow from the ABT unit system is routed to a sump, which has an automatic level control pump. Excess water from process areas generated during a 100-year storm (2.6") is easily handled by this system. The impoundments have 698,000 gallons of additional capacity to the top of the freeboard and the pump can remove 720,000 gallons of water daily. This capacity management total greatly exceeds the 406,000 gallons of water that would be drained from 250,000 square feet of process area. The pump is backed up by two portable diesel backup pumps, which can function in the event of a power outage.

3 WWTU Upgrades

As a result of an EPA Consent Agreement and Final Order (CAFO) dated May 18, 2006, upgrades are being made to wastewater treatment operations at the Bloomfield Refinery. This EPA-mandated change at the Bloomfield Refinery will be accomplished through construction and operation of a benzene stripper/tank system that will decharacterize all hazardous process wastewater prior to further biological treatment in the ABT impoundments. The tank system will also be equipped with an additional 10,000 barrel tank to provide surge capacity. As a result, all process wastewater streams, including any contaminated runoff, will be decharacterized prior to discharge into the ABT units for aggressive biological treatment.

3.1 Contingency Plan

In the event of a major failure, the first contingency response is to direct the wastewaters that have not been through the benzene stripping treatment process into the 10,000 barrel surge tank. At a rate of wastewater flow of 80 gpm, that would permit 87.5 hours of flow to be managed without discharge to the ABT units in the event of a benzene stripper failure. During that 87.5 hours for repair work, the benzene strippers in most cases could be fixed and returned to operation. At that point in time, additional wastewaters collected in surge tank could then be appropriately metered back through the benzene strippers consistent with capacity available (in excess of the 80 gpm flow being handled).

In the event the surge tank capacity may be exceeded, it may be possible to make additional surge tank capacity available, depending on other tank usage at the Bloomfield Refinery. Such evaluation would occur if there was a significant likelihood the strippers could not be restored to working order within the 87.5 hour time frame available for repairs.

4 ABT Unit Closure

This modified Closure Plan is submitted to bring the Bloomfield Refinery into compliance with both the requirements of the EPA CAFO from May 18, 2006 and the requirements of the NMED Order dated July 27, 2007 (also referred to as the Enforceable Document). Because the hazardous characteristic (D018 benzene) will be removed from the wastewater prior to placement in the ABT units (as the result of the wastewater treatment upgrades discussed in Section 3) no further treatment of hazardous waste will occur in the ABT units. Instead, the ABT units will continue to perform their essential function of biologically treating/aerating the non-hazardous wastewater. Such aggressive biological treatment of non-hazardous wastewater in ABT units will be essential for the operation of the Bloomfield Refinery to assure that F037/F038 formation does not occur at Bloomfield and to achieve water quality required for wastewater disposition pursuant to the Class I UIC permit.

The applicable closure standard for the North and South Aeration Lagoons is 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.

4.1 Closure Procedures

When the ABT impoundments became RCRA units as a result of the TC regulations, the Bloomfield Refinery became obligated to prepare and maintain a closure plan for the regulated unit. The previous closure plan for the ABT units was submitted on December 21, 1995 as a portion of the Part B RCRA permit application for this facility.

This modified closure plan coordinates retention of the environmental safeguards of the liners and leachate collection systems for the ABT units with corrective action that includes removal and appropriate disposition of all hazardous wastes, hazardous constituents, decomposition products, and leachate above that liner system while addressing any historic contamination (below the liners/leachate collection system) under the corrective action portion of the NMED Order (Enforceable Document) and any post-closure monitoring. In order to implement these requirements

consistent with the guidance provided by NMED and EPA, the original 1995 closure plan for the ABT Units is modified as set forth below.

In accordance with guidance from NMED, the South ABT unit will be initially taken through this modified closure process, followed by the North ABT unit once the South ABT unit is placed back into service for the nonhazardous wastewaters coming from the upgraded wastewater treatment system. To accomplish closure of the South ABT Unit, nonhazardous wastewaters will flow directly from the API separator/benzene stripper system to the North ABT units, bypassing the South ABT unit.

After completion of the modified closure of the South ABT unit, the aggressive biological treatment system in the South ABT unit will become operational and the wastewater will be routed from the API separator/benzene stripper system back to the South ABT unit. Following appropriate aggressive biological treatment, the treated wastewaters will be then routed from the South ABT unit directly for disposition via evaporation and/or UIC-permitted injection, bypassing the North ABT. After completion of the modified closure for the North ABT unit, it will be restored to service as an additional wastewater treatment unit.

Each ABT unit will be decontaminated following the procedures discussed below. After the flow of decharacterized wastewater to an ABT unit is shut off as part of the closure process, aggressive aeration of the nonhazardous wastewaters will continue. Such aeration shall continue at a minimum long enough to prevent F037/F038 formation. After such residence time and aeration, and sufficient sampling to confirm the lack of the benzene characteristic, this nonhazardous wastewater will be pumped to the evaporation units and/or UIC disposal well assuming confirmation of parameters appropriate for such nonhazardous wastewater disposition by injection.

The sludges (including some attendant watery solution entrained with the sludges) in the ABT unit above the liner will be sampled for hazardous characteristics. A representative number of samples will be collected sufficient to account for potential variability. If the sludges do not exhibit any hazardous characteristics, they will be removed from the ABT units by a vacuum truck for appropriate disposal. Additional wastes not amenable to vacuum removal may be removed through careful shovel or other similar small-scale operations in such a manner as to assure protection of the 100 mil liner. The remaining materials [after vacuum and other removal operations have occurred] and the entire top liner will then be powerwashed with water. This nonhazardous washwater will then be pumped to the evaporation units/UIC wells as appropriate for disposition.

If wastes removed from the ABT units exhibit one or more hazardous characteristics, the wastes will be removed and placed into appropriate RCRA tanks/containers for disposal offsite as hazardous waste. All of the equipment used will then be appropriately decontaminated with any rinse waters being appropriately handled. In addition, the remaining materials [after vacuum and other removal operations have occurred] and the entire top liner then will be powerwashed with water. The liner/residue washwater will be collected in the impoundment and pumped back to the WWTU system for handling through the oil/water separator and benzene strippers, followed by aggressive biological treatment in the other ABT unit still in service. This procedure will be followed even if the washwaters do not exhibit a hazardous characteristic.

As required by NMED, the liners will be inspected for any damage and repaired if necessary. If there is damage to the 100-mil HDPE top liner, then the underlying 60-mil HDPE secondary liner will be checked for damage and repaired, as necessary. There has not been any indication based on a accumulation of fluids in the underlying (non-RCRA) collection system that the 60-mil HPDE secondary liner has any damage. However, if the 60-mil liner is damaged, then the underlying (i.e., lowermost) 100-mil HDPE liner will be inspected and may also be repaired although this liner is not required. If the lowermost 100-mil liner is damaged, then the underlying environmental media (e.g., 6" layer of soil with 33% bentonite and native soils) will be investigated to determine if mobile non-aqueous phase liquid (NAPL) hydrocarbons are present immediately beneath the ponds. Only if mobile NAPL is present immediately beneath the ponds, which could migrate to ground water, will remediation of the underlying environmental media be conducted to remove the mobile NAPL. Otherwise, any impacts to the underlying media should not present a threat to human health or the environment due to the fact that multiple overlying liners will prevent any direct contact to or leaching of contaminants.

After all repairs are complete, the impacted leachate collection systems will be flushed with clean water. The collected flush water will be sampled. If it tests hazardous, it will be disposed of offsite and the flushing will be repeated. When the flush water tests nonhazardous, then that first nonhazardous flush will be pumped back to the WWTU system for handling through the API separator and benzene strippers.

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 Enforceable Document modified closure performance standards in §§265.11(a) and (b) as specified by §265.110(d)(2).

5 Construction Details

The original Schedule of Closure in the 1995 closure plan provided about 13 weeks for the closure of the ABT units. The closure time frame will be doubled for serial closure of the South ABT unit, followed by North ABT-E and North ABT-W, plus any additional time to repair damage to the liners and address impacts to underlying environmental media.

The schedule for closure of the ABT South ABT unit is as follows:

"Description	Duration
Start of closure [in this case 60 days after NMED plan approval]	
Aeration of impoundments	2 weeks
Testing of treated waste water	1 week
Removal of treated waste water	1 week
Drying of residual solids	4 weeks
Testing of residual solids	1 week
Removal of residual solids	1 week
Washing of impoundments	1 week
Inspection and repair of liners, as necessary	1 week
Flushing of equipment	1 week
Final testing and certification	1 week
Total time required	14 weeks"

The current cost of ABT unit closure[5] is presently estimated at $35,532.00, based on the following:

> "Since these impoundments are undergoing continuous treatment in which the waste stream (a D018 waste because of benzene concentration) is being rendered non-hazardous, closure will simply require:
>
> 1) Stop adding new waste to the treatment stream [in this case the ABT unit];
> 2) Continue treatment until TC characteristic is gone;
> 3) Empty impoundments;
> 4) Analyze sediments for TC characteristics; and
> 5) Remove and dispose of sediments.

[5]The 1995 Closure Plan estimated closure costs at $20,800 total, based on the same type of analysis used here, but this plan updates those costs to be current for 2007.

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 treated water		
Benzene: 15 samples @ $120/sample		1,800
Testing of residual solids		
TCLP: 15 samples @ $500/sample		7,500
Removal of residual solids		
Labor: 2 workers @ 40 hrs/ea x $30/hr		2,400
Disposal: 40,000 lbs x $0.20/lb + $2,200 freight		10,200
Washing of impoundments		
Mobil wash: 24 hours x $80/hr		1,920
Flushing of equipment		
Mobil wash: 8 hrs x $80.hr		640
Final testing and certification		2,000
Total Closure Cost (estimate)		**$35,532**