GW - 21

REPORTS

YEAR(S):

2004

Marathon Oil Corporation

Groundwater Discharge Plan
GW-21
for
Indian Basin Gas Plant

329 Marathon Road
(Eddy County Road 401)
Lakewood, New Mexico

Prepared For:

Marathon Oil Company
Southern Business Unit
P.O. Box 3487
Houston, Texas 77253-3487

Submitted to:

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division

On behalf of:

Working Interest Owners

September 17, 2004
(Amended December 2, 2004)

Marathon Oil Corporation

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1.0 TYPE OF OPERATION

The major purpose of the facility is gas processing. Although the components of the plant have been updated since it first began operations in 1966, the basic function and purpose of the plant have not changed. The plant owners have invested in new technology and replacement of aging equipment as necessary.

2.0 OPERATOR/LEGALLY RESPONSIBLE PARTY & LOCAL REPRESENTATIVE

The name of the operator is Marathon Oil Company. The mailing address for the Southern Business Unit is P.O. Box 3487, Houston, Texas 77253-3487. The telephone number for the Region office in Houston is (713) 629-6600.

The local Marathon Oil Company representative at the Indian Basin Gas Plant is Tom Breninger, Plant Superintendent. The street address of the plant is 329 Marathon Road (Eddy County Road 401), Lakewood, New Mexico. The mailing address is P.O. Box 1324, Artesia, New Mexico 88211. The plant telephone number is (505) 457-2621.

3.0 LOCATION OF FACILITY

The Indian Basin Gas Plant (facility) is located in the Northeast 1/4 of Section 23, T21S, R23E, NMPM, Eddy County, New Mexico, approximately 20 miles west of Carlsbad and 28 miles southwest of Artesia. Figure 1 is excerpted from the U.S.G.S. 7.5-minute topographic quadrangle, titled "Martha Creek", showing the location of the facility.

4.0 LANDOWNER

Marathon Oil Company is the landowner of record of a 160-acre site legally described as the Northeast 1/4 of Section 23, T21S, R23E, NMPM, Eddy County, New Mexico. The gas plant facility, which consists of approximately 60 acres, is located on the 160-acre property. Marathon's corporate headquarters address is P.O. Box 3128, Houston, Texas, 77253. Correspondence regarding the site should be directed to Tom Breninger, Plant Superintendent, at the plant address provided in Section 2.0.

5.0 FACILITY DESCRIPTION

The gas plant facility approximately occupies the Southwest 1/4 of the Northeast 1/4 of Section 23, T21S, R23E. Figure 1 shows the plant site, the boundary of the 160-acre property, and the adjacent property managed by the BLM. The plant waste water is now disposed at the OCD permitted injection well AGI#1 SWD well (API# 30-015-31294). The two previously used waste water injection wells Marathon Federal SWD Well #1 and Marathon IB Gas Com Well #1 are also shown on Figure 1, these wells are not being used for waste water injection anymore. Figure 2 shows current plot plan of the plant.

6.0 MATERIALS STORED/USED AT THE FACILITY

A list of materials stored and used at the facility is included in Tables 3 and 4. See section 8.0 for more information.

7.0 SOURCES AND QUANTITIES OF EFFLUENTS & WASTE SOLIDS

Wastes that are generated at the gas plant consist of commingled effluent (Section 7.1) and solid and liquid wastes (Section 7.2). The commingled effluent is gathered by the drain and sump system and the solid and liquid wastes are generated at the plant but are not part of the commingled effluent.

7.1 Effluents

The commingled effluent consists of produced water and various other plant effluents. The individual waste effluent streams in the commingled effluent are identified in Table 1. The waste effluent streams from the various plant processes are collected and conveyed by the open drain piping system, the closed drain piping system, and several underground pipelines. Effluent volumes at the plant are variable and depend upon plant and field operations. Commingled effluent is normally discharged into a Marathon-operated Class II injection well – identified as the AGI #1 well -- located on adjacent Bureau of Land Management (BLM) property. (Note: Another formerly-used injection well located southeast of the plant has been plugged and abandoned.) The commingled effluent is also occasionally trucked off-site to commercial disposal facilities during emergencies.

Produced water, cooling tower blowdown, and boiler and condenser blowdowns consist of a combination of wastewater and chemical additives. The name and volume of additives in each effluent are listed on Table 1. These effluents, effluents from cleaning operations, and miscellaneous plant process effluents are commingled via the open drain piping system, which drains to the skimmer basin before being pumped to the steel saltwater tank.

The new Selexol unit has added two additional effluents. These effluents are outlined in Table 1. The Selexol effluent is drained via the open drain system, and is then sent to a Marathon-operated Class II injection well. It is commingled with the plant disposal system only during an emergency.

Reverse osmosis (RO) wastewater is disposed with plant wastewater. Groundwater remediation is now performed through vapor extraction in place of pump & treat system. Remediation system does not produce any effluents. Hence infiltration wells IW-1 and IW-2 have been shut-in. During an emergency the remediation system effluents can be commingled with the plant waste water for disposal into the OCD permitted injection well, therefore remediation effluents are listed on Table 1.

Domestic sewage is not commingled with other plant effluent and is therefore regulated by the New Mexico Environment Department. Sewage is conveyed through an underground pipeline to one of two underground septic tanks, which are designed to drain the sewage leachate. One of the septic systems was installed prior to December 1972, the other in April 1997.

7.2 Solid and Liquid Wastes

Solid and liquid wastes are generated at the plant that are not part of the commingled effluent or conveyed by underground piping. The waste classification, treatment/disposal methods, treatment/disposal/recycle locations, and waste storage areas are provided in Table 2.

Waste oil is collected from various plant equipment (Table 2) and stored in a 500-gallon waste oil storage tank located on the west side of the plant. The oil is stored in the tank until enough oil accumulates to warrant transport of the oil to a used oil recycling facility. Vehicle motor oil no longer is changed at the plant; rather it is performed off-site.

There are two Safety-Kleen parts cleaning units located in the pumper shack. One of the cleaning units is an open-top spray basin containing naptha solvent and the other unit is a self-contained cleaning unit that contains an aqueous solvent. Safety-Kleen services both units and recycles the solvent whenever the spent solvent is replaced. The naptha solvent is hazardous and the aqueous solvent is non-hazardous. The Environmental Protection Agency (EPA) small quantity generator number for hazardous waste generated at the Indian Basin Gas Plant is NMD 982760183-1235. The EPA hazardous waste site identification is NMO-1406.

Laboratory wastes are a starch and iodine mix, silver nitrate, and water test reagents. These liquids are temporarily stored in a 5-gallon container in the laboratory and later hand carried to a 55-gallon drum in the drum storage area on the west side of the plant. Waste paint is stored in a 55-gallon drum in the drum storage area. Both streams are stored until enough waste has accumulated for disposal/recycle by Safety-Kleen.

7.3 Effluent and Solid Waste Quality Characteristics

7.3.1 Commingled Effluent

On November 8, 1999, a grab sample of the commingled effluent was collected from a valve between the saltwater tank pump and the pipeline to the injection well. Total dissolved solids (TDS), pH, general chemistry, chlorinated hydrocarbons, aromatic hydrocarbons, and Resource Conservation and Recovery Act (RCRA) metals analysis of the effluent sample was conducted by Severn Trent Laboratories (STL). Laboratory results indicated that all commingled effluent

constituents are below the WQCC 3-103 standards for groundwater except for benzene, toluene, ethylbenzene, total xylenes, chloride, sulfate, and TDS. The concentrations of benzene, toluene, ethylbenzene, and total xylenes were 4,300, 13,000, 700, and 7,000 µg/l, respectively. The laboratory results are included in Appendix A.

Testing for polychlorinated biphenols (PCBs) was not necessary because PCB-contaminated transformers were removed from service at the gas plant before 1981. No other sources of PCB contamination have been identified to warrant testing for PCBs in the plant effluent.

Table 1 lists two plant effluents that contain one or more constituents as defined by WQCC Section 1101.TT. These effluents are the produced water and groundwater contaminated with condensate. It should be noted that the groundwater contaminated with condensate is transferred through an underground pipeline from the treatment compound to the fiberglass saltwater tank only in emergency situations. Treated groundwater is not an effluent anymore. The hazardous constituents that are likely contained in these effluents are benzene, toluene, ethylbenzene, meta-, para-, and ortho-xylenes, and naphthalene.

7.3.2 Wastewater Quality Characteristics

Marathon has been sampling the commingled reverse osmosis (RO) wastewater and the treated groundwater on a monthly basis for benzene, toluene, ethylbenzene and xylenes (BTEX), and on a quarterly basis for major cations/anions and polyaromatic hydrocarbons (PAHs) analysis using EPA approved methods. As described in Section 7.1, reverse osmosis wastewater is commingled with plant waste water and disposed off into the injection well. Pump and treat system, which was used to treat condensate contaminated groundwater was shut-in January 2003 after receiving approval from the OCD. Hence, above referenced monthly sampling of RO wastewater and treated groundwater has been discontinued since.

7.3.3 Solid Waste Quality Characteristics

Most solid wastes generated at the plant are not characterized by the definition in WQCC Section 1101.TT. Table 2, which has been updated to reflect new and modified waste sources, classifies each waste as either exempt, non-exempt (non-hazardous or potentially hazardous), or naturally occurring radioactive material (NORM). All non-exempt wastes will be characterized according to 40 CFR 261 to determine the appropriate method of disposal. After the waste stream has been characterized, the data will be kept on file at the gas plant. Solid wastes will be stored and handled in accordance with all applicable federal and state laws.

8.0 TRANSFER AND STORAGE OF PROCESS FLUIDS AND EFFLUENTS

8.1 Onsite Collection and Storage Systems

The open drain and closed drain systems are used to manage some of the effluents at the plant. Table 1 indicates which effluents are conveyed in the open drain system. These include two of the boiler and condenser blowdowns, cleaning operation effluents, and miscellaneous plant process effluents. Open drain system is used to collect commingled effluents. The closed drain system is used to collect effluent from pressurized vessels.

8.1.1 Open Drain System

The open drain system collects plant effluent under atmospheric conditions. The underground part of this system includes: four double-walled fiberglass sumps; one single-walled fiberglass sump at the air compressor building; two single-walled steel sumps (open-drain collection sump and LACT sump); steel collection pots; steel pipelines; and, polyethylene pipelines. The open drain system includes a total of seven underground sumps. The aboveground part of the system consists of concrete drainage and containment pads that collect and drain effluent into the underground part of the system for collection and disposal. All open drain sump pumps send their effluent to the open-drain collection sump where they are commingled. Commingled effluent collected in the open-drain collection sump is pumped to the skimmer basin gunbarrel tank, located on the skimmer basin pad.

8.1.2 Description of Integrity Test of Open Drain System

Seven separate sections of underground piping are tested by filling the piping to volumetric capacity and visually observing any fluctuations in fluid levels at the sump and manway locations. The test is performed at atmospheric conditions for 5 hours. In order to reduce the effects of temperature fluctuations that occur during the day, the test is conducted in the early morning or late evening hours. All sources for active drainage are isolated to prevent accidental introduction of non-test fluids into the system. A successful test has been conducted when the initial fluid levels remain constant throughout the 5-hour test period. The double walled fiberglass sumps are integrity tested by filling the inner chamber to capacity and observing any leaking of fluid from the inner chamber to the outer chamber. A successful test of the double-walled sumps has occurred if fluid does not leak to the outer chamber from the inner chamber during the 5-hour test period. The OCD will be notified at least 72 hours prior to all testing.

Successful integrity tests were conducted on the entire system during two testing periods. Initial testing was completed November 1999 on the majority of the system. Final integrity tests were completed February 2000. Records of all integrity tests are available at the Indian Basin Gas Plant office.

8.1.3 Closed Drain System

The closed drain was constructed in 1980 and modified in 1984 and 1996 and is mainly aboveground. This system is used to collect effluent from pressurized vessels. The maximum operating pressure is 200 psig. The closed drain system is connected to process vessels: inlet filter coalescer, four expander/compressors, three amine contactors, glycol contactor, Selexol contactor, three amine scrubbers, glycol overhead filter coalescer, Selexol scrubber, two amine flash tanks, amine still, Selexol still, glycol inlet filter coalescer, Selexol 3-phase separator, product contactor, new fuel gas scrubber, old fuel gas scrubber, two regen scrubbers, vertical inlet separator, cyclone separator and horizontal inlet separator. (See Figure 3 for a schematic of the process flow.) Steel piping leads from these process vessels to the closed drain scrubber, located near the generators. Collected liquids in the tank are sent to the skimmer basin gunbarrel for recovery and then to disposal via the wastewater injection system.

8.2 Inventory of Tanks and Vessels

Tables 3 and 4 are lists of tanks and vessels, respectively, with a potential to discharge. Table 3 lists the 55 tanks at the plant, and it has been updated to include 4 new storage tanks with liners that were put in service June 2003. Table 4 lists all process vessels such as separators, boilers, exchangers, condensers and scrubbers.

8.3 Measures to Prevent Unintentional and Inadvertent Discharges

8.3.1 Secondary Containment for Tanks

All storage tanks, except those that contain uncontaminated freshwater, are bermed to contain 133% of the volume of the largest tank. If two or more tanks are connected within the same containment, the berm contains 133% of the total volume of the interconnected tanks. New or existing tanks that undergo a major modification, as determined by the Division, will be placed within an impermeable enclosure.

8.3.2 Chemical and Drum Storage Area Containment

Drum storage areas are concrete paved and curbed to prevent a potential discharge to the ground of leaking or spilled drum contents. All tanks, drums, and containers will be clearly labeled to identify their contents and other emergency notification information.

8.3.3 New and Existing Sump Inspection

Construction plans for installing new sumps will be submitted to the Oil Conservation Division (OCD) for approval prior to project commencement. New sumps will incorporate secondary containment and leak-detection into the design prior to installation. The only below-grade tank at the plant is the sulfur underground storage tank.

8.3.4 Aboveground Tank Inspection

The glycol storage, 1200-barrel freshwater storage, and steel softwater tanks are on a concrete pad. Therefore, these tanks have leak detection. All other on-ground tanks are inspected every five years.

8.3.5 Process Areas

All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface will be either paved and curbed or have some type of spill collection device incorporated into the design.

8.3.6 Housekeeping

All systems designed for spill collection/prevention will be inspected weekly and after each storm event to ensure proper operation and to prevent overtopping or system failure. A record of inspections will be retained on site for a period of five years.

8.4 Underground Pipelines

Table 5 lists underground pipelines that convey either process or waste effluents within the plant. The name of the pipeline, where the fluids are transferred from and to, year of construction or modification, piping diameter, fabrication material, average throughput during use, operating pressure, and the date of the last or next scheduled integrity test of each pipeline are indicated on Table *5.* The Marathon procedures for mechanical integrity testing are on file at the plant. The procedures are based upon the third edition (dated December 1993) of the American Petroleum Institute document HP 1110 titled "Pressure Testing of Liquid Petroleum Pipelines."

8.5 Effluent Disposal

8.5.1 On-site Disposal

Surface impoundments or ponds, injection wells, leach fields (except for two septic tanks), drying beds, or other pits do not exist onsite. Onsite disposal of liquid and solid waste effluents is limited to the discharge of cooling tower effluent in the form of a mist onto the ground around the base of the cooling tower and solid sulfur that is discharged onto the ground on the west side of the plant. Marathon no longer uses the solid waste landfill onsite to dispose of exempt plant wastes and office trash. The landfill was closed in 1995.

8.5.2 Onsite Treatment

8.5.2.1 Treatment of Soils

Marathon will no longer treat soils onsite landfarm. All waste soils generated at the plant will be collected in a waste bin (roll-off box) supplied by a commercial landfill. Once the waste bin is full the container will be shipped off to an OCD approved landfill for disposal. Waste manifest and other documents related to offsite disposal will be kept onsite.

The existing landfarm will be evaluated for closure. Confirmation samples will be collected as per condition #17 of previously approved permit. If samples do not meet levels on condition #17 of the discharge permit, then soils will be disposed off at an OCD approved landfill. The confirmation sampling for the treated soils will be one sample per 50 yards of soil. The existing landfarm area measures approximately 100 feet by 300 feet. The landfarm was originally constructed in 1989 with a 4-mil plastic liner with approximately 12-inch-high earthen berms on all four sides.

8.5.3 Off-Site Disposal

8.5.3.1 Injection Wells

All exempt gas-plant waste effluents are collected by the open-drain system, closed-drain system, or other underground piping, and commingled at either the fiberglass or steel saltwater tanks (Figure 2). The commingled effluent is conveyed by underground pipeline and discharged at OCD permitted off-site injection well AGI #1 (API# 30-015-31294). This Marathon operated

Class II injection well is located on adjacent BLM property. 2138 feet from the North line and 1060 feet from the West line (Unit E) of Section 23, Township 21S, Range 23E. The composition of the commingled effluent is identified in Table 1. Laboratory analysis of the commingled effluent is provided in Appendix A.

8.5.3.2 Commercial Disposal Facilities

All waste soils generated from the plant will be transported to offsite OCD approved landfills as described in Section 8.5.2.1. All waste streams are evaluated and classified before transported offsite. Office refuse and other inert wastes are transported to the local municipal landfill for disposal. All other wastes are handled according to Table 2.

9.0 PROPOSED MODIFICATIONS

1. There are four new storage tanks in the southeast portion of the gas plant which were put in service last year. These tanks were constructed with impermeable secondary containment as per Condition #5 of the discharge permit. The new tanks are listed in Table 3.

2. Waste streams and different disposal facilities that are currently in use have been updated. The changes are outlined in Table 2.

3. A Selexol process has been added to the plant to remove mercaptans from the gas stream. All of the tables have been updated accordingly to reflect the changes.

4. A new Glycol Inlet Filter Coalescer has been added to the plant to remove water and condensate from the gas stream. All of the tables have been updated accordingly to reflect the changes.

5. The use of existing landfarm will be discontinued. The landfarm will be closed as per OCD requirements.

10.0 INSPECTION, MAINTENANCE, AND REPORTING

Marathon is actively involved in maintaining and improving spill and leak prevention procedures and good housekeeping practices. These goals are achieved by encouraging plant employees to be observant, to notify the appropriate persons of their observations, to correct problems quickly, and to prevent future spills and leaks by learning from problematic past practices.

10.1 Routine Inspection Procedures

Table 3 and 4 identify the aboveground storage tanks and process vessels (AST and APV; *i.e.*, those in-air tanks and vessels that allow 360 degree visual inspection) that are routinely inspected. The closed drain system is also routinely inspected. Plant employees routinely inspect plant equipment (*i.e.,* tanks, piping, pumps, fittings, valves, etc.) for leaks and spills during their daily work tasks. Four plant tours are conducted by plant personnel during each of two, twelve-hour shifts. A primary objective of these tours is to detect equipment leaks and spills. The current Best Management Plan for spills is provided in Appendix B.

10.2 Routine Maintenance Procedures

Employees are encouraged to identify and report potential spill situations. All plant employees have completed an 8-hour hazardous waste operations and emergency response (HAZWOPER) training session. In addition, all employees participate in an annual refresher training course which includes instruction on spill prevention and control measures as required by the Best Management Plan.

10.3 Routine Reporting Procedures

Small leaks or spills are reported and remediated immediately. A Marathon policy requires employees to complete a spill report upon discovery of a spill or leak. Spills or leaks are reported to the OCD according to the requirements of OCD Rule 116 and WQCC Regulations Section 1-203. BLM is notified if a spill or leak occurs on BLM land. The National Response Center is notified in accordance with 40 CFR 110.10. Spill reports are kept on file at the plant office.

10.4 Stormwater Runoff and Flood Protection

The potential for flooding of the plant is very low. Normally, flooding due to significant rainfall events is limited to the braided stream channels of Rocky Arroyo. The stream bed of Rocky Arroyo is approximately 10 feet lower than the elevation at the southern plant perimeter fence. The last time Rocky Arroyo overran its banks was in 1986, but the water did not reach the plant.

Perimeter diversion berms consisting of dirt, piled two to three feet high, are located on the west and north sides of the plant to prevent upgradient stormwater from running onto the plant site. These stormwater berms prevent stormwater from contacting hydrocarbons or flooding the open-drain system which is designed to manage normal process flow only.

The Indian Basin Gas Plant Stormwater Pollution Prevention Plan (SWPPP), dated March 12, 1998, is included in Appendix C. This document describes the potential pollutant sources, stormwater measures and controls, stormwater runoff management, inspection and preventative maintenance, spill prevention and response procedures, employee stormwater training, and recordkeeping and internal reporting procedures. Select employees participate in stormwater pollution prevention training on an annual frequency according to the requirements in the SWPPP.

11.0 SPILL/LEAK PREVENTION & REPORTING (CONTINGENCY PLANS)

A contingency plan for potential occurrence of leaks and spills at the Indian Basin Gas Plant is located in the Best Management Plan which is included as Appendix B. The contingency plan describes the steps proposed to contain and remove spilled substances and mitigate the damage caused by the discharge, including protection from future migration to groundwater. The OCD notification threshold levels will be followed for discharges at the plant as defined by WQCC Regulations Section 1203 and significant leaks or spills as defined by OCD Rule 116.

12.0 SITE CHARACTERISTICS

12.1 Geologic Description of Discharge Site

The typical stratigraphic sequence beneath the gas plant is Queen Formation fractured sandstone, limestone, and dolomite bedrock at a depth of approximately 20 feet overlain by approximately 16 feet of silty, pebble to boulder gravel overlain by 4 feet of clayey silt and silt.

12.2 Hydrologic Features

Rocky Arroyo is a watercourse located approximately 600 feet south of the southern boundary of the site (Figure 1) that contains flowing water only during and for a period of time following heavy rainfall events. The main channel of Rocky Arroyo is 840 feet south of a fence at plant. South of the plant site, the stream channel of Rocky Arroyo trends southeast.

The first groundwater encountered below the plant site occurs within alluvium deposits. This shallow zone is perched above locally fractured, Permian sandstone, limestone, and dolomite of the Queen Formation. The presence of perched shallow groundwater is dependant on the amount of local rainfall. The flow direction of the perched shallow groundwater is generally southeast. A commercial supply well permitted by the State Engineer Office and completed in the shallow alluvial deposits is located approximately 2.5 miles east of the site boundary. The well is located where alluvial deposits are thick and downstream of the confluence of three major drainage channels in the southern Seven Rivers embayment. These are Rocky Arroyo, Martha Creek, and Dunnaway Draw.

A rancher well (Lee well) is located approximately 0.7 miles west of the western boundary of the 160-acre property and approximately 100 feet north of County Road 401 (Figure 1). This active well is permitted by the State Engineer Office as a stock supply well and is completed in the Lower Queen regional aquifer which is the next saturated zone below the shallow groundwater zone.

13.0 OTHER COMPLIANCE INFORMATION

Summary of groundwater remediation activities are provided in Appendix D. Marathon has been submitting annual Groundwater Monitoring Reports to OCD March/April of every year. The 2003 annual report was submitted to the OCD on March 31, 2004. This annual monitoring report consists of detailed descriptions of remediation activities performed since the start of the project. Also included in the annual report are plot plans, groundwater gradient and BTEX/TPH distribution maps, analytical results copies, tables summarizing data.

Table 1. Effluents and Estimated Volumes

Effluent	Pathway	Waste Effluent Constituents	Volume	(Section 1-101.Z ZZ constituents)
PRODUCED WATER	Inlet separators to skimmer basin to saltwater tanks	Condensate, saltwater, Calgon pretest 32- 2 gal./day	2000 Bbls/day	none
COOLING TOWER BLOWDOWN	Aboveground piping to fiberglass saltwater tank	Softwater make-up	200 Bbls/day	none
		Calgon conductor XLP-170	2.1 gal/day	none
		Van Waters Rogers sulfuric acid	5 Bbls/mo	none
		Calgon Tower Brom 960 (solid)	100 lbs/mo	none
		Calgon H75	3 gal/wk	none
BOILER AND CONDENSER BLOWDOWNS		Caustic Soda - Unichem	1.5 gal/day	none
SRU Waste Heat Boiler Blowdown	Underground & aboveground steel pipeline to steel saltwater tank	Softwater make-up	95 Bbls/day	none
SRU Large Condenser Blowdown	Underground & aboveground steel pipeline to steel saltwater tank	Calgon Ultra Amine 120	3.6 gal/day	none
SRU Small Condenser Blowdown	Glycol sump of open drain to steel saltwater tank	Calgon Burlook 2220	4.5 gal/day	none
Turbine Waste Heat Boliers (3) Blowdown	Open Drain System to skimmer basin	Calgon Conquer 3470	1.8 gal/day	none
Process (main) Steam Bolier Blowdown	Open Drain System to skimmer basin			
CLEANING OPERATIONS	Open Drain to Skimmer Basin to Saltwater Tank to Injection	Water	50 Bbls/day	none
Steam-cleaning				
Truck, tank, and drum washing				
PLANT PROCESS EFFLUENTS	Open Drain to Skimmer Basin to Saltwater Tank to Injection		75 Bbls/day	
Products sweetening		Huntsman diglycolamine (DGA)		none
Glycol		Triethylene glycol (TEG)		none
Reflux Water	Pumped from selexol unit to gunbarrel	Water	50 gal/day	none
Selexol*	Selexol unit to open drain to injection	Dimethyl Ether of Polyethylene Glycol Mixture, Glycol Ethers	120 Bbls	none
SOFTWATER REGEN	Softwater building to saltwater tank via underground piping	Saltwater	75 Bbls/day	none
REVERSE OSMOSIS WASTEWATER*	Primary: Water treatment to infiltration system via underground piping Secondary: Water treatment building to saltwater tank		300 Bbls/day	none
GROUNDWATER CONTAMINATED W/CONDENSATE*	Primary: Freshwater gathering to infil. Via underground piping	Freshwater	2375 Bbls/day	none
(Shut-in since January 2003)	Secondary: Freshwater gathering to saltwater tank	Condensate (as TPH; EPA Mod. 8015)	<3,200 ug/L	BTEX

* Denotes effluent is only commingled into disposal system in case of emergency or mechanical failure

Last Updated: 9/3/2004

Table 2. Waste Sources, Waste Classification, and Waste Treatment/Disposal Methods

Waste	Waste Classification	Treatment/Disposal Method	Disposal Location	Plant Storage Location
AEROSOL CANS (empty)	Non-exempt, Non-hazardous	Landfill	Southwest Disposal	Municipal waste stream
ANTIFREEZE (vehicle/glycol water bath)	Exempt & Non-exempt, Potentially hazardous	Disposal well	Safety Kleen	In original containers
BATTERIES, SPENT (generator, backup lighting, and vehicle)	Non-exempt, Potentially hazardous	Recycle	Best-Buy	Drum storage area
CALCIUM SILICATE INSULATION	Non-exempt, Non-hazardous	Landfill	1) Southwest Disposal 2) Lea Land 3) Control Recovery, Inc.	Roll-off bin
CARBON, SPENT (Amine or Glycol System)	Exempt	1) Exempt waste disposal facility 2) Non-hazardous industrial landfill	1) Exempt waste disposal facility 2) Control Recovery, Inc. 3) Lea Land	Roll-off bin when needed
CONCRETE, UNCONTAMINATED	Non-exempt, Non-hazardous	1) Leave on site OR 2) Municipal landfill	1) On site 2) Municipal landfill	NA
COOLING TOWER CLEANING WASTE SOLIDS	Non-exempt, Potentially hazardous	Injection; Off site Class II well	1) Control Recovery, Inc. 2) Lea Land	Frac tank until testing complete
DEBRIS (Mercury Contaminated)	Non-exempt, Hazardous	Recycle	Safety-Kleen	NA
DRUMS, SPENT	Non-exempt, Potentially hazardous	Recycle	U.S. Filter	Drum storage area
EFFLUENTS (Spent DGA and TEG, washwater, boiler, condenser blowdown fluids, waste saltwater, Selexol)	Exempt, Non-hazardous	Injection	MOC SWD Well	Saltwater Tank
ELECTRICAL MATERIALS (Conduit, Panels, Etc.)	Non-exempt, Non-hazardous	Recycle	U.S. Filter	Scrap metal recycling bin
FILTERS - AIR	Non-exempt, Non-hazardous	Landfill	Southwest Disposal	Dumpster
FILTERS - NATURAL GAS FILTERS	Exempt	1) Recycle by incineration 2) Exempt waste disposal facility	1) Quell or U.S. Filter 2) exempt waste disposal facility	South east of plant
FILTERS - STABILIZER COMMPRESSOR/AIR COMPRESSOR LUBE OIL FILTERS	Non-exempt	Recycle by incineration	Quell or U.S. Filter	West side plant
FILTERS - TURBINE LUBE OIL FILTERS	Non-exempt	Recycle by incineration	Quell or U.S. Filter	South east of plant
FILTERS, GLYCOL & AMINE FILTERS & FILTER MEDIA (glycol sock filters, amine charcoal filters, amine bag filters)	Exempt	1) Recycle by incineration 2) Exempt waste disposal facility	1) Quell or U.S. Filter 2) Exempt waste disposal faciltiy	South east of plant
FLUORESCENT LAMPS (Used)	Non-exempt, Hazardous	Recycle	Safety Kleen	NA
GLYCOL CERAMIC SADDLES, SPENT	Exempt	1) Exempt waste disposal facility 2) Non-hazardous industrial landfill	1) Exempt waste disposal facility 2) Control Recovery, Inc. 3) Lea Land	Roll-off bin or drums when needed
HYDROBLASTING & SANDBLASTING MEDIA	Non-exempt, Potentially hazardous	As dictated by sampling	As dictated by sampling	NA
LABORATORY WASTES (starch and iodine, silver nitrate, water test reagents)	Non-exempt, Potentially hazardous	Incinerated	Safety-Kleen determines	Drum storage area
METAL, SCRAP (NORM contaminated)	Non-exempt, Potentially hazardous	NORM disposal	Newpark Environmental	NORM storage area
METAL, SCRAP (not NORM contaminated)	Non-exempt, Non-hazardous	Recycle	U.S. Filter	Scrap metal recycling bin
METHANOL	Non-exempt, Hazardous	Recycle	Safety Kleen	Methanol storage area
MOLECULAR SIEVE, SPENT	Exempt	1) Exempt waste disposal facility 2) Non-hazardous industrial landfill	1) Exempt waste disposal facility 2) Control Recovery, Inc. 3) Lea Land	West side plant

Table 2. Waste Sources, Waste Classification, and Waste Treatment/Disposal Methods

Waste	Waste Classification	Treatment/Disposal Method	Disposal Location	Plant Storage Location
NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM)	NORM waste	NORM disposal	Newpark Environmental	NORM storage area
OFFICE AND PLANT TRASH	Non-exempt, Non-hazardous	Dumpster	Southwest Disposal	West side plant
OIL (vehicle motor, crankcase (chemical injection pumps, high pressure pumps), regen compressor, instrument air compressor, lube oil, stabilizer vapors compressor oil, turbine/expander compressor oil, inlet compressors oil.)	Non-exempt, Potentially hazardous	Recycle	U.S. Filter	Oil recycle storage area
PAINT, WASTE (non-empty cans, dried paints, waste paint)	Non-exempt, Potentially hazardous	Incinerated; Supplemental fuel	Safety-Kleen determines	Drum storage area
POLY-PIPE (Scrap Polyethylene)	Non-exempt, Non-hazardous	Landfill	Southwest Disposal	West Side of Plant
RAGS, OILY	Exempt & Non-exempt	Recycle by incineration	Quell or U.S. Filter	South east of plant
RAIN WATER, TANK BATTERY	Exempt (contaminated) & Non-exempt (clean), Non-hazardous	Injection	MOC SWD Well	Bulk tank
RUBBER PRODUCTS (Belts, hoses, etc.)	Non-exempt, Non-hazardous	Landfill	Southwest Disposal	Roll-off bin
SOIL - AMINE CONTAMINATED, (spent)	Exempt	Landfill	Offsite Landfill	Roll-off bin
SOIL - AMINE CONTAMINATED, (virgin)	Non-exempt	Landfill	Offsite Landfill	Roll-off bin
SOIL - GLYCOL CONTAMINATED (spent)	Exempt	Landfill	Offsite Landfill	Roll-off bin
SOIL - GLYCOL CONTAMINATED (virgin)	Non-exempt	Landfill	Offsite Landfill	Roll-off bin
SOIL - HYDROCARBON CONTAMINATED (exempt)	Exempt	Landfill	Offsite Landfill	Roll-off bin
SOIL - LUBE OIL CONTAMINATED (non-exempt)	Non-exempt	Landfill	Offsite Landfill	Roll-off bin
SOIL - PRODUCED WATER CONTAMINATED (exempt)	Exempt	Bioremediation	In place	NA
SOIL - SULFUR CONTAMINATED	Exempt	Land discharge	1) Lea Land 2) Control Recovery, Inc.	West side of SRU, west of fence
SOLVENT, SPENT	Non-exempt, Potentially hazardous	Recycle	Safety Kleen	Naptha 105 - pumper shack; 55-gallon drum Aquaworks - NA
SULFUR RECOVERY UNIT USED CATALYST & SUPPORT BALLS	Exempt	1) Exempt waste disposal facility 2) Non-hazardous industrial landfill	1) Exempt waste disposal facility 2) Control Recovery, Inc. 3) Lea Land	Roll-off bin when needed
SULFUR, OFF-SPEC	Exempt, Non-hazardous	1) Land discharge 2) Non-hazardous industrial landfill	1) West side of SRU, west of fence 2) Control Recovery, Inc. 3) Lea Land	Sulfur storage yard west of Sulfur Recovery Unit (SRU)
SULFURIC ACID	Non-exempt, Hazardous	Neutralized and landfilled	Safety-Kleen	NA
TIRES, VEHICLE USED	Non-exempt, Non-hazardous	Recycle	The Tire Co. - Carlsbad,NM	NA

Table 3. Inventory of Tanks

Name	Tank Volume	Type	Containment	Storage Contents
Condensate tank (bullet)/SE plant	1700 Bbl	npASST	Earthen dike	NA
Condensate tank (bullet)/SE plant	1700 Bbl	npASST	Earthen dike	NA
Tank (bullet)/SE plant (not in service)	1700 Bbl	npASST	Earthen dike	NA
Tank (bullet)/SE plant tank	1700 Bbl	npASST	Earthen dike	NGL
Tank (bullet)/SE plant tank	1700 Bbl	npASST	Earthen dike	NGL
Tank (bullet)/SE plant tank	1700 Bbl	npASST	Earthen dike	NGL
Gun Barrel Storage Tank	750 Bbl	npASST	Earthen dike	Condensate and Produced Water
Condensate Storage Tank	1000 Bbl	npASST	Earthen dike	Stabilized Condensate
Condensate Storage Tank	1000 Bbl	npASST	Earthen dike	Stabilized Condensate
Water Storage Tank	500 Bbl	npASST	Earthen dike	Water
Lube oil tank/recompressor	210 Bbl	npASST	Earthen dike	NA
Lube oil saddle tank/inlet compressor	52 Bbl	npASST	Concrete	NA
Open-top skimmer tank/skimmer pit	437 Bbl	npAST	Earthen dike	Wastewater
Saltwater tank (steel)/SW plant area(not in serv)	1000 Bbl	npASST	No	To injection
Saltwater tank (fiberglass)/SW plant area	500 Bbl	npAST	Concrete	To injection
Lube oil saddle tank/stablilizer compressor	11.9 Bbl	npASST	Steel	NA
Diesel tank/north plant area	10 Bbl	npASST	Concrete	Diesel
Meropa tank/SW plant area	100 gal	npASST	Steel	Meropa oil
Waste oil tank/west plant area	500 gal	npASST	Concrete	Waste & slop oils
Condensate tank/treatment compound	210 Bbl	npAST	Earthen dike	Cond. Contaminated Water
Condensate tank/treatment compound	210 Bbl	npAST	Earthen dike	Cond. Contaminated Water
Freshwater steel tank/NE plant area	1200 Bbl	npAST	No	Freshwater
Freshwater fiberglass tank/NE plant area	125 Bbl	npAST	No	Freshwater
Softwater tank/SW plant area	90 Bbl	npAST	Concrete	Freshwater
Reverse osmosis freshwater tank/SW plant	280	npAST	No	Freshwater
Glycol steel tank/SW plant area	90 Bbl	npAST	Concrete	Softwater
Sulfur tank/NW plant area	47,000 gal	npUST	No	Liquid sulfur
Large DGA Slop Tank*	200 Bbl	npASST	Earthen dike	Used DGA; Royal Purple oil
Small DGA Slop Tank*	70 Bbl	npASST	Earthen dike	Used DGA; Royal Purple oil
Burolock 2220 Storage Tank	1000 Bbl	npASST	Earthen dike	Calgon Burolock 2220
Ultramine 120 Storage Tank	1000 Bbl	npASST	Earthen dike	Calgon Ultramine 120
Conquor 3470 Storage Tank	1000 Bbl	npASST	Earthen dike	Calgon Conquor 3470
DEA Storage Tank #8	3000 gal	npASST	Earthen dike	New DEA
DEA Storage Tank #9*	4200 gal	npASST	Earthen dike	New DEA
TEG Storage Tank	750 g	npASST	Concrete	TEG
TEG Storage Tank	500 gal	npASST	Concrete	TEG
Methanol Storage Tank	500 gal	npASST	No	Methanol
Methanol Storage Tank	650 g	npASST	No	Methanol
Varsol Storage Tank	400 g	npASST	Concrete	Varsol
Kerosene Storage Tank	400 g	npASST	Concrete	Kerosene
Antifreeze Storage Tank	500 g	npASST	Concrete	Ethylene Glycol antifreeze
Selexol Storage Tank	210 Bbl	npAST	Concrete	Selexol
Caustic soda tank	500 gal	npASST	Steel	Caustic soda
Anti-foam tank	250 gal	npASST	Steel	Coastal Chem. 1017-F
Gun Barrel/treatment compound	500 bbl	npAST	Earthen dike	Cond. Contaminated water
Frac Tank	200 bbl	npAST	No	Fresh water
Frac Tank	200 bbl	npAST	No	Fresh water
Skimmer Oil tank	210 bbl	npAST	Concrete	Oil/water
Skimmer gun barrel	500 bbl	npAST	Concrete	Water/oil
Saltwater tank (east)	500 bbl	npAST	Concrete	Produced water/oil
Saltwater tank (middle)	500 bbl	npAST	Concrete	Produced water/oil
Saltwater tank (west)	500 bbl	npAST	Concrete	Produced water/oil
Calgon Pre-tect 32	500 gal	npASST	Steel	Calgon pretect 32
Gibraltar A-105 Tank (AGC)	500 gal		Steel	Oil

npASST = nonpressurized aboveground saddle storage tank (I.e. 360 degree inspection possible)

npAST = nonpressurized aboveground storage tank (I.e. 360 degree inspection possible)

npUST = nonpressurized underground storage tank

NA = not applicable

Table 4. Inventory of Process Vessels

Source location	Volume (Bbls)	Vessel Type	Vessel Bottom Lined/ Ground Underneath Paved	Contents	Fluids Drained to
Water exchanger/gas inlet	28	APV	In air/no	Cooling tower water	Abandoned OD
Inlet gas separator #1/gas inlet	90	APV	In air/no	Produced water	CD
Inlet gas separator #2/gas inlet	32	APV	In air/yes, conc.foundation pad	Produced water	CD
Air receiver/gas inlet	1	APV	In air/yes, conc. foundation pad	Atmospheric water	Bucket
Inlet separator/inlet compressor	75	APV	In air/no	Produced water	OD
Suction scrubber/inlet compressor	58	APV	In air/yes, conc. foundation pad	Produced water	OD
Air receiver/inlet compressor	3	APV	In air/yes, conc. foundation pad	Atmospheric water	Bucket
Amine contactor/amine sweetening	324	APV	In air/yes, conc. foundation pad	Produced water, amine	CD
Amine contactor overhead gas scrubber/amine sweetening	8	APV	In air/yes, conc. foundation pad	Produced water, amine	CD
Rich amine flash tank/amine sweetening	76	APV	In air/no	Produced water, amine	Amine bag filter
Amine bag filter/amine sweetening	2	APV	In air/yes	Produced water, amine	OD & rich-lean amine exchanger
Condensate stabilizer overhead condenser/amine sweetening	2	APV	In air/no	Produced water	Aerial cooler to stabilizer reflux dru
Amine still condenser/amine sweetening	2	APV	In air/no	Produced water	Aerial cooler to reflux accumulator
Lean amine-water plate exchanger/amine sweetening	2	APV	In air/yes	Produced water, amine	OD
Rich-lean amine exchanger/amine sweetening	22	APV	In air/no	Amine	Amine still
Amine still/amine sweetening	300	APV	In air/yes conc. foundation pad	Reflux water, amine	CD
Amine reflux accumulator/amine sweetening	8	APV	In air/yes conc. foundation pad	Reflux water, amine	CD
Amine still reboiler/amine sweetening	19	APV	In air/no	Reflux water, amine	Steam condensate surge tank
Steam condensate surge tank/amine sweetening	50	APV	In air/no	Condensed steam water	CD
Amine charcoal filter/amine sweetening	60	APV	In air/yes, conc. pad	Amine	Slp amine tank
Glycol water exchanger/glycol dehydration	2	APV	In air/no	Produced water, glycol	
Glycol contactor/glycol dehydration	205	APV	In air/yes, conc. foundation pad	Produced water, glycol	CD
Glycol contactor overhead scrubber/glycol dehydration	8	APV	In air/yes, conc. foundation pad	Produced water, glycol	CD
Glycol regenerator/glycol dehydration	73	APV	In air/no	Produced water, glycol	Atmosphere
Rich-lean glycol exchanger/glycol dehydration	59	APV	In air/no	Glycol	Glycol contactor
Glycol surge tank/glycol dehydration	16	APV	In air/no	Produced water, glycol	OD
Water collection drum/glycol dehydration	3	APV	In air/yes	Steam, glycol	OD
Inlet water separator/inlet condensate	291	APV	In air/no	Produced water, cond.	Abandoned OD
Stabilizer feed tank/inlet condensate	291	APV	In air/no	Produced water, cond.	OD
Regeneration gas scrubber/regeneration gas	10	APV	In air/yes, conc. foundation pad	Produced water, cond.	CD
Product contactor/product treating	128	APV	In air/yes, conc. foundation pad	Amine, KOH	Buckets
Product solvent separator/product treating	16	APV	In air/yes, conc. foundation pad	Amine, KOH	Rich amine flash tank
Acid gas scrubber #1/SRU	11	APV	In air/no	Reflux water	Amine reflux accumulator
Acid gas scrubber #2/SRU	11	APV	In air/no	Reflux water	Amine reflux accumulator
Small condeser/SRU	20	APV	In air/no	Cooling tower water	OD
Large condenser/SRU	59	APV	In air/no	Cooling tower water	CD
Line 1, 3-phase separator/inlet pit	20	APV	In air/no	Produced water, cond.	Skimmer basin
Line 3, 3-phase separator/inlet pit	14	APV	In air/no	Produced water, cond.	Skimmer basin
Line 4, 3-phase separator/inlet pit	36	APV	In air/no	Produced water, cond.	Skimmer basin
Cond.stabilizer feed-bottoms exchanger/cond.stabilization	5	APV	On ground/no	Condensate	Cond.stabilizer tower or cooler
Condensate stabilizer reboiler/cond.stabilization	10	APV	In air/no	Condensate, steam	OD
Condensate stabilizer/cond.stabilization	119	APV	On ground/yes, concrete pad	Condensate	OD
Stabilizer reflux drum/cond. Stabilization	10	APV	On ground/yes, concrete pad	Cond. Reflux water	OD
Stabilizer bottoms cooler/cond. Stabilization	1	APV	In air/no	Condensate	Condensate stabilizer tower or cooler

Table 4. Inventory of Process Vessels

Source location	Volume (Bbls)	Vessel Type	Vessel Bottom Lined/ Ground Underneath Paved	Contents	Fluids Drained to
Steam waste heat boiler #1/steam system	71.4	APV	In air/no	Softwater w/ additives	OD
Steam waste heat boiler #2/steam system	71.4	APV	In air/no	Softwater w/ additives	OD
Steam waste heat boiler #3/steam system	71.4	APV	In air/no	Softwater w/ additives	OD
Blowdown drum/steam system	11.9	APV		Softwater w/ additives	OD
Main boiler/steam system	35.7	APV	In air/no	Softwater w/ additives	OD
Utility flare drum/plant flare system		APV	In air/no	Gas	Flare
Inlet gas flare drum/plant flare system	61	APV	In air/no	Produces water, cond.	Condensate
Stabilizer compressor suction scrubber	2	APV	In air/concrete pad	Condensate	OD
Stabilizer compressor suction scrubber		APV	Concrete pad with berm	Water/lube oil	OD
Inlet compressor		Comp	Concrete pad with berm	Water/lube oil	OD
A-2 Amine contactor	55	APV	In air/yes, conc. foundation pad	Produced water/Amine	CD
A-2 Amine contactor overhead scrubber	8	APV	In air/yes, conc. foundation pad	Produced water/Amine	CD
A-2 Rich Amine Flash tank	35	APV	In air/yes, steel skid	Amine/Produced water	Bag filter
A-2 Amine Pre-bag filter	3	APV	In air/yes, steel skid	Amine	Amine charcoal filter
A-2 Amine Charcoal Filter	12	APV	In air/yes, steel skid	Amine	Amine Post- bag filter
A-2 Amine Post-bag filter	3	APV	In air/yes, steel skid	Amine	High pressure pumps
A-2 Rich/Lean Amine Exchanger	10	APV	In air/yes, steel skid	Amine	Amine still
A-2 Amine Reboiler/Surge Tank	46	APV	In air/yes, steel skid	Reflux water/Amine	CD
A-2 Lean Amine/water heat exchanger	8	APV	In air/yes, steel skid	Produced water/Amine	Pre-bag filter
A-2 Lean Amine cooler	2	APV	In air / no	Amine	Lean Amine/ water exchanger
A-2 Amine condensor fans	2	APV	In air / no	Produced water	Aerial cooler to reflux accumulator
A-2 Amine Reflux Accumulator	9	APV	In air/yes, conc. foundation pad	Reflux water/Amine	CD
A-2 Amine Still	48	APV	In air/yes, conc. foundation pad	Reflux water/Amine	CD
A-2 Rich Bag Filter	5	APV	In air/yes, steel skid	Amine/Produced water	OD rich/ lean amine exchanger
Field Fuel Gas Scrubber South side	7	APV	In air/yes, conc. foundation pad	Fuel gas	Closed drain
Inlet Gas Filter Seperator South side	29	APV	In air/no	Produced water, cond.	Condensate system
Gas/water heat exchanger South side	35	APV	In air/no	Water/gas	Cooling tower
Selexol Contactor	27	APV	In air/yes, conc. foundation pad	In air/yes, conc. foundation pad	Selexol Flash Tank
Selexol Overhead Filter Coalescer	1	APV	In air/yes, conc. foundation pad	In air/yes, conc. foundation pad	Selexol Flash Tank
Selexol Flash Tank	22	APV	In air/yes, steel skid	R.O. Water/Selexol (95%)	Rich Selexol Filter
Selexol (Rich) Filter	3	APV	In air/yes, steel skid	R.O. Water/Selexol (95%)	L/R HEX / OD
Selexol Lean/Rich Heat Exchanger	94	APV	In air/yes, conc. foundation pad	R.O. Water/Selexol (95%)	Selexol Still Column
Selexol Still Column	34	APV	In air/yes, conc. foundation pad	R.O. Water/Selexol (95%)	Selexol Surge Tank/Gun Barrel
Selexol Surge Tank	35	APV	In air/yes, steel skid	R.O. Water/Selexol (95%)	L/R HEX / OD
Selexol Cooler	5	APV	In air/no	R.O. Water/Selexol (95%)	Charcoal Filter
Selexol Charcoal Filter	2	APV	In air/yes, steel skid	R.O. Water/Selexol (95%)	Lean Selexol Filter / OD
Selexol (Lean) Filter	3	APV	In air/yes, steel skid	R.O. Water/Selexol (95%)	OD
Selexol Reflux Cooler	1	APV	In air/no	Process Water/ Selexol (<1%)	Reflux Accumulator / OD
Selexol Reflux Accumulator	2	APV	In air/yes, conc. foundation pad	Process Water/ Selexol (<1%)	Selexol Still Column / OD
Selexol Anti-Foam Pot	0.05	APV	In air/yes, steel skid	Silicone Based Anti-Foam	Selexol Contactor / Still / OD

APV = aboveground process vessel (I.e. 360 degree inspection possible)
comp = compressor
cond. = condensate

OD=Open Drain
CD=Closed Drain

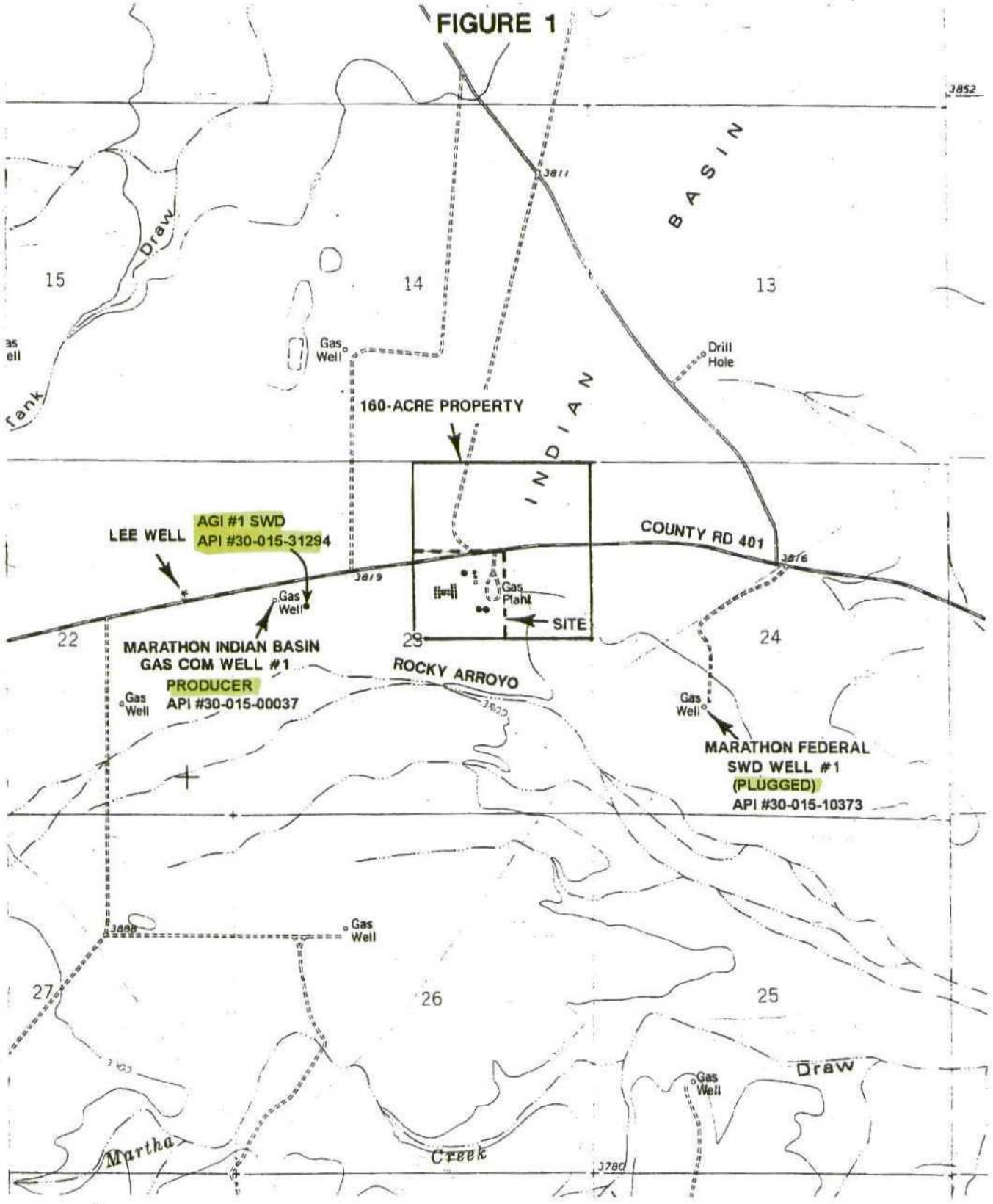
Table 5. Underground Piping

Piping Name	Pathway	Constructed or Modified	Flow Rate (Bbls/day)	Pressure (psig)	Diameter (Inch)	Piping Type	Integrity Test
Open drain system	Various plant units to open drain collection sump	2002	15	no	3.2	IC Steel	Sept 2019
Softwater regeneration	Water softener in water treatment building to fiberglass SWD tank	Before 1990	385	15	2	PVC	Jan 2015
Reverse osmosis wastewater piping (Out of service due to permit)	RO unit in water treatment building to air stripper outlet to infiltration	1991	200	60	2	Poly	Jan 2016
Untreated groundwater bypass piping	Diversion valve at treatment compound to Skimmer Basin	1995	2676	50	2	Poly	Jan 2016
Treated groundwater piping	Air stripper at treatment compound to skimmer basin SWD tank	1995	125	20	6	Poly	Jan 2020
Piping to A.G.I. #1 well	Saltwater tank to injection well	2000	3000	2000	6	Fiberglass	Jan 2020
Waste effluent transfer piping	Open drain collection sump to skimmer basin	1996	80		4	IC Steel	Jan 2011
Co-production line to skimmer basin gunbarrel	Co-production line outside plant to skimmer basin gunbarrel	1996	2000	<10	6	Fiberglass	Jan 2016
Condensate Delivery Sales	Condensate bullet storage tanks(1) to condensate loading area (LA)	1993	300	<10	4	Poly	Mar 2018
SRU waste heat boiler & large condenser blowdown discharge piping (OOS)	Waste heat boiler and large condenser to steel saltwater tank	1985/1992	10	70	2	Steel	Jan 2017
Condensate make line	Stabilizer to condensate bullet storage tanks	1989	300		2	Steel	Jan 2014
Condensate rerun line	Condensate bullet storage tanks to overhead pipe rack	1989	10;100 max	<20	2	Steel	Jan 2014
LACT sump pump to main boiler sump	LACT sump pump to main boiler sump	1966/1989	1	<35	2	Steel/Poly	Jan 2014
Inlet condensate line	Inlet valve pit to overhead pipe rack	1990	350	<30	4	Steel	Jan 2015
Divert line	Inlet valve pit to condensate bullet storage tanks	1993	1	40	2	Poly	Jan 2018
Produced water line	Inlet valve pit to skimmer basin gunbarrel	1996	1500	15	6	Poly	Jan 2018
Product skimmer recovery line	Skimmer basin oil transfer pump to inlet condensate line	1996	20	40	2	Steel	Jan 2011
Dump line	Stabilizer feed tank to skimmer basin	1996	50	40	4	Poly	Jan 2017
Injection line	Fiberglass saltwater tank to pump suction header	1996	3000	30	10	Steel	Jan 2013
Open top tank to skimmer basin gunbarrel	Open top transfer pump to skimmer basin gunbarrel	1996	50	10	2	Steel	Jan 2021
Cooling tower blowdown to skimmer basin	Cooling tower blowdown to skimmer basin SWD tank	1999	200	<10	2	Poly	Jan 2024
Morrow gas separator dump line	Morrow gas separator to closed drain	1996	0	<5	2	Steel	Jan 2021
Closed drain scrubber dump line	Closed drain scrubber to skimmer basin gunbarrel	1996	5	40	2	Poly	Jan 2021
Inlet filter/separator dump line	Inlet filter/separator to inlet condensate line	1998	20	<10	2	Steel	Jan 2023
Inlet filter/separator closed drain connection	Inlet filter/separator to closed drain header	1998	0	40	2	Steel	Jan 2023
Blow down colelction header	Open drain collection sump area to boiler blow down bottle	1996	80	40	2	Steel	Jan 2021
SRU Steam Condensate Return		2001	10	0	2	Stainless	Jan 2009
Horizontal H.P. Inlet Scrubber Closed Drain		1994	1	40	2	Steel	Dec 2019
WHB Blowdown	WHB's to open drain collection sump area	1991	65	100	2	Steel	Jan 2016
Main boiler blowdown to sump	Main boiler to blow down collection header	1996	15	100	2	Steel	Jan 2015
Open drain collection sump pump to skimmer basin gunbarrel	Open drain collection sump pump to skimmer basin gunbarrel	1980	80	100	4	IC Steel	Jan 2005
Stabilizer Compressor Dump		1982	15	30	1	Steel	Jan 2007
Inlet Condensate Divert Line to the Transfer Tank (OOS)	Inlet Condensate Divert Line to the Transfer Tank	1986	1	270	2	Steel	Jan 2011
Line 3 & 4 Metering Separator Oil Dump Line to Inlet Condensate Line	Line 3 & 4 Metering Separator Oil Dump Line to Inlet Cond. Line	1996	200	40	3	Steel	Jan 2018
Inlet Compressor Suction Scrubber (H&V) Dump Lines to Inlet Metering Separator	Inlet Compr. Suction Scrubber (H&V) Dump Lines to Inlet Metering System	1989	3	30	2	Steel	Jan 2014
Recompressor & Expander Lube Oil Makeup Line		1980	<1	150	1	Steel	Jan 2005
Underground Amine Lines Tied to Valve "Octopus" From:							
Little slop		1988	1	5	2	Steel	Jan 2013
Flash tank		1988	1	80	2	Steel	Jan 2013
Bag filters		1988	<1	80	2	Steel	Jan 2013
Charcoal filters		1988	<1	80	2	Steel	Jan 2013
Reflux pumps		1988	1	20	2	Steel	Jan 2013
Amine Storage Tank 8		1988	1	5	2	Steel	Jan 2013
Amine Storage Tank 9		1988	1	5	2	Steel	Jan 2013
Glycol Storage Tank Discharge	Storage Tank transfer pump to glycol flash tank	1999	1	70	2	Poly	Dec 2019
Acid Gas Compressor Suction Line	SRU to Acid Gas Compressor	1996	1MMSCF/d	6	10	Steel	Jan 2021
Acid Gas Compressor Sweet Purge Gas	Pipe rack at Glycol Unit to Acid Gas Compressor	1996		50	2	Steel	Jan 2021
Acid Gas Compressor instrument air	Pipe rack at Glycol Unit to Acid Gas Compressor	1996		80	2	Steel	Jan 2021
Selexol reflux water	Selexol unit to gunbarrel	2002	1	20	2	Steel	None scheduled
Selexol underground pipeline	Selexol storage tank to Selexol Unit	2002	As needed	25	2	Steel	None scheduled
Glycol flash gas to Closed Drain	Glycol flash tank to closed drain scrubber	2003	1 MMSCF/d	100	2"	steel	-
Cylcone dump to Closed Drain	Cylcone to Closed drain scrubber	2003		1000	2"/3"	steel	-

Table 6. Soil Treatment Cleanup Standards

Use of Treated Soil	Cleanup Standards (mg/kg)		
	TRPH (EPA 418.1)	Total BTEX	Benzene
Reburied	100	50	10
Stormwater control dikes	1000	50	10
Secondary containment berms in the gas plant	3000	50	10
Roadspread or patching lease roads	3000	50	10
Pad dirt on production locations	3000	50	10

FIGURE 1



HG002048001

Find Rebar w/ Yellow Plastic Cap MRKD "676"

S. 89°58'40" E.

1320.34'

Rain Gauge on Post For Bur. Q Phone Cable

Find Rebar w/ No Yellow Plastic Cap

21 FT WIDE PAVEMENT

ENTRANCE GATE

ESD LINE

EARTH BERM

EDDY COUNTY ROAD 401

15' PLANT ROAD

HEATER

N

6" CHAIN LINK FENCE

OFFICE BUILDING

SEPTIC TANK

NEW MAIN CONTROL ROOM

TRAILER HOUSE

WELDING SHOP

CONTAINMENT DIKE

TANK STORAGE

GATE

4' GATE

AIR STRIPPER COMPOUND

3' PIPE FENCE

6' CHAIN LINK FENCE

0 25 50 FEET

FRESH WATER TANK

FRESH WATER PUMP BUILDING

FIRE PUMP BUILDING

PULL BOX "A"

STABILIZER COMPRESSOR

INSTRUMENT AIR COMPRESSOR AND WAREHOUSE BLDG.

PARKING

OFFICE

PARKING

PARKING

WORK SHOP

WAREHOUSE

4' GATE

IRON PIPE & CABLE FENCE

GATE

SULFUR PIT

5' BERM

4' GATE

LIQUID SULFUR STORAGE (UNDERGROUND)

ACID GAS SCRUBBER

SULFUR TICKET BLDG.

SULFUR STACK INCINERATOR

SRU SKID

AMINE & GLYCOL SYSTEMS

CALOON TANK

WATER COOLING TOWER

SULFURIC ACID

WATER PUMPS

INST. AIR SCRUBBERS

STABILIZER COMPRESSOR SUCTION SCRUBBER

MAC BLDG.

PROPANE CHILLER TANK

ETHANE/PROPANE SEPARATOR

CRYO #2 SKID

CRYO #1 SKID

CRYO #1 EXPANDER SKID

DEMETH. SKID CRYO #2

CRYOGENIC SKIDS

OVERFLOW AMINE SLOP TANK

AMINE SLOP TANK

AMINE STOR. TANK 9

AIR COMPRESSORS

STEAM BOILER (EP)

ACID GAS SCRUBBER

ULTRAMINE TANK

ADA BUILDING

MOLECULAR SIEVE REGENERATION GAS HEATERS

CHARCOAL

AMINE FLASH TANK

DEHY SKID

COOLER

AMINE COAT./ESCER

INLET SEPARATORS

OLD FUEL GAS SCRUBBER

H.P. AMINE PUMPS

STABILIZER REFLUX ACCUM.

STABILIZER TOWER

STABILIZER REBOILER

STABILIZER HX

STABILIZER FEED TANK

INLET CONDENSATE TANK

OLD CONTROL ROOM

RES. GAS COMP. BATTERY BLDG.

TURBINE OIL

WATER SOFTENER BUILDING

SOFT WATER PUMPS

SOFT WATER TANKS

H.P. GLYCOL PUMPS

INLET FILTER

GLYCOL FILTERATION

GLYCOL COOLER

INLET COALESCER

CONTACTOR

N. GEN.

M. GEN.

S. GEN.

EMERGENCY GENERATOR BUILDING

SALT WATER PUMPS

SALT WATER TANK

GLYCOL STORAGE TANK

GLYCOL REBOILER (OVERHEAD) GLYCOL HX

GLYCOL SURGE TANK

FW-17.203 CIRC. PUMPS

PROPANE TANK

FUEL GAS SCRUBBER

LEAN AMINE COOLER

AMINE OVERHEAD SCRUBBER

ACC-2 BUILDING

FIN FAN COOLERS

UNIT A

UNIT B

UNIT C

UNIT D

RESIDUE GAS COMPRESSORS

UNIT A

UNIT B

UNIT C

COMPRESSOR UNIT D

ES-24

ES-12

BOILER

AIR FILTER INTAKE

HT-17.204 SELEXOL COOLER

HT-17.203 SELEXOL COND.

PV-17.204 SELEXOL STILL

REGEN SKID

FLASH TANK SKID

PV-17.201 SELEXOL CONTACTOR

HT-17.201

PV-17.201 COALESCING FILTER

AMINE A-2 SKID

SALT WATER TANKS

COND. SEPARATOR TANK

SWD SKID

SKIMMER OIL TANK

SWD CONTROL BUILDING

FLARE SCRUBBER

ELEC PANEL

6' CHAIN LINK FENCE

LANDFILL

5' EARTH BERM

LAND FARM

15' PLANT ROAD

EARTH BERM

IRON PIPE & CABLE FENCE

CONC. SLAB DRUM STORAGE

EARTH BERM

INLET GAS COOLER

INLET GAS COMPRESSOR CONTROL ROOM

INLET GAS COMPRESSOR

PV-12V104 METER SEP.

PV-34LV400 INLET GAS FLARE DRAIN

CONOCO ESD VALVE

ESD VALVE

CLOSED BLOWDOWN DRAIN TANK

INLET VALVE PIT

PV-20-3286 LINE 1 SEP.

PV-20-4679 LINE 4 SEP.

MAPCO BUILDING

1000 Bbl Condensate Storage

500 Bbl Water Tank

750 Bbl Gunbarrel

NEW CONDENSATE TANKS

OLD CONDENSATE TANKS

5A

5B

GATE

STORAGE TANK CONDENSATE

NATURAL GASOLINE 3A

NATURAL GASOLINE 3B

BUTANE 2A

BUTANE 2B

PROPANE 1A

PROPANE 1B

PROPANE 1C

6' CHAIN LINK FENCE

SEPERATOR

SEPERATOR

6' CHAIN LINK FENCE

GATE

4' GATE

CABLE FENCE

TANK NORM STORAGE #2

PIPE FENCE

GATE

PIPE FENCE

PIPE FENCE

W ES-13

W ES-14

EARTH BERM

EARTH BERM

LOADING RAMP

LIGHT POLE

HYDRANT

LACT UNIT

ELECTRIC PANEL

FIRE EXTINGUISHER CONCRETE PAD

VALVE BOX

LOADING DOCK

LOADING DOCK

Norm Storage Area #1 4str Bw Fence

Tank

Find Rebar w/ Yellow Plastic Cap "Illegible"

N. 89°58'40" W.

1320.49'

Find Rebar w/ No Yellow Plastic Cap

1319.50'

1320.08'

N.00°04'35" W.

S.00°04'58" E.

sulfur disposal AREA ?

NSFI CLOSURE PLAN

OLD SKIMMER BASIN

2004 3/22/05

Marathon Oil Company Houston, Texas

PRELIMINARY APP.	DATE	FINAL APP.	DATE

DATE	BY	REVISIONS
8/1/96	JLS	MINOR REVISIONS
5/31/00	VHR	UPDATED BY AL COMPTON
3/25/02	CH	ADDED SELEXOL UNIT & DEHY "D"
7/1/02	SSJ	REVISED FOR ALCOT
1/22/04	DGB	REVISED FOR MOC 04-006 Ethanol Tank
12/08/04	MLN	MINOR REVISIONS

FIGURE 2
INDIAN BASIN GAS PLANT
PLOT PLAN

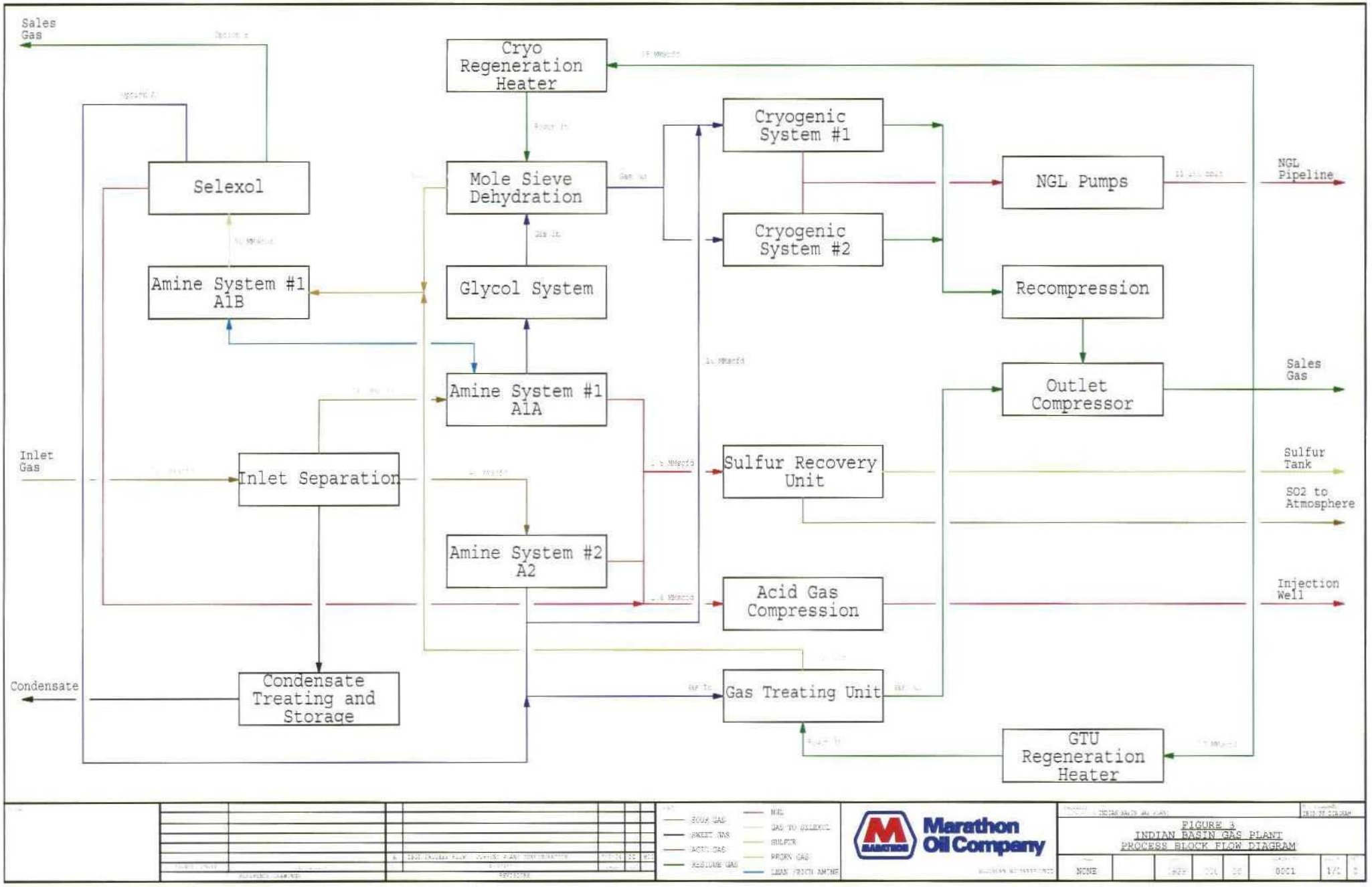
SCALE: AS SHOWN DATED: 2 - 26 - 92

DRAFTED BY: MICHAEL REED DWG. NO.

BY: MAHA RATANABANTITAYADHANA IBGPPP

INDIAN BASIN GAS FIELD

SCALE: 42"x1"


Sales Gas
Cryo Regeneration Heater
Cryogenic System #1
Selexol
Mole Sieve Dehydration
NGL Pumps
NGL Pipeline
Cryogenic System #2
Amine System #1 A1B
Glycol System
Recompression
Amine System #1 A1A
Outlet Compressor
Sales Gas
Inlet Gas
Inlet Separation
Sulfur Recovery Unit
Sulfur Tank
SO2 to Atmosphere
Amine System #2 A2
Acid Gas Compression
Injection Well
Condensate
Condensate Treating and Storage
Gas Treating Unit
GTU Regeneration Heater
Marathon Oil Company
FIGURE 3
INDIAN BASIN GAS PLANT
PROCESS BLOCK FLOW DIAGRAM

APPENDIX A

LABORATORY RESULTS OF COMMINGLED DISCHARGE FLUID

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ANALYTICAL REPORT

JOB NUMBER: 912816

Prepared For:

Marathon Oil Company
125 West Missouri Street
P.O. Box 552
Midland, TX 79702-0552

Attention: Mr. Paul Peacock

Date: 11/16/99

Les Arnold
Signature

11/16/99
Date

Name: Les Arnold

Title: Laboratory Manager

Severn Trent Laboratories
2400 Cumberland Drive
Valparaiso, IN 46383

PHONE: 219-464-2389
FAX..: 219-462-2953

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SAMPLE INFORMATION
Date: 11/16/99

Job Number.: 912816
Customer...: Marathon Oil Company
Attn.....: Mr. Paul Peacock

Project Number.....: 96000651
Customer Project ID....: INDIAN BASIN GAS PLT
Project Description....: Marathon Oil Co., Midland, Tx

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
912816-1	COMINGLED GAS PLT WASTE EFFLUENT	Aqueous	11/08/1999	10:00	11/09/1999	15:25

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LABORATORY TEST RESULTS

Job Number: 912816

Date: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: INDIAN BASIN GAS PLT ATTN: Mr. Paul Peacock

Customer Sample ID: COMINGLED GAS PLT WASTE EFFLUENT
Date Sampled.....: 11/08/1999
Time Sampled.....: 10:00
Sample Matrix.....: Aqueous

Laboratory Sample ID: 912816-1
Date Received.....: 11/09/1999
Time Received.....: 15:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
EPA 160.1	Solids, Total Dissolved (TDS)	21000	10	mg/L	11/10/99	lam
EPA 300.0	Chloride	6600	1000	mg/L	11/10/99	kso
EPA 300.0	Fluoride (F)	<50	50	mg/L	11/10/99	kso
EPA 300.0	Nitrogen, Nitrate as N (NO3-N)	<1.0	1.0	mg/L	11/10/99	kso
EPA 300.0	Sulfate (SO4)	1460	100	mg/L	11/10/99	kso
EPA 420.2	Phenol, Total Recoverable	0.18	0.05	mg/L	11/11/99	dmw
SM 4500 CN	Cyanide, Total	0.08	0.05	mg/L	11/15/99	jdb
EPA 3010	Acid Digestion, Metals (ICP)	Complete			11/10/99	amw
PA 7470	Mercury (Hg)	<0.001	0.001	mg/L	11/11/99	pal
EPA 3510	Separatory Funnel Liq/Liq Extraction	Complete			11/12/99	bjl
EPA 6010B	Metals Analysis (ICAP)					
	Aluminum (Al)	<0.1	0.1	mg/L	11/11/99	pal
	Arsenic (As)	<0.02	0.02	mg/L	11/10/99	amw
	Barium (Ba)	0.06	0.01	mg/L	11/10/99	chh
	Boron (B)	1.67	0.05	mg/L	11/11/99	pal
	Cadmium (Cd)	<0.005	0.005	mg/L	11/10/99	chh
	Chromium (Cr)	0.01	0.01	mg/L	11/10/99	chh
	Cobalt (Co)	<0.03	0.03	mg/L	11/10/99	chh
	Copper (Cu)	0.02	0.01	mg/L	11/10/99	chh
	Iron (Fe)	6.83	0.05	mg/L	11/10/99	chh
	Lead (Pb)	<0.05	0.05	mg/L	11/10/99	chh
	Manganese (Mn)	0.23	0.01	mg/L	11/10/99	chh
	Molybdenum (Mo)	<0.05	0.05	mg/L	11/10/99	chh
	Nickel (Ni)	0.03	0.01	mg/L	11/10/99	chh
	Selenium (Se)	<0.02	0.02	mg/L	11/10/99	amw
	Silver (Ag)	<0.01	0.01	mg/L	11/10/99	amw
	Zinc (Zn)	0.21	0.01	mg/L	11/10/99	chh
EPA 8310	Polynuclear Aromatic Hydrocarbons-HPLC					
	Acenaphthene	ND	5.0	ug/L	11/16/99	rm
	Acenaphthylene	ND	5.0	ug/L	11/16/99	rm
	Anthracene	ND	1.0	ug/L	11/16/99	rm
	Benzo(b)fluoranthene	ND	0.10	ug/L	11/16/99	rm
	Benzo(k)fluoranthene	ND	0.10	ug/L	11/16/99	rm
	Benzo(a)anthracene	ND	0.10	ug/L	11/16/99	rm
	Benzo(a)pyrene	ND	0.10	ug/L	11/16/99	rm
	Benzo(ghi)perylene	ND	0.10	ug/L	11/16/99	rm
	Chrysene	ND	1.0	ug/L	11/16/99	rm

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LABORATORY TEST RESULTS

Job Number: 912816

Date: 11/16/99

CUSTOMER: Marathon Oil Company | PROJECT: INDIAN BASIN GAS PLT | ATTN: Mr. Paul Peacock

Customer Sample ID: COMINGLED GAS PLT WASTE EFFLUENT
Date Sampled.....: 11/08/1999
Time Sampled.....: 10:00
Sample Matrix.....: Aqueous

Laboratory Sample ID: 912816-1
Date Received.....: 11/09/1999
Time Received.....: 15:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	REPORTING LIMIT	UNITS	DATE	TECH
	Dibenzo(a,h)anthracene	ND	0.10	ug/L	11/16/99	rm
	Fluoranthene	ND	1.0	ug/L	11/16/99	rm
	Fluorene	ND	1.0	ug/L	11/16/99	rm
	Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L	11/16/99	rm
	Naphthalene	<5.0	5.0	ug/L	11/16/99	rm
	Phenanthrene	ND	1.0	ug/L	11/16/99	rm
	Pyrene	ND	1.0	ug/L	11/16/99	rm
EPA 8260B	Volatile Organic Compounds					
	Vinyl chloride	ND	500	ug/L	11/15/99	weh
	1,1-Dichloroethene	ND	200	ug/L	11/15/99	weh
	Methylene chloride	ND	200	ug/L	11/15/99	weh
	Benzene	4300	200	ug/L	11/15/99	weh
	Carbon tetrachloride	ND	200	ug/L	11/15/99	weh
	Chloroform	ND	200	ug/L	11/15/99	weh
	1,2-Dibromoethane (EDB)	ND	200	ug/L	11/15/99	weh
	1,1-Dichloroethane	ND	200	ug/L	11/15/99	weh
	1,2-Dichloroethane	ND	200	ug/L	11/15/99	weh
	Ethylbenzene	700	200	ug/L	11/15/99	weh
	1,1,2,2-Tetrachloroethane	ND	200	ug/L	11/15/99	weh
	Tetrachloroethene	ND	200	ug/L	11/15/99	weh
	Toluene	13000	200	ug/L	11/15/99	weh
	1,1,1-Trichloroethane	ND	200	ug/L	11/15/99	weh
	1,1,2-Trichloroethane	ND	200	ug/L	11/15/99	weh
	Trichloroethene	ND	200	ug/L	11/15/99	weh
	Xylenes (total)	7000	500	ug/L	11/15/99	weh

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company

PROJECT: Marathon Oil Co., Midland, Tx

ATTN: Mr. Paul Peacock

Test Method.....: EPA 300.0
Method Description.: Ion Chromatography Analysis
Parameter.....: Chloride

Batch.....: 49213
Units.....: mg/L

Analyst...: kso
Test Code.: CHL

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		V199269C	9.197		10		92.0	%	85-115	11/10/1999	1149
ICB			0.274							11/10/1999	1202
CCV		V199269C	9.602		10		96.0	%	85-115	11/10/1999	1253
CCB			0.277							11/10/1999	1306
CCV		V199269C	9.760		10		97.6	%	85-115	11/10/1999	1358
CCB			0.317							11/10/1999	1411
MD	912816-1		6.777.269			6.645604	2.0	R	20	11/10/1999	1436
MS	912816-1	V199269B	17.954		10.000000	6.645604	113.1	%	75-125	11/10/1999	1449
CCV		V199269C	9.837		10		98.4	%	85-115	11/10/1999	1502
CCB			0.320							11/10/1999	1515

Test Method.....: SM 4500 CN
Method Description.: Cyanide
Parameter.....: Cyanide, Total

Batch.....: 49471
Units.....: mg/L

Analyst...: jdb
Test Code.: CNT

	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
			0.000461							11/15/1999	1857
ICV		V199237D	0.100252		0.1		100.3	%	85-115	11/15/1999	1857
MB			-0.000704							11/15/1999	1858
LCS		V199237C	0.081533		0.080000		101.9	%	80-120	11/15/1999	1859
MD	912698-4		0.006644			0.001112	0.005532	A	0.005000	11/15/1999	1901
MS	912698-4	V199237C	0.217930		0.200000	0.001112	108.4	%	75-125	11/15/1999	1901
CCV		V199237D	0.103436		0.1		103.4	%	85-115	11/15/1999	1906
CCB			0.000040							11/15/1999	1907
CCV		V199237D	0.098843		0.1		98.8	%	85-115	11/15/1999	1916
CCB			0.001002							11/15/1999	1917
CCV		V199237D	0.096158		0.1		96.2	%	85-115	11/15/1999	1927
CCB			0.001337							11/15/1999	1929
CCV		V199237D	0.098777		0.1		98.8	%	85-115	11/15/1999	1931
CCB			0.001160							11/15/1999	1932

Test Method.....: EPA 300.0
Method Description.: Ion Chromatography Analysis
Parameter.....: Fluoride (F)

Batch.....: 49213
Units.....: mg/L

Analyst...: kso
Test Code.: FL

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		V199269C	1.063		1		106.3	%	85-115	11/10/1999	1149
ICB			0.0000							11/10/1999	1202
CCV		V199269C	1.071		1		107.1	%	85-115	11/10/1999	1253
CCB			0.000							11/10/1999	1306
MD	912816-1		0.00			0.00	0.00	A	0.50	11/10/1999	1332
MS	912816-1	V199269B	0.952		1.000000	0.00	95.2	%	75-125	11/10/1999	1345
CCV		V199269C	0.965		1		96.5	%	85-115	11/10/1999	1358
CCB			0.000							11/10/1999	1411
CCV		V199269C	0.973		1		97.3	%	85-115	11/10/1999	1502
CCB			0.000							11/10/1999	1515

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816 — Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company — PROJECT: Marathon Oil Co., Midland, Tx — ATTN: Mr. Paul Peacock

Test Method.....: EPA 300.0 — Batch.....: 49213 — Analyst...: kso
Method Description.: Ion Chromatography Analysis — Units.....: mg/L — Test Code.: NO3
Parameter.....: Nitrogen, Nitrate as N (NO3-N)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		V199269C	0.944		1		94.4	%	85-115	11/10/1999	1149
ICB			0.010							11/10/1999	1202
MD	912816-1		0.0158			0.000	0.0158	A	0.1000	11/10/1999	1228
MS	912816-1	V199269B	0.890		1.000000	0.000	89.0	%	75-125	11/10/1999	1241
CCV		V199269C	0.986		1		98.6	%	85-115	11/10/1999	1253
CCB			0.010							11/10/1999	1306
CCV		V199269C	1.007		1		100.7	%	85-115	11/10/1999	1358
CCV		V199269C	0.999		1		99.9	%	85-115	11/10/1999	1502
CCB			0.011							11/10/1999	1515

Test Method.....: EPA 420.2 — Batch.....: 49279 — Analyst...: dmw
Method Description.: Phenolics, Total Recoverable (Auto.) — Units.....: mg/L — Test Code.: PHENTR
Parameter.....: Phenol, Total Recoverable

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
		V199270G	0.198905		0.2000		99.5	%	85-115	11/11/1999	1451
			-0.002587							11/11/1999	1452
LCS		V199268C	0.089323		0.100000		89.3	%	80-120	11/11/1999	1453
MB			-0.003807							11/11/1999	1453
MS	912777-2	V199268C	0.095418		0.100000	-0.005935	101.4	%	75-125	11/11/1999	1455
MD	912777-2		-0.004557			-0.005935	0.001378	A	0.005000	11/11/1999	1455
CCV		V199270G	0.198366		0.2000		99.2	%	85-115	11/11/1999	1502
CCB			-0.002379							11/11/1999	1503
CCV		V199270G	0.200532		0.2000		100.3	%	85-115	11/11/1999	1510
CCB			-0.003195							11/11/1999	1511
CCV		V199270G	0.199045		0.2000		99.5	%	85-115	11/11/1999	1514
CCB			-0.003235							11/11/1999	1514

Test Method.....: EPA 160.1 — Batch.....: 49210 — Analyst...: lam
Method Description.: Solids, Total Dissolved (TDS) — Units.....: mg/L — Test Code.: TDS
Parameter.....: Solids, Total Dissolved (TDS)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
MB			0.0							11/10/1999	1410
LCS		V199269D	9503.0		10000		95.0	%	80-120	11/10/1999	1420
MD	912804-1		1782.0			1774.0	0.4	R	20	11/10/1999	1450
MS	912804-1	V199269D	2326.0		500.000000	1774.0	110.4	%	75-125	11/10/1999	1500

Test Method.....: EPA 300.0 — Batch.....: 49213 — Analyst...: kso
Method Description.: Ion Chromatography Analysis — Units.....: mg/L — Test Code.: SO4
Parameter.....: Sulfate (SO4)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		V199269C	20.217		20		101.1	%	85-115	11/10/1999	1149
ICB			0.506							11/10/1999	1202
		V199269C	20.660		20		103.3	%	85-115	11/10/1999	1253
			0.506							11/10/1999	1306

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company

PROJECT: Marathon Oil Co., Midland, Tx

ATTN: Mr. Paul Peacock

Test Method.....: EPA 300.0
Method Description.: Ion Chromatography Analysis
Parameter.....: Sulfate (SO4)

Batch.....: 49213
Units.....: mg/L

Analyst...: kso
Test Code.: SO4

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
MD	912816-1		14.51647			14.61164	0.7	R	20	11/10/1999	1332
MS	912816-1	V199269B	35.568		20.000000	14.61164	104.8	%	75-125	11/10/1999	1345
CCV		V199269C	21.063		20		105.3	%	85-115	11/10/1999	1358
CCB			0.485							11/10/1999	1411
CCV		V199269C	21.054		20		105.3	%	85-115	11/10/1999	1502
CCB			0.503							11/10/1999	1515

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Aluminum (Al)

Batch.....: 49281
Units.....: mg/L

Analyst...: pal
Test Code.: AL

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.00630		0.00					11/11/1999	1003
CAL		ICPCALSTD	2.17210		10.0					11/11/1999	1008
ICV		V211204A	2.03914		2.00		102.0	%	90-110	11/11/1999	1026
ICB			-0.01382							11/11/1999	1030
		V211206A	488.59609		500.0		97.7	%	80-120	11/11/1999	1035
PB	1110-2		0.01572							11/11/1999	1046
LCS	1110-2	ICPSPK99B	1.02274		1.000		102.3	%	80-120	11/11/1999	1051
MD	912804-1		0.01623			0.04165	0.02542	A	0.10000	11/11/1999	1100
MS	912804-1	ICPSPK99B	1.16268		1.000	0.04165	112.1	%	75-125	11/11/1999	1104
ISB		V211206A	473.41082		500.0		94.7	%	80-120	11/11/1999	1132
CCV		V211204A	1.97128		2.00		98.6	%	90-110	11/11/1999	1143
CCB			-0.01565							11/11/1999	1148

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Arsenic (As)

Batch.....: 49229
Units.....: mg/L

Analyst...: amw
Test Code.: AS

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		V211205B	4.11327		4.00		102.8	%	90-110	11/10/1999	2109
ICB			0.00220							11/10/1999	2115
PB	1103-3		0.00598							11/10/1999	2144
LCS	1103-3	ICPSPK99B	0.53014		0.5000		106.0	%	80-120	11/10/1999	2150
MD	912510-1		0.02004			0.03000	0.00996	A	0.02000	11/10/1999	2202
MS	912510-1	ICPSPK99B	0.58903		0.5000	0.03000	111.8	%	75-125	11/10/1999	2207
PB	1110-2		0.00174							11/10/1999	2228
LCS	1110-2	ICPSPK99B	0.51947		0.5000		103.9	%	80-120	11/10/1999	2234
CCV		V211205B	4.09142		4.00		102.3	%	90-110	11/10/1999	2240
CCB			0.00120							11/10/1999	2246
MD	912804-1		0.02857			0.03230	0.00373	A	0.02000	11/10/1999	2257
MS	912804-1	ICPSPK99B	0.51995		0.5000	0.03230	97.5	%	75-125	11/10/1999	2303
PB	1108-1		0.00689							11/10/1999	2315
LCS	1108-1	V16008711	0.50299		0.516906		97.3	%	80-120	11/10/1999	2323
MS	912685-1	V16008208	1.72295		2.000000	0.00515	85.9	%	75-125	11/10/1999	2336
MSD	912685-1	V16008208	1.78756	1.72295	2.000000	0.00515	89.1	%	75-125	11/10/1999	2342
							3.7	R	20		
		V211205B	3.61105		4.00		90.3	%	90-110	11/11/1999	0006
			-0.00010							11/11/1999	0012

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company

PROJECT: Marathon Oil Co., Midland, Tx

ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Barium (Ba)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: BA

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	-0.00120		0.00					11/10/1999	1432
CAL		ICPCALSTD	0.99510		1.00					11/10/1999	1439
ICV		V211204A	2.07557		2.00		103.8	%	95-105	11/10/1999	1501
ICB			0.00050							11/10/1999	1506
ISB		V211204E	0.50175		0.50		100.3	%	80-120	11/10/1999	1510
CCV		V211204A	2.02930		2.00		101.5	%	95-105	11/10/1999	1602
CCB			0.00100							11/10/1999	1607
PB	1110-2		0.00100							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.50697		0.5000		101.4	%	80-120	11/10/1999	1634
MD	912804-1		0.45277			0.45106	0.4	R	20	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.97761		0.5000	0.45106	105.3	%	75-125	11/10/1999	1646
CCV		V211204A	2.09976		2.00		105.0	%	95-105	11/10/1999	1713
CCB			0.00130							11/10/1999	1717
PB	1108-5		0.00010							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.52072		0.5000		104.1	%	80-120	11/10/1999	1755
CCV		V211204A	2.07467		2.00		103.7	%	95-105	11/10/1999	1803
CCB			0.00010							11/10/1999	1807
		V211204A	1.97571		2.00		98.8	%	95-105	11/10/1999	1947
			0.00115							11/10/1999	1953
ISB		V211204E	0.48981		0.50		98.0	%	80-120	11/10/1999	1956
MD	912691-2		0.06832			0.06634	2.9	R	20	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.54399		0.5000	0.06634	95.5	%	75-125	11/10/1999	2009
ISB		V211204E	0.48180		0.50		96.4	%	80-120	11/10/1999	2022
CCV		V211204A	1.96174		2.00		98.1	%	95-105	11/10/1999	2032
CCB			0.00097							11/10/1999	2036

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Boron (B)

Batch.....: 49281
Units.....: mg/L

Analyst...: pal
Test Code.: B

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.01799							11/11/1999	1003
CAL		ICPCALSTD	1.17519		2.00					11/11/1999	1020
ICV		V211204A	1.90770		2.00		95.4	%	90-110	11/11/1999	1026
ICB			0.00034							11/11/1999	1030
PB	1110-2		0.00674							11/11/1999	1046
LCS	1110-2	ICPSPK99B	0.48306		0.5000		96.6	%	80-120	11/11/1999	1051
MD	912804-1		0.34013			0.31991	6.1	R	20	11/11/1999	1100
MS	912804-1	ICPSPK99B	0.88627		0.5000	0.31991	113.3	%	75-125	11/11/1999	1104
CCV		V211204A	1.82682		2.00		91.3	%	90-110	11/11/1999	1143
CCB			-0.00276							11/11/1999	1148

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Cadmium (Cd)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: CD

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.00179		0.00					11/10/1999	1432
CAL		ICPCALSTD	3.98740		3.00					11/10/1999	1443
ICV		V211204A	2.04204		2.00		102.1	%	95-105	11/10/1999	1501
ICB			-0.00090							11/10/1999	1506
ISB		V211204E	0.89071		1.00		89.1	%	80-120	11/10/1999	1510
CCV		V211204A	1.99431		2.00		99.7	%	95-105	11/10/1999	1602
CCB			0.00067							11/10/1999	1607
PB	1110-2		-0.00173							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.04821		0.05000		96.4	%	80-120	11/10/1999	1634
MD	912804-1		0.00075			-0.00233	0.00308	A	0.00500	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.04670		0.05000	-0.00233	98.1	%	75-125	11/10/1999	1646
CCV		V211204A	2.02239		2.00		101.1	%	95-105	11/10/1999	1713
CCB			0.00037							11/10/1999	1717
PB	1108-5		-0.00331							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.05024		0.05000		100.5	%	80-120	11/10/1999	1755
CCV		V211204A	2.00440		2.00		100.2	%	95-105	11/10/1999	1803
CCB			-0.00007							11/10/1999	1807
		V211204A	2.02085		2.00		101.0	%	95-105	11/10/1999	1947
			0.00349							11/10/1999	1953
ISB		V211204E	0.90071		1.00		90.1	%	80-120	11/10/1999	1956
MD	912691-2		-0.00065			-0.00092	0.00027	A	0.00500	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.05126		0.05000	-0.00092	104.4	%	75-125	11/10/1999	2009
ISB		V211204E	0.91419		1.00		91.4	%	80-120	11/10/1999	2022
CCV		V211204A	2.07255		2.00		103.6	%	95-105	11/10/1999	2032
CCB			0.00026							11/10/1999	2036

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Chromium (Cr)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: CR

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.00069		0.00					11/10/1999	1432
CAL		ICPCALSTD	0.48109		1.0					11/10/1999	1436
ICV		V211204A	1.98753		2.00		99.4	%	95-105	11/10/1999	1501
ICB			0.00228							11/10/1999	1506
ISB		V211204E	0.44476		0.50		89.0	%	80-120	11/10/1999	1510
CCV		V211204A	1.94411		2.00		97.2	%	95-105	11/10/1999	1602
CCB			0.00061							11/10/1999	1607
PB	1110-2		-0.00291							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.19136		0.2000		95.7	%	80-120	11/10/1999	1634
MD	912804-1		-0.00145			-0.00104	0.00041	A	0.01000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.18719		0.2000	-0.00104	94.1	%	75-125	11/10/1999	1646
CCV		V211204A	1.97649		2.00		98.8	%	95-105	11/10/1999	1713
CCB			0.00353							11/10/1999	1717
PB	1108-5		-0.00187							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.19530		0.2000		97.7	%	80-120	11/10/1999	1755
CCV		V211204A	1.94762		2.00		97.4	%	95-105	11/10/1999	1803
CCB			0.00291							11/10/1999	1807
CCV		V211204A	1.97503		2.00		98.8	%	95-105	11/10/1999	1947
			0.00570							11/10/1999	1953
		V211204E	0.45111		0.50		90.2	%	80-120	11/10/1999	1956

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816 Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B Batch.....: 49224 Analyst...: chh
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: CR
Parameter.....: Chromium (Cr)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
MD	912691-2		0.09901			0.09012	9.4	R	20	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.28722		0.2000	0.09012	98.5	%	75-125	11/10/1999	2009
ISB		V211204E	0.44951		0.50		89.9	%	80-120	11/10/1999	2022
CCV		V211204A	1.99441		2.00		99.7	%	95-105	11/10/1999	2032
CCB			0.00889							11/10/1999	2036

Test Method.....: EPA 6010B Batch.....: 49224 Analyst...: chh
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: CO
Parameter.....: Cobalt (Co)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.00009		0.00					11/10/1999	1432
CAL		ICPCALSTD	0.66299		1.00					11/10/1999	1439
ICV		V211204A	2.07074		2.00		103.5	%	95-105	11/10/1999	1501
ICB			-0.00150							11/10/1999	1506
		V211204E	0.43837		0.50		87.7	%	80-120	11/10/1999	1510
		V211204A	2.02262		2.00		101.1	%	95-105	11/10/1999	1602
CCB			0.00015							11/10/1999	1607
PB	1110-2		-0.00030							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.50339		0.5000		100.7	%	80-120	11/10/1999	1634
MD	912804-1		-0.00090			0.00045	0.00135	A	0.02000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.49766		0.5000	0.00045	99.4	%	75-125	11/10/1999	1646
CCV		V211204A	2.05672		2.00		102.8	%	95-105	11/10/1999	1713
CCB			0.00075							11/10/1999	1717
PB	1108-5		-0.00316							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.51802		0.5000		103.6	%	80-120	11/10/1999	1755
CCV		V211204A	2.03333		2.00		101.7	%	95-105	11/10/1999	1803
CCB			-0.00075							11/10/1999	1807
CCV		V211204A	1.97970		2.00		99.0	%	95-105	11/10/1999	1947
CCB			-0.00080							11/10/1999	1953
ISB		V211204E	0.43766		0.50		87.5	%	80-120	11/10/1999	1956
MD	912691-2		0.00531			0.00211	0.00320	A	0.02000	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.50418		0.5000	0.00211	100.4	%	75-125	11/10/1999	2009
ISB		V211204E	0.43685		0.50		87.4	%	80-120	11/10/1999	2022
CCV		V211204A	2.01401		2.00		100.7	%	95-105	11/10/1999	2032
CCB			-0.00241							11/10/1999	2036

Test Method.....: EPA 6010B Batch.....: 49224 Analyst...: chh
Method Description.: Metals Analysis (ICAP) Units.....: mg/L Test Code.: CU
Parameter.....: Copper (Cu)

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	-0.00010		0.00					11/10/1999	1432
CAL		ICPCALSTD	0.23160		1.00					11/10/1999	1439
ICV		V211204A	2.05607		2.00		102.8	%	95-105	11/10/1999	1501
ICB			0.00646							11/10/1999	1506
ISB		V211204E	0.44436		0.50		88.9	%	80-120	11/10/1999	1510
	912648-4		0.01120			0.00861	0.00259	A	0.01000	11/10/1999	1554
	912648-4	V16008208	0.27411		0.250000	0.00861	106.2	%	75-125	11/10/1999	1558

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company

PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Copper (Cu)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: CU

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CCV		V211204A	2.01206		2.00		100.6	%	95-105	11/10/1999	1602
CCB			0.00388							11/10/1999	1607
PB	1110-2		0.00129							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.24774		0.2500		99.1	%	80-120	11/10/1999	1634
MD	912804-1		0.00086			0.00129	0.00043	A	0.01000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.24558		0.2500	0.00129	97.7	%	75-125	11/10/1999	1646
CCV		V211204A	2.05779		2.00		102.9	%	95-105	11/10/1999	1713
CCB			0.00474							11/10/1999	1717
PB	1108-5		-0.00172							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.25292		0.2500		101.2	%	80-120	11/10/1999	1755
CCV		V211204A	2.03578		2.00		101.8	%	95-105	11/10/1999	1803
CCB			-0.00000							11/10/1999	1807
CCV		V211204A	1.98334		2.00		99.2	%	95-105	11/10/1999	1947
CCB			0.00040							11/10/1999	1953
ISB		V211204E	0.45043		0.50		90.1	%	80-120	11/10/1999	1956
MD	912691-2		0.06876			0.05000	0.01876	A	0.01000	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.29549		0.2500	0.05000	98.2	%	75-125	11/10/1999	2009
		V211204E	0.44395		0.50		88.8	%	80-120	11/10/1999	2022
		V211204A	1.97769		2.00		98.9	%	95-105	11/10/1999	2032
CCB			-0.00000							11/10/1999	2036

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Iron (Fe)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: FE

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.00960		0.00					11/10/1999	1432
CAL		ICPCALSTD	83.38069		100.00					11/10/1999	1439
ICV		V211204A	2.06757		2.00		103.4	%	95-105	11/10/1999	1501
ICB			-0.00263							11/10/1999	1506
ISB		V211204E	184.46746		200.0		92.2	%	80-120	11/10/1999	1510
CCV		V211204A	2.03659		2.00		101.8	%	95-105	11/10/1999	1602
CCB			0.00647							11/10/1999	1607
PB	1110-2		0.01391							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.50448		0.5000		100.9	%	80-120	11/10/1999	1634
MD	912804-1		0.03982			0.01907	0.02075	A	0.05000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.52440		0.5000	0.01907	101.1	%	75-125	11/10/1999	1646
CCV		V211204A	2.07416		2.00		103.7	%	95-105	11/10/1999	1713
CCB			0.00035							11/10/1999	1717
PB	1108-5		0.00000							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.53003		0.5000		106.0	%	80-120	11/10/1999	1755
CCV		V211204A	2.05836		2.00		102.9	%	95-105	11/10/1999	1803
CCB			-0.00120							11/10/1999	1807
CCV		V211204A	1.98853		2.00		99.4	%	95-105	11/10/1999	1947
CCB			0.01584							11/10/1999	1953
ISB		V211204E	180.25849		200.0		90.1	%	80-120	11/10/1999	1956
MD	912691-2		0.41103			0.35765	13.9	R	20	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.85928		0.5000	0.35765	100.3	%	75-125	11/10/1999	2009
ISB		V211204E	179.55508		200.0		89.8	%	80-120	11/10/1999	2022
		V211204A	2.01156		2.00		100.6	%	95-105	11/10/1999	2032
			0.01956							11/10/1999	2036

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Lead (Pb)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: PB

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	-0.02160		0.00					11/10/1999	1432
CAL		ICPCALSTD	5.03679		10.0					11/10/1999	1443
ICV		V211204A	2.08801		2.00		104.4	%	95-105	11/10/1999	1501
ICB			0.04962							11/10/1999	1506
ISB		V211204E	1.06901		1.00		106.9	%	80-120	11/10/1999	1510
CCV		V211204A	2.01665		2.00		100.8	%	95-105	11/10/1999	1602
CCB			0.02570							11/10/1999	1607
PB	1110-2		0.04796							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.51828		0.5000		103.7	%	80-120	11/10/1999	1634
MD	912804-1		0.02968			0.00260	0.02708	A	0.05000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.49773		0.5000	0.00260	99.0	%	75-125	11/10/1999	1646
CCV		V211204A	1.98915		2.00		99.5	%	95-105	11/10/1999	1713
CCB			0.05239							11/10/1999	1717
PB	1108-5		0.03366							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.53097		0.5000		106.2	%	80-120	11/10/1999	1755
CCV		V211204A	2.01825		2.00		100.9	%	95-105	11/10/1999	1803
CCB			0.06504							11/10/1999	1807
		V211204A	2.02497		2.00		101.2	%	95-105	11/10/1999	1947
			0.01537							11/10/1999	1953
ISB		V211204E	0.95396		1.00		95.4	%	80-120	11/10/1999	1956
MD	912691-2		-0.00452			0.04172	0.04624	A	0.05000	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.50937		0.5000	0.04172	93.5	%	75-125	11/10/1999	2009
ISB		V211204E	0.94240		1.00		94.2	%	80-120	11/10/1999	2022
CCV		V211204A	2.03451		2.00		101.7	%	95-105	11/10/1999	2032
CCB			-0.01311							11/10/1999	2036

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Manganese (Mn)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: MN

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.01740		0.00					11/10/1999	1432
CAL		ICPCALSTD	0.92269		2.00					11/10/1999	1443
ICV		V211204A	2.03519		2.00		101.8	%	95-105	11/10/1999	1501
ICB			-0.00132							11/10/1999	1506
ISB		V211204E	0.44561		0.50		89.1	%	80-120	11/10/1999	1510
CCV		V211204A	1.99253		2.00		99.6	%	95-105	11/10/1999	1602
CCB			0.00044							11/10/1999	1607
PB	1110-2		-0.00088							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.48168		0.5000		96.3	%	80-120	11/10/1999	1634
MD	912804-1		-0.00131			-0.00153	0.00022	A	0.01000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.47856		0.5000	-0.00153	96.0	%	75-125	11/10/1999	1646
CCV		V211204A	2.04535		2.00		102.3	%	95-105	11/10/1999	1713
CCB			-0.00220							11/10/1999	1717
PB	1108-5		-0.00287							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.49507		0.5000		99.0	%	80-120	11/10/1999	1755
CCV		V211204A	2.03253		2.00		101.6	%	95-105	11/10/1999	1803
CCB			-0.00309							11/10/1999	1807
CCV		V211204A	2.01995		2.00		101.0	%	95-105	11/10/1999	1947
			0.00137							11/10/1999	1953
		V211204E	0.45609		0.50		91.2	%	80-120	11/10/1999	1956

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Manganese (Mn)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: MN

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
MD	912691-2		0.00869			0.00598	0.00271	A	0.01000	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.50038		0.5000	0.00598	98.9	%	75-125	11/10/1999	2009
ISB		V211204E	0.45571		0.50		91.1	%	80-120	11/10/1999	2022
CCV		V211204A	2.04127		2.00		102.1	%	95-105	11/10/1999	2032
CCB			0.00206							11/10/1999	2036

Test Method.....: EPA 7470
Method Description.: Mercury, Total
Parameter.....: Mercury (Hg)

Batch.....: 49327
Units.....: mg/L

Analyst...: pal
Test Code.: HG

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		HGCALBLK	26277		0.000					11/11/1999	1520
CAL		V211205C	33050		0.000050					11/11/1999	1523
CAL		V211205C	48244		0.000200					11/11/1999	1526
CAL		V211205C	131319		0.001000					11/11/1999	1529
		V211205C	602098		0.005000					11/11/1999	1532
		V211205C	1094966		0.010000					11/11/1999	1535
ICV		V211205D	0.00547		0.005000		109.4	%	90-110	11/11/1999	1538
ICB			-0.000003							11/11/1999	1541
PB			-0.000131							11/11/1999	1544
LCS		V211205D	0.00543		0.005000		108.6	%	80-120	11/11/1999	1547
MD	912809-2		-0.000142			-0.000167	0.000025	A	0.001000	11/11/1999	1552
MS	912809-2	V211205D	0.00501		0.005000	-0.000167	103.5	%	75-125	11/11/1999	1555
CCV		V211205C	0.00471		0.005000		94.2	%	90-110	11/11/1999	1613
CCB			-0.000008							11/11/1999	1616
CCV		V211205C	0.00490		0.005000		98.0	%	90-110	11/11/1999	1649
CCB			-0.000013							11/11/1999	1652
CCV		V211205C	0.00467		0.005000		93.4	%	90-110	11/11/1999	1724
CCB			-0.000032							11/11/1999	1727

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Molybdenum (Mo)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: MO

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.00130							11/10/1999	1432
CAL		ICPCALSTD	0.20409		2.00					11/10/1999	1453
ICV		V211204A	2.10563		2.00		105.3	%	95-105	11/10/1999	1501
ICB			0.04635							11/10/1999	1506
CCV		V211204A	1.96660		2.00		98.3	%	95-105	11/10/1999	1602
CCB			0.07593							11/10/1999	1607
PB	1110-2		0.00098							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.48404		0.5000		96.8	%	80-120	11/10/1999	1634
MD	912804-1		0.02957			0.05818	0.02861	A	0.10000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.53729		0.5000	0.05818	95.8	%	75-125	11/10/1999	1646
CCV		V211204A	2.01293		2.00		100.6	%	95-105	11/10/1999	1713
CCB			0.06804							11/10/1999	1717
		V211204A	2.02379		2.00		101.2	%	95-105	11/10/1999	1803
			0.04832							11/10/1999	1807

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Nickel (Ni)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: NI

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	-0.00160		0.00					11/10/1999	1432
CAL		ICPCALSTD	0.64550		1.0					11/10/1999	1436
ICV		V211204A	2.03516		2.00		101.8	%	95-105	11/10/1999	1501
ICB			-0.00030							11/10/1999	1506
ISB		V211204E	0.83814		1.00		83.8	%	80-120	11/10/1999	1510
CCV		V211204A	1.97738		2.00		98.9	%	95-105	11/10/1999	1602
CCB			0.00139							11/10/1999	1607
PB	1110-2		-0.00448							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.47202		0.500		94.4	%	80-120	11/10/1999	1634
MD	912804-1		-0.00139			-0.00680	0.00541	A	0.01000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.45625		0.500	-0.00680	92.6	%	75-125	11/10/1999	1646
CCV		V211204A	2.01105		2.00		100.6	%	95-105	11/10/1999	1713
CCB			0.00324							11/10/1999	1717
PB	1108-5		-0.00231							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.47619		0.500		95.2	%	80-120	11/10/1999	1755
CCV		V211204A	1.99174		2.00		99.6	%	95-105	11/10/1999	1803
CCB			0.00834							11/10/1999	1807
		V211204A	1.98981		2.00		99.5	%	95-105	11/10/1999	1947
			0.00189							11/10/1999	1953
ISB		V211204E	0.86134		1.00		86.1	%	80-120	11/10/1999	1956
MD	912691-2		0.05968			0.05142	14.9	R	20	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.53017		0.500	0.05142	95.8	%	75-125	11/10/1999	2009
ISB		V211204E	0.86280		1.00		86.3	%	80-120	11/10/1999	2022
CCV		V211204A	2.02778		2.00		101.4	%	95-105	11/10/1999	2032
CCB			0.00206							11/10/1999	2036

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Selenium (Se)

Batch.....: 49229
Units.....: mg/L

Analyst...: amw
Test Code.: SE

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ICV		V211205B	4.13607		4.00		103.4	%	90-110	11/10/1999	2109
ICB			0.00716							11/10/1999	2115
PB	1103-3		-0.00774							11/10/1999	2144
LCS	1103-3	ICPSPK99B	0.52583		0.5000		105.2	%	80-120	11/10/1999	2150
MD	912510-1		0.04239			0.05221	0.00982	A	0.02000	11/10/1999	2202
MS	912510-1	ICPSPK99B	0.60952		0.5000	0.05221	111.5	%	75-125	11/10/1999	2207
PB	1110-2		0.00754							11/10/1999	2228
LCS	1110-2	ICPSPK99B	0.51176		0.5000		102.4	%	80-120	11/10/1999	2234
CCV		V211205B	4.11920		4.00		103.0	%	90-110	11/10/1999	2240
CCB			-0.00049							11/10/1999	2246
MD	912804-1		0.06091			0.06711	0.00620	A	0.02000	11/10/1999	2257
MS	912804-1	ICPSPK99B	0.53834		0.5000	0.06711	94.2	%	75-125	11/10/1999	2303
PB	1108-1		-0.00048							11/10/1999	2315
LCS	1108-1	V16008711	1.26703		1.389429		91.2	%	80-120	11/10/1999	2323
MS	912685-1	V16008208	1.66516		2.000000	-0.00141	83.3	%	75-125	11/10/1999	2336
MSD	912685-1	V16008208	1.73536	1.66516	2.000000	-0.00141	86.8	%	75-125	11/10/1999	2342
							4.1	R	20		
CCV		V211205B	3.61532		4.00		90.4	%	90-110	11/11/1999	0006
CCB			0.00502							11/11/1999	0012

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company

PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Silver (Ag)

Batch.....: 49229
Units.....: mg/L

Analyst...: amw
Test Code.: AG

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
ISB		V21122A	1.01911		1.00		101.9	%	80-120	11/10/1999	2059
ICV		V211205B	0.82532		0.80		103.2	%	90-110	11/10/1999	2109
ICB			0.00639							11/10/1999	2115
PB	1103-3		0.00602							11/10/1999	2144
LCS	1103-3	ICPSPK99B	0.21922		0.2000		109.6	%	80-120	11/10/1999	2150
MD	912510-1		-0.00134			0.00301	0.00435	A	0.01000	11/10/1999	2202
MS	912510-1	ICPSPK99B	0.23286		0.2000	0.00301	114.9	%	75-125	11/10/1999	2207
PB	1110-2		0.00387							11/10/1999	2228
LCS	1110-2	ICPSPK99B	0.20008		0.2000		100.0	%	80-120	11/10/1999	2234
CCV		V211205B	0.81442		0.80		101.8	%	90-110	11/10/1999	2240
CCB			0.00538							11/10/1999	2246
MD	912804-1		-0.00299			0.00267	0.00566	A	0.01000	11/10/1999	2257
MS	912804-1	ICPSPK99B	0.18444		0.2000	0.00267	90.9	%	75-125	11/10/1999	2303
PB	1108-1		0.00394							11/10/1999	2315
LCS	1108-1	V16008711	0.98418		1.039642		94.7	%	80-120	11/10/1999	2323
MS	912685-1	V16008208	0.42520		0.400000	0.09302	83.0	%	75-125	11/10/1999	2336
MSD	912685-1	V16008208	0.44731	0.42520	0.400000	0.09302	88.6	%	75-125	11/10/1999	2342
							5.1	R	20		
		V21122A	0.92430		1.00		92.4	%	80-120	11/10/1999	2356
CCV		V211205B	0.72690		0.80		90.9	%	90-110	11/11/1999	0006
CCB			0.00329							11/11/1999	0012

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Zinc (Zn)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: ZN

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CAL		ICPCALBLK	0.00100		0.00					11/10/1999	1432
CAL		ICPCALSTD	0.74320		3.00					11/10/1999	1443
ICV		V211204A	2.05861		2.00		102.9	%	95-105	11/10/1999	1501
ICB			0.00000							11/10/1999	1506
ISB		V211204E	0.94520		1.00		94.5	%	80-120	11/10/1999	1510
CCV		V211204A	2.01376		2.00		100.7	%	95-105	11/10/1999	1602
CCB			-0.00241							11/10/1999	1607
PB	1110-2		-0.00399							11/10/1999	1629
LCS	1110-2	ICPSPK99B	0.49158		0.5000		98.3	%	80-120	11/10/1999	1634
MD	912804-1		0.02308			0.01626	0.00682	A	0.01000	11/10/1999	1642
MS	912804-1	ICPSPK99B	0.51147		0.5000	0.01626	99.0	%	75-125	11/10/1999	1646
CCV		V211204A	2.06765		2.00		103.4	%	95-105	11/10/1999	1713
CCB			-0.00283							11/10/1999	1717
PB	1108-5		-0.00442							11/10/1999	1750
LCS	1108-5	ICPSPK99B	0.49473		0.5000		98.9	%	80-120	11/10/1999	1755
CCV		V211204A	2.04205		2.00		102.1	%	95-105	11/10/1999	1803
CCB			-0.00407							11/10/1999	1807
CCV		V211204A	2.04812		2.00		102.4	%	95-105	11/10/1999	1947
CCB			-0.00179							11/10/1999	1953
ISB		V211204E	0.95902		1.00		95.9	%	80-120	11/10/1999	1956
MD	912691-2		0.42511			0.40387	5.1	R	20	11/10/1999	2005
MS	912691-2	ICPSPK99B	0.92205		0.5000	0.40387	103.6	%	75-125	11/10/1999	2009
		V211204E	0.96117		1.00		96.1	%	80-120	11/10/1999	2022
		V211204A	2.06797		2.00		103.4	%	95-105	11/10/1999	2032

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company

PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Test Method.....: EPA 6010B
Method Description.: Metals Analysis (ICAP)
Parameter.....: Zinc (Zn)

Batch.....: 49224
Units.....: mg/L

Analyst...: chh
Test Code.: ZN

QC	Lab ID	Reagent	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits	Date	Time
CCB			-0.00401							11/10/1999	2036

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company | PROJECT: Marathon Oil Co., Midland, Tx | ATTN: Mr. Paul Peacock

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: EPA 8310 | Batch.....: 49504 | Analyst...: rm

Method Description.: Polynuclear Aromatic Hydrocarbons-HPLC | Units.....: ug/L

MB	Method Blank				11/16/1999	0111

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Acenaphthene	ND						
Acenaphthylene	ND						
Anthracene	ND						
Benzo(b)fluoranthene	ND						
Benzo(k)fluoranthene	ND						
Benzo(a)anthracene	ND						
Benzo(a)pyrene	ND						
Benzo(ghi)perylene	ND						
Chrysene	ND						
Dibenzo(a,h)anthracene	ND						
Fluoranthene	ND						
Fluorene	ND						
Indeno(1,2,3-cd)pyrene	ND						
Naphthalene	ND						
Phenanthrene	ND						
Pyrene	ND						

LCS	Laboratory Control Sample	V173725B			11/16/1999	0154

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Acenaphthene	651.7		1000.000000		65.2	%	10-92
Acenaphthylene	735.6		1000.000000		73.6	%	11-127
Anthracene	632.7		1002.000000		63.1	%	13-110
Benzo(b)fluoranthene	348.2		500.000000		69.6	%	57-102
Benzo(k)fluoranthene	360.5		500.000000		72.1	%	59-107
Benzo(a)anthracene	346.8		500.000000		69.4	%	61-109
Benzo(a)pyrene	328.3		500.000000		65.7	%	42-131
Benzo(ghi)perylene	427.2		500.000000		85.4	%	55-119
Chrysene	364.7		500.000000		72.9	%	59-103
Dibenzo(a,h)anthracene	323.0		500.000000		64.6	%	63-108
Fluoranthene	350.5		500.000000		70.1	%	40-122
Fluorene	735.3		1000.000000		73.5	%	20-95
Indeno(1,2,3-cd)pyrene	358.8		500.000000		71.8	%	57-104
Naphthalene	483.3		1000.000000		48.3	%	10-82
Phenanthrene	380.7		502.500000		75.8	%	37-102
Pyrene	382.8		500.000000		76.6	%	59-111

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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QUALITY CONTROL RESULTS

Job Number.: 912816 Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: EPA 8260B Batch.....: 49489 Analyst...: weh
Method Description.: Volatile Organic Compounds Units.....: ug/L

MB	Method Blank				11/15/1999	1439

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
Vinyl chloride	ND						
1,1-Dichloroethene	ND						
Methylene chloride	ND						
Benzene	ND						
Carbon tetrachloride	ND						
Chloroform	ND						
1,2-Dibromoethane (EDB)	ND						
1,1-Dichloroethane	ND						
1,2-Dichloroethane	ND						
Ethylbenzene	ND						
1,1,2,2-Tetrachloroethane	ND						
Tetrachloroethene	ND						
Toluene	ND						
1,1,1-Trichloroethane	ND						
1,1,2-Trichloroethane	ND						
Trichloroethene	ND						
Xylenes (total)	ND						

LCS	Laboratory Control Sample	CLPVOAMS2			11/15/1999	1510

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
1,1-Dichloroethene	50.90		50		101.8	%	51-141
Benzene	50.28		50		100.6	%	67-130
Toluene	50.26		50		100.5	%	75-114
Trichloroethene	49.80		50		99.6	%	72-114

MS	Matrix Spike	CLPVOAMS2	913032-1		11/15/1999	1611

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
1,1-Dichloroethene	50.80		50	ND	101.6	%	51-141
Benzene	50.91		50	1.12	99.6	%	67-130
Toluene	50.52		50	ND	101.0	%	75-114
Trichloroethene	49.66		50	ND	99.3	%	72-114

MSD	Matrix Spike Duplicate	CLPVOAMS2	913032-1		11/15/1999	1642

Parameter/Test Description	QC Result	QC Result	True Value	Orig. Value	Calc. Result	*	Limits
1,1-Dichloroethene	51.40	50.80	50	ND	102.8	%	51-141
					1.2	R	30
Benzene	50.41	50.91	50	1.12	98.6	%	67-130
					1.0	R	30
Toluene	50.59	50.52	50	ND	101.2	%	75-114
					0.1	R	30
Trichloroethene	48.32	49.66	50	ND	96.6	%	72-114
					2.7	R	30

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

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SURROGATE RECOVERIES REPORT

Job Number.: 912816

Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company PROJECT: Marathon Oil Co., Midland, Tx ATTN: Mr. Paul Peacock

Method.....: Volatile Organic Compounds
Method Code.....: 826TCL

Batch.....: 49489
Analyst.....: weh

Surrogate	Units
1,2-Dichloroethane-d4 (surrogate)	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		MB		51.26	50.00	102.5	76-120		11/15/1999	1439
		LCS		50.76	50.00	101.5	76-120		11/15/1999	1510
913032-1				51.66	50.00	103.3	76-120		11/15/1999	1540
913032-1		MS		50.97	50.00	101.9	76-120		11/15/1999	1611
913032-1		MSD		50.92	50.00	101.8	76-120		11/15/1999	1642
913032-3				50.89	50.00	101.8	76-120		11/15/1999	1712
913032-2				51.00	50.00	102.0	76-120		11/15/1999	1743
912816-1			50	47.02	50.00	94.0	76-120		11/15/1999	2036
912767-15				52.17	50.00	104.3	76-120		11/15/1999	2107
912767-16				51.00	50.00	102.0	76-120		11/15/1999	2137

Surrogate	Units
BFB (Surrogate)	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		MB		51.80	50.00	103.6	85-115		11/15/1999	1439
		LCS		51.23	50.00	102.5	85-115		11/15/1999	1510
913032-1				52.45	50.00	104.9	85-115		11/15/1999	1540
913032-1		MS		53.36	50.00	106.7	85-115		11/15/1999	1611
913032-1		MSD		52.32	50.00	104.6	85-115		11/15/1999	1642
913032-3				52.36	50.00	104.7	85-115		11/15/1999	1712
913032-2				52.46	50.00	104.9	85-115		11/15/1999	1743
912816-1			50	48.12	50.00	96.2	85-115		11/15/1999	2036
912767-15				50.96	50.00	101.9	85-115		11/15/1999	2107
912767-16				50.19	50.00	100.4	85-115		11/15/1999	2137

Surrogate	Units
Toluene-d8	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		MB		50.11	50.00	100.2	85-112		11/15/1999	1439
		LCS		49.94	50.00	99.9	85-112		11/15/1999	1510
913032-1				49.91	50.00	99.8	85-112		11/15/1999	1540
913032-1		MS		50.52	50.00	101.0	85-112		11/15/1999	1611
913032-1		MSD		51.24	50.00	102.5	85-112		11/15/1999	1642
913032-3				51.57	50.00	103.1	85-112		11/15/1999	1712
913032-2				50.89	50.00	101.8	85-112		11/15/1999	1743
912816-1			50	50.44	50.00	100.9	85-112		11/15/1999	2036
912767-15				51.31	50.00	102.6	85-112		11/15/1999	2107
912767-16				54.32	50.00	108.6	85-112		11/15/1999	2137

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SURROGATE RECOVERIES REPORT

Job Number.: 912816 Report Date.: 11/16/99

CUSTOMER: Marathon Oil Company **PROJECT: Marathon Oil Co., Midland, Tx** **ATTN: Mr. Paul Peacock**

Method.....: Polynuclear Aromatic Hydrocarbons-HPLC Batch.....: 49504
Method Code.....: 8310 Analyst.....: rm

Surrogate	Units
1-Fluoronaphthalene	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		MB		371.7	1000	37.2	10-74		11/16/1999	0111
		LCS		555.3	1000	55.5	10-74		11/16/1999	0154
912816-1				720.4	1000	72.0	10-74		11/16/1999	0236

Surrogate	Units
Terphenyl-d14	ug/L

Lab ID	Matrix	QC Type	Dilution	Result	True Value	Percent Recovery	Limits	Flag	Date	Time
		MB		749.9	1000	75.0	56-122		11/16/1999	0111
		LCS		936.4	1000	93.6	56-122		11/16/1999	0154
912816-1				776.2	1000	77.6	56-122		11/16/1999	0236

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QUALITY ASSURANCE FOOTER

METHOD REFERENCES

1. EPA SW-846, Test Methods for Evaluating Solid Waste Update I, IIA, IIB, III
2. Standard Methods for the Examination of Water and Wastewater, 18th Edition
3. EPA 600/4-79-020, Methods of Chemical Analysis for Waters and Wastes, March 1983
4. Federal Register, Friday, October 26, 1984 (40 CFR Part 136)
5. American Society for Testing and Materials, Volumes 5.01, 5.02, 5.03, 11.01,11.02,11.03,11.04
6. EPA Methods for Environmental Samples

COMMENTS

All methods of chemical analysis have a statistical uncertainty associated with the results. Unless otherwise indicated, the data in this report are within the limits of uncertainty as specified in the referenced method. Quality Control acceptance criteria are based either on actual laboratory performance or on limits specified in the referenced method. The date and time of analysis indicated on the QA report may not reflect the actual time of analysis for QC samples. All data are reported on an "as received" basis unless otherwise indicated. Data reported in the QA report may be lower than sample data due to dilution of samples into the calibration range of the analysis. Sample concentration for solid samples are calculated on an as received (wet) basis. Unless otherwise indicated, volatiles by gas chromatography (GC) are reported from a single column. Volatile analysis by GC on low level soil extractions are conducted at room temperature.

FLAGS, FOOTNOTES AND ABBREVIATIONS (as needed)

NA	=	Not Analyzed	ND	=	Not detected at a value greater than the reporting limit
N/A	=	Not applicable	NC	=	Not calculable due to values lower than the reporting limit
ug/L	=	Micrograms per liter	mg/L	=	Milligrams per liter
ug/Kg	=	Micrograms per kilogram	mg/kg	=	Milligrams per kilogram
U	=	Undetected			
J	=	Indicates value is > MDL, but < Reporting Limit			
B	=	Analyte was detected in the method blank analyzed with this sample.			
D	=	Surrogate recoveries are not calculated due to sample dilution.			
X	=	Surrogate recovery is outside quality control limits.			
Y	=	Spike or spike duplicate recovery is outside quality control limits.			
Z	=	Relative percent difference for a spike and spike duplicate is outside quality control limits. The precision of the method was impacted by matrix.			
^	=	Indicates value is above QC acceptance criteria.			

QC SAMPLE IDENTIFICATIONS

MB	=	Method Blank	SB	=	Storage Blank
RB	=	Reagent Blank	EB	=	Extraction Blank
PB	=	Preparation Blank	CALB	=	Calibration Blank
MD	=	Method Duplicate	RS	=	Reference Standard
LCS	=	Laboratory Control Sample	LCSD	=	Laboratory Control Sample Duplicate
MS	=	Matrix Spike	MSD	=	Matrix Spike Duplicate
ICB	=	Initial Calibration Blank	CCB	=	Continuing Calibration Blank
ICV	=	Initial Calibration Verification	ICB	=	Initial Calibration Blank
PDS	=	Post Digestion Spike	SS	=	Surrogate Spike
ISA	=	Interference Check standard "A"	ISB	=	Interference Check Standard "B"
ISCAB	=	Interference Check Sample AB	MSA	=	Method of Standard Additions
CAL	=	Calibration standard	SD	=	Serial Dilution
MST	=	TCLP Matrix Spike	MSQ	=	TCLP Matrix Spike Duplicate
PST	=	TCLP Post Digestion Spike	LCT	=	TCLP Laboratory Control Sample

ckl | Job Sample Receipt Checklist Report 11/09/99 | V2

Job Number.....: 912816 Location.: 57211 Customer Job ID.....: Job Check List Date.: 11/09/99
Project Number.: 96000746 Project Description.: INDIAN BASIN REMEDIATION STRIPPER Project Manager.....: lpa
Customer.....: Marathon Oil Company Contact.: Mr. Paul Peacock

Questions ?	(Y/N)	Comments
Chain-of-Custody Present?	Y	
Custody seal on shipping container?	Y	
...If "yes", custody seal intact?	Y	
Custody seals on sample containers?		
...If "yes", custody seal intact?		
Samples chilled?	Y	
Temperature of cooler acceptable? (4 deg C +/- 2).		RECEIVED ON ICE
Samples received intact (good condition)?	Y	
Volatile samples acceptable? (no headspace)	Y	
Correct containers used?	Y	
Adequate sample volume provided?	Y	
Samples preserved correctly?	Y	
Samples received within holding-time?	Y	
Agreement between COC and sample labels?	Y	
Additional		
Comments		
Sample Custodian Signature		

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Severn Trent Laboratories

CHAIN OF CUSTODY RECORD

Customer Information	
PO	
WO	
COMPANY	Marathon Oil Company
SEND REPORT TO	Mr. Paul Peacock
ADDRESS	Midland, Tx
	Bottles to: Mr. Jack Brown
CITY/STATE/ZIP	Lakewood, New Mexico
PHONE	
FAX	

Project Information			
PROJECT NAME	INDIAN BASIN GAS PLT		
LAB NUMBER	912816	BOTTLE ORDER	96000813
BILL TO	Marathon Oil Company		
INVOICE ATTN	Mr. Paul Peacock		
ADDRESS	125 West Missouri Street		
	P.O. Box 552		
CITY/STATE/ZIP	Midland, TX 79702-0552		
PHONE	915-687-8312		
FAX	915-687-8305		

	Analysis/Method	No. 57211-10411
A	6010	20 NMAC 6.2 TABLE 3103
B	4500CN	STL PROJECT ID 96000651-
C	7470	group 4
D	420.2	
E	300.0	
F	160.1	
G	8310	
H	8260V1	
I		
J		
K		
L		
M		
N		
O		
P		
Q		
R		
S		

SAMP NO.	SAMPLE DESCRIPTION	PRESERV.	F	SAMPLE MATRIX	SAMPLE DATE	SAMPLE TIME	#CONTAINR	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	COMMINGLED GAS PLT WASTE EFF	HNO_3	N	AQ	11/8/99	1000	1-1L Plas.	X		X																
		$NaOH$				2	1-1L Plas		X																	
		H_2SO_4				2	1-1L Glass				X															
		NONE				2	1-1L Plas					X	X													
		NONE				6	3-1L Glass							X												
		HCl				8	4-40ml VOA								X											

Sampler:	Shipment Method:	Airbill No.:	Required TurnAround:

1. Relinquished By: J BROWN	Date 11/8/99	2. Relinquished By:	Date	3. Relinquished By:	Date
Company Name: MARATHON	Time 11:30	Company Name:	Time	Company Name:	Time
1. Received By: BL	Date 11/9/99	2. Received By:	Date	3. Received By:	Date
Company Name: STL	Time 1000	Company Name:	Time	Company Name:	Time

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

For

MARATHON OIL COMPANY
INDIAN BASIN GAS PLANT

August 2001

Name of facility	Indian Basin Gas Plant
Operator	Marathon Oil Company

INDIAN BASIN GAS PLANT
SPILL PREVENTION CONTROL AND COUNTERMEASURE
PLAN CONTENTS

SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN
PART I - GENERAL INFORMATION

1. Name of Facility Indian Basin Gas Plant
2. Type of Facility Onshore Production Facility
3. Location of Facility Eddy Count, New Mexico
   Approximately 20 miles W/NW of Carlsbad, New Mexico
   Unit Letter G, Section 23, Township 21S, Range 23E
4. Name and address of owner or operator:
   Name: Marathon Oil Company
   Address: P O Box 1324
   Artesia, New Mexico 88210
5. Designated person accountable for oil spill prevention at facility:
   Name and title: Mike Schweser, Gas Plant Superintendent
6. Facility experienced a reportable oil spill event during the twelve months prior to the issuance date of this Plan below. (If YES, complete attachment #1) No

---

MANAGEMENT APPROVAL

This SPCC Plan will be implemented as herein described.

Signature _____

Name C.M. Schweser

Title Plant Superintendent

CERTIFICATION

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR, Part 112, attest that the SPCC Plan has been prepared in accordance with good engineering practices.

Roger D. Edelbrock
Printed Name of Registered Professional Engineer

Roger D. Edelbrock
Signature of Registered Professional Engineer

Date 8/16/01 Registration No. 20128 State LA

PART I
GENERAL INFORMATION

7. Potential Spills -- Prediction and Control

ITEM	SOURCE	MAJOR TYPE OF FAILURE	QUANTITY LARGEST TANK	RATE Bbls/Hr	DIRECTION OF FLOW	SECONDARY CONTAINMENT
1	Generator Turbine Oil	Leaks, Tank Rupture	7 bbl	N/A*	SE	Yes
2	Open Top Transfer Tank	Leaks, Tank Rupture	500 bbl	N/A*	SE	Yes
3	Outlet Compressor Lube Oil	Leaks, Tank Rupture	24 bbl	N/A*	SE	Yes
4	Field Storage Area	Leaks, Tank Rupture	12 bbl	N/A*	SE	Yes
5	Stabilizer Compressor Lube Oil	Leaks, Tank Rupture	5 bbl	N/A*	SE	Yes
6	IBLEAP Stripper Tank Area	Leaks, Tank Rupture	500 bbl	.001 BO 112 BW	SE	Yes
7	Skimmer Basin	Leaks, Tank Rupture	500 bbl	8 BO 833 BW	SE	Yes
8	Recompressor Lube Oil	Leaks, Tank Rupture	210 bbl	N/A*	SE	Yes
9	SWD Pump Lube Oil	Leaks, Tank Rupture	7 bbl	N/A*	SE	Yes
10	Condensate Storage Tank 5B	Leaks, Tank Rupture	3000 bbl	12.5 BO	SE	Yes
11	1 Bullet - Flare Drum PV-34.2B	Leaks, Tank Rupture	1571 bbl	Approx .125 BO	SE	Yes
12	1 Bullet - Sales Condensate Knockout	Leaks, Tank Rupture	1571 bbl	12.5 BO	SE	Yes
13	3 Bullets - Sour NGL Surge Tanks	Leaks, Tank Rupture	1605 bbl	Note 2	SE	Yes
14	LACT Unit Loading Rack	Leaks, Truck Rupture, Premature Departure	180 bbl	12.5 BO Note 3	SE	Yes

* Not connected to an inflowing process.

Note 2 NGL stored during upset situations only. Tanks kept empty as is practicable during normal operations. NGL is 100% volatile at atmospheric conditions.

Note 3 Condensate sold at same rate its produced. Hauled by truck.

PART I
GENERAL INFORMATION

(Response to statements should be: Yes, No, or NA)

8. Containment or diversionary structures or equipment to prevent oil from reaching navigable waters are practicable. (If No, complete Attachment #2) No

9. Inspections and Records

A. The required inspections follow written procedures. Yes

B. The written procedures and a record of inspections, signed by the appropriate supervisor or inspector, are attached Yes

Discussion: : Daily visual inspections are made and readings taken and recorded by operational personnel during normal rounds on both twelve hour shifts. During these rounds, operating personnel search for atypical situations. If these situations are encountered, they are documented and promptly reported to supervisory personnel via the plant work order system. Spills are reported as soon as practical to the supervisor on a Marathon Spill Reporting form. Semi-Annual inspections are conducted by plant supervision or their designee. Records of these inspections are on file at the Indian Basin Gas Plant.

10. Personnel Training and Spill Prevention Procedures

A. Personnel are properly instructed in the following:

1. Operation and Maintenance of equipment to prevent oil discharge Yes

2. Applicable pollution control laws, rules, and regulations. Yes

Describe procedures employed for instruction: All employees have received 8 hours of HAZWOPER training, and many are 24 hour HAZWOPER trained. Annual instruction is provided on SPCC and other environmental topics by the Southern Business Units HES department. Other instructions are narrative. Environmental Control and Site Security are discussed at safety meetings, which are held on a monthly basis. Potential spill situations are reported to the superintendent via the plant work order system and also reported by the safety committee on a monthly basis. Such situations are corrected

B. Scheduled prevention briefings for the operating personnel are conducted frequently enough to assure adequate understanding of the SPCC Plan Yes

Describe Briefing program: Operation Management frequently reviews environmental standards at safety meetings. Such reviews assure an adequate understanding of SPCC. Operation superintendents are periodically requested to update Contingency Plans. Superintendents thereby assess and revise procedures when necessary.

PART II, ALTERNATE A
DESIGN AND OPERATING INFORMATION
ONSHORE FACILITY (EXCLUDING PRODUCTION)

(Prior to completing Part II Alternate A, Refer to regulations and instructions, pages 6-7)

A. Facility Drainage

1. Drainage from diked storage areas is controlled as follows (include operating description of valves, pumps, ejectors, etc. (Note: Flapper type valves should not be used):

None of the earthen diked areas have installed drains. Any spill that might occur would be removed with a vacuum truck, or transferred, via a portable pump, to the plant open drain system. Concrete pollution catchments are connected directly to the plant open drain system which processes the fluid for removal of free hydrocarbon. The waste is then commingled and injected with Indian Basin Field produced water. Rain water captured in containments is also removed in this manner.

2. Drainage from undiked areas is controlled as follows (include description of ponds, lagoons, or catchment basins and methods of retaining and returning oil to facility):

The plant operates under a Storm Water Pollution Prevention Plan and a Groundwater Discharge Plan created for the New Mexico Oil Conservation Division. The plant is in compliance with all phases of these plans. The Groundwater Discharge Plan and the Storm Water Pollution Prevention Plan is available for review on site at the Indian Basin Gas Plant office and in the Southern Business Unit office, Midland, Texas.

3. The procedure for supervising the drainage of rain water from secondary containment in to a storm drain or an open watercourse is as follows (include description of (a) inspection for pollutants, and (b) method valving security). (A record of inspection and drainage events is to be maintained on a form similar to Attachment #3):

No secondary containment is drained into a storm drain or open watercourse.

PART II, ALTERNATE A
DESIGN AND OPERATING INFORMATION
ONSHORE FACILITY (EXCLUDING PRODUCTION)

(Response to statements should be: Yes, No, or NA)

B. Bulk Storage Tanks

1. Describe tank design, materials of construction, fail-safe engineering features, and if needed, corrosion protection:

Generator Turbine Oil - A vented, 7 barrel, welded, carbon steel, above ground lube oil storage tank. This tank is filled by vendor from a truck and is attended at all times during filling operations.

Open top transfer tank - A 500 barrel fiberglass open top tank used to transfer produced fluids hauled in by truck into the skimmer system. The tank is continuously monitored during loading operations to prevent overfilling.

Outlet compressor lube oil tank - A vented, 24 barrel, welded, carbon steel, above ground, lube oil storage tank. This tank is filled by vendor from a truck and is attended at all times during filling operations.
Field storage area - .

- One, vented, 12 barrel, welded ,carbon steel, above ground, storage tank containing gasoline.
- One, vented, 7 barrel, welded, carbon steel, above ground, lube oil storage tank.

  These tanks are filled by vendor from a truck and are attended at all times during filling operations

Stabilizer compressor lube oil - A vented, 5 barrel, welded, carbon steel, above ground, lube oil storage tank. This tank is filled by vendor from a truck and is attended at all times during filling operations.
IBLEAP stripper tanks:

- One, 500 barrel, fiberglass, gun barrel (separator)tank. Tank has a high level switch which shuts the inlet valve.
- Two, 210 barrel, welded, carbon steel, untreated, water tanks. These tanks have high level switches that shut the inlet valve.
- One, 34 barrel, horizontal, welded, carbon steel, condensate storage tank.

Skimmer Basin:
All tanks are equipped with thief hatches for vacuum/vent protection.

- One, 210 barrel, welded, carbon steel, oil tank. This tank has a level transmitter and high level alarm
- One, 500 barrel, fiber glass, gun barrel (separator) tank.
- Four, 500 barrel, fiber glass, produced water, storage tanks. These tanks are equipped with level transmitters and high level alarms. Signals from these instruments are transmitted to the plant control room which is manned 24 hours a day.

PART II, ALTERNATE A
DESIGN AND OPERATING INFORMATION
ONSHORE FACILITY (EXCLUDING PRODUCTION)

(Response to statements should be: Yes, No, or NA)

C. Facility Transfer Operations, Pumping, and In-plant Process.

1. Corrosion protection for buried pipelines:

(a) Pipelines are wrapped and coated to reduce corrosion Cathodic protection is provided for pipelines if determined necessary by electrolytic testing. Yes

(b) Electrolytic testing is not performed. No

(c) When a pipeline section is exposed, it is examined and corrective action taken as necessary. Yes

2. Pipeline terminal connections are capped or blank-flanged and marked if the pipeline is not in service or on standby service for extended periods NA

Describe criteria for determining when to cap or blank-flange:

The plant is in continuous operation. Procedures for abandonment of pipelines will be developed when necessary.

3. Pipe supports are designed to minimize abrasion and corrosion and allow for expansion and contraction. Yes

Describe pipe support design:

Pipe supports are steel stanchion with wear plated protection at points of wear and contact. Where large temperature swings are anticipated, expansion loops are installed.

4. Describe procedures for regularly examining all above-ground valves and pipelines (including flange joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces):

All equipment is observed in operation daily by plant operating personnel for signs of leakage or other deterioration. Such signs are reported and corrected via the plant work order system.

Where deemed appropriate, more rigorous inspection methods, such as ultra-sonic thickness testing or X-ray inspection, are conducted. (Records of these tests are on file at the Indian Basin Gas Plant.)

5. Describe procedures for warning vehicles entering the facility to avoid damaging above ground piping:

Signs and traffic barrier guards are installed where needed.

PART II, ALTERNATE A
DESIGN AND OPERATING INFORMATION
ONSHORE FACILITY (EXCLUDING PRODUCTION)

(Response to statements should be: Yes, No, or NA)

D. Facility Tank Car & Tank Truck Loading/Unloading Rack Tank car and tank truck loading/unloading occurs at the facility.

(If yes complete 1 through 5 below). Yes

1. Loading/unloading procedures meet the minimum requirements and regulations of the Department of Transportation. Yes
2. The unloading area has a quick drainage system. No
3. The containment system will hold the maximum capacity of any single compartment of a tank truck loaded/unloaded in the plant. Yes

Describe containment system design, construction materials, and volume:

The truck loading facility is enclosed by an earthen dike designed to contain 110% of the volume of one transport truck. See attached drawing and calculation sheets for more detail.

4. An interlocked warning light, a physical barrier system, or warning signs are provided in loading/unloading areas to prevent vehicular departure before disconnect of transfer lines. No

Describe methods, procedures, and/or equipment used to prevent premature vehicular departure:

A ground wire system is in use, which will not allow the transfer pump to operate unless the truck is attached to both the ground wire and to the loading rack via the transfer line. If this circuit is broken, the transfer pump will shut down. In addition, the loading rack is equipped with an automatic shutoff, which activates when a pre-set volume passes through the LACT meter. This will limit the volume of condensate that could be leaked if premature truck departure would occur.

5. Drains and outlets on tank trucks and tank cars are checked for leakage before loading/unloading or departure. Yes

PART II, ALTERNATE A
DESIGN AND OPERATING INFORMATION
ONSHORE FACILITY (EXCLUDING PRODUCTION)

(Response to statements should be: Yes, No, or NA)

E. Security

1. Plants handling, processing or storing oil are fenced. No*
2. Entrance gates are locked and/or guarded when the plant is unattended or not in production. NA*
3. Any valves which permit direct outward flow of a tanks contents are locked closed when in non-operating or standby status. Yes
4. Starter controls on all oil pumps in non-operating or standby status are:
   (a) Locked in the off position, No**
   (b) located at sites accessible only to authorized personnel. Yes
5. Discussion of items 1 through 4 as appropriate:

* The gas plant is attended 24 hours per day, each day of the year. The gas plant is fenced, the condensate storage tanks are outside the fenced area.

** The LACT unit addressed in Item D. 4, has a key lock security system which requires an assigned key to allow loading trucks.

6. Discussion of lighting around the facility:

   Flood lighting and localized area lighting provided by Marathon Oil Company.

IGBP SPCC Plan Attachments Index

Section 1

Attachment 1	____	Plan re-certification / modification record
Attachment 2	____	API SPCC Plan Attachment #2
Attachment 3	____	Commitment of Manpower, Equipment, and Materials
Attachment 4	____	SBU Oil Spill Contingency Plan (5 pages)
Attachment 5	____	SPCC Inspection procedure
Attachment 6	____	SPCC Plan annual review form
Attachment 7A	____	SPCC semi-annual facility inspection form, page 1
Attachment 7B	____	SPCC semi-annual facility inspection form, page 2
Attachment 8	____	Example of daily SPCC inspection documentation
Attachment 9	____	Plant plot plan
Attachment 10	____	Contact information. Marathon and contract
Attachment 11	____	Marathon spill report form

Section 2

Worksheets	____	Secondary containment volume worksheets & drawings

Section 3

Maps	____	Topographic Map
	____	Road map to plant
	____	Gathering system

Section 4

Documentation	____	Inspection records

SPCC Plan Review Record.

This SPCC plan will be periodically reviewed for accuracy in a timely manner as specified by current SPCC regulations. Any amendment to the SPCC plan shall be certified by a PE (Professional Engineer) within six months after a change in the facility design, construction, operation, or maintenance occurs which materially affects the facility's potential for the discharge of oil into or upon the navigable water of the United States or adjoining shorelines. Amendments and PE certifications can be added to the plan as an Attachment, as long as it is consistent with the spill prevention goals of the rest of the plan. The PE is not required to re-certify the entire plan again under these circumstances.

Review Dates	Title	Signature

Attachment 1

SPCC PLAN, ATTACHMENT #2
OIL SPILL CONTINGENCY PLANS AND
WRITTEN COMMITMENT OF MANPOWER, EQUIPMENT, AND MATERIALS

Secondary containment or diversionary structures are not practical for this facility for the following reasons (attach additional pages if necessary):

Secondary containment is not provided around the bases of selected storage tanks and process vessels since trapped volatile liquid will vaporize at atmospheric conditions and/or trapped hydrocarbons would create an extreme fire hazard in the plant area. All secondary containments in existence are capable of containing at least 110% the volume of the largest tank within.

A strong oil spill contingency plan is attached. Yes

A written commitment of manpower, equipment, and materials is attached. Yes

Attachment 2

SPCC PLAN
COMMITMENT OF MANPOWER, EQUIPMENT AND MATERIALS

To: OPERATIONS SUPERVISORS

This is your authority to expeditiously commit manpower, equipment and materials necessary to arrest and contain and initiate cleanup of any harmful quantity of oil or hazardous material discharged from this facility. This authority may be delegated by yourselves to the person in charge of the facility to ensure that necessary activities are implemented as quickly as possible after a spill is noted.

R. V. Coleman

Operations Superintendent

Southern Business Unit

Attachment 3

OIL SPILL

ON LAND

All oil spills, regardless of the quantity shall be reported to the respective area Production Supervisor. The Production Supervisor and/or their designee shall in turn, use the flowcharts contained in the Reporting Section(s) of this is manual to determine if the spill is reportable.

If the spill is determined to be reportable the Production Supervisor will be responsible for notifying the proper federal/state and local authorities of the oil spill. They will also be responsible for notifying the area's Production Superintendent and HES Department of the spill. If additional Marathon Oil Company (MOC) resources are needed to respond to the spill the Production Supervisor shall inform the Production Superintendent of this need. The Production Superintendent will be responsible for obtaining the additional MOC resources that are needed to respond to the spill (i.e. activating the Regions Incident Command System).

Gas leaks and gas line breaks shall be reported in the same manner as oil spills. All gas leaks (whether it is natural gas or casinghead gas) need to be reported to the appropriate state oil and gas regulatory agency. Venting of gas from tanks, pressure relief valves, etc. is not reportable under this section. However, these types of releases may be reportable under Federal regulations (CERCLA/SARA) or under the State Air Control Agency regulations. If the escaping gas or oil contains H_2S consult the applicable H_2S Contingency Plan for that facility for additional guidance.

In the case of an oil spill/gas leak from a producing well, a testing vessel, a tank, flow line or any other related oil field equipment, action should be designed to protect human life and control the spill as rapidly as possible. All steps should be considered carefully; however, timing of these steps should be altered to fit the individual circumstances.

1. Shut off source feeding the spill, analyze the type of spill and determine the best immediate action to be taken to contain the spill.

2. Obtain labor and equipment from the nearest source to construct a containment barrier as rapidly as possible.

3. If Item 2 is only a temporary measure and earth moving equipment is required, call out the necessary equipment from the source from which it is most readily available.

4. Employ the use of the most readily available absorbent material (straw, dirt, lost circulation material, etc.). When the location is a heavy clay soil, dirt will be ineffectual.

Attachment 4

OIL SPILL

5. If practical, call for vacuum truck to pick up hydrocarbons.

6. Collect lighters and matches from personnel working in the area to assure an explosion or fire does not occur.

7. Restrict entrance to affected area by persons not involved in containment and cleanup operations.

8. Notify Production Superintendent of spill and action being taken. The Production Superintendent will notify the Region's upper management (Operations Superintendent, Region Production Manager, etc) of the spill.

9. Keep livestock from affected area and if practical, notify the farmer or rancher of the situation.

10. The Production Supervisor will notify the required regulatory agencies (National Response Center, TRRC, NMED, etc) of the spill.

11. Be aware of the presence of H_2S gas. Personal Protective Equipment (SCBA's) should be readily available if H_2S gas is known or suspected.

12. In the event the spill results in curtailing deliveries, the Production Superintendent will notify the crude oil purchaser.

13. The Duty Officer at the National Response Center must be notified immediately when a spill reaches "waters of the U.S.", or it appears a certainty that the spill will reach "waters of the U.S.".

ON INLAND WATER

All action should be designed to protect human life and control the spill as rapidly as possible. All steps listed should be considered; however, timing of these steps should be altered to the individual circumstances to best accomplish these objectives.

Attachment 4

OIL SPILL

1. Any employee sighting a spill will immediately attempt to shut off the source feeding it.

2. The employee will notify his supervisor or the Production Supervisor who will in turn advise the Production Superintendent of the spill.

3. The Production Supervisor shall notify immediately the appropriate state and federal agencies (National Response Center, TRRC, NMED, etc).

4. The employee and/or Production Supervisor will furnish their best estimate of the following information concerning the spill.

   A. Location of the spill.

   B. Source and type of oil spilled.

   C. Is the source still feeding the spill?

   D. Area covered and volume.

   E. Direction of movement

   F. Speed of movement.

   G. Currents (if applicable).

   H. Estimate of the area likely to be affected.

   I. Other action taken.

5. The Incident Commander or his/her designated representative shall keep a daily log of response activities. The log book shall be bound, not loose leaf. Entries shall be dated, time and signed.

A. **MINOR SPILLS**

1. If the spill is minor (5 to 25 bbls) and a boom is not immediately available, sorbent material should be spread on the spill and collected afterwards.

2. Attempts should be made to cleanup the shoreline and recover as much oil as possible

Attachment 4

OIL SPILL

B. **MAJOR SPILLS**

In all probability, a major spill (greater than 25 bbls) will initially require twobasic efforts: 1) stop the leak, and 2) contain the spill. Stopping the leak may require other outside services such as well control specialists, a drilling or workover rig, pipeline repair crew, etc. Requirements should be determined and action initiated as soon as possible.

1. To contain the spill, if a containment boom is readily available, order it out immediately and commence skimming operations as soon as possible.

2. If a contract or coop-containment service is to be employed, it should be mobilized without delay.

3. If weather and water conditions are such that the time required to implement containment will permit the spill to spread beyond possible containment; sorbent material should be spread on the spill.

4. Shoreline work sites for each facility shall be pre-selected, marked as such and made known to the employees who will be involved in spill control activities for the facility.

5. In shallow water, containment should be attempted by boom and the material hand-harvested.

6. If sorbent material has been employed, the local air control agency should be contacted for permission to burn the collected material.

8. When applicable, aircraft should be employed to discourage waterfowl from staying in the spill area.

9. A photographic record of the spill movement, containment and cleanup operations, damage to property, fish kills, efforts to disperse waterfowl, waterfowl kills, and other relevant actions should be kept.

Attachment 4

CERT REPORTING REQUIREMENTS

In certain cases a spill or release may trigger reporting requirementsunder Marathon's Corporate Emergency Response Plan. Refer to the section on CERT to make this determination.

REGULATORY AGENCIES TO BE NOTIFIED

The flowcharts contained in the State and Federal Reporting sections provide guidance for determining when a spill is reportable and which regulatory agencies need to be notified. Phone numbers for all of these agencies are listed in the section entitled, "Agency Information."

DEFINITION OF WATERCOURSE OR WATERS OF THE U.S.

The term watercourse is defined as any lakebed (playa), gully, draw, streambed, wash, arroyo, or natural or man-made channel through which water flows or has flowed. An arroyo, which is dry most of the time but flows after a heavy rainstorm is, considered a watercourse. A spill into the arroyo when it is dry is a reportable spill to the National Response Center. Two examples of a watercourse in this Region are Rocky Arroyo behind the Indian Basin Gas Plant and the arroyo's located in Discovery Canyon in the Yates Field. Both happen to drain into the Pecos River. If there is any doubt concerning whether or not a spill has entered a watercourse contact should be made with the Environmental and Safety Department for a final determination.

CERCLA/SARA REPORTING REQUIREMENTS

In some cases a spill may trigger reporting requirements under EPA's CERCLA/SARA regulations. Reference the Federal section of this manual to determine when a spill is covered by these reporting requirements.

IBGP SPCC PLAN INSPECTION PROCEDURES

Eddy County, New Mexico

1. As part of his normal routine, the plant operator(s) will visually inspect the plants production facilities for accumulations, leaks of oil or other hazardous substances. The operator must perform the inspection at least once per shift.

2 The production facilities to be inspected will include but are not limited to lines, vessels, valves, pumps, sumps, ditches, containments, and miscellaneous fittings.

3. In the event that an accumulation or leak is discovered, the operator shall initiate the actions detailed in the current SPCC Plan.

4. The operator shall record his daily inspection on the plant daily reading sheets.

5. Annual SPCC plan and semi-annual SPCC facility inspections will be performed by the plant superintendent, or their designee, using the attached inspection forms. Completed inspections forms will be filed with this plan.

C.M. Schweser

Indian Basin Gas Plant
Superintendent

8/16/01
Date

R.V. Coleman

Indian Basin Operations
Superintendent

8/16/01
Date

Attachment 5

Indian Basin Gas Plant
Annual SPCC Plan Review Record

Instructions:

Each inspection item listed below should be checked with the most appropriate answer (Y)es or (N)o. If the inspection item requires additional work to complete, note it in the comment section.

Note; the IBGP semiannual facility inspection should also be performed.

Work order(s) should be written for all corrective actions noted during review or inspections. Work orders should written to show requested by SPCC. Include work order numbers or copies of work orders in this report. The Inspector must initial each item inspected and print their name on each form. The Marathon Supervisor responsible for the facilities being inspected must sign all forms and ensure all necessary corrections are completed.

Plan Review	Y	N	Comments
*Has there been a change in any facility covered by the plan which materially affects its discharge potential to navigable waters?			(See note below)
Has the plan been PE certified within the last 3 years or documentation attached affirming that re-certification is not required?			Note: If the plan is still in effect a originally prepared, this may be documented on a signature page and attached.
Are there three years of inspection records on file?			
Are facility plot plans attached with drainage directions?			
Has the spill history been reviewed for NRC reportable spill trends?			Note: all spills are investigated and actions to correct are tracked to completion.
Has any facility had 2 NRC reportable spill within 12 calendar months or an NRC spill greater than 1000 gallons of oil?			Note: If Yes, was the SPCC plan submitted to the EPA Regional Administrator?
Is an Emergency Contingency Plan available?			
Is a written commitment to manpower, equipment and material attached? Current?			
Is Substantial Harm self determination attached?			
Is drainage direction shown on plot plans?			
Is a topographic map of the area attached or on file?			
Does PART I, #7 of plan accurately describe spill potential and direction?			
Are all oil storage tanks compatible with material stored?			
Have there been any facility modifications which affect the dike size requirements?			
Are daily visual inspections being performed and documented by operators?			
Are oil tanks of adequate capacity to prevent overfilling?			
Is there adequate vacuum/pressure relief protection on oil tanks?			
Have all previously written SPCC related work orders been closed?			

Printed Name **Inspector**	**Signature**	**Date Inspected**
Printed Name **Plant Superintendent**	**Signature**	**Date Accepted**

Attachment 6

Form located at N:/SafetyandEnv/SPCC/PlantSPCCplan

IBGP SPCC Facility Inspection

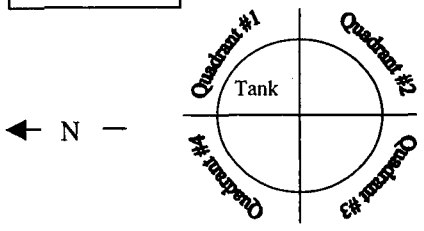
Comments Code:			
Tanks	Tank foundations	Dikes	Piping / Valves
T1 Drip Marks	TF 1 Cracks	D1 Dike damaged.	P1 Droplets of stored material
T2 Discoloration	TF2 Discoloration	D2 Dike material not impervious	P2 Discoloration
T3 Puddles containing spilled or leaked material	TF3 Settling	D3 Dike not large enough to contain current potential oil volume.	P3 Corrosion
T4 Corrosion	TF4 Gaps between tank and foundation	D4 Vegetation growing in dike.	P4 Pipe supports OK?
T5 Cracks	TF5 Damage caused by vegetation roots	NOTE: There should be NO drainage valves from dikes.	P5 Bowing of pipe between supports
			P5 Evidence of stored material seepage from valves or seals
			P6 Valve glands and bodies OK?

General inspection items to look for:

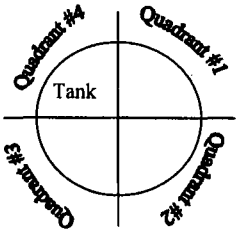
G1. Drip pans empty ?	G5. Drainage ditches empty?
G2. Lube oil tanks/drums in secondary containment?	G6. Netting in place & in good condition (if applicable)
G3. Chemical Tanks/Pumps in secondary containment?	G7. Sumps empty?
G4. Drain valves plugged?	G8. Localized dead vegetation

Tank inspection guide. For vertical tanks, wall inspections should be described by quadrant. Start quadrant #1 on the North side of tank. For horizontal tanks start description at the top, include direction of view (i.e. looking west). Number quadrants in a clockwise rotation.

Top view
Vertical tank



End view
Horizontal tank



Does Facility Drawing Represent Current Facility Layout & Direction of Drainage? Yes/No_____

Inspector Name Printed _____ Signature _____ Date Complete _____

Tank Description	Comments
Generator Turbine Oil	
Transfer Tank	

Attachment 7A

Created - 6/28/01
Revised -

Outlet Compressor Lube Oil	
Field Storage Area	
Stabilizer Compressor Lube Oil	
IBLEAP Stripper Tank Area	
Skimmer Basin	
Recompressor Lube Oil	
SWD Pump Lube Oil	
Condensate tank 5B	
Flare Drum Bullet	
Sales Condensate Knockout Bullet	
Sour NGL Surge Bullets (3 ea)	
LACT: Grounding and Auto-shutoff	
General Area Piping and Equipment	

Superintendent Name Printed _____ Signature _____ Date Accepted _____

Work orders shall be written for any item requiring correction. Work orders will be requested by **SPCC.** The IBGP work order system will serve to track action items to completion. Attach a copy of SPCC work orders generated by this inspection to this report. File with the SPCC plan.

Attachment 7B

Created - 6/28/01
Revised -

INDIAN BASIN GAS PLANT
DAILY LOG SHEET #5

Cryo Plant Readings

Date On: _____ Off: _____

	Normal Operating Range	3 AM	6 AM	9 AM	12 - N	3 PM	6 PM	9 PM	12 - M
Cryo Temperatures:									
Warm G/G Inlet Gas In	80 - 115 F								
Warm G/G Inlet Gas Out	65 - 80 F								
Warm G/G Residue Gas Out	80 - 100 F								
Cool G/G Inlet Gas In	65 -80 F								
Cool G/G Residue Gas In	-50 - -5 F								
Cool G/G Residue Gas Out	50 - 80 F								
Side Reboiler Inlet Gas In	5 - 25 F								
Side Reboiler Inlet Gas Out	-10 - 15 F								
Side Reboiler Draw	-65 - -40 F								
Side Reboiler Return	0 - 25 F								
Cold G/G Inlet Gas In	-10 - 15 F								
Cold G/G Inlet Gas Out	-110 - -90 F								
Cold G/G Residue Gas In	-145 - -120 F								
Cold G/G Residue Gas Out	-35 - -20 F								
Ratio Control Valve Out	-150 - -135 F								
Exp Compressor Discharge	125 - 140 F								
Expander Outlet	-105 - -75 F								
Bottom Reboiler Draw	40 - 55 F								
Bottom Reboiler Out	65 - 90 F								
Trim Reboiler Return	70 - 105 F								
Product to MAPCO	70 - 105 F								

Dehydration/Regeneration System Readings

	Normal Operating Range	3 AM	6 AM	9 AM	12 - N	3 PM	6 PM	9 PM	12 - M
Filter Separator delta P	55 - 85 "H2O								
Dehydrated Gas Dewpoint	-120 - -80 F								
Dust Filter delta P	55 - 85 "H2O								
Dehydrated Gas Flowrate	120 - 180 mmscfd								
Regeneration Gas System:									
Regen Gas Flow	15 - 18 mmscfd								
Regen Bed	A, B or C								
Heating or Cooling	LH, HH or C								
Regen Gas Temperature	80 - 580 F								
Regen Cooler Outlet Temp	80 - 120 F								
Regen Scrubber Pressure	850 - 875 psig								
Regen Compressor	Circle One	E or W	E or W	E or W	E or W	E or W	E or W	E or W	E or W
Oil Pressure	18 - 25 psig								
Oil Temperature	120 - 150 F								
Suction Pressure	850 - 875 psig								
Discharge Pressure	925 - 950 psig								

COMMENTS DAYS _____

_____

_____

I have inspected the equipment and find no leaks or other hazardous conditions

_____
Operator Signature

COMMENTS NIGHTS _____

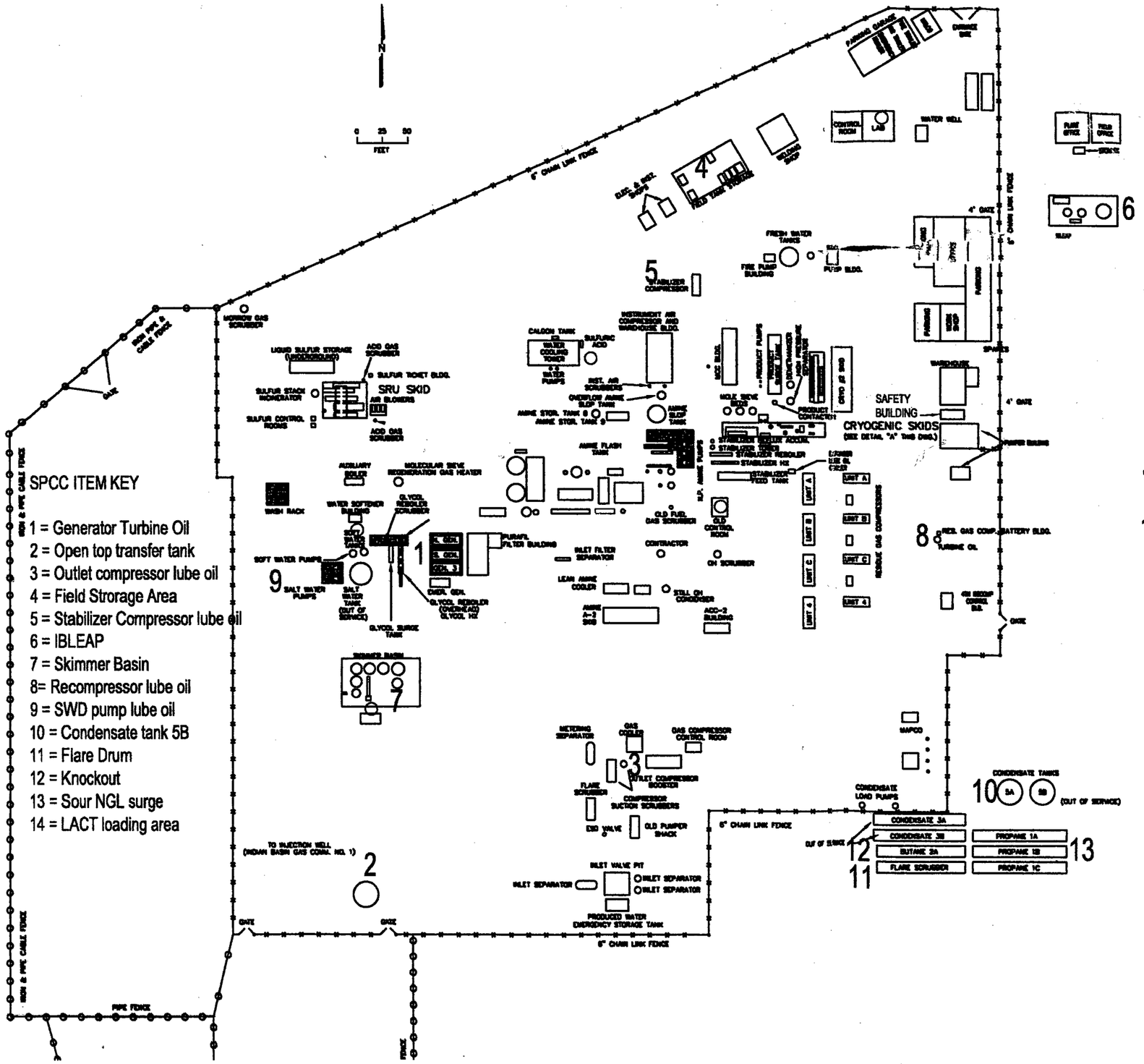
_____

_____

I have inspected the equipment and find no leaks or other hazardous conditions

_____
Operator Signature

ATTACHMENT #8



SPCC ITEM KEY

1 = Generator Turbine Oil
2 = Open top transfer tank
3 = Outlet compressor lube oil
4 = Field Strorage Area
5 = Stabilizer Compressor lube oil
6 = IBLEAP
7 = Skimmer Basin
8= Recompressor lube oil
9 = SWD pump lube oil
10 = Condensate tank 5B
11 = Flare Drum
12 = Knockout
13 = Sour NGL surge
14 = LACT loading area

INDIAN BASIN
PRODUCTION AREA
ICS STRUCTURE

Position	Office Phone	Pager or Cellular (2)	Mobile/ Cellular	Home Phone	Hrs Hazwoper	Radio Number
Incident Commander						
Bob Coleman	(505) 457-2621 (Ext 103)	(505) 361-0898		(505) 628-0049	40	1
Operations Section						
Dwight Brodbeck* Field ♦	(505) 457-2621 (Ext 131)	(505) 365-7253		(505) 887-9097	24	36
Tom Breninger* IGBP ♦	(505) 457-2621 (Ext 104)	(505) 361-7331		(505) 885-5172		2
Jerry Harrison	(505) 457-2621 (Ext 121)	(505) 365-5864	(505) 365-5863	(505) 746-6754	24	3
Timmy Klein	(505) 457-2621 (Ext 108)	(505) 361-5606	(505) 365-5518	(505) 484-3675	24	13
Tim Winters	(505) 457-2621 (Ext 120)	(505) 364-1910	(505) 365-7589	(505) 746-4662	24	4
Planning Section						
Richard Aves	(505) 457-2621 (Ext 105)	(505) 361-8258	(505) 365-8258	(505) 885-1990		
Monty Corbett	(505) 457-2621 (Ext 140)	(505) 365-7607	(505) 361-7607	(505) 628-3298		34
Logistics Section						
James Faught*	(505) 457-2162 (Ext 151)	(505) 361-8260	(505) 365-8259	(505) 392-6575	24	32
Sharky Morgan	(505) 457-2621 (Ext 111)	877-210-6841	(505) 365-7618	(505) 745-3327	24	16
Bruce Waldrip*	(505) 457-2621 (Ext 107)	(866) 499-7641		(505) 457-2252	24	13
Safety						
Pat Reynolds*	(505) 457-2621 (Ext 139)	(505) 365-4871	(505) 365-7514	(505) 748-1472	40	Handheld
Jim Wilson	(505) 457-2621 (Ext 106)	(505) 365-4257		(505) 746-6481	40	Handheld
Jack Ivy	(505) 457-2621 (Ext 138)	(505) 365-4859	(505) 365-8442	(505) 748-2763	24	17
Public Affairs						
Pat Bowen	(505) 457-2621 (Ext 133)	(505) 365-8422	(505) 365-8411	(505) 748-2885	24	26

*** Denotes Command Staff/Section Chief "Lead" if applicable.**

♦ Denotes Alternate Incident Commanders

IB MARATHON EMPLOYEES

PRINTED 12/6/2004

Updated First	Last	Spouse	Extension	Cell Phone 1	Cell Phone 2	Pager Number
Keith	Anderson	Jo	156	(505) 365-7592	(505) 361-7592	
Shawna	Austin	Lee	102			
Richard	Aves	Katie	105	(505) 365-8258	(505) 361- 8258	
Winston	Ballard	Jan	128	(505) 365-8417	(505) 361-8000	866-499-7610
Jimmy	Barnett	Linda	110			866-499-7623
Javier	Berdoza	Jessica		(505) 365-5040	(505)365-4531	
Pat	Bowen	Terri	133	(505) 365-8411	(505) 365-8422	
Gerald	Brasfield	Lauri	110		(505) 746-7593	866-499-5220
Tom	Breninger	Pat	104	(505) 361-7331		
Dwight	Brodbeck	Brenda	131	(505) 365-7253		
Robert (Bob)	Coleman	Kim	103	(505) 361-0898		
Monty	Corbett	Barb	140	(505) 365-7607	(505) 361-7607	
Archie	Crossland	Lisa	125	(505) 361-9240	(505) 361-9241	
Larry	Davis	Vickie	110		(505) 703-2323	866-499-7619
Dan	Dowhower	Melinda		(505) 365-8214	(505) 365-4459	
James	Faught	Norma	151	(505) 365-8259	(505)361-8260	
Kenny	Garrett	Debbra	114	(505) 361-3459		
Dolores	Gonzales			(505) 365-8413	(505) 365-4459	
Brady	Hamilton		142	(505) 365-7614	(505)365-4531	
Jerry (Bubba)	Harrison	Lynn	121	(505) 365-5863	(505) 365-5864	
Jack	Ivy	Gayla	138	(505) 365-8442	(505) 365-4859	
Morris	Jones	Rhonda		(505) 365-4350		866-499-7639
Clint	Kirkes	Stephanie	110			866-499-7620
Timmy	Klein	Tammy	108	(505) 365-5518	(505) 365-5606	
Al	Leyva	Corina		(505) 365-6854	(505) 365-4471	
Wendell	Malone		110	(505) 365-7464		
Steve (Sharky)	Morgan	Judy	111	(505) 365-7618		877-210-6841
John	Norris	Becky	146	(505) 365-6776		866-499-7612
Pat	Reynolds	Cyndi	139	(505) 365-7514	(505) 365-4871	none
David	Rouse	Karen	110			866-499-7624
Margie	Ruiz		101			
Tito	Salmon	Jessica		(505) 365-7623	(505)365-4471	
Donna	Suter	Todd	130			
Joe	Trevino	Terry	127	(505) 365-5899		866-499-7629
Reggie	Turner	Lanette	110	(505)365-6562		
Bruce	Turpin	Debora	110			866-499-7638
Dario	Velasquez	Delma	110			866-499-7621
Bruce	Waldrip	Jan	107			866-499-7641
Charlie	Williams	Beth	142	(505) 365-8441	(505) 365-4864	
Don	Williams	Paula	117	(505) 365-5585	(505) 361-5586	
Jim	Wilson	Dorothy	106	(505) 365-4257		
Tim	Winters	Rita	120	(505) 365-7589		364-1910
Dominic	Zelnik	Jess	115	(505) 365-7652	(505) 361-8216	
CERT - (toll free) 1-866-662-2378						
Field Radio Frequency (repeater) 451.650 MHz receive, 456.650 MHz transmit, tone 127.3 Hz						
Plant Radio Frequency 462.525 MHz (receive and transmit), tone 127.3 Hz						
Highlighted names are personnel that can be expected to lead an emergency response						

911 or Sheriff (505)887-7551
NM St Police (505)885-3737
To view the most current information go to; O:/Permanent/Indian Basin Contacts/All IB contact Info List.xls 12/6/2004

Printed 1/[illegible]/2004
Updated 3/19/03

REGULATORY CONTACTS

Note: Number in bold is emergecy/after hours number

Contact Name									
First	**Last**	**Title**	**Division/Area**	**Main Phone Number**	**Secondary Number**	**Cell Phone 1**	**Fax No.**	**Home Phone Number**	**Address**
Robin	Smith		Roswell	(505) 622-6001			(505) 622-0943		400 North Pennsylvania Avenue , Roswell NM
Emergency Number			District 2	**(505) 746-4302**					
Field Rep On-Call			District 2	**(505) 939-8622**	Pager number				
Tim	Gum	District Supervisor	District 2	(505) 748-1283	ext 102	(505) 626-0824		(505) 324-1387	
Bryan	Arrant	Geologist	District 2	(505) 748-1283	ext 103	(505) 626-0830			
Van	Barton	Field Representative II	District 2	(505) 748-1283	ext 109	(505) 626-0812		(505) 748-2259	
Gerry	Guye	Field Representative	District 2	(505) 748-1283	ext 105	(505) 626-0843		(505) 887-3254	
Phil	Hawkins	Field Representative	District 2	(505) 748-1283	ext 106	(505) 626-0836		(505) 746-9272	
Mike	Bratcher	Compliance Officer	District 2	(505) 748-1283	ext 108	(505) 626-0857			
Main Office			Santa Fe Division Offices, District 4	(505) 476-3440				(505) 466-0134	
Ed	Martin		Santa Fe Division Offices	(505) 476-3492				(505) 685-4056	
Roger	Anderson		Santa Fe Division Offices	(505) 476-3490				(505) 471-2017	1220 Saint Francis, Santa Fe, NM 87505
			District 3, Roswell	(505) 827-9312					
			Sub-District 3, Roswell	(505) 622-7200		(call this number for dispatch to our area)			
			Carlsbad	(505) 887-6544		**(505) 369-2814**			620 E. Green, Carlsbad,
			National Response Center	(800) 424-8802					
			Air Quality Bureau	(505) 827-1494					
Note: in NM the SERC is the State Police				**(505) 827-9126**					NM DPS Emergency Management
Joel	Arnwine		Eddy County	(505) 885-2111	(505) 887-9511	**(505) 369-3404**	(505) 887-1039	(505) 885-8009	
New Mexico OSHA Office				(505) 827-2850					

To view the most current information go to; O:/Permanent/Indian Basin Contacts/All IB contact Info List.xls

Service Provider	*Description*	*Main Phone*	Contact Person	
General Emergency	**Police, Fire, Ambulance**	**911**		
Carlsbad Police, Fire & Ambulance Service	To reach 911 operator in Carlsbad	(505) 885-2111 +0		
Artesia General Hospital	Medical Services	(505) 748-3333		
Artesia Police Dept.	Law enforcement	(505) 746-5001		
Carslbad Fire Dept.	Fire Control	(500) 885-3124	Mike Reynolds (Chief)	
Artesia Fire Dept.	Fire Control	(505) 746-2701		
Happy Valley Fire Dept.	Fire Control	(505) 885-1982		
NM State Police	Sub-District 3, Carlsbad			
NM State Police	District 3, Roswell	(505) 622-7200		Dispatcher for our area
Eddy County Sheriff	Law enforcement	(505) 887-7551		manned 24/7
Eddy County Sheriff	Law enforcement	(800) 658-9942		

Other Services

Facility Name	*Address*	*City*	*Phone Number*	*Services*
Stevens Motel	1829 S. Canal	Carlsbad	(505) 887-2851	Lodging, Food, Laundry, Meeting Rooms
Comfort Inn & Suites	2429 W. Pierce	Carlsbad	(505) 887-1994	Lodging
Holiday Inn Express	2210 W. Main	Artesia	(505) 748-3904	Lodging
Best Western Pecos Inn	2209 W. Main	Artesia	(800) 676-7481	Lodging, Food, Meeting Rooms
Denny's Restaurant	810 W. Pierce	Carlsbad	(505) 885-5600	Food
Furr's Family Dinning	901 S Canal St	Carlsbad	(505) 885-0430	Food
K-Bob's Steakhouse	601 S 1st St	Artesia	(505) 748-2208	Food
LaFonda Restaurant	206 W. Main S .	Artesia	(505) 746-9377	Food, Meeting Room
Catering- Granny's Chuckwagon	3204 W. Main	Artesia	(505) 746-3209	Food Catering
Domino's Pizza	302 S. 1st	Artesia	(505) 746-0030	
Carlsbad Civic Center	4012 Nationals Prk Hw	Carlsbad	(505) 887-9004	Meeting Rooms
Carlsbad Country Club	1700 Orchard Ln.	Carlsbad	(505)885-3926	Meeting Rooms
Artesia Country Club	2701 W. Richey	Artesia	(505)746-6732	Meeting Rooms

MARATHON OIL COMPANY
NEW MEXICO SPILL AND RELEASE REPORT

This form to be completed for any spill or release

Release/Spill Date Mo Day Yr	Estimated Time of Release/Spill	Fluid Type	Amount Released	Volume Recovered
/ /	am/pm	Oil	Bbls	Bbls
Was Spill Contained?		Water	Bbls	Bbls
☐ Yes ☐ No	Other (please list) →		Bbls	Bbls
☐ Dike ☐ Pit ☐ Basin		Total	0 Bbls	0 Bbls
GAS RELEASE	MSCF			

LOCATION OF RELEASE

* Use unit letter or footages, both are not required.

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County

Field _____ Lease No. _____ Well: _____

Facility Name: _____ Facility Type: _____

CAUSE OF RELEASE

Equipment Which Leaked
- ☐ Tank
- ☐ Heater Treater
- ☐ Separator
- ☐ FWKO
- ☐ Valve
- ☐ Stuffing Box
- ☐ Process Piping
- ☐ Other (specify) _____

Flowline →
- ☐ Buried
- ☐ Surface

Size: _____

Type of Failure Causing Leak
- ☐ Break
- ☐ Cracked
- ☐ Hole
- ☐ Plugged
- ☐ Split
- ☐ Striker Plate Missing
- ☐ Overfill
- ☐ Other (specify) _____

If Flowline
- ☐ Steel
  - ☐ Int. Coating
  - ☐ Wrapped
- ☐ Poly/PVC
- ☐ Fiberglass

Location of Leak
- ☐ Shell
- ☐ Bottom
- ☐ Connection
- ☐ Associated Piping
- ☐ Line
- ☐ Fire tube
- ☐ Gasket
- ☐ Manway
- ☐ Nozzle (specify) _____
- ☐ Seam
- ☐ Weld
- ☐ Other _____

Cause of Failure/Leak
- ☐ Joint Failure
- ☐ Internal Corrosion
- ☐ External Corrosion
- ☐ Improper Application
- ☐ Freezing
- ☐ High Temperature
- ☐ Over Pressure
- ☐ Electrical Failure
- ☐ High Gas Line Pressure
- ☐ Excessive Volume
- ☐ Process Shut Down
- ☐ Maintenance
- ☐ Instrumentation Failure
- ☐ Vibration/Impact
- ☐ Human Error (specify) _____
- ☐ Other (specify) _____

Probable Method of Repair
- ☐ Replaced
- ☐ Clamped
- ☐ Repaired
- ☐ Coated
- ☐ Other (specify) _____
- ☐ Return to Service

Cause of Spill or Release (Detailed Description)

Description of Spill Area (proximity to water course, surface water, penetration depth, direction of flow, dimensions, etc.)

(include diagram)

Action taken to contain & begin cleanup spill:

Action taken to prevent recurrence:

Was recommendation to prevent recurrence entered in to a Tracking System? ☐ Yes ☐ No

ATTACHMENT 11

Surface Conditions
☐ Sandy ☐ Sandy Loam ☐ Clay
☐ Rocky ☐ Caliche

Weather Conditions
☐ Raining ☐ Dry ☐ Snow ☐ Wind
☐ Other _____

Land Use
☐ Cultivated ☐ Rural ☐ Residential
☐ Grazing ☐ Vacant

HOW & WHEN WAS SPILL/RELEASE DISCOVERED:

_____ : **am/pm** **DATE:**

Person Initiating Report / Date

Supervisor Review / Date

Supervisor Review / Date

Distribution - Original : *Environmental and Safety Department (in Midland)*

Copy: Indian Basin Asset Team Manager

Field Office Spill Report File

HES Technician

Check if Notified

NOTIFICATION OF REGULATORY AGENCIES OR OTHER PERTINENT PARTIES

☐ **OCD** (Hobbs 393-6161) (Artesia 748-1283) (Aztec 334-6178) Date: _____ Time: _____ am/pm
Person Contacted: _____ Report Number: _____
Comments: _____

☐ **OCD Environmental Bureau** (505) 476 - 3490 Date: _____ Time: _____ am/pm
Person Contacted: _____ Report Number: _____
Comments: _____

☐ **BLM** (Hobbs 393-3612) (Carlsbad 887-6544) (Farmington 599-8900) Date: _____ Time: _____ am/pm
Person Contacted: _____ Report Number: _____
Comments: _____

☐ **National Response Center** (800) 424-8802 Date: _____ Time: _____ am/pm
Person Contacted: _____ Report Number: _____
Comments: _____

☐ **Corporate Emergency Response Team** (713) 629-7118 Date: _____ Time: _____ am/pm
Person Contacted: _____ Report Number: _____
Comments: _____

☐ **Environmental and Safety Dept** (915) 687-8305 Date: _____ Time: _____ am/pm
Fax report _____
Person Contacted: _____

☐ **Other:** _____ Date: _____ Time: _____ am/pm
Fax report _____
Person Contacted: _____

Immediate Verbal Notice Required When:

	Not in Water course		In Water course							
	Oil	Water	Oil	Water	Vent H2S	Flare SO2	Natural Gas	Blowout	Chemical[1]	Results in Fire
OCD (district office)	>25 Bbls		Any Amount				>500 mcf	All	> RQ	YES
OCD (Env. Bureau)			Any Amount							
BLM	>100 Bbls & [3]		Any Amount				>500 mcf	Yes		Note 2
NRC	Note 4		Any Amount		Note 4	Note 4	N/A	Note 4	> RQ	Note 4
LEPC					> 100 Lbs	N/A	N/A	N/A	> RQ	
CERT	> 500 Bbl	N/A	> 50 Bbl	N/A	> 300 Lbs	N/A	N/A	All	> 3 x RQ	

Note 1 - RQ = SARA Title III or CERCLA Reportable Quantities.

Note 2 - YES if in a sensitive area or >100 Bbls or >500 mcf

Note 3 - YES if not entirely contained in secondary containment.

Note 4 - YES for any spill, release, or fire in a sensitive area.

Revised 1/11/01

ATTACHMENT 11

DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft^3
	1.4		6		6		50

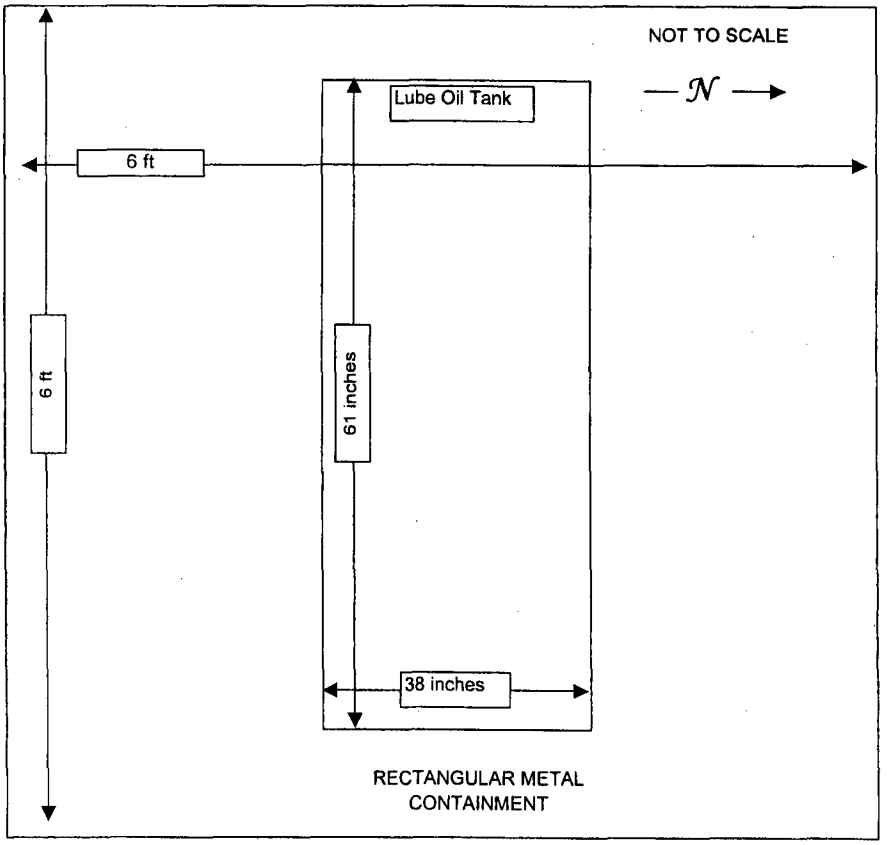
Tank Capacity	Volume(bbl)	X	Gal/bbl	X	Ft^3/Gal	=	Ft^3
	7.13		42		0.1337		40

dimensions: Diameter = 38", Length = 61"

Available Space	Dike Capacity	X	BBl/Ft^3 =	BBLs
	50		0.1781	8.98

Freeboard	Available Space	Tank Capacity =	Freeboard (Ft^3)	BBl/Ft^3 =	BBLs
21%	50	40	10	0.1781	2

Diagram: IBGP
Generator Turbine Oil Storage Tank



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS Height from lowest point on dike

	Radius		PI		Height =		Ft³
	20.25		3.14159		2.5		3220.621

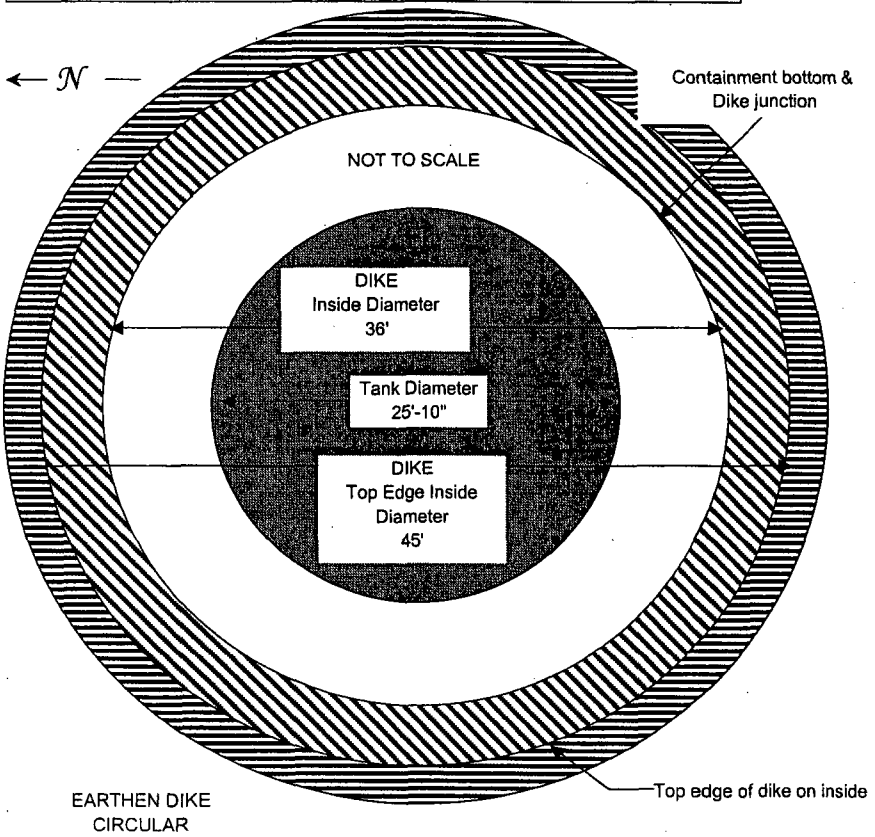
ACTUAL VOLUME AVAILABLE (Tank Capacity)

	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal =	Ft³
(Largest Tank)	498.00		42		0.1337	2796

Available Space	Dike Capacity	-	Occupied Area =	Ft³	X	BBl/Ft³ =	BBLs
	3220.62		0	3221		0.1781	574

Freeboard	Available Space	-	Tank Capacity =	Freeboard (Ft³)	BBl/Ft³ =	BBLs
13%	3221		2796	424	0.1781	76

Diagram: IBGP
Open Top Fiber Glass Transfer Tank
Tank Height 5'-4"



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft³
	1		14.67		12.67		186

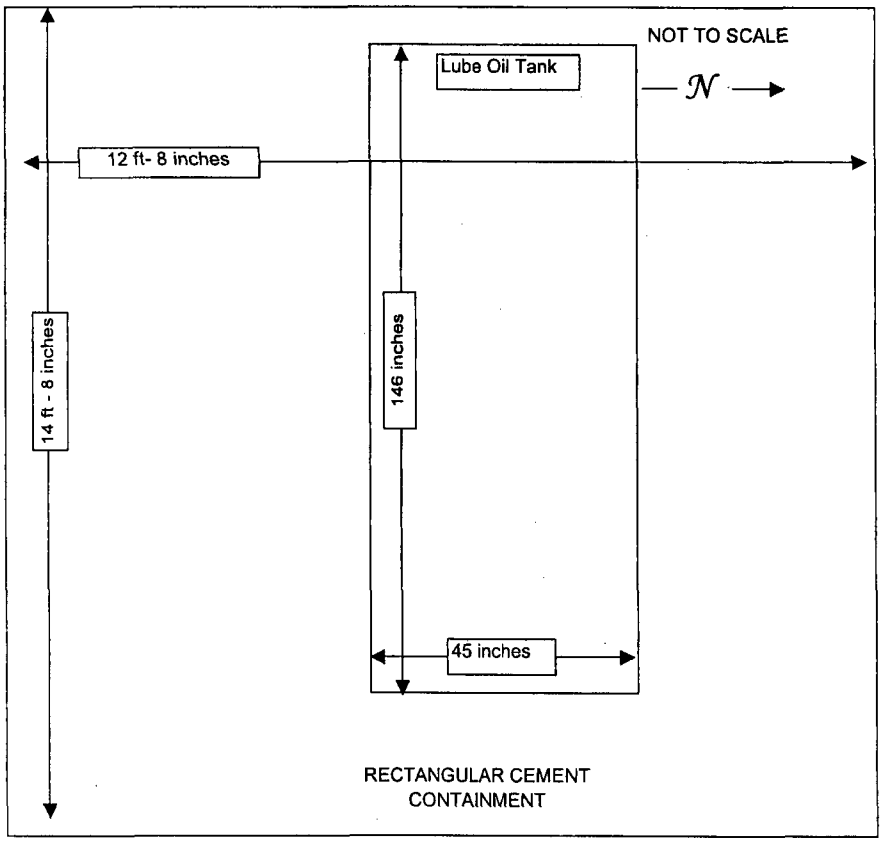
Tank Capacity	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft³
	24		42		0.1337		135

dimensions: Diameter = 45", Length = 146"

Available Space	Dike Capacity	X	BBl/Ft³	=	BBLs
	186		0.1781		33.10

Freeboard	Available Space	Tank Capacity	=	Freeboard (Ft³)	X	BBl/Ft³	=	BBLs
27%	186	135		51		0.1781		9

Diagram: IBGP
24 Barrel Outlet Compressor Lube Oil Storage Tank



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft³
	0.416		57		32.5		770.64

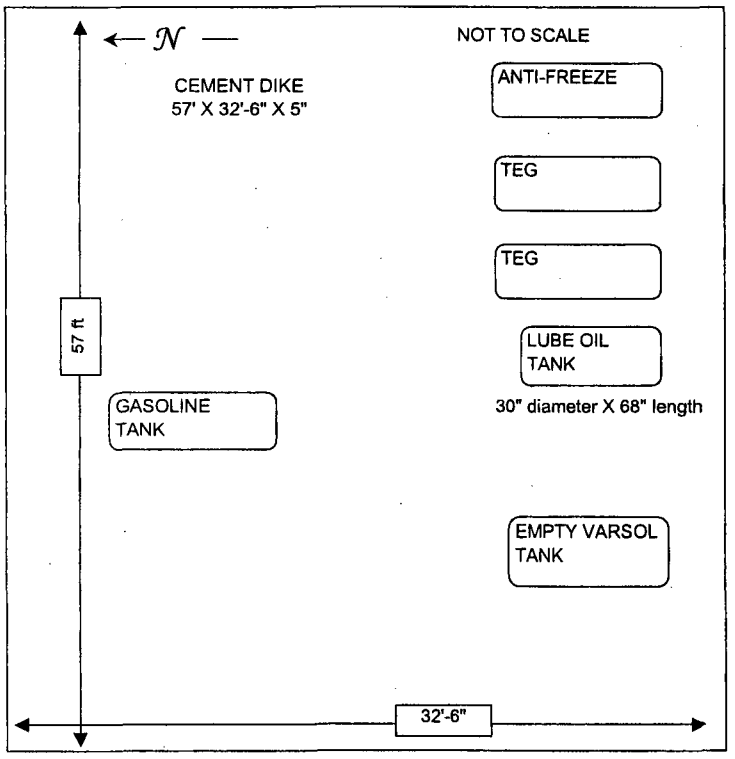
ACTUAL VOLUME AVAILABLE **(Tank Capacity)**

	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft³
(Largest Tank)	4.95		42		0.1337		28

	Dike Capacity	-	Occupied Area	=	Ft²	X	BBl/Ft²	=	BBLs
Available Space	770.64		0		771		0.1781		137

	Available Space	-	Tank Capacity	=	Freeboard (Ft³)	BBl/Ft³	=	BBLs
Freeboard	771		28		743	0.1781		132
96%								

Diagram: IBGP
FIELD STORAGE AREA



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft³
	1.5		6.25		5		47

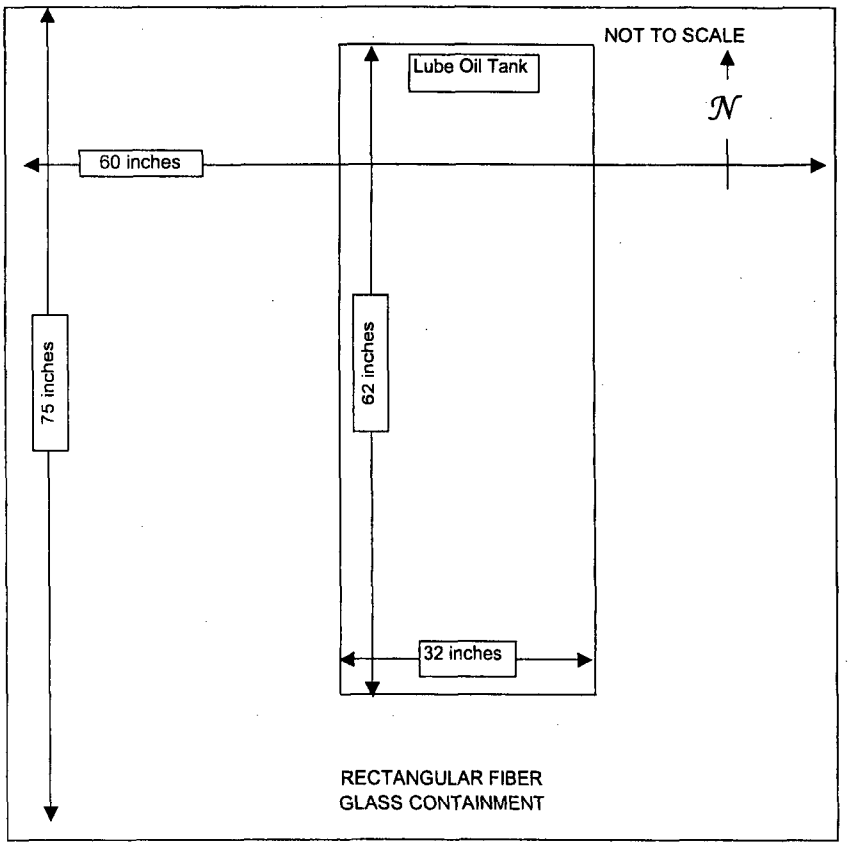
Tank Capacity	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft³
	5		42		0.1337		29

dimensions: Diameter = 32", Length = 62"

Available Space	Dike Capacity	X	BBl/Ft³	=	BBLs
	47		0.1781		8.35

Freeboard	Available Space	-	Tank Capacity	=	Freeboard (Ft³)	X	BBl/Ft³	=	BBLs
38%	47		29		18		0.1781		3

Diagram: IBGP
Stabilizer Compressor Lube Oil Storage Tank



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft³
	1.08		80		36		3110.4

OCCUPIED AREA

Tanks	Number of Tanks*	X	Pi	X	Radius²	X	Height	=	Ft²
Untreated water East	1		3.14		5		1.08		85
Untreated water West	1		3.14		5		1.08		85
									170 total

*Do not count single tank of largest capacity.

Air Strippers	Length	X	Width	X	Height	=	Ft²
East	6		3		1.08		19.44
West	6		3		1.08		19.44
							38.88 total

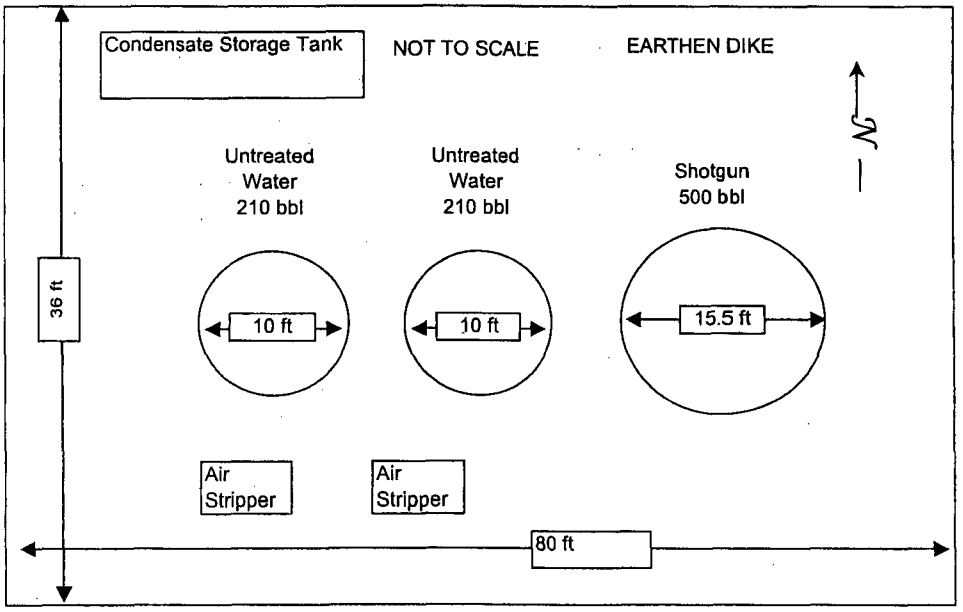
ACTUAL VOLUME AVAILABLE (Tank Capacity)

	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft³
(Largest Tank)	500		42		0.1337		2808

Available Space	Dike Capacity	-	Occupied Area	=	Ft³	X	BBl/Ft³	=	BBLs
	3110.4		209		2902		0.1781		517

Freeboard	Available Space	-	Tank Capacity	=	Freeboard (Ft³)	BBl/Ft³	=	BBLs
3%	2902		2808		94	0.1781		17

Diagram: IBLEAP Remediation Project Treatment Area



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS - Sloped cement containment

Rectangular section	Height X	Length X	Width =	Ft³
	0.5	100	74	3700

Prisim section	Area X	Length =	Ft³
	18.5	100	1850

Total Dike Volume = 5550 Ft^3

OCCUPIED AREA (Concrete Hexagonal Tank Foundations)

Tank Foundations		Side Length X	Constant	Height =	Ft³	
Oil Storage tank		4.58	2.5981	0.8	43.6	Height is actual base height.
Gunbarrel		5.42	2.5981	0.9	68.7	
Water Tanks		6.83	2.5981	0.6	72.7	No tank left out of calculations due
	4D	6.83	2.5981	0.6	72.7	to tanks being on elevated
	4E	6.83	2.5981	0.8	97.0	foundations.
Salt Water tank	4	6.58	2.5981	0.75	84.4	
TEG Tank		4.08	2.5981	0.63	27.2	
				Total =	466.3	Ft^3

Pump Bases	Length X	Width X	Height =	Ft³	
SWD Pump	36.67	5.33	0.5	98	Height equal to approx. dike height
each	4.75	1.75	0.5	4	
each	11	1.42	0.5	8	
			Total =	109.7	Ft^3

ACTUAL VOLUME AVAILABLE

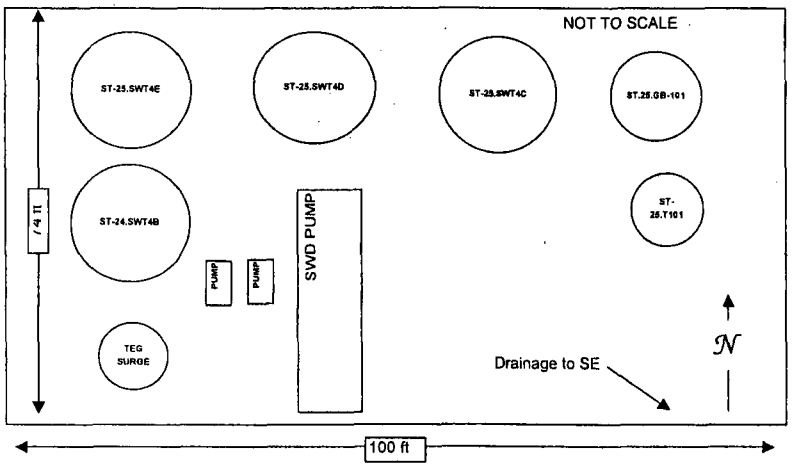
Tank Capacity	Volume(bbl) X	Gal/bbl X	Ft³/Gal =	Ft³
	500	42	0.1337	2808

Available Space	Occupied Dike Capacity -	Occupied Area (-)	Ft³ X	BBl/Ft³ =	BBLs
	5550	576	4974	0.1781	386

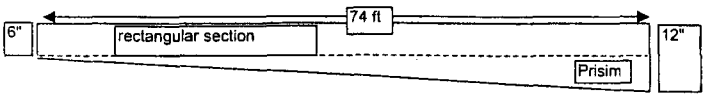
886

Freeboard	Available Space -	Tank Capacity =	Freeboard (Ft³) X	BBl/Ft³ =	BBLs
~~100%~~ 84	4974	2808	2166	0.1781	386

Diagram: IBGP SKIMMER BASIN



End View of Dike from east side.



Prisim Area = .5 ft X 74 ft / 2
Prisim Volume = Area X Width

DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft³
	2.66		26		26		1798.16

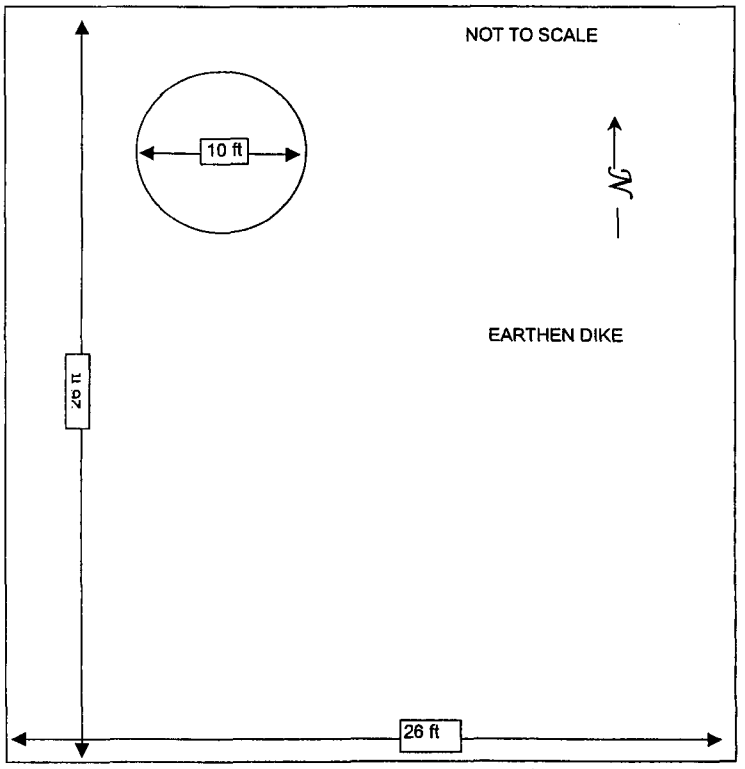
ACTUAL VOLUME AVAILABLE (Tank Capacity)

	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft³
(Largest Tank)	210		42		0.1337		1179

	Dike Capacity	-	Occupied Area	=	Ft³	X	BBl/Ft³	=	BBLs
Available Space	1798.16		0		1798		0.1781		320

	Available Space	X	Tank Capacity	=	Freeboard (Ft³)		BBl/Ft³	=	BBLs
Freeboard 34%	1798		1179		619		0.1781		110

Diagram: IBGP
210 Barrel Recompressor Lube Oil Storage Tank
ST-15.21.2102



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft³
	1.5		6.08		5		46

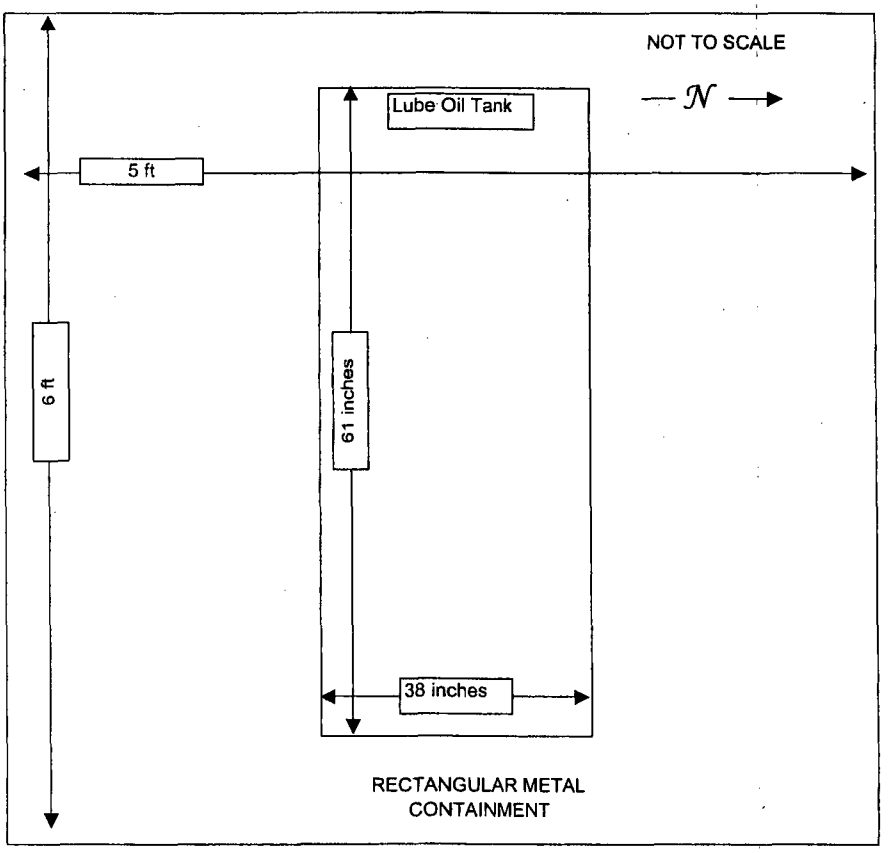
Tank Capacity	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft³
	7.13		42		0.1337		40

dimensions: Diameter = 38", Length = 61"

Available Space	Dike Capacity	X	BBl/Ft³	=	BBLs
	46		0.1781		8.12

Freeboard	Available Space		Tank Capacity	=	Freeboard (Ft³)	=	BBl/Ft³	=	BBLs
12%	46		40		6		0.1781		1

Diagram: IBGP
SWD Tri-plex Pump Oil Storage Tank



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS

Area	Height	X	Length	X	Width	=	Ft³
	2.67		110		114		33481.8

OCCUPIED AREA

Area	Number of Tanks*	X	Pi	X	Radius²	X	Height	=	Ft³
	1		3.14		12		2.67		1208

*Do not count single tank of largest capacity.

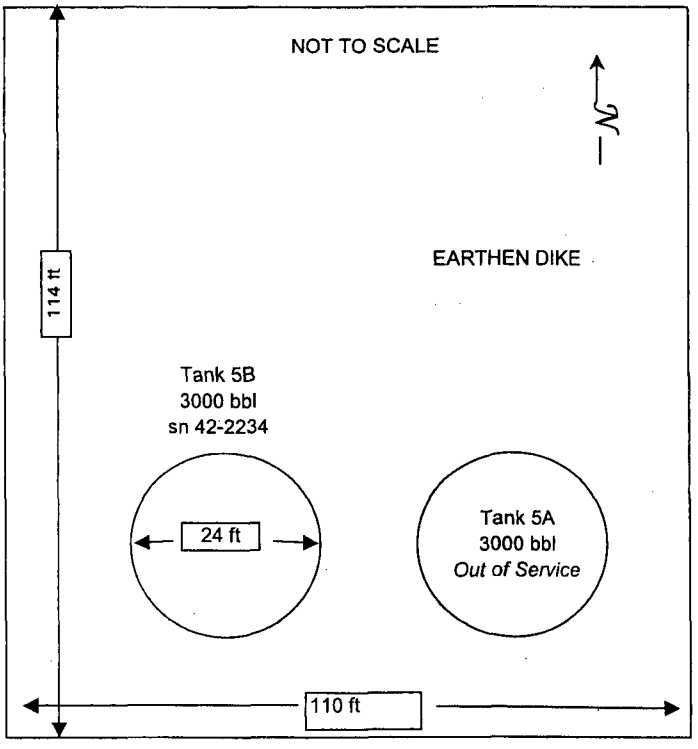
ACTUAL VOLUME AVAILABLE (Tank Capacity)

Area	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft³
(Largest Tank)	3000		42		0.1337		16846

Available Space	Dike Capacity	-	Occupied Area	=	Ft³	X	BBl/Ft³	=	BBLs
	33481.8		1208		32274		0.1781		5748

Freeboard	Available Space	-	Tank Capacity	=	Freeboard (Ft³)	BBl/Ft³	=	BBLs
48%	32274		16846		15428	0.1781		2748

Diagram: IBGP condensate strorage tank 5B



Located approximately one-half mile north west of Rocky Arroyo.

Drainage to SE

DIKE CALCULATIONS

Bullet tanks	Height	X	Length	X	Width	=	Ft^3
	1		221		55		12155

OCCUPIED AREA (Concrete Tank supports)

Tank supports	Length	X	Width	X	Height	=	Ft^3
each	11		1.42		1		16
number of	14						
Total Area =	218	Ft^3					

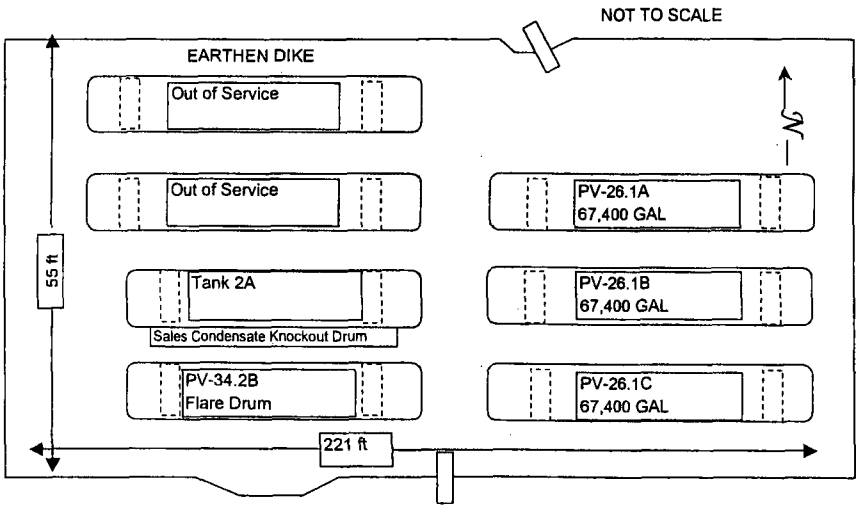
ACTUAL VOLUME AVAILABLE

Tank Capacity	Volume(bbl)	X	Gal/bbl	X	Ft³/Gal	=	Ft^3
	1605		42		0.1337		9013

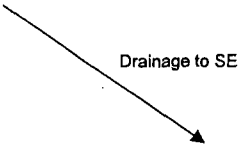
Available Space	Dike Capacity	-	Occupied Area	=	Ft^3	X	Bbl/Ft^3	=	BBLs
	12155		218		11937		0.1781		2126

Freeboard	Available Space	-	Tank Capacity	=	Freeboard (Ft^3)		Bbl/Ft^3	=	BBLs
24%	11937		9013		2924		0.1781		521

Diagram: IBGP Bullet Storage Tanks



Located approximately one-half mile north west of Rocky Arroyo.



DIKE CALCULATIONS

	Height	X	Length	X	Width	=	Ft^3
	1.83		57		29		3025

OCCUPED AREA (Concrete Slab)

Drive Thru	Total Area of A,B,C,D				Ft^2
					743
LACT Base	Length	X	Width	X	Height = Ft^3
	20		11.5		0.83 192
Side Walk	Length	X	Width	X	Height = Ft^3
	54		3.5		0.33 63

Combined Total Area 998

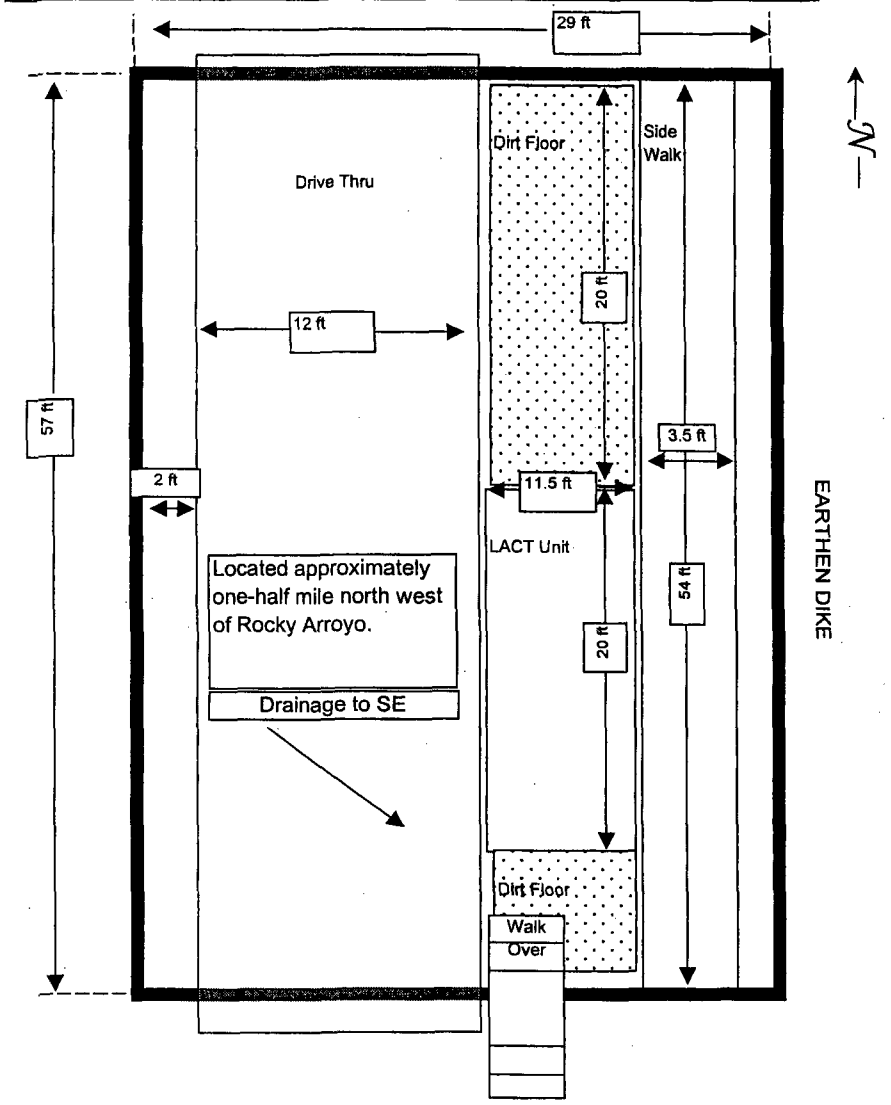
ACTUAL VOLUME AVAILABLE

Truck Capacity	Volume(bbl)	X	Gal/bbl	X	Ft^3/Gal =	Ft^3
	180		42		0.1337	1011

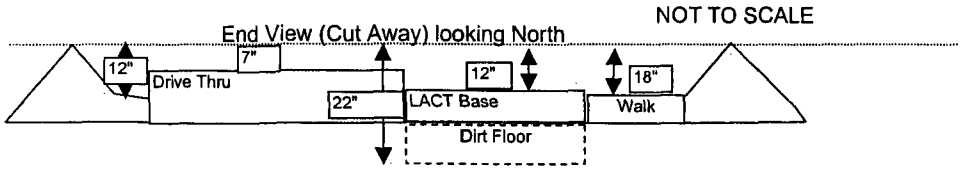
Available Space	Dike Capacity	-	Occupied Area = Ft^3		Ft^3 X BBl/Ft^3 =	BBLs
	3025		998		2027 0.1781	361

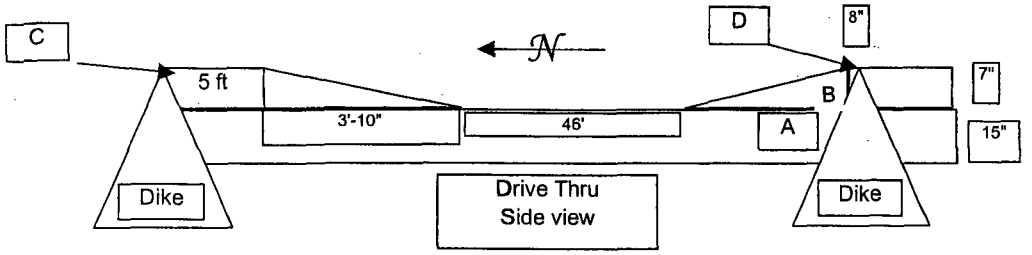
Freeboard	Available Space	-	Tank Capacity =	Freeboard (Ft^3)	BBl/Ft^3 =	BBLs
50%	2027		1011	1016	0.1781	181

Diagram: IBGP LACT Unit



NOT TO SCALE



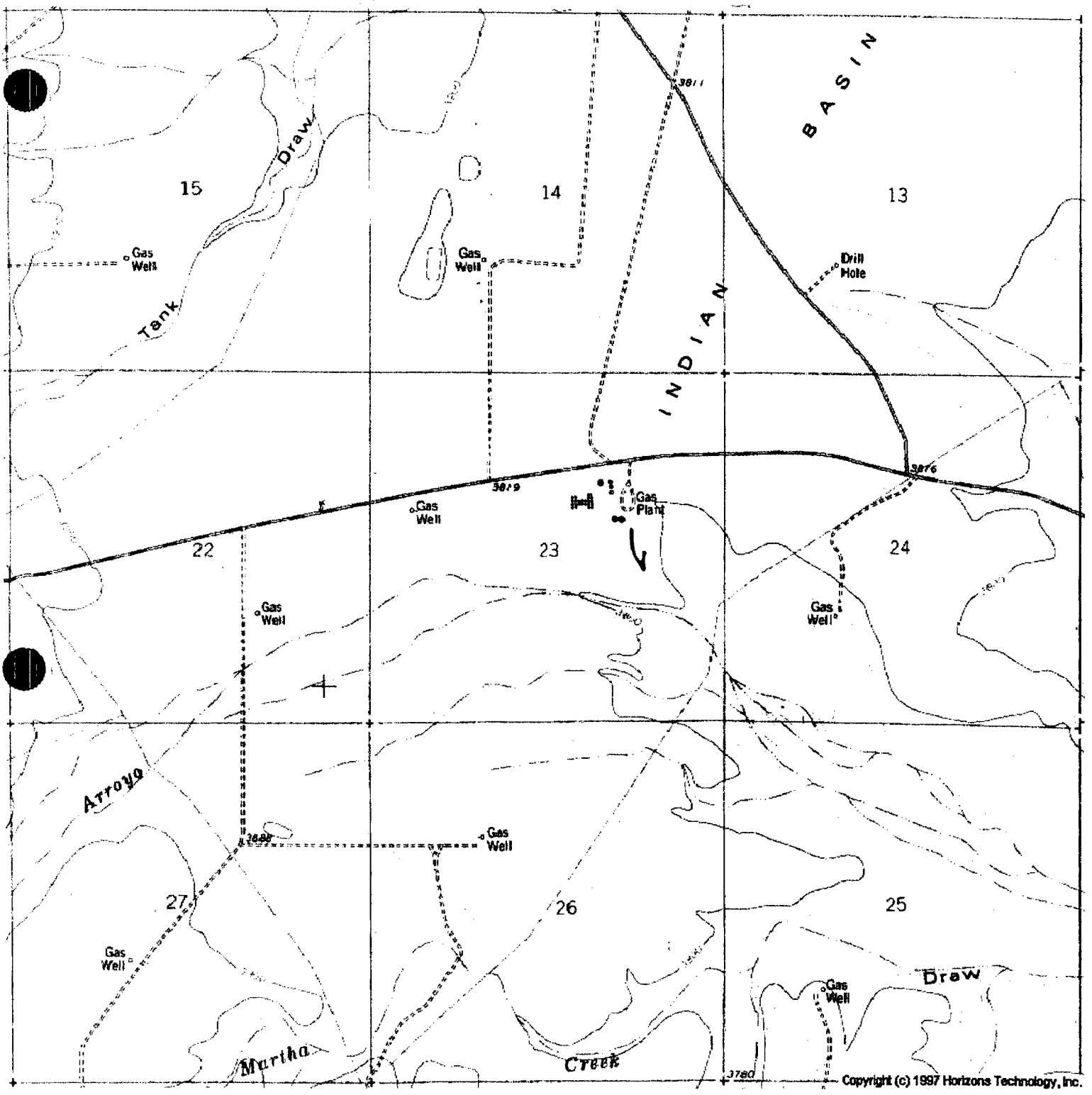


A	Length	552	Area	1192320 cu/in
	Width	144		
	Height	15		
B	Height	7	Area	23184 cu/in
	Width	144		
	Length	46		
C	Length	60	Area	60480 cu/in
	Width	144		
	Height	7		
D	Length	8	Area	8064 cu/in
	Width	144		
	Height	7		
Total displacement by drive thru				1284048 cu/in

LACT Pad	Length	240	Area	331200 cu/in
	Width	138		
	Height	10		

Side Walk	Length	648	Area	108864 cu/in
	Width	42		
	Height	4		

Total cement structure displacement =	1724112 cu/in



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MILE

Marathon Oil Company
Southern Business Unit

Indian Basin

Eddy County, New Mexico

ANTELOPE SINK
TUMBLEWEED
FOURMILE
DRAW
GARDNER
Windmill
Ranch
Rio Peñasco
Frontier Post
Farm
SEGREST
DRAW
DEER CANYON
DAGGER
DRAW
North Seven Rivers
Middle Seven Rivers
Lakewood
Lake McMillan
MCMILLAN
Seven Rivers
LONG
DRAW
South Seven Rivers
BOX
CANYON
LITTLE BOX CANYON
STINKING DRAW
Oil field
ATCHISON TOPEKA AND SANTA FE
SEVEN RIVERS HILLS
WILLOW DRAW
Service station
Gaging station
Pecos River
FANNING DRAW
ROCKY ARROYO
INDIAN BASIN
DEADMAN DRAW
AZOTEA POINT
Golden Eagle Mine
Spencer Dam
SPENCER DRAW
ADOBE FLAT
SOAPBERRY DRAW
Lake Avalon
OCOTILLO HILLS
Fanning Wells
THE TEPEE
DUNNAHOO DRAW
OLD RANCH KNOLL
MESA
LITTLE WALT CANYON
WALT CANYON
Rocky Arroyo
CONE BUTTE
LYONS CANYON
BOYDS CAVE
BOYDS CANYON
LOOKOUT POINT
MCKITTRICK HILL
MCKITTRICK DRAW
GRUDER HILL
HACKBERRY HILLS
Toe Lake
Windmills
BOGLE FLATS
WAGONTIRE DRAW
BANDANNA POINT
WEST FORK LITTLE MCKITTRICK DRAW
LITTLE MCKITTRICK DRAW
RED BLUFF DRAW
AZOTEA MESA
FLORIDA DRAW
Sheep Draw Tank
Sheep Draw Well
SHEEP DRAW
ROBERTS CANYON
LAST CHANCE CANYON
WALKER DRAW
EAST HESS HILLS
DARK CANYON
CUEVA ESCARPMENT
Cavern City
Burnes Tank
DARK CANYON
JOHNSON
WEST HESS HILLS
LECHUGUILLA CANYONS
TRIMBLE CANYON
FRONTIER HILLS
ELBOW CANYON
Cocke Tank
SOUTH MOSLEY CANYON
SERPENTINE BENDS
BALDRIDGE CANYON
JUNIPER CANYON
GUADALUPE
RIDGE
WALNUT CANYON
CARLSBAD
Administration building
CARLSBAD CAVERNS
White's City
CHINABERRY DRAW
THREEMILE DRAW
Ewing Place
Woodruff Well
Chermidas Zoo

FLUOR DANIEL GTI

MARATHON OIL COMPANY
STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
INDIAN BASIN GAS PLANT

March 12, 1998
Revised June 1, 1998

MARATHON OIL COMPANY
P.O. BOX 1324
ARTESIA, NEW MEXICO 88211

Prepared by:
Fluor Daniel GTI, Inc.
2501 Yale Boulevard, SE, Suite 204
Albuquerque, New Mexico 87106

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ATTACHMENT 5

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1.0 INTRODUCTION AND REGULATORY INFORMATION

This Storm Water Pollution Prevention Plan (SWPPP) has been prepared to transfer the Indian Basin Gas Plant from prior coverage under EPA's Baseline General Permit to the modified Multi-Sector General Permit. This action was taken pursuant to EPA's Proposed Modification of National Pollutant Discharge Elimination System (NPDES) Storm Water Multi-Sector General Permit (MSGP) for Industrial Activities (Notice; Federal Register, Vol. 62, No. 133, Friday, July 11, 1997). The Indian Basin Gas Plant (SIC code 1311) had previously completed, a SWPPP prepared pursuant to EPA's Baseline General Permit for the Storm Water NPDES program. This prior SWPPP was prepared following the submittal of a Notice of Intent (NOI) to EPA prior to October 1, 1992. The facility has been assigned Permit No. NMR05A228.

This new SWPPP is based on the implementation experiences and information for the prior SWPPP that was prepared pursuant to the Baseline General Permit. A new Notice of Intent has been completed pursuant to the permit coverage transfer instruction in the EPA July 11, 1997 Federal Register Notice. A copy of this new NOI is attached to this plan (Attachment 1). The information contained in this SWPPP satisfies the content requirements of the 1995 MSGP, as described in Section I of the MSGP Notice (Federal Register Vol. 60, No. 189, Friday, September 29, 1995).

The primary objectives of this SWPPP are to:

1. Evaluate plant operating procedures as they relate to storm water pollution;
2. Identify potential sources of storm water pollution;
3. Suggest specific techniques for minimizing pollution of storm water,
4. Provide instructions, procedures, guidance, and sample forms for SWPPP implementation;
5. Serve as a focal point and training tool for plant personnel; and,
6. Establish an overall framework for the continuing effort of storm water pollution prevention at the plant.

2.0 FACILITY DESCRIPTION AND GENERAL COMPLIANCE INFORMATION

2.1 Facility Description

The Indian Basin Gas Plant is approximately 26 acres in area. It processes gas gathered from a much larger producing gas field. The plant produces natural gas, demethanized hydrocarbon mix, stabilized condensate, and sulfur on a continuous 24 hour per day schedule. The location of the Indian Basin Gas Plant is indicated in Figure 1 (Attachment 2). Approximately one percent of the plant is paved. The gas plant is located on Eddy County Road 401. There is a truck loading area on the east side of the plant. Offices, a warehouse, and parking areas are located near the eastern part of the plant (Figure 2, Attachment 2).

The plant is located in a relatively flat area surrounded by mountainous terrain. The soil is rock and sand with scrub brush and grassy vegetation. The mean annual total precipitation is approximately 14 inches. Average annual Class A pan evaporation is approximately 100 inches, and average annual lake evaporation is approximately 65 inches in this area.

2.2 Summary of Mapping Requirements

The following site-specific information is included in Figure 2:

- Storm water drainage patterns/outfalls (on-site);
- Surface water bodies to which site drainage is directed;
- Footprints of buildings, structures, paved areas, parking lots;
- Storm water pollution source areas (See Table A in Attachment 3); and
- Existing and currently planned storm water structural controls.

2.3 Summary of Spills and Leaks

Spills or leaks of a reportable quantity since 1994 are identified in Table 2-1. Table 2-1 indicates the nature of the release, the amount released and recovered, date, and cause of the release (where possible).

This facility implements a SPCC plan pursuant to EPA regulations and guidelines. Provisions have been developed and are implemented through the SPCC program, to address future spills and releases at this facility. The SPCC plan for this facility is referenced in this SWPPP as being a part of this facility's storm water pollution prevention program as well. This facility also has a Groundwater Discharge Plan (GDP) that defines policies and procedures that affect spill/release planning and response. A current list of spills and/or leaks is maintained in the SPCC/SWPPP file.

2.4 Non-Storm Water Discharges and Certification

Storm water outfalls at this facility were inspected to determine the presence or absence of non-storm water discharges. The procedure used is described below:

> Visual Inspection - involves inspection of the storm water discharge points on several different dry-weather occasions in order to visually look for any flow in the storm drain. In the absence of precipitation, no water flow should be observed. If there is water flowing through the outfalls during dry weather, tests should be conducted to determine the source of the flow. An inspection should take place concurrently with an activity that is likely to cause such discharges.

No discharge of water was found on the days that this inspection was conducted. The following table includes this facility's certification regarding non-storm water discharges. Because of the nature of this facility's drainage system this visual inspection for non-storm water discharges can be conducted on a recurring basis.

Table 2-2. Non-Storm Water Discharge Certification

I certify that storm drain systems at the Indian Basin Gas Plant have been tested for non-storm discharges, and that the non-storm water testing described above was conducted and the results presented above are true and accurate.
_____ Storm Water Coordinator _____ Signature _____ Date

2.5 Description of Existing Storm Water Measures

Since October 30, 1989, Indian Basin Gas Plant has been operated under the conditions of a Groundwater Discharge Plan (GDP). That GDP was approved by the State of New Mexico and includes the following aspects that affect storm water runoff:

1. A large uphill diversion berm has been constructed around the north and west sides of the plant. It diverts surface runoff away from the plant and reduces the volume of water that can potentially contact polluting materials at the plant.

2. Containment devices have been constructed around most of the chemical storage areas. In most cases, the containment device is an earth berm. In other cases (such as the sulfuric acid tank at the water treatment unit), a steel pan with manual valve is used for secondary containment. Marathon Oil Company is attempting to reduce the use of drums at the Indian Basin Gas Plant and rely more on bulk chemical storage.

3. Product effluent from most plant equipment is drained through a closed system. In addition, an open collection system has been constructed around much of the plant process equipment. The system consists of concrete pads with curbs, concrete troughs covered with steel grates, drainage collection pipes, sumps, and sump pumps. The purpose of this system is to capture material that originates from a leak or spill, convey it to the sump, and pump it into the skimmer basin. Material collected in this manner is ultimately reprocessed, or disposed in the injection well. (Refer to the "Plant Processes" section of the GDP, pages 5 and 6, for descriptions of an integrity test on the open collection system and closed drain system disposal procedures.)

4. Material handling practices include employee education as to proper procedures and spill/leak response, storing chemical containers in containment berms, and routine inspections.

5. Domestic sewage is treated with a septic system on the plant site. It does not contribute any flow to storm water runoff. There are three septic treatment systems, and a warning to avoid non-domestic sewage is posted on each one.

6. Plant equipment is periodically cleaned with detergents, solvents, or steam. Consistent with the GDP, cleaning effluent is captured by the open drain collection system and disposed of in the injection well (see part 3 above).

7. The SPCC for the Indian Basin Gas Plant has recently been revised (October 15, 1997) and plant spill response capabilities have been improved.

8. Underground storage tanks are not used at the Indian Basin Gas Plant.

9. Spent process catalyst is not exposed to storm water.

In addition to the measures listed above, storm water from approximately four acres of site drains to the southeast corner and passes through a vegetated strip. Storm water from the remainder of the site drains as sheet flow to the southeast where it passes through approximately 800 feet of vegetation before it reaches Rocky Arroyo.

2.6 Coordination with Existing Environmental Management Plans

Marathon has a number of existing regulatory compliance programs and/or plans in effect at the Indian Basin Gas Plant. These plans and/or programs were evaluated during the preparation of this SWPPP and appropriate information for these existing environmental management plans was used as necessary. In addition, existing Marathon standard operating procedures have been incorporated into the development of this SWPPP. The Indian Basin Gas Plant has the following spill prevention and response procedures that relate to, and/or are considered a part of this SWPPP:

- Daily Inspection Checklist
- SPCC Plan
- Hazardous Waste Contingency Plan
- Emergency Response Plan
- Groundwater Discharge Plan

2.7 Existing Sampling Data

There are no storm water quality data available for the Indian Basin Gas Plant.

2.8 EPCRA Section 313 Requirements

Based on current information, the Indian Basin Gas Plant is not a plant subject to EPCRA Section 313 water priority chemical regulations.

Table 2-1. Reportable Spill Summary					
Record #	**Date**	**Spill Type**	**Spill Quantity**	**Quantity Recovered**	**Cause**
1706	02-07-94	Condensate	0.48	0	Oil dump failed. Spilled out of vent of BP valve.
1714	02-15-94	30 percent DEA sol'n.	59	1.5	Amine pump plunger broke. Solution leaked around the seal.
1741	03-09-94	Condensate	1	1	Tank overflowed (High level switch failed).
1792	05-09-94	Condensate	5.5	5	Skimmer basin overflowed.
1794	05-12-94	Lube Oil	0.25	0.2	Heavy rain run-off caused sump to overflow.
1797	05-23-94	Lube Oil	0.4	0.3	Open drain sump did not start automatically.
1828	06-22-94	Lube Oil	0	0	Pin hole leak in piping.
1841	07-13-94	Condensate	125	1	Pinhole leak on dresser coupling (line 1)
1842	07-16-94	Condensate	3	2.5	SWD Tank ran over.
1858	08-01-94	Amine	1.2	0	Two-inch opened by mistake.

Table 2-1. Reportable Spill Summary					
Record #	**Date**	**Spill Type**	**Spill Quantity**	**Quantity Recovered**	**Cause**
1878	08-27-94	Condensate	2	0	Leak in line due to corrosion.
1880	09-13-94	Condensate	0.1	0	Unplugging sample line.
1936	12-29-94	Condensate	0.2	0	Tank 3A overfilled.
1963	01-23-95	Condensate	1	0.5	Spillover weir set to high.
1948	03-01-95	Lube oil	0.12	0.08	Pulled plug during maintenance.
2000	03-13-95	Triethylene glycol	0.11	0.04	Unit 25 tank overfilled.
2036	05-15-95	Condensate	2	0	West skimmer tank discharge pump line leaked.
2021	06-01-95	Condensate	10	5	LACT failed to shut down.
2043	06-19-95	Condensate	0.5	0	Separator overflow.
2118	09-14-95	Amine	1.5	1	Pump failure.
2107	10-09-95	Condensate	2.3	0	Separator overfilled.

Table 2-1. Reportable Spill Summary					
Record #	**Date**	**Spill Type**	**Spill Quantity**	**Quantity Recovered**	**Cause**
2200	02-01-96	Basic sediment	0.75	0	Tank overfill
2201	02-05-96	Basic sediment	3.5	2.5	Tank overfill. Bypass was not shut on SWD pump.
2151	02-07-96	Condensate	2	2	Tank overfill. Electrical or instrument failure.
2135	03-01-96	Gasoline	0.24	0	Valve came off of hose. Loose clamp.
2191	03-09-96	Condensate	8	5	Tank overfill out top of tank. Freezing.
2214	04-27-96	Condensate	4	2	6-inch PVC gathering line west of valve pit leaked.
2239	05-30-96	Condensate	2	2	Separator relief valve not completely opened.
2238	05-30-96	Condensate	5	0	Loading condensate into truck. Driver let overfill, spill.
2279	08-01-96	Condensate	8	7	Top of tank at hatch. Overfill exceeded process capacity.
2343	11-14-96	Condensate	3	2	Tank overflow at vent on tank. Human error.
2395	12-29-96	Condensate	3	0	Tank. Plugged drain. Bottom. Human error.

Table 2-1. Reportable Spill Summary					
Record #	Date	Spill Type	Spill Quantity	Quantity Recovered	Cause

3.0 STORM WATER POLLUTION SOURCE INFORMATION

3.1 Drainage Patterns

The property is quite flat, but generally drains to the southeast. The only distinct outfall is from a small channel which begins near the west side of the old office, flows south past the residue gas compressors, turns east, and continues between the loading docks and the out-of-service condensate tanks. This channel mainly conveys storm water from the office and workshop areas. Runoff from the remainder of the plant drains to the southeast as sheet flow. All of the runoff eventually drains to the receiving watercourse, Rocky Arroyo. The arroyo is an intermittent stream that contains flowing water only after a significant rainfall.

3.2 Inventory of Exposed Materials

This section contains a description of the Indian Basin Gas Plant's potential storm water pollution sources. Pursuant to EPA guidelines for preparing SWPPPs, this section identifies potential sources which could reasonably be expected to add "significant" amounts of pollutants to storm water discharges. The source areas were also limited to those identified in EPA regulations and guidance as source areas associated with industrial activity that needs to be addressed in an SWPPP.

In addition to identifying and mapping the source areas, this section also describes an inventory of the materials (e.g., chemicals) that are associated with each source area. A narrative description is provided (see Table A, Attachment 3) that lists the materials that are handled at the indicated source area which could be exposed to precipitation. Table A in Attachment 3 presents the necessary SWPPP source area information in a way that:

- is easily understood (i.e., each regulatory source area is listed in Table A and shown on the facility map (Figure 2, Attachment 2).
- meets multiple SWPPP needs in a single table.

3.3 SWPPP Risk Identification

Determining potential storm water runoff pollution "risks" associated with "industrial activity" involves the following steps:

1. Define the chemical use characteristics of the source area(s), by facility activity, using site inspection and an available data review. Evaluate the nature of each source area to determine:
   a. The level, or extent, of chemical use or storage in each area.
   b. The potential for the discharge of this chemical as storm water pollution from the area.

2. Review and evaluate the existing water quality standards for the receiving water bodies.

3. Based on a review of the factors in items 1 and 2 above, specify a relative "risk" ranking for each storm water pollution source area, identifying the potential for storm water runoff to cause a water quality impact.

The simple three-step approach described above results in the identification of not only the potential storm water runoff pollution "risk" from the identified source area(s), but also helps in prioritizing the sources area(s) by their relative "risk." This process then leads to the development of a responsive set of best management practice plans (BMPs) that are related to the priority of pollution risk for the source area, which helps in developing a prioritized schedule for their implementation. In order to implement the three-step risk identification approach described above for the Indian Basin Gas Plant source areas, the following specific procedure was used:

1. Evaluate each facility source area for the materials stored or used in the area and the nature of any existing storm water pollution management measures, or systems, currently in place for that activity.

2. Evaluate the nature of the existing storm water management systems, that do (or could) control storm water pollution from the source area and rank them as "adequate" versus "inadequate" using a common sense judgement approach. This ranking is based on the ability of the existing management system to protect the potential storm water pollution source area during rainfall events.

3. Evaluate readily available water quality information for the receiving water(s) for storm water discharges from the facility, including any existing water quality standards. In addition, identify any specific chemical compounds, or categories of compounds that are of concern to appropriate regulatory agencies for the receiving water(s) to which storm water discharge from this facility is directed.

4. Based on the types of chemicals used or stored in/at the source area, the existing level of runoff management for the source area, and the sensitivity of the receiving water(s) to those chemicals, identify a relative "risk" (i.e., high, medium, low) for potential storm water pollution to the receiving water(s).

The following list shows how the four factors outlined above determine the relative risk factors for storm water pollution source areas at the Indian Basin Gas Plant:

Chemical Use and Control Characteristics	No Specific Standards
Heavy Chemical Use, Adequate Controls	MEDIUM
Heavy Chemical Use, Inadequate Controls	HIGH
Moderate Chemical Use, Adequate Controls	LOW
Moderate Chemical Use, Inadequate Controls	MEDIUM
Light Chemical Use, Adequate Controls	LOW
Light Chemical Use, Inadequate Controls	MEDIUM

The High, Medium, and Low designations in the above listing are defined as follows:

1. HIGH - source area has likely impact on receiving water quality, due to significant chemical use, or currently inadequate management controls, or because of identified receiving water sensitivities to a particular chemical being used at the source area. Management controls for this area should be given a high priority for implementation.

2. MEDIUM - source area may have an impact on receiving waters, but specific water quality limits for the chemical(s) being used at the source area may not exist. In addition, a MEDIUM storm water pollution risk would exist for areas with current management controls that are deemed to be "adequate," but the extent of chemical use is high, such that management attention should continue to be focused on maintaining these management controls. Storm water pollution problems are difficult to reliably quantify for this risk category. Therefore, more information may be necessary concerning storm water pollution amounts, and receiving water conditions, before a more extensive (and/or costly) management control can or should be selected.

3. LOW - source area is currently fully contained and controlled, or chemical use is low. Impacts on receiving water quality is not likely. Areas should be included in other management control programs, if applicable, but no prioritized storm water pollution management control is necessary for this source area.

Table A, in Attachment 3, contains the results of a risk evaluation for the Indian Basin Gas Plant storm water pollution source areas, conducted using the procedure outlined above.

4.0 BEST MANAGEMENT PRACTICES (BMP)

This section provides general descriptive information for the BMPs that have been identified (see Table B, Attachment 3) for the storm water pollution source areas at this facility (see Table A, Attachment 3). Table B lists the specific type of BMP, from those described in this section, that can be used to control storm water pollution from each of the specifically identified source areas listed in Table A. This section (4.0) provides background and descriptive information for how the particular BMP can be implemented for a source area.

BMP is a term which refers to measures for preventing or controlling storm water pollution from regulated "industrial activities". BMP's can include processes, procedures, schedules of activities, prohibitions on practices and other management practices to prevent or reduce storm water pollution. Despite the broad nature of BMP's, they can be characterized into two types: structural and non-structural. These two types of BMP's are described in greater detail below.

4.1 Non-Structural BMP's

Non-structural BMP's are primarily (simple and inexpensive) management program(s) that are applicable to a wide variety of regulated "industrial activities". The following six non-structural BMP's are identified in this SWPPP.

- Good Housekeeping
- Preventive Maintenance
- Visual Inspections
- Spill Prevention and Response
- Employee Training
- Recordkeeping and Reporting

Good Housekeeping

Good housekeeping involves developing and maintaining a clean and orderly work environment. Good housekeeping is already practiced at the Indian Basin Gas Plant as part of existing environmental management plans. A slight tailoring of existing good housekeeping practices will help prevent storm water pollution as a part of this SWPPP.

Examples of good housekeeping actions to be conducted pursuant to this SWPPP include:

- Implementing a routine clean-up program using hand shovels, hand brooms, vacuum machines, sweeping machines or other types of cleaning machines.
- Storing containers away from direct traffic paths and stack containers in accordance with manufacturer's instructions to avoid damage and spills.
- Labeling all containers showing contents.

- Covering receptacles and drums when possible or protecting them from storm water exposure (e.g., using indoor storage).
- Prevent potential overflow of harmful chemicals by ensuring regular pick up and disposal of waste material.
- Using temporary covers and pallets for outside parts storage (e.g., tarps) whenever practical or store indoors.

Maintaining employee interest in good housekeeping is an important part of the overall storm water pollution control program at Marathon. Methods for maintaining good housekeeping goals include regular housekeeping inspections by supervisors, discussions of housekeeping at meetings and publicity through posters, suggestion boxes, bulletin boards, and employee publications are other tools that will be used to implement good housekeeping activities.

Preventive Maintenance

An effective Preventive Maintenance Program is a key to a successful pollution management effort. This includes a regular visual inspections of systems, equipment, or devices such as valves, dikes and oil/water separator.

The following are the basic elements of Marathon's SWPPP preventive maintenance program:

- Inventory and identify systems, equipment and areas that should be inspected/maintained.
- Conduct routine inspections and/or tests of the systems, equipment and areas.
- Assure that timely repair, adjustment, replacement, cleaning or other needed maintenance is performed. Use equipment manufacturers' recommended procedures as a guide.
- Maintain documentation on inspections, repairs, maintenance, and corrective actions taken.

Many aspects of this SWPPP preventive maintenance program are currently being implemented at the Indian Basin Gas Plant through existing operating procedures and environmental management plans.

Visual Inspections

A routine visual inspection program is a key element in preventing storm water pollution and is an intricate part of the compliance evaluation component of this SWPPP (see Section 5.0). The Indian Basin Gas Plant Storm Water Coordinator is responsible for performing, or specifically delegating, the necessary visual inspections. The inspections will be integrated with the existing Marathon Inspection Check List. The Compliance Evaluation Inspection Form (Table 5-1) will be used to document the annual compliance evaluations.

Spill Prevention and Response

Spill prevention and control, as well as spill response, is an extremely important component of existing Marathon environmental management plans. Vacuum trucks are called to the site, when needed, to remove free liquid resulting from a spill. Other equipment required for spill response (e.g., shovels) is readily available at the facility.

Employee Training

Employee training programs serve to instill in personnel, at all levels of responsibility, an understanding of the storm water regulatory requirements, potential storm water pollution source areas and this SWPPP's BMP program. In addition, training may be used to instruct employees on proper practices for preventing storm water pollution and establishing proper procedures for responding to a release or spill. To the extent possible, SWPPP training will be coordinated with other existing environmental management plan training programs, as well as other Marathon training programs.

Open communications shall be used for matters relating to storm water pollution. The following principles are guidelines for communications, but may be modified when direct action is needed to reduce storm water pollution:

1. Each employee is empowered to take immediate action to prevent or reduce storm water pollution. Such actions shall be reported at the first available opportunity to the Storm Water Coordinator.

2. Any employee may ask questions, discuss ideas, make suggestions regarding storm water.

Record Keeping and Internal Reporting

Relevant documents are maintained at the Indian Basin Gas Plant as part of Marathon's overall regulatory compliance program. These documents include:

- SWPPP(s);
- Inspection and Spill Records;
- Training Records; and
- Certifications;
- SPCC Plan;
- Groundwater Discharge Plan (GDP)

4.2 Structural BMPs

Structural BMP's serve three basic functions:

1. Reduce or eliminate the volume and pollution from storm water runoff or run-on;
2. Divert or direct storm water runoff/run-on; and
3. Reduce the velocity of the storm water runoff/run-on.

The objective in diverting storm water runoff (or run-on) falls into one of two categories:

1. Divert storm water away from, or around (instead of across or through) regulated "industrial activities".
2. Direct storm water runoff that may have come in contact with chemicals from regulated "industrial activities" to a storm water BMP.

Structural BMP's are considered an "advanced" approach for the reduction or elimination of storm water pollution. Several structural BMPs are in place at the Indian Basin Gas Plant. These structural BMPs are described in Parts 1, 2, and 3 of Section 2.5 of this SWPPP. Storm water runoff from regulated "industrial activities" that is not controlled through the existing and proposed structural BMPs for the facility will be controlled using non-structural BMPs presented in Section 4.1. The following is a general list of structural BMPs that may be applied to a facility.

- Sediment and Erosion Control
- Ballast Ground Cover
- Grassed Swales
- Curbs/Berms
- Grading and Paving
- Storm water Conveyances
- Roofing
- Dikes

Each of these structural BMP's is described in greater detail below with details applying to the Indian Basin Gas Plant added as appropriate.

Sediment and Erosion Control

Erosion prevention may be achieved by using one or more or the following techniques:

- Maintaining beneficial vegetation;
- Reducing runoff velocity;
- Minimizing the exposure of bare soil;
- Immediately stabilizing disturbed soil areas;
- Providing appropriate drainage path ways for runoff;

- Preventing runoff from flowing across exposed (bare earth) areas; or
- Filtering, settling, or removing sediment from runoff.

Preserving as much ground cover as possible will decrease the impact rainfall has on ground surfaces, which in turn prevents erosion. For example, a buffer zone is a naturally vegetated strip that is adjacent to a stream, ditch, or steep, unstable slope. The buffer zone decreases the velocity of storm water runoff and helps prevent erosion. The outfall from approximately four acres of the Indian Basin Gas Plant passes through a vegetated strip. Storm water from the remainder of the facility drains as sheet flow to the southeast where it passes through about 800 feet of vegetation before reaching Rocky Arroyo.

The following structural practices can be used to implement the techniques listed above:

- Straw Bale Dikes, Silt Fences, Earth Dikes
- Subsurface Drain, Pipe Slope Drain
- Storm Drain Inlet Protection, Rock Outlet Protection
- Sediment Traps, Temporary Sediment Basins
- Retention/Detention Basins

Ballast Ground Cover

Infiltration is a structural BMP that causes storm water to enter the ground surface into subsurface soils rather than runoff into surface water bodies. Ballast cover used for storm water infiltration should be installed with a depth and gradation that will promote infiltration and prevent erosion. Soil type and ground slope should also be considered. Potential ground water impacts must also be considered for this (and in fact any) infiltration type of BMP. When storm runoff from areas with known storm water pollution risk is directed to infiltration type systems an evaluation of groundwater pollution impacts must be performed.

Ballast sometimes requires cleaning and/or replacement due to sediment build up that can prevent proper drainage. Cleaning procedures should be conducted in a manner that avoids or minimizes the potential for storm water contamination.

Grassed Swales

Grassed swales are gentle sloping vegetated depressions constructed to promote infiltration, control runoff pollution by filtering sediments, and to channel runoff to a desirable location.

Curbs/Berms

Diversionary structures prevent the flow of storm water onto regulated "industrial activities". Often a diversion structure and a storm water conveyance are used together to achieve this goal. Conveyances carry the water away and prevent it from pooling at the curb or berm. For example, an employee parking lot is not a regulated area. If a parking lot drains across a regulated "industrial activity", curbing the perimeter of the lot may be an appropriate BMP. Such action would reduce the amount of storm water that would flow across the "industrial activity", and therefore reduce the potential for generating storm water pollution. Curbing, berms, and associated conveyances need regular inspection, repair, and cleaning to keep them functioning properly.

A large uphill diversion berm has been constructed around the north and west sides of the Indian Basin Gas Plant. It diverts surface runoff away from the plant and reduces the volume of water than can potentially contact polluting materials at the plant.

Grading and Paving

Finished grades at the Indian Basin Gas Plant are designed to facilitate the prevention of run on onto regulated "industrial activities". Therefore, this surface grading is a BMP, and is a part of this SWPPP that can reduce the exposure of storm water to potential pollutants. However, due to the constraints imposed by normal operations grading and paving may have to be combined with other BMP's (such as curbs or conveyances) to be effective.

Storm Water Conveyances

Storm water conveyances are channels, gutters, drains, and sewers which are used to collect storm water and direct its flow. They are part of a site's storm water collection system. A primary purpose of a storm water conveyance is to prevent storm water from being exposed to a storm water pollution source area.

Gutter systems, down spouts and storm sewers can be retrofitted to discharge runoff away from regulated "industrial activities". This will help minimize the volume of potentially polluted storm water generated at the site. Subsurface conveyance systems are already in place at the Indian Basin Gas Plant. Product effluent from most plant equipment is drained through a closed system. In addition, an open collection system has been constructed around much of the plant process equipment. The system consists of concrete pads with curbs, concrete troughs covered with steel grates, drainage collection pipes, sumps, sump pumps. The purpose of this system is to capture material that originates from a leak or spill, convey it to the sump, and pump it into the skimmer basin. Material collected in this manner is ultimately reprocessed or disposed in the injection well.

Roofing

The construction of a roof over a potential storm water pollution source area (e.g., drum storage) will eliminate the direct exposure of chemicals in that area to rainfall. However, simply covering potential storm water pollution source areas may not be sufficient to prevent contact with "run-on" and "run-through". Simply stated, these terms refer to storm water that does not fall onto potential source materials, but rather flows through a potential source area. Therefore, for roofing to be effective, combination with curbs/berms may be required.

Dikes

Earthen and concrete dikes are used around storage and break-out tankage as a means of collecting storm water and any potential spills. The storm water can than be inspected prior to being discharged into the surface water body. Earthen and concrete dikes are used extensively at the Indian Basin Gas Plant as part of the SPCC. A summary of the storage tanks and the volumes of the dikes are presented in the SPCC.

Executive Summary

The Indian Basin Gas Plant (site) is located approximately 20 miles northwest of Carlsbad in Eddy County, New Mexico. Cleanup efforts at the site, collectively known as the Indian Basin Remediation Project (IBRP), were initiated in April 1991 to recover free-phase petroleum hydrocarbons related to the release of a liquid by-product of natural gas production known as "condensate". The subsurface at the site includes two distinct geologic zones referred to as the "Shallow Zone" and the "Lower Queen". Both of these zones contain saturated and unsaturated strata. Through February 2003, there were a total of 150 wells present at the site related to the IBRP. However, with New Mexico Oil Conservation District approval, thirty-nine Shallow Zone wells were plugged and abandoned in March 2003, reducing the well total to 111 wells. The remaining wells are used for a combination of groundwater monitoring, groundwater and condensate recovery, treated groundwater infiltration and condensate vapor extraction.

In order to determine and evaluate the groundwater flow conditions and separate-phase condensate occurrences, site-wide well gauging events were performed in April and October 2003. The liquid-level measurements obtained from each well and the surveyed well elevations were used to calculate groundwater elevations, with density corrections where condensate was present. The resulting elevation data were used to generate groundwater piezometric contour maps. Review of these maps and the elevation data indicate Shallow Zone and Lower Queen groundwater flow were consistent with patterns observed in previous years. Flow in the Shallow Zone is to the southeast at an approximate gradient of 0.014 feet/ft, and flow in the Lower Queen is generally in a northerly direction at an approximate gradient of 0.0005 feet/ft.

During each of the gauging events, groundwater samples were also collected from selected wells to evaluate groundwater quality at the site. In April 2003, the analytical suite primarily included benzene, toluene, ethylbenzene and xylene (BTEX). In October 2003, groundwater samples were analyzed for BTEX and total dissolved solids (TDS) and chlorides. The analytical results indicate that total BTEX concentrations in both water-bearing units remained consistent or declined slightly in most wells.

Remediation efforts completed at the site in 2003 included continued groundwater extraction and treatment (including dual pump recovery) in the Lower Queen for the first month and a half in 2003 and vapor extraction in the Shallow Zone and Lower Queen throughout the 2003 calendar year. The groundwater extraction and treatment remedy was operated to both recover and control potential migration of condensate in both the liquid and dissolved phase. Recovered groundwater was treated and then infiltrated in upgradient wells. NMOCD conditional acceptance of a Marathon plan to use vapor extraction system (VES) to control condensate in groundwater extraction system wells was successfully implemented from March to the end of 2003.

During the calendar year, the VES used one blower per well to extract vapor. This operation allowed enhanced removal of condensate from the subsurface via both recovery in the vapor phase and aerobic biodegradation of condensate.

During 2003, approximately 1,620 barrels of condensate were recovered at the site, as follows:

- The equivalent of approximately 0.06 barrels of condensate was removed in the vapor phase by VES wells in the Shallow Zone;

- The equivalent of approximately 416 barrels of condensate was removed in the vapor phase by VES wells in the Lower Queen;
- The equivalent of approximately 1,204 barrels of condensate was removed by aerobic biodegradation enhanced by the use of vapor extraction within the Shallow Zone and Lower Queen; and
- No condensate was removed in the liquid phase through pump and treat efforts in the Lower Queen.

Cumulatively, from the initiation of remedial efforts in April 1991 through December 2003, a total of approximately 19,248 barrels of condensate has been removed.

Through the operation of the VES and groundwater recovery systems, Marathon has maintained hydraulic control of the condensate and separate-phase hydrocarbons in groundwater at the site. The operations of the groundwater extraction system between April 2000 and December 2002 have resulted in an asymptotic mass removal trend indicating an ineffective method of removing condensate from the site. In fact, no condensate was recovered by the groundwater extraction system during the calendar year 2002. However, the operations of the VES during the same time period have proven to be an effective and viable technology to enhance condensate mass removal. Remediation efforts in the year 2003 and beyond have oR will include the following:

- Compliance monitoring and reporting, regular groundwater monitoring; and
- Continued operation of the VES, while continuing to evaluate and modify the wells that will be used for vapor extraction to maximize condensate removal.

As stated in a response by the OCD to the "Petition to Discontinue Groundwater Extraction Operations, Indian Basin Remediation Project" and the "Annual Groundwater Monitoring Report, January-December 2001", Marathon Oil Company discontinued the groundwater extraction system and abandoned 39 Shallow Zone monitoring wells that were approved by the OCD for abandonment. The OCD deferred comment on dismantling the groundwater extraction system until the OCD has the opportunity to evaluate the future performance of groundwater remediation activities.

The wells selected for abandonment in the Shallow Zone were based on historical gauging results and relative locations of these wells. Using the following criteria:

- Wells had been dry for at least three years;
- Wells had been determined to be redundant because of proximity of other wells;
- Wells did not monitor known groundwater areas of concern; and
- Wells did not provide pertinent information for defining the groundwater flow direction.

In addition to the abandonment of wells in the Shallow Zone, monitoring well MW-126, also completed in the Shallow Zone, was modified. The goal of this monitoring well modification was to enhance the ability of the well to remove hydrocarbons via vapor extraction in the future.

No changes to the current Groundwater Monitoring Plan are proposed for calendar year 2004. However, there are proposed changes Marathon would like to implement beginning in 2005.

The proposed changes in calendar year 2005 involve reducing semi-annual sampling at the site to a single annual sampling event to be conducted in April of each calendar year. Based on historical sampling data collected through 2003, it is apparent that BTEX concentrations are significantly reduced in most of the wells in the sampling program, with most of the wells showing very low or no BTEX above OCD regulatory limits. In addition, where BTEX is detected in monitored wells, there appears to be no seasonal variation in the concentrations. The single April sampling event work plan will include sampling the same constituent list as approved in the original OCD approved monitoring plan. Table A provides a list of wells scheduled for sampling and a constituent list for the proposed annual sampling program.

Marathon proposes to continue collecting semi-annual liquid level measurements from all existing site wells as approved in the original groundwater monitoring plan. This will also facilitate documentation of water level fluctuations and provide an early warning system for unexpected separate phase condensate movement. During each gauging event, liquid level measurements (depth to water and condensate thickness) will be collected from each accessible monitoring well.

Indian Basin Remediation Project
Eddy County, New Mexico

Following is an excerpt of 2003 Annual Groundwater Monitoring Report which was submitted to the OCD in April 2004.

Groundwater Sampling and Analysis

ARCADIS personnel conducted two groundwater sampling events at the site in 2003. The sampling events were performed according to the modified Groundwater Monitoring Plan, as approved by the OCD in March 1999. The sampling involved the following:

- In April 2003, groundwater samples were collected from 14 Shallow Zone wells and 25 Lower Queen wells. These samples were analyzed for BTEX analysis, total dissolved solids (TDS) and chlorides and
- In October 2003, groundwater samples were collected from 12 Shallow Zone and 25 Lower Queen wells. These samples were analyzed for laboratory analysis and analyzed for BTEX, total dissolved solids (TDS) and chloride.

A total of 40 locations, consisting of 38 monitoring wells and 2 recovery sumps, completed in the Shallow Zone were gauged during both gauging events in 2003. A total of 70 locations completed in the Lower Queen, consisting of 67 monitoring wells, 2 plant water supply wells and 1 infiltration well, were gauged during both gauging events in 2003.

The Lower Queen tends to be generally in a northerly direction at an approximate gradient of 0.0005 feet/ft. This flow direction and gradient are consistent with patterns observed in previous years. During one or more of the gauging events in 2003, condensate was observed in Lower Queen wells MW-68, MW-72, MW-75, MW-82, MW-112, MW-113, MW-120, MW-121, MW-125, MW-129, MW-130, VE-16 and VE-19. Observed condensate thicknesses in these wells ranged from 0.01 feet in Well MW-120 in October 2003 to 3.31 feet in Well MW-129 in April 2003.

Remediation System Operation and Maintenance

Remediation efforts completed at the site as part of the IBRP from April 1991 through December 2003 have included emergency excavation work; pumping in Rocky Arroyo sumps, open excavations, and Shallow Zone wells; condensate recovery from Shallow Zone Well MW-69; groundwater and condensate recovery (and treatment) including dual pump recovery from the Lower Queen; and vapor extraction in both the Shallow Zone and Lower Queen. The following sections discuss remedial activities conducted at the site during 2003.

Groundwater Recovery and Infiltration

Groundwater and total fluids (condensate and groundwater) recovery wells that operated at the site from January 1, 2003 to February 13, 2003 included Lower Queen wells MW-58, MW-65A, MW-72, MW-75, MW-81, MW-83, MW-84, MW-85, MW-86 and MW-110. Recovered groundwater was treated and then

infiltrated in upgradient wells IW-1 and IW-2 in the Lower Queen. During the 2003 calendar year, there was no active groundwater recovery from the Shallow Zone.

From February 14, 2003 through the end of the year 2003, the groundwater extraction system was inactive. However, vapor extraction remediation of selected wells that are a part of the groundwater extraction system was conducted as part of a plan proposed by Marathon to the NMOCD.

During the period of groundwater and total fluids recovery in the early portion of 2003 (January to mid-February, approximately 188,224 barrels of total fluids were recovered from the Lower Queen and treated, with no measurable recovery of condensate in the liquid phase. Subsequently, approximately 117,802 barrels of treated water were infiltrated in Lower Queen Infiltration Wells IW-1 and IW-2, and 70,422 barrels of untreated water were sent to the gas plant for disposal in the Class II injection wells.

Groundwater Treatment

Historically, recovered groundwater at the site was treated by two air-strippers, designated "east" and "west". During the operation of the groundwater treatment system in the early portion of 2003, recovered groundwater at the site was treated only by the east air stripper. Marathon personnel collected monthly water samples from the influent and effluent of the east air stripper. The west air stripper was not operational during the 2003 calendar year. Therefore, no monthly water samples were collected for the west air stripper. The monthly sampling events were performed according to the Groundwater Discharge Plan GW-21. The monthly samples were submitted for BTEX analysis using USEPA Method 8260B.

Vapor Extraction

The following sections provide information regarding the initial startup of the vapor extraction system (VES), field testing and expansion of the VES, and the mass removal results of the VES during 2003.

The VES was first started at the site in March 1992, using Shallow Zone wells MW-19, MW-20, MW-21, MW-35 and MW-56. The Shallow Zone VES operated from 1992 through 1994, removing the equivalent of 135 barrels of condensate in the vapor phase, as calculated from effluent vapor concentrations and vapor extraction flow rates. Vapor extraction in the Shallow Zone recommenced in August 1997, using wells MW-11, MW-19, MW-26 and MW-41.

VES was initiated in the Lower Queen in January 1997, using wells VE-1 through VE-5 and MW-61A. The system operated through June 1997, removing the equivalent of approximately 13 barrels of condensate in the vapor phase. Based on the low mass removal rates generated by this system, it was decided to discontinue VES operation in this location. Five new vapor extraction wells (VE-16 through VE-20) were installed in 1997, and the system was then relocated to these new wells in June 1997 and operated through the end of 1998.

Based upon the results of the vapor testing completed in 1999 and 2000, 6 blowers (VES-600, VES-700, VES-800, VES-900, VES-1000 and VES-1100) were added to the VES in 2001. Two of the existing blowers, VES-400 and VES-500, were equipped with thermal oxidizers; however, VOC control was no longer needed so these blowers were removed from the Site. Blowers VES-600 and VES-700 were added to the system in July 2001, and blowers VES-800, VES-900, VES-1000 and VES-1100 were added to the

system in September 2001. The VES was configured so each blower was extracting vapor from only one well. This configuration allows for operation of a maximum of 9 blowers extracting from up to 9 wells at any one time. The operation of the nine blowers (VES-100, VES-200, VES-300, VES-600, VES-700, VES-800, VES-900, VES-1000 and VES-1100) continued at the site through 2003.

Shallow Zone Vapor Extraction

Vapor extraction in the Shallow Zone was conducted on Well MW-126 from April 3 to July 30, 2003. For the year, the total equivalent of approximately 0.06 barrels of condensate was removed from the Shallow Zone in the vapor phase.

Lower Queen Vapor Extraction

During 2003, vapor extraction in the Lower Queen primarily included wells MW-65A, MW-68, MW-72, MW-74, MW-85, MW-110, MW-112, MW-113, MW-120, MW-121, MW-123, MW-124, MW-125, MW-129 and MW-130. The combined vapor extraction in 2003 ranged from the equivalent of 0 barrels of condensate in MW-110 to the equivalent of 68.16 barrels of condensate in MW-113. For the year, a total equivalent of approximately 416.24 barrels of condensate was removed from the Lower Queen in the vapor phase.

Aerobic Biodegradation

There has been evidence that a significant amount of aerobic biodegradation of condensate is occurring in the site subsurface. In fact, data suggests that the mass destruction due to aerobic biodegradation may be limited by a lack of sufficient oxygen in the subsurface to support the aerobic respiration. These data indicate that more extensive use of vapor extraction at the site would not only increase vapor-phase mass recovery, but would also increase aerobic biodegradation by adding oxygen to the subsurface.

Summary and Action Plan

Condensate Mass Removal

During 2003, a total of approximately 1,620 barrels of condensate were removed at the site. Of the total recovery, approximately 416 barrels of condensate were removed in the vapor phase by VES efforts in the Shallow Zone and Lower Queen. In addition to the vapor phase recovery, it is estimated that an additional 1203 barrels of condensate were removed via enhanced aerobic degradation in the subsurface. There was no significant amount of condensate removed in the liquid phase through pump and treat efforts from January 1 to February 13, 2003 at the site.

The 2003 vapor phase condensate recovery of 416 barrels is 26% greater than the 330 barrels of vapor phase condensate recovered in 2002. Overall, the total condensate removed at the site in 2003 represents a slight decrease of 7% (123 barrels), as compared to that achieved in 2002. This overall decrease is a result of the lower calculated aerobic degradation in 2003 versus that calculated in 2002 (1203 barrels in 2003; 1410 barrels in 2002; a difference of 14.6% less in 2003).

The 2003 removal results indicate a substantial trend in greater recovery of hydrocarbons compared to the condensate removed in 1997 and 1998. There has been a significant increase of condensate removed both via vapor phase extraction and enhanced aerobic degradation since the vapor extraction system installation.

The significant increase in condensate removal from the VES can be attributed to the following three items:

- Focusing vapor extraction in discrete zones from the well modifications;
- Increasing the scale of the VES through the addition of six blowers in 2001 for a total of nine blowers; and
- Operating one blower per extraction well, thus increasing the maximum attainable flow rate.

Cumulatively, from the initiation of remedial efforts in April 1991 through December 2003, a total of approximately 19,248 barrels of condensate have been recovered. Of the 19,248 barrels of condensate recovered to date, approximately 3,006 barrels have been removed in the liquid phase from recovery wells and sumps, and the equivalent of approximately 16,242 barrels has been removed or degraded in the vapor phase by VES operation.

Planned Activities

The operation of the VES and groundwater recovery systems suggests lines of evidence that Marathon has provided hydraulic control of condensate and separate-phase hydrocarbons in groundwater at the site (as demonstrated by continual gauging and sampling data). In addition, the total recovery of all hydrocarbons, i.e. vapor phase hydrocarbons and aerobic degradation of hydrocarbons in 2003, is less than that observed in the remediation results of 2002. The rigorous application of the VES technology during 2003 resulted in an increase of annual condensate recovered in the vapor phase versus that recovered in 2002. However, the decrease in the aerobic degradation was greater than the vapor phase increase resulting in an overall decrease in condensate removal. This may be significant because a concerted effort was made during 2003 to maximize recoveries using the VES including the GWES wells in the VES program. If this trend of reducing hydrocarbon recovery continues in future years, it may indicate that potential closure of the site will be warranted in the foreseeable future.

The ongoing remediation efforts in the year 2004 and beyond will include the following:

- Semi-annual groundwater monitoring;
- Compliance monitoring and reporting; and
- Continued operation of the VES while continuing to evaluate the wells that will be used for vapor extraction. The current system has the capacity for nine blowers and nine wells and allows for the flexibility to change which wells are used for vapor extraction.
- The GWES will remain idled but the program of evaluating separate-phase conductor in GWES wells and the use of VES for recovery of these hydrocarbons in selected wells will continue.

Groundwater Monitoring Plan

The current groundwater monitoring plan was approved by the OCD (with conditions) in correspondence with Marathon dated March 4, 1999. OCD approved Marathon's request to reduce semi-annual sampling at the site to a single annual sampling event to be conducted in April of each calendar year. Based on historical sampling data collected through 2003, it is apparent that BTEX concentrations are significantly reduced in most of the wells in the sampling program, with most of the wells showing very low or no BTEX above OCD regulatory limits. In addition, where BTEX is detected in monitored wells, there appears to be no seasonal variation in the concentrations. The plan will include sampling the same constituent list as approved in the original OCD approved monitoring plan. Table A provides a list of wells scheduled for sampling and a constituent list for the annual sampling program. The purging and sampling techniques will be conducted using low-flow procedures.

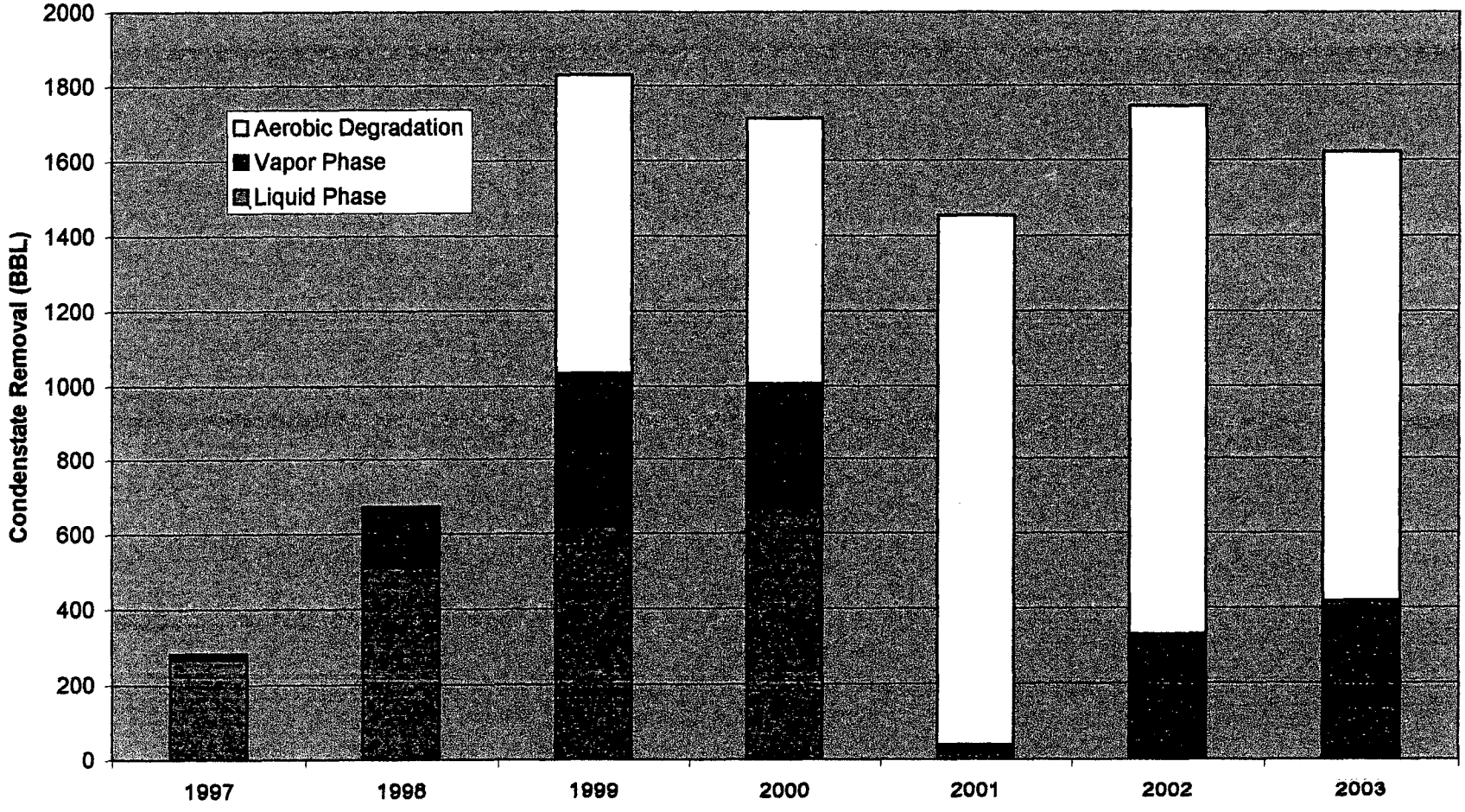
Marathon proposes to continue collecting semi-annual liquid level measurements from all existing site wells as approved in the original groundwater monitoring plan. During each gauging event, liquid level measurements (depth to water and condensate thickness) will be collected from each accessible monitoring well.

Proposed Site Closure Plan

Based on a review of the data collected through 2003, Marathon proposes the following plan to ultimately achieve site closure:

- The groundwater monitoring program will continue as specified above;
- The VES remediation program will continue to be implemented in a manner that will optimize removal of condensate and enhance natural biological degradation. The optimization will include bubbling compressed air into wells containing condensate to enhance the removal of condensate as necessary. In addition, the VES remediation program will be operated in a manner to ensure compliance with the approved plan to shut down the GWES system;
- When it can be determined through monitoring that a portion of the site no longer has evidence of condensate or dissolved BTEX constituents exceeding OCD regulatory limits, that portion of the site will be monitored for two years. If at the end of the two-year period, no condensate occurs, and samples collected from the wells in the area do not show dissolved BTEX above OCD regulatory limits, Marathon would petition the OCD to remove the wells in that portion of the site from the monitoring program. In this manner, Marathon intends to begin closing portions of the site showing no further impacts and focusing remediation and monitoring efforts on those portions of the site that still contain hydrocarbon impacts.

Figure 11 - Estimated Yearly Condensate Removal (1997 - 2003)
Marathon Oil Company
Indian Basin Remediation Project
Eddy County, New Mexico



T - 21 - S
R - 23 - E

T - 21 - S
R - 24 - E

23 24 25 26 19 30

3,623.00'
3,622.00'
3,624.00'
3,625.00'
3,626.00'

Rocky Arroyo

MW-111 3,621.94'
SW-02 3,621.90'
SW-01
MW-110 3,621.99'
MW-117A 3,621.62'
SW-03 3,622.07'
MW-127 3,622.18'
MW-086 3,622.52'
MW-119 3,622.71'
MW-085 3,622.47'
MW-058 3,621.88'
MW-081 3,622.61'
MW-120 3,623.13'
MW-122 3,622.83'
MW-072 3,620.97'
MW-074 3,623.22'
MW-073 3,623.23'
MW-075 3,619.97'
MW-094 3,632.99'
MW-121 3,623.13'
MW-115 3,622.45'
MW-063 3,624.26'
MW-129 3,622.32'
MW-059 3,622.43'
MW-060 3,623.11'
MW-116 3,622.95'
MW-128 3,623.23'
MW-052 3,623.59'
MW-125 3,622.89'
MW-131 3,623.17'
MW-076 NM
MW-114 3,622.68'
MW-112 3,578.63'
MW-057 3,623.46'
MW-082 3,623.19'
MW-064 3,623.32'
MW-130 3,623.49'
MW-083 3,623.93'
MW-104 3,623.55'
MW-128 3,623.38'
MW-070 3,623.43'
IW-01
VE-20
MW-123 3,623.60'
MW-123 3,623.41'
VE-19
MW-065A 3,624.83'
3,623.17'
MW-113 3,623.58'
VE-18 3,623.67'
3,623.00'
3,622.00'
3,621.00'
MW-118 3,623.02'
MW-084 3,621.79'
(3,638.54')
VE-17
VE-16 3,623.70'
MW-067 3,623.46'
MW-098 3,624.69'
MW-108 3,623.71'
MW-095 3,624.00'
IW-02 DRY
MW-097 3,623.67'
MW-096 3,623.58'
MW-088 3,622.81'
MW-089 3,622.33'
MW-055 3,622.57'
VE-01 3,622.95'
VE-02 3,623.15'
VE-03 3,623.30'
VE-04 DRY
VE-05 DRY
MW-061A 3,626.55'
MW-071 3,622.20'
MW-087 MW-087A 3,623.74' (3,632.41')

N

0 600 1,200 2,400
Scale in Feet

Source: Portions of U.S. Geological Survey 7½ Minute Topographic Series, Martha Creek Quadrangle, New Mexico Sheet, Published 1978.

NEW MEXICO

Explanation

- Monitoring Well
- Infiltration Well
- Recovery Well
- Vapor Extraction Well
- Industrial Supply Well
- Recovery Sump
- Phase I Infill Wells Installed During July, 1999
- Phase II Infill Wells Installed During August, 1999
- NM — Well Not Gauged – Not Accessible, Or Not Part Of Gauging Plan
- ( ) — Data Not Used In Contour Interpolation
- 3,622.55' — Groundwater Elevation In Feet Above Mean Sea Level
- DRY — Indicates Well Was Dry At Time Of Gauging
- NR — No Reading
- 3,623.00' — Groundwater Elevation Contour Line
- Rocky Arroyo

31-009-00087

Current Plotstyle : ByColor
Layout Tab: BH

Date\Time : Wed, 24 Mar 2004 - 2:46pm
Path\Name : G:\AutoCAD\DWG\Marathon Oil\Indian Basin\MT000830.0001\MT830109.dwg

Acad Version : R16.0
User Name : gehlck

Area Manager	A. Schmidt
Project Manager	A. J. Reed, Jr.
Task Manager	J. Ornelas
Technical Review	S. Tischer

ARCADIS
1004 North Big Spring Street
Suite 300
Midland, TX 79701-3383
Tel: 432-687-5400 Fax: 432-687-5401
www.arcadis-us.com

Marathon Oil Company
Indian Basin Remediation Project

Groundwater Elevation Contours
Lower Queen - October, 2003

Eddy County, New Mexico

Project Number	MT000830.0001
Drawing Date	16 March 2004
Figure	8

T - 21 - S

R - 23 - E

MW-111	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	6

MW-089	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-066	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-061A	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-088	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-074	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-071	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-073	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-094	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-059	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-063	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-060	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-087	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-087A	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-062	
Benzene	8
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-064	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-057	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-104	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-070	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-067	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-096	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-108	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-097	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-098	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

MW-095	
Benzene	<5
Toluene	<5
Ethylbenzene	<5
Total Xylenes	<5

Marathon Owned Property

Rocky Arroyo

23 24 19 26 25 30

NM

DRY

0.60 2.33 0.01 0.04 2.02 0.12 0.03 1.65 0.12 0.53 0.02

0 600 1,200 2,400

Scale in Feet

N

Source: Portions of U.S. Geological Survey 7½ Minute Topographic Series, Martha Creek Quadrangle, New Mexico Sheet, Published 1978.

NEW MEXICO

Explanation

- Monitoring Well
- Infiltration Well
- Recovery Well
- Vapor Extraction Well
- Industrial Supply Well
- Recovery Sump
- Phase I Infill Wells Installed During July, 1999
- Phase II Infill Wells Installed During August, 1999
- 2.67 Thickness Of Separate-Phase Condensate In Feet
- DRY Indicates Well Was Dry At Time Of Gauging
- NM Well Not Gauged; Not Accessible, Or Not Part Of Gauging Plan
- Rocky Arroyo

Well ID

MW-059	
Benzene	29
Toluene	<1
Ethylbenzene	130
Total Xylenes	405

Red Indicates BTEX Constituents Present At Concentrations Above Regulatory Limits.

Indicates Constituent Not Detected Above Noted Laboratory Detection Limit (With Limit Shown).

Concentration (µg/L)

Constituent

OCD Cleanup Goals/Regulatory Limits

Benzene	10 µg/L
Toluene	750 µg/L
Ethylbenzene	750 µg/L
Total Xylenes	620 µg/L

Notes:

OCD New Mexico Energy, Minerals And Natural Resources Department, Oil Conservation Division

µg/L Micrograms Per Liter

31-009-00088

Current Plotstyle : ByColor
Layout Tab: BH

Date\Time : Thu, 25 Mar 2004 - 9:48am
Path\Name : G:\AutoCAD\DWG\Marathon Oil\Indian Basin\MT000830.0001\MT830110.dwg

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User Name : gahlick

Area Manager	A. Schmidt
Project Manager	A. J. Reed, Jr.
Task Manager	J. Ornelas
Technical Review	S. Tischer

ARCADIS
1004 North Big Spring Street
Suite 300
Midland, TX 79701-3383
Tel: 432-687-5400 Fax: 432-687-5401
www.arcadis-us.com

Marathon Oil Company
Indian Basin Remediation Project

BTEX And Separate-Phase Condensate Distribution
Lower Queen - April, 2003

Eddy County, New Mexico

Project Number	MT000830.0001
Drawing Date	16 March 2004
Figure	9