~~AP004~~ → GW035

H2A ENVIRONMENTAL, LTD.

STAGE 2 ABATEMENT / DISCHARGE PLAN

JAL BASIN STATION

H_2A JOB NO. 106.001

RECEIVED
JUL 28 2000
ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Prepared for:

EQUILON ENTERPRISES LLC EQUIVA SERVICES LLC

Approved by:

J. Michael Hawthorne, P.G., REM
President

July 2000

TABLE OF CONTENTS

TABLE OF CONTENTS

TYPE OF OPERATION

The major purpose for installing and operating the mobile Hi-Vac soil and groundwater remediation system is to recover subsurface diesel from the site. The hydrocarbon removal process utilizes a multi-phase recovery system designed to simultaneously extract hydrocarbons from the subsurface in 3 phases (free liquid, dissolved phase, and vapor phase). In general, the system consists of a liquid ring pump, extensive liquid/solid/vapor separation equipment, and water treatment system. Based upon the results of the pilot test, vapor abatement equipment will not be necessary to maintain compliance with current emissions requirements. The Hi-Vac remediation system will be located on the Jal Basin Station facility in Lea County, New Mexico. However, the Hi-Vac remediation equipment and its processes are being presented for consideration independently from all other equipment and processes currently operating at the Jal Basin Station facility.

NAME OF OPERATOR - FACILITY

The Jal Basin Station is a transportation and storage facility for crude oil. Crude oil is received at Jal Station from area crude oil producing wells via pipeline gathering systems. Approximately 1.8 million barrels of crude oil is stored at Jal Station and pumped via pipeline to refining facilities. Equilon Pipeline Company LLC currently operates the Jal Basin Station facility. The local contact is:

Ernest Richarte
Jal Basin Station
2 miles South of Jal on Highway 18
Jal, New Mexico 88252
(505) 395-2026

NAME OF OPERATOR – HI-VAC SYSTEM

A third party owner/operator for the Hi-Vac system slated to conduct the remediation activities at the Jal Basin Station will be determined through competitive bidding.

Project management activities will be conducted by H_2A Environmental, Ltd. and the contacts are as follows:

J. Michael Hawthorne
H_2A Environmental, Ltd.
500 North Carroll Avenue, Suite 120
Southlake, Texas 76092
(817) 251-9466

Theresa Nix
H_2A Environmental, Ltd.
418 San Saba
Portland, Texas 78374
(361) 777-0860

This report presents the proposed remediation and abatement of soil and groundwater including recovery, treatment, and discharge systems. This Stage 2 Abatement/Discharge Plan is based on previous subsurface investigation activities and pilot testing performed at the project site.

LOCATION OF FACILITY

The Jal Basin Station is located approximately 2 miles south of Jal in the northeast quarter of the northeast quarter of Section 5, Township 26 South, Range 37 East, in Lea County, New Mexico. Jal Station is not located in an incorporated city or town. A facility location map is presented on FIG. 1. Site details, including the proposed system location, are presented on FIG. 2.

FACILITY DESCRIPTION

Jal Basin Station improvements are situated in the central portion of the property and encompass approximately 55 acres of the 80 acre property. The northern and southern portions of the property are undeveloped. A site plan is presented as Fig. 2. A perimeter fence approximately 6 feet high with 3 strands of barbed wire surrounds the developed portion of the site.

HI-VAC SYSTEM DESCRIPTION

The system consists of a mobile Hi-Vac system incorporating a liquid ring extraction pump and associated separation and treatment equipment. The system includes primary and secondary bulk separators on the inlet side of the liquid ring pump system, a secondary air/water/particulate separator, a closed loop heat exchanger cooling system for the liquid ring pump, and associated equipment. The system is trailer mounted.

The liquid ring pump extracts groundwater, product, suspended particles, and soil vapors with a vacuum up to 26 inches of mercury. The collected media is processed through a series of separators. The vapor stream is discharged to the atmosphere. Collected fluids are pumped through an 800 gallon (nominal) oil/water separator (OWS) for separation. During the pilot test, all fluids were retained within the OWS, and the test was terminated when the OWS was full. This discharge plan is being prepared for submittal to the Oil Conservation Division (OCD) to surface discharge the water upon initiation of full-time system operation. Upon approval, the system will be operated such that product separated in the OWS is recovered in a product storage tank, and water separated in the OWS is treated. The water will be processed through a counter current air stripping system (A/S) and zeolite and carbon filters, as necessary. Vapors from the A/S will be discharged to the atmosphere and water from the A/S will be

filtered and then discharged to the surface, pending OCD approval. The system will be equipped with safety shutoff switches in the event of a high level condition. A process flow diagram for the Hi-Vac system is presented as FIG. 3.

Various monitoring wells at the site that exhibit hydrocarbon impact will be utilized as the extraction points. Vaccuum readings will be collected during the initial operation period to evaluate the radius of influence and optimum arrangement of the recovery system.

The recovery wells are fitted with a vacuum pipe (stinger) extending through a sealed well cap to maximize the recovery of LNAPL while minimizing the recovery of groundwater. The vacuum pipe is plumbed to the liquid ring pump. All piping and facilities from the well to the liquid ring pump are under vacuum. A gate valve and vacuum gauge is installed on the line to control the vacuum exerted on each extraction well. A sample port is installed to monitor the hydrocarbon concentrations in the vent stack from the discharge line of the liquid ring pump. A multi-phase vacuum extraction well detail is presented as FIG. 4.

The LNAPL fractionation tank (OWS) is constructed of 10-gauge steel and epoxy coated to inhibit rust and primed and painted with an industrial white paint.

DISPOSITION OF TREATED GROUNDWATER

The groundwater will be treated to the Water Quality Control Commission (WQCC) drinking water standards prior to discharge. The WQCC standards are presented in TABLE I as maximum effluent concentrations.

Upon treatment to WQCC standards, the treated water will be piped to the western property line and discharged to the surface.

MATERIALS USED OR STORED

Materials stored on-site for the Hi-Vac system operation may include zeolite and water conditioning agents. The general composition of the material, container type, estimated volume stored, and location is provided below. Material Safety Data Sheets (MSDS) for all materials used at the facility are available upon request and are maintained at the on-site office building. All other materials stored or used at the facility for the storage and transfer of crude oil and operation and maintenance activities associated with these will be covered under a separate facility discharge plan.

ZEOLITE

A filter containing Zeolite will be installed in the process stream following the oil/water separator and before the air stripper. The purpose of the Zeolite is to prevent hydrocarbon emulsion with recovered groundwater from reaching the air stripper. The vessel will be placed on the ground next to the remediation system. A copy of the MSDS sheet for Zeolite is presented in APPENDIX B.

- Draining the line into tankage.
- Closing gate valves to isolate flow to the leak area.

3. Notify the appropriate Company representatives in the response zone. Begin the Incident Command System (ICS), if appropriate.
4. Many petroleum vapors are heavier than air and will migrate to lower elevations. Consideration should be given to warning the public in low lying areas and
   - Notify emergency response agencies (fire, police) so that they can assist in warning the public, if necessary.
   - Notify appropriate government agencies. Be sure to contact all potentially impacted local jurisdictions and water intakes.
   - Determine equipment and personnel needed. The resources needed can be determined by assessing the size of the spill, the location of the spill (inside or outside containment basin), type of material spilled, threatened environmentally sensitive areas (wetlands, wildlife refuges), threatened economically sensitive areas (public water intakes, cooling water intakes), and weather conditions.
5. Mobilize and deploy response personnel and equipment. Local personnel are the primary responders to a spill. Additional personnel can be obtained from:
   - Non Company Personnel
   - Contractors and Co-ops
   - Equilon Response Team
6. Investigate the cause of the spill and take corrective action to prevent similar spills.

CONTAINMENT AND RECOVERY

Containment and recovery activities should be conducted under safe conditions. Evaluate and obtain as necessary atmosphere monitoring, excavation techniques, dig permits, and personal protection equipment.

RELEASE REPORTING

The OCD shall be notified of any unauthorized release occurring during the system operation in accordance with the requirements of NMOCD Rule 116.

The OCD shall be notified in accordance with NMOCD Rule 116 with respect to any release from any facility of oil or other water contaminant, in such quantity as may, with reasonable probability, be detrimental to water or cause an exceedance of the standards in 19 NMAC 15.A.19.B(1), B(2) or B(3).

Notification of the above releases shall be made by the person operating or controlling either the release or the location of the release in accordance with the following requirements:

A Major Release shall be reported by giving both verbal notice and timely written notice pursuant to Paragraphs C(1) and C(2) of NMOCD Rule 116. A Major Release is:

- an unauthorized release of a volume, excluding natural gases, in excess of 25 barrels
- an unauthorized release of any volume which:
  - ◊ results in a fire
  - ◊ will reach a water course

- ◊ may with reasonable probability endanger public health
- ◊ results in substantial damage to property or the environment
- ◊ an unauthorized release of natural gases in excess of 500 mcf
- ◊ a release of any volume which may with reasonable probability be detrimental to water or cause an exceeding of the standards in 19 NMAC 15.A.19.B(1), B(2) or B(3).

A Minor Release shall be reported by giving timely written notice pursuant to NMOCD Rule 116. A Minor Release is an unauthorized release of a volume, greater than 5 barrels but not more than 25 barrels; or greater than 50 mcf but less than 500 mcf of natural gases.

Verbal notification shall be reported within 24 hours of discovery to the OCD District Office for the area within which the release takes place. In addition, verbal notification shall be reported to the OCD's Environmental Bureau Chief. This notification shall provide the information required on OCD Form C-141.

Timely written notification is required to be reported within 15 days to the OCD District Office for the area within which the release takes place by completing and filing OCD Form C-141. In addition, timely written notification required shall also be reported to the OCD's Environmental Bureau Chief within 15 days after the release is discovered. The written notification shall verify the prior verbal notification and provide any appropriate additions or corrections to the information contained in the prior verbal notification.

The responsible person must complete OCD approved corrective action for releases which endanger public health or the environment. Releases will be addressed in accordance with a remediation plan submitted to and approved by the OCD.

PROJECT HISTORY AND SITE CHARACTERISTICS

SITE ASSESSMENT HISTORY

The Equilon diesel release at Jal Basin Station was confirmed during a Phase II Limited Environmental Subsurface Investigation performed by StanTech Environmental Services in January of 1998. During the investigation, 2 monitoring wells (MW-1 and MW-2) and 3 borings (B-1 through B-3) were installed. Light non-aqueous phase liquids (LNAPL) were observed in monitoring well MW-2 with an approximate thickness of 3 feet. A water sample was collected from the on-site water well utilized as a non-potable water source for the facilities located at this site. This sample had non-detectable results for TPH-DRO, TPH-ORO, and BTEX concentrations, however, a TPH-GRO concentration of 0.088 mg/L was observed.

Another 13 monitoring wells (MW-3 through MW-15) were installed to delineate horizontal and vertical extent of hydrocarbon impact from the suspected source area. The facility required the installation of a new electric pump for pipeline operations. The new pump location was near monitoring well MW-7. Therefore, MW-7 was plugged and abandoned and monitoring well MW-15 was installed to replace MW-7.

During previous assessment activities, LNAPL was detected in monitoring wells MW-2, MW-3, MW-4, MW-6, MW-8, and MW-9. The LNAPL thickness observed from measurements taken

October 26, 1999 ranged from 1.24 to 7.47 feet. Results of the previous assessments are presented in the Stage 1 Abatement Plan, dated April 8, 1999, and the Additional Stage 1 Abatement Activities, dated January 6, 2000. A groundwater contour map and LNAPL thickness map are presented as FIG. 5 and FIG. 6.

A pilot test was conducted using the Hi-Vac system on December 15, 1999 and January 19, 2000. The results of the pilot test indicated the Hi-Vac system would be effective at the depths at which groundwater and LNAPL are encountered at the site (approximately 90 feet below ground surface). The results of the pilot test are discussed in the Pilot Test Results section of this report.

REGIONAL GEOLOGY AND HYDROGEOLOGY

Geology

The property is located in the geographic region known as the Eunice Plain. The Eunice Plain is bound on the north by the Llano Estacado and on the southwest by San Simon Ridge and Antelope Ridge. The westward extension of the Eunice Plain is bounded by an irregular, low, south-facing scarp which is most prominent at Custer Mountain, where it attains a height of about 60 feet. East and west of Custer Mountain the scarp is less pronounced. To the west the scarp is buried under a mantle of dune sand. To the east the scarp becomes more subdued and irregular, owing to dune sand cover and to dissection by numerous gullies and draws. Monument Draw traverses the east side of Eunice Plain from north to south. The Eunice Plain is the most highly developed part of the area.

The Eunice Plain is underlain by a hard caliche surface and is almost entirely covered by reddish-brown dune sand. In some places the underlying surface consists of alluvial sediments, most commonly calcareous silt in buried valleys or Quaternary lake basins. It has a general southeast slope toward Monument Draw. The underlying surface is exposed only locally, but it is reflected to some degree in many places by the overlying sand cover a few inches to several feet thick.

Hydrogeology

Former City of Jal water wells bottomed out in the Santa Rosa sandstone at depths of 500 feet (Well 25.37.19.221) and 450 feet below ground surface (bgs) (Well 25.37.19.240). The groundwater level was noted to be 284 and 65 feet below ground surface in these 2 wells, respectively. These wells were later abandoned as public supply wells. Jal then bought an irrigation well about 5 miles east of Jal and converted it into a public supply. The well bottomed in the Ogallala formation at a depth of 152 feet bgs (Well 25.37.13.312a). The depth to the water was noted to be 73 feet below ground surface. Jal also drilled 2 other wells in township 26 south, range 36 east (Wells 26.36.18.311, 26.36.21.233, and 26.36.21.443). These wells were drilled in the Quaternary Alluvium to depths of 559 feet, 700 feet, and 159 feet bgs, respectively. The third well drilled was dry. Groundwater in Wells 26.36.18.311 and 26.36.21.233 were noted at depths of 220.8 and 198.0 feet bgs, respectively.

A pond is located 0.42 miles to the east-southeast of the subject property. An unnamed intermittent stream/creek is located 1.67 miles to the northwest of the subject property. An aqueduct is located approximately 1.78 miles to the northwest of the subject property.

According to Mr. Ken Frescas with the State of New Mexico's Engineering Department, there are no permitted water wells within one-quarter mile radius of the outside perimeter of the facility. Jal water wells include the following:

WELL NUMBER	AQUIFER	TOTAL DEPTH OF WELL	DEPTH TO GROUNDWATER	YEAR DRILLED	TOTAL DISSOLVED SOLIDS
26.37.7.331	Tr	467		1937	
25.37.19.221	Tr	500	284.0	1954	825
25.37.19.240	Tr	450	65	1942	759
25.37.15.310	Qal	70	65	1942	
25.37.13.312a	To	152	73	1954	250/295
26.36.18.311	Qal	559	220.8	1960	
26.36.21.233	Qal	700	198.0	1960	
26.36.21.443	--	137 (?)	Dry	1958	

SOIL SURVEY INFORMATION

According to the "Soil Survey of Lea County, New Mexico" the soil type for the center portion and the majority of the property is the Wink fine sand with 0 to 3 percent slopes. The Wink fine sand is moderately permeable, and the water runoff is very slow. The water intake is rapid and the available water holding capacity is 2 to 4 inches. Roots penetrate to a depth of 20 to 35 inches, and the depth of bedrock or caliche is greater than 5 feet. Soil blowing is a severe hazard. The soil profile of the Wink fine sand is as follows:

- From 0 to 12 inches, the unit consists of a brown fine sand, which is darkish brown when moist. The soil is loose when dry or moist, and non-sticky and non-plastic when wet. This layer is moderately alkaline, slightly calcareous with a gradual boundary to the next profile layer. The permeability ranges from 2.0 to 20.0 inches per hour, the available water capacity ranges from 0.06 to 0.08 inch per inch of soil, and the pH ranges from 7.9 to 8.4.
- From 12 to 23 inches, the unit consists of a brown sandy loam, which is dark brown when moist. The soils are weak, with medium, sub-angular blocky structure. The soils are soft, and very friable when moist, and non-sticky and non-plastic when wet. This layer is moderately alkaline, slightly calcareous with a gradual boundary to the next profile layer. The permeability ranges from 2.0 to 6.3 inches per hour, the available water capacity ranges from 0.11 to 0.13 inch per inch of soil, and the pH ranges from 7.9 to 8.4.
- From 23 to 60 inches, the unit consists of a white, soft caliche of sandy loam texture, which is light gray when moist. The soils are massive, hard, and friable when moist, and slightly sticky and slightly plastic when wet. The upper part of this layer contains a few, fine, weakly cemented lime concretions. This layer is strongly alkaline and strongly calcareous. The permeability ranges from 2.0 to 6.3 inches per hour, and the pH ranges from 8.4 to 9.0.

The soil type for the northwest corner and the southern portion of the site consists of the Pyote and Maljamar fine sands with 0 to 3 percent slopes. The Pyote and Maljamar fine sand has moderately rapid permeability, and very slow water runoff. The water intake is rapid and the available water holding capacity is 5 to 7 inches. Roots penetrate to a depth of 60 inches or more, and the depth of bedrock or caliche is greater than 5 feet. Soil blowing is a severe hazard. The soil profile of the Pyote and Maljamar fine sand is as follows:

- From 0 to 30 inches, the unit consists of light-brown fine sand, which is brown when moist. The soils are loose when dry or moist and non-sticky and non-plastic when wet. This layer is neutral, non-calcareous, and has a clear boundary to the next soil layer. The permeability ranges from 6.3 to 20.0 inches per hour, the available water capacity ranges from 0.06 to 0.08 inch per inch of soil, and the pH ranges from 6.6 to 7.3.
- From 30 to 40 inches, the unit consists of a reddish-yellow fine sandy loam, which has a strong brown color when moist. The soils are soft, very friable when most, slightly sticky and slightly plastic when wet. This layer is neutral, non-calcareous, and has a clear boundary before the next layer. The permeability ranges from 2.0 to 6.3 inches per hour, the available water capacity ranges from 0.13 to 0.15 inch per inch of soil, and the pH ranges from 6.6 to 7.3.
- From 40 to 48 inches, the unit consists of a light-brown fine sandy loam, and is brown when moist. The soils are soft, very friable when moist, slightly sticky and slightly plastic when wet. This layer is neutral, non-calcareous, and has a clear boundary before the next layer. The permeability ranges from 2.0 to 6.3 inches per hour, the available water capacity ranges from 0.13 to 0.15 inch per inch of soil, and the pH ranges from 6.6 to 7.3.
- From 48 to 60 inches, the unit consists of a pink fine sandy loam, which is light brown when moist. The soils are slightly hard, friable when moist, slightly sticky and slightly plastic when wet. This layer is neutral, non-calcareous, and has a clear boundary before the next layer. The permeability ranges from 2.0 to 6.3 inches per hour, the available water capacity ranges from 0.13 to 0.15 inch per inch of soil, and the pH ranges from 6.6 to 7.3.

HI-VAC PILOT TEST RESULTS

A pilot test was conducted at the facility utilizing a Hi-Vac system on December 15, 1999 and January 19, 2000. The duration of the test was less than one week and maximum emissions were 1.21 pounds per hour and 5.3 tons per year. A maximum pumping rate of 6.11 gpm was observed. A total of 975 gallons of water and 68 gallons of diesel were recovered during the test. The fluids are stored on-site pending treatment and disposal. Detailed results of the pilot test are presented in APPENDIX A.

PERMITTING REQUIRMENTS

In addition to this Stage2/Discharge Plan, permits will be obtained for the operation of the recovery wells, discharge to State Land Office (SLO) lands, and air emissions according to the requirements of OCD, NMED, SLO, and the State Engineer's office.

RECOVERY WELL PERMIT

Groundwater recovery wells require permitting under the Rules and Regulations of the State Engineer, Article I, Section 17 titled Applications for Pollution Plume Control Wells and Pollution Recovery Wells. Prior to operation of the groundwater recovery system, a permit application will be submitted for each extraction well.

AIR PERMIT

Hydrocarbon emissions are regulated by NMED. Due to the low levels of potential emissions from the Hi-Vac system, a permit is not required. However, a notice of intent (NOI) has been submitted for review.

STATE LAND OFFICE DISCHARGE

Discharge onto State Land Office land will require approval through the State Land Office. Prior to operation of the groundwater recovery system, approval will be obtained through the State Land Office.

HI-VAC SYSTEM MONITORING

Influent monitoring, effluent monitoring, emissions monitoring, and routine maintenance will be conducted by a technician on a regularly scheduled basis.

Emissions samples will be obtained from the system to verify compliance with standards specified in the NMED NOI.

INFLUENT MONITORING

Water samples will be obtained from the influent to the treatment system to evaluate system treatment efficiency. Influent samples will be initially analyzed for BTEX and PAH concentrations by EPA Method SW846-8020 and 8270, respectively. Analytical data will be used to quantify dissolved phase hydrocarbon recovery. Subsequent sampling events will be limited to BTEX.

EFFLUENT MONITORING

The effluent from the groundwater treatment system will be monitored as necessary in accordance with guidelines outlined in this discharge plan and in 20 NMAC 6.2.III.3107. Representative samples of the effluent will be obtained at a point prior to entering the discharge conduit extending to the surface and will be initially analyzed by an approved laboratory for the constituents listed in TABLE I. Subsequent analyses will be limited to BTEX and any other hydrocarbon constituents detected in the initial round of sampling.

EMISSIONS MONITORING

After installation and testing, pre-treatment and post-treatment hydrocarbon emissions will be monitored on a weekly basis using portable field screening equipment. The monitoring data from the liquid ring pump emissions will be used to help quantify total hydrocarbon recovery. A Tedlar bag sample will be obtained monthly for laboratory analysis.

SYSTEM OPERATION AND MAINTENANCE

Maintenance of the remediation system will be conducted as necessary by a trained field technician. Maintenance will consist of inspecting the extraction wells, vacuum pump, separation equipment, air stripping unit, influent and effluent flow meters, gauges, manway covers, discharge hoses and conduits, and control panels. The equipment will be inspected thoroughly and cleaned or repaired as necessary. Filters will be cleaned or changed regularly to assure proper system operation. Readings will be taken of all pressure gauges, vacuum gauges, and flow meters, and necessary adjustments will made to the system. Operations and maintenance may be conducted in conjunction with system monitoring and sampling activities.

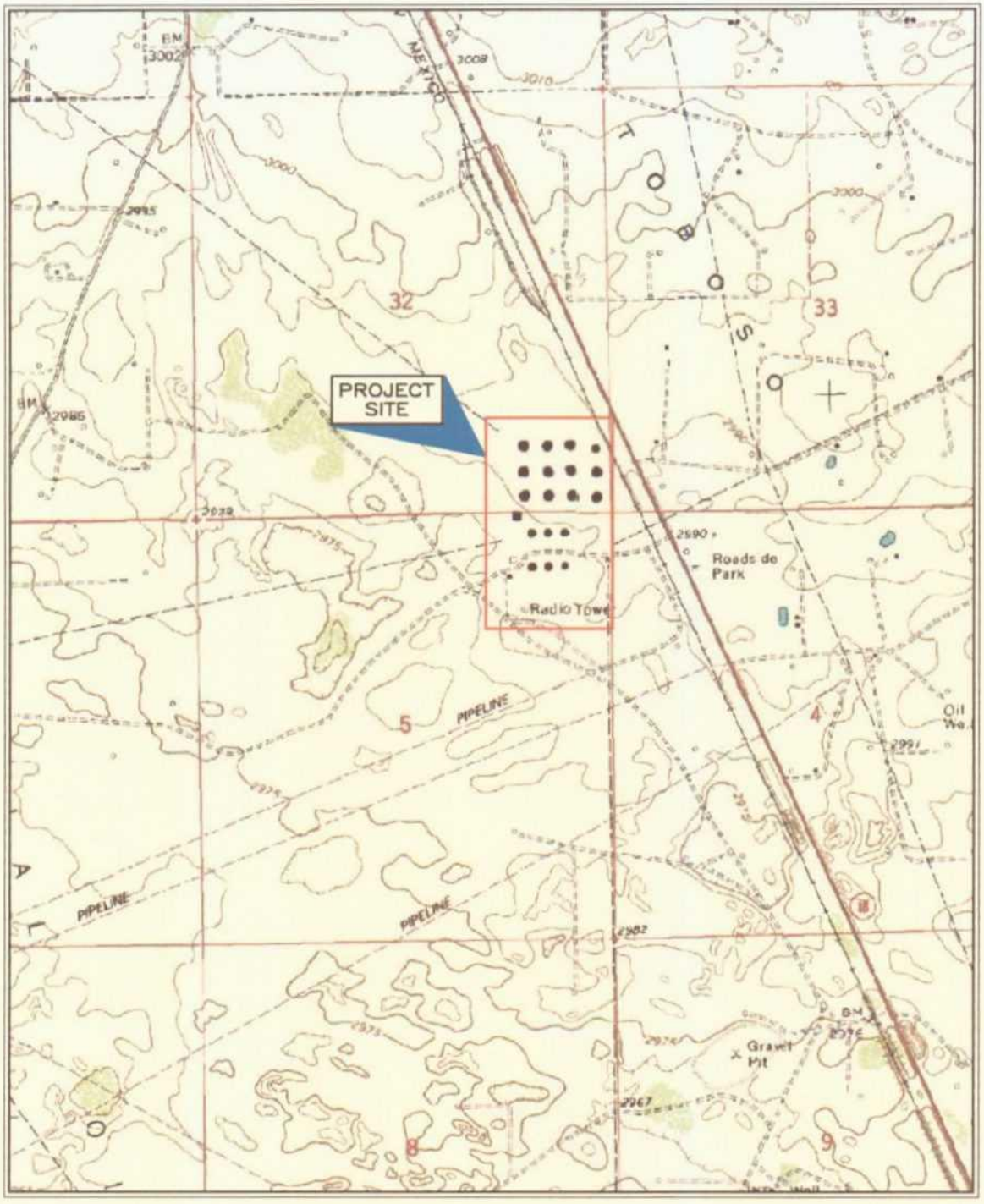
REPORTING SCHEDULE

A report summarizing the monitoring activities will be prepared and transmitted annually. The reports will include laboratory results for influent, treated effluent, emissions monitoring, and information obtained during operations and maintenance activities. Additional recommendations will be made, if necessary, to enhance the effectiveness of the recovery system.

GROUNDWATER MONITORING

Monitoring wells will continue to be sampled quarterly for BTEX concentrations. A report summarizing the groundwater results will be prepared and transmitted annually.

JAL QUADRANGLE
NEW MEXICO - TEXAS



LAT=32° 04' 36"
LONG=103° 10' 38"
PHOTOREVISED 1981

SCALE 1:24000

0 1/2 1
(Miles)

0 2000 4000
(Feet)

FIGURE 1

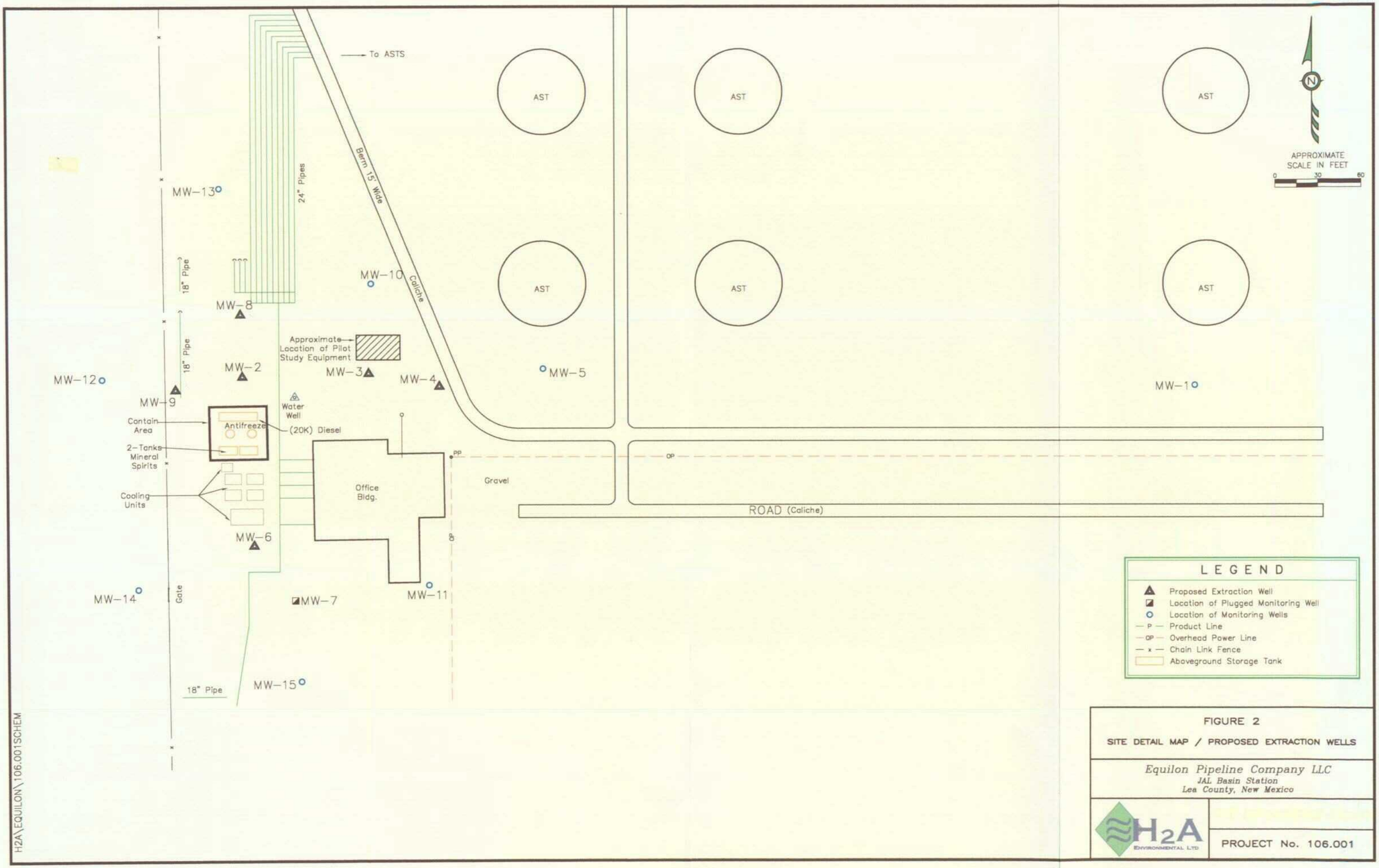
SITE LOCATION MAP

Equilon Pipeline Company LLC
JAL Basin Station
Lea County, New Mexico

H2A ENVIRONMENTAL LTD

PROJECT No. 106.001

H2A\EQUILON\106.001SCHEM



H2A\EQUILON\106.001SCHEM

FIGURE 2

SITE DETAIL MAP / PROPOSED EXTRACTION WELLS

Equilon Pipeline Company LLC
JAL Basin Station
Lea County, New Mexico

H2A ENVIRONMENTAL LTD

PROJECT No. 106.001

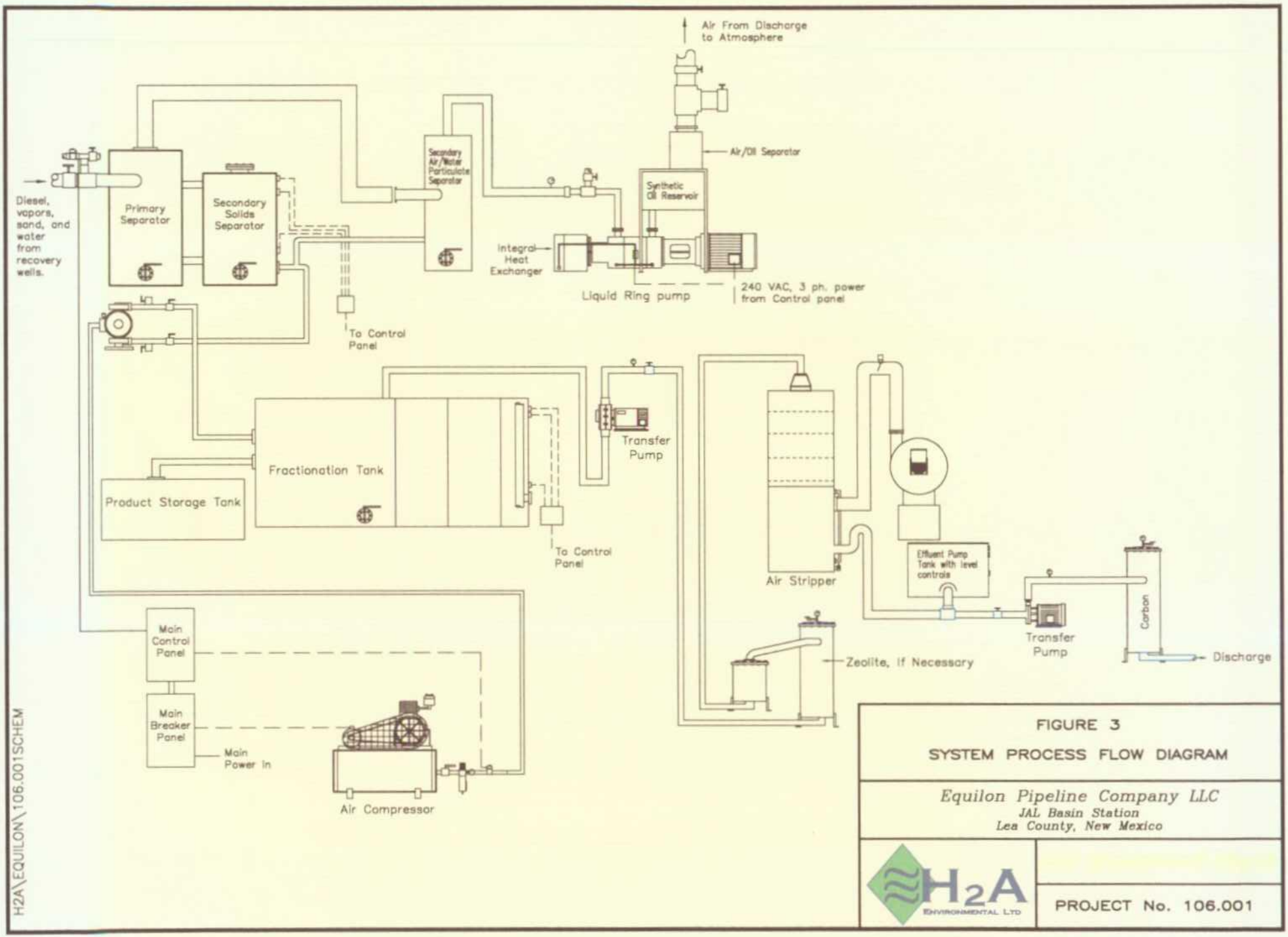


FIGURE 3

SYSTEM PROCESS FLOW DIAGRAM

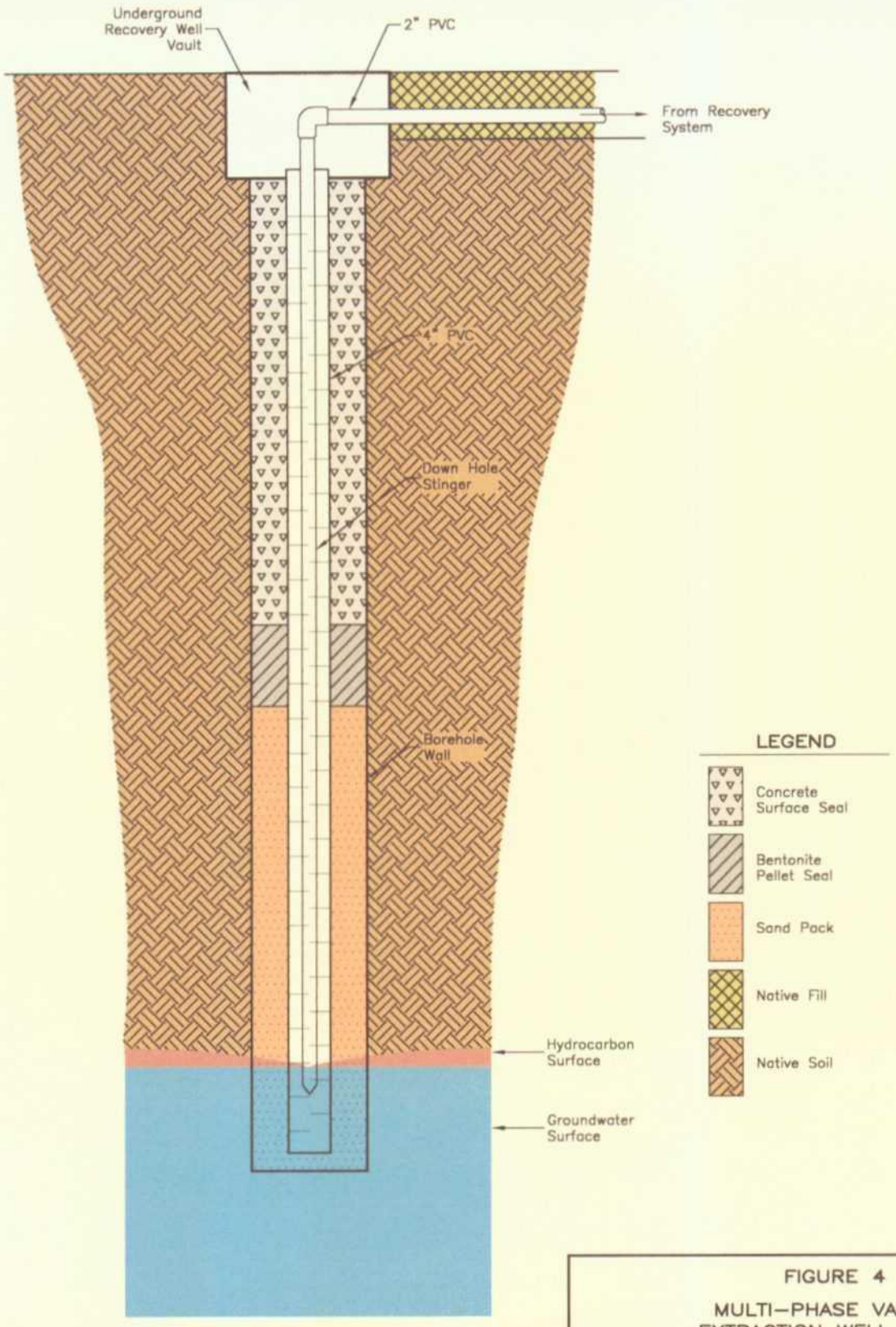
Equilon Pipeline Company LLC

JAL Basin Station

Lea County, New Mexico

H2A ENVIRONMENTAL LTD

PROJECT No. 106.001



H2A\EQUILON\106.001SCHEM

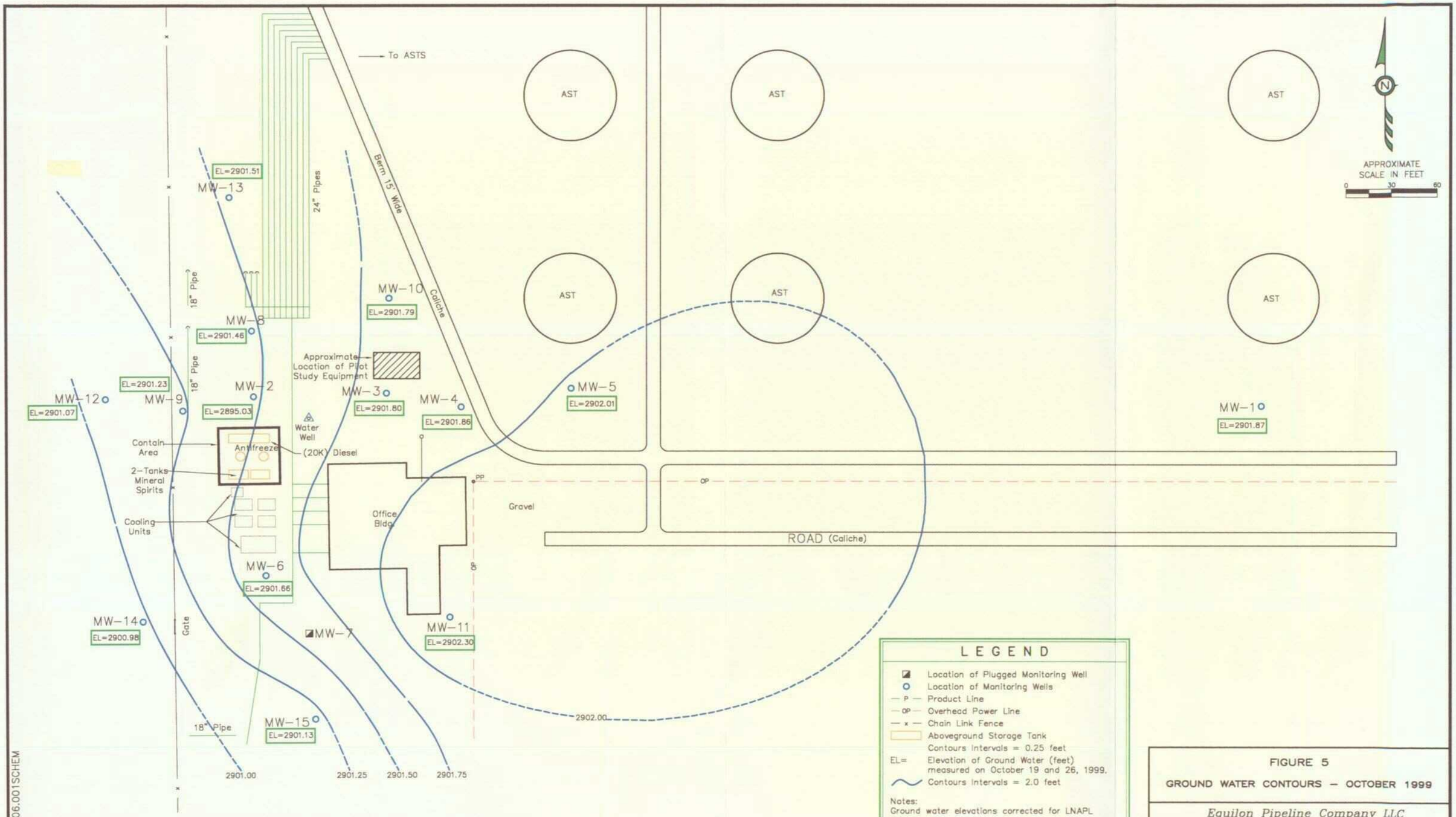
FIGURE 4

MULTI–PHASE VACUUM EXTRACTION WELL DETAIL

Equilon Pipeline Company LLC
JAL Basin Station
Lea County, New Mexico

H2A Environmental Ltd

PROJECT No. 106.001



LEGEND

- Location of Plugged Monitoring Well
- Location of Monitoring Wells
- P — Product Line
- OP — Overhead Power Line
- x — Chain Link Fence
- Aboveground Storage Tank
- Contours Intervals = 0.25 feet
- EL= Elevation of Ground Water (feet) measured on October 19 and 26, 1999.
- Contours Intervals = 2.0 feet

Notes:
Ground water elevations corrected for LNAPL thickness.
Wells with LNAPL present were measured on October 26, 1999.

FIGURE 5

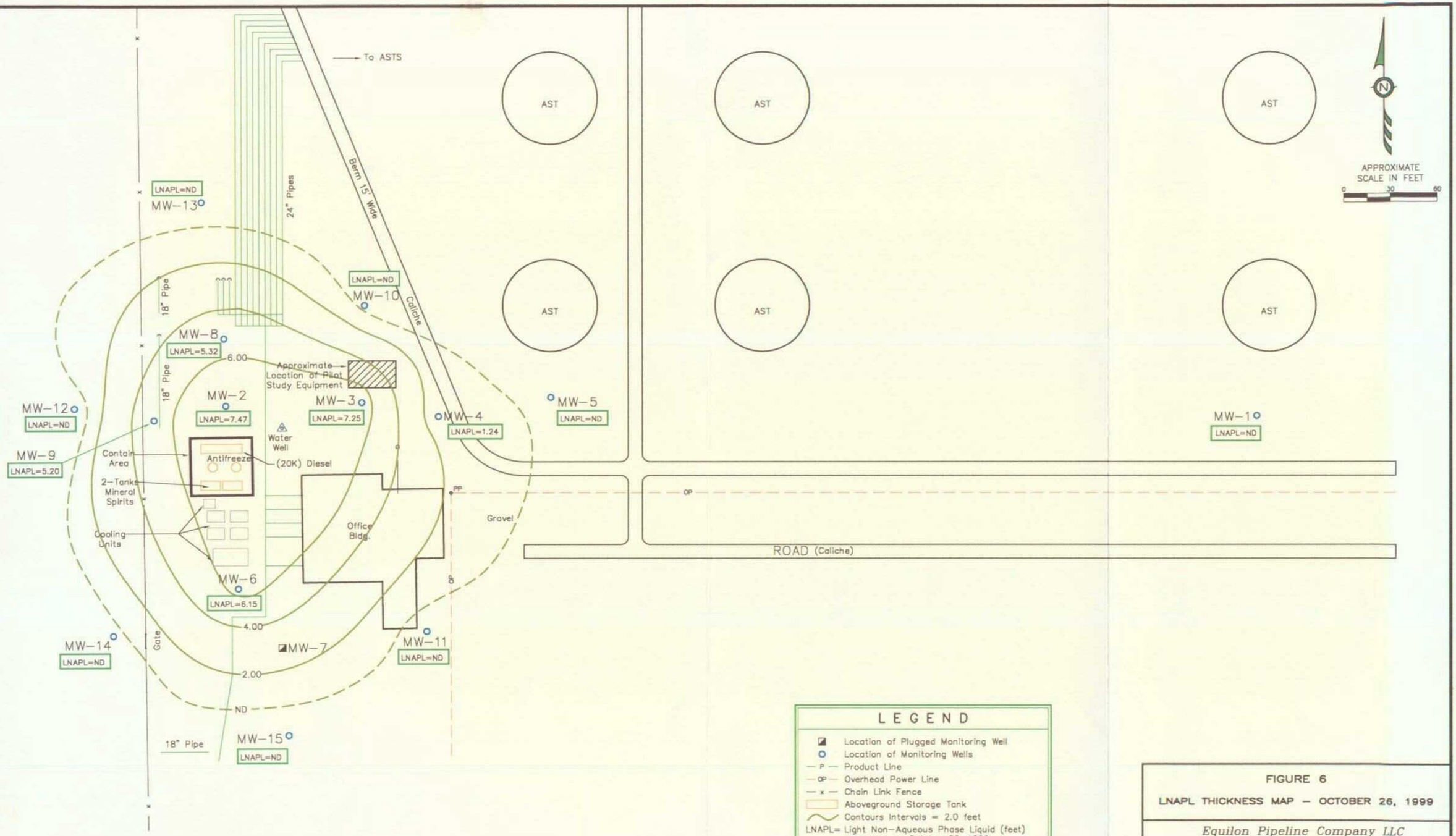
GROUND WATER CONTOURS – OCTOBER 1999

Equilon Pipeline Company LLC
JAL Basin Station
Lea County, New Mexico

H2A ENVIRONMENTAL LTD

PROJECT No. 106.001

H2A\EQUILON\106.001SCHEM



LEGEND

- Location of Plugged Monitoring Well
- Location of Monitoring Wells
- — P — Product Line
- — OP — Overhead Power Line
- — x — Chain Link Fence
- Aboveground Storage Tank
- Contours Intervals = 2.0 feet
- LNAPL= Light Non-Aqueous Phase Liquid (feet) measured on October 26, 1999.
- ND = Not Detected

FIGURE 6

LNAPL THICKNESS MAP – OCTOBER 26, 1999

Equilon Pipeline Company LLC
JAL Basin Station
Lea County, New Mexico

H2A ENVIRONMENTAL LTD

PROJECT No. 106.001

H2A\EQUILON\106.001SCHEM

TABLE I

SAMPLING SCHEDULE – Hi-VAC SYSTEM
JAL BASIN STATION
LEA COUNTY, NEW MEXICO

CONTAMINANT	SAMPLING FREQUENCY*	SAMPLE LOCATION	TOTAL NO. OF SAMPLES	EPA METHOD	CLOSURE CONCENTRATION (mg/l)
Arsenic	Initial testing Annually	System Effluent	1 1 per year	6010	0.1
Barium	Initial testing Annually	System Effluent	1 1 per year	6010	1.0
Cadmium	Initial testing Annually	System Effluent	1 1 per year	6010	0.01
Chromium	Initial testing Annually	System Effluent	1 1 per year	6010	0.05
Cyanide	Initial testing Every 3 years	System Effluent	1 1 per 3 yrs	335.2	0.2
Fluoride	Initial testing Every 3 years	System Effluent	1 1 per 3 yrs	300	1.6
Lead	Initial testing Annually	System Effluent	1 1 per year	6010	0.05
Total Mercury	Initial testing Annually	System Effluent	1 1 per year	7470	0.002
Nitrate (NO_3 as N)	Initial testing Annually	System Effluent	1 1 per year	353.2	10.0
Selenium	Initial testing Annually	System Effluent	1 1 per year	6010	0.05
Silver	Initial testing Annually	System Effluent	1 1 per year	6010	0.05
Benzene	Initial testing Monthly	System Effluent	1 1 per mo.	8020	0.01
Toluene	Initial testing Monthly	System Effluent	1 1 per mo.	8020	0.75
Carbon Tetrachloride	Initial testing Annually	System Effluent	1 1 per year	8260	0.01
1,2-Dichloroethane	Initial testing Annually	System Effluent	1 1 per year	8260	0.01

TABLE I
(continued)

SAMPLING SCHEDULE – Hi-VAC SYSTEM
JAL BASIN STATION
LEA COUNTY, NEW MEXICO

CONTAMINANT	SAMPLING FREQUENCY*	SAMPLE LOCATION	TOTAL NO. OF SAMPLES	EPA METHOD	MAX EFFLUENT CONCENTRATION (mg/l)
1,1-Dichloroethylene	Initial testing Annually	System Effluent	1 1 per year	8260	0.005
1,1,2,2-Tetrachloroethylene	Initial testing Annually	System Effluent	1 1 per year	8260	0.02
1,1,2-Trichloroethylene	Initial testing Annually	System Effluent	1 1 per year	8260	0.1
Ethylbenzene	Initial testing Monthly	System Effluent	1 1 per mo.	8020	0.75
Total Xylenes	Initial testing Monthly	System Effluent	1 1 per mo.	8020	0.62
Methylene Chloride	Initial testing Annually	System Effluent	1 1 per year	8260	0.1
Chloroform	Initial testing Annually	System Effluent	1 1 per year	8260	0.1
1,1-Dichloroethane	Initial testing Annually	System Effluent	1 1 per year	8260	0.025
Ethylene Dibromide	Initial testing Annually	System Effluent	1 1 per year	8260	0.0001
1,1,1-Trichloroethane	Initial testing Annually	System Effluent	1 1 per year	8260	0.06
1,1,2-Trichloroethane	Initial testing Annually	System Effluent	1 1 per year	8260	0.01
1,1,2,2-Tetrachloroethane	Initial testing Annually	System Effluent	1 1 per year	8260	0.01
Vinyl Chloride	Initial testing Annually	System Effluent	1 1 per year	8260	0.001
PAHs: Total Naphthalene plus monomethylnaphthalenes	Initial testing Annually	System Effluent	1 1 per year	8270	0.03
Benzo-a-pyrene	Initial testing Annually	System Effluent	1 1 per year	8270	0.0007
Chloride	Initial testing Annually	System Effluent	1 1 per year	300	250.0
Copper	Initial testing Annually	System Effluent	1 1 per year	6010	1.0
Iron	Initial testing Annually	System Effluent	1 1 per year	6010	1.0
Manganese	Initial testing Annually	System Effluent	1 1 per year	6010	0.2
Phenols	Initial testing Every 3 years	System Effluent	1 1 per 3 yrs	8270	0.005

TABLE I
(continued)

SAMPLING SCHEDULE – Hi-VAC SYSTEM
JAL BASIN STATION
LEA COUNTY, NEW MEXICO

CONTAMINANT	SAMPLING FREQUENCY*	SAMPLE LOCATION	TOTAL NO. OF SAMPLES	EPA METHOD	MAX EFFLUENT CONCENTRATION (mg/l)
Sulfate	Initial testing Annually	System Effluent	1 1 per year	300.0	600.0
Total Dissolved Solids (TDS)	Initial testing Annually	System Effluent	1 1 per year	160.1	1000.0
Zinc	Initial testing Annually	System Effluent	1 1 per year	6010	10.0
pH	Initial testing Annually	System Effluent	1 1 per year	150.1	between 6 and 9
Aluminum	Initial testing Annually	System Effluent	1 1 per year	6010	5.0
Boron	Initial testing Annually	System Effluent	1 1 per year	6010	0.75
Cobalt	Initial testing Annually	System Effluent	1 1 per year	6010	0.05
Molybdenum	Initial testing Annually	System Effluent	1 1 per year	6010	1.0
Nickel	Initial testing Annually	System Effluent	1 1 per year	6010	0.2

APPENDIX A

PILOT TEST – TOTAL FLUIDS PRODUCTION
JAL STATION DIESEL REMEDIATION
JAL, NEW MEXICO

Date	Hour Meter (hours)	Hours (hours)	Flow Meter (gal)	Gallons (gal)	Gallons/minute (gpm)
12/15/1999	2,197.89	2,197.89	0	0	0.00
12/15/1999	2,197.90	0.01	0	0	0.00
12/15/1999	2,198.90	1.00	94	94	1.57
12/15/1999	2,201.40	2.50	328	234	1.56
01/19/2000	2,201.60	0.20	350	22	1.81
01/19/2000	2,202.03	0.43	398	48	1.86
01/19/2000	2,202.40	0.37	468	70	3.15
01/19/2000	2,202.90	0.50	608	140	4.67
01/19/2000	2,203.40	0.50	792	184	6.13
01/19/2000	2,203.90	0.50	975	183	6.11

APPENDIX A

PILOT TEST – VAPOR RESULTS
JAL STATION DIESEL REMEDIATION
JAL, NEW MEXICO

			Discharge						Vapor Discharged		
	Hour		Pipe	Discharge Air Flow				Vapor	Before Treatment		
	Meter	Hours	Diameter	Pressure	Temp	Velocity	Flow Rate	Conc.	Pounds	Lb / Hr	Tons/Year
Date	(hr)	(hr)	(in)	(in. H2O)	(Deg F)	(ft/min)	(scfm)	(ppmv)	(lb)	(lb/hr)	(ton/yr)
12/15/99	2,197.89	2,197.89	3.0	0	0	0	0	1	0.00	0.00	0.0
12/15/99	2,197.90	0.01	3.0	0	106	600	27	2,230	0.01	0.86	3.8
12/15/99	2,198.90	1.00	3.0	0	122	195	9	2,350	0.29	0.29	1.3
12/15/99	2,201.40	2.50	3.0	0	135	259	11	2,510	0.99	0.40	1.7
01/19/00	2,201.60	0.20	3.0	0	49	125	6	1,488	0.03	0.13	0.6
01/19/00	2,202.03	0.43	3.0	0	98	270	13	1,708	0.13	0.30	1.3
01/19/00	2,202.40	0.37	3.0	0	111	580	26	3,270	0.45	1.21	5.3
01/19/00	2,202.90	0.50	3.0	0	117	630	28	2,600	0.52	1.03	4.5
01/19/00	2,203.40	0.50	3.0	0	120	642	29	2,280	0.46	0.92	4.0
01/19/00	2,203.90	0.50	3.0	0	123	630	28	1,450	0.28	0.57	2.5

AMERICAN ABSORBENTS NATURAL PRODUCTS, INC.

Return to AANPI Home Page

MATERIAL SAFETY DATA SHEET FOR ZEOLITE

(VARIETY CLINOPTILOLITE)

SECTION 1- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT MANUFACTURER: AMERICAN ABSORBENT NATURAL PRODUCTS INC. 3800 HUDSON BEND ROAD, AUSTIN, TEXAS 78734 TELEPHONE: (512) 266-2481

EFFECTIVE DATE: 06/01/99

PRODUCT NAME: AMERICAN ABSORBENT NATURAL ZEOLITE (VARIETY CLINOPTILOLITE)

CAS#: 12173-10-3

DERIVATION: NATURALLY OCCURRING MINERAL AGGREGATE

GENERAL USE: ABSORBENT, MECHANICAL AND CHEMICAL FILTRATION

SECTION 2- COMPOSITION / INFORMATION ON INGREDIENTS

CONSTITUENTS: SILICATE MINERAL SPECIES PRIMARILY CLINOPTILOLITE (CLINO), CLAY, FELSPAR AND MORDENITE (TOTAL >99.9%) CLINO = $(Na_4K_4)Al_8Si_{40}O_{96}) \times 24H_2O$

SECTION 3: HAZARDS IDENTIFICATION

EXPOSURE POTENTIAL: CAN BECOME POWDERY AND EASILY AIRBORNE IF CRUSHED. LIMITED DUST EXPOSURE POTENTIAL TO UNCRUSHED OR COARSE CRUSHED MATERIAL (>120 STANDARD MESH, .125 MILLIMETERS)

PRIMARY ENTRY ROUTE (DUST ONLY): RESPIRATORY SYSTEM, EYES

TARGET ORGANS: LUNGS, EYES

ACUTE EFFECTS:

INHALATION	EXPOSURE TO HEAVY CONCENTRATIONS OF AIRBORNE POWDER CAN CAUSE RESPIRATORY CONGESTION
EYES	CAN CAUSE REDDENEDING AND BLURRED VISION WITH EXPOSURE TO EYES
DERMAL EXPOSURE	EXPOSED SKIN CAN BECOME IRRITATED

CHRONIC EFFECTS:

INHALATION	PROLONGED BREATHING OF AIRBORNE PARTICLES MAY CAUSE SILICOSIS OR DIMINISHED RESPIRATORY CAPACITY

SECTION 4: FIRST AID MEASURES

INHALATION	REMOVE FROM EXPOSURE, PLACE ON RESPIRATOR IF NECESSARY
EYES	IRRIGATE EYES WITH WATER OR EYE WASH
DERMAL EXPOSURE	FLUSH EXPOSED SKIN AREA WITH WATER TO REMOVE RESIDUE

SECTION 5: FIREFIGHTING MEASURES

NON-COMBUSTIBLE

SECTION 6: ACCIDENTAL RELEASE MEASURES

SCOOP OR SWEEP UP SPILL AND PLACE IN CONTAINER FOR NON HAZARDOUS MATERIALS. MINIMIZE DUST GENERATION

SECTION 7: HANDLING AND STORAGE

HANDLING: HANDLE THE PRODUCT AS NONHAZARDOUS MATERIAL AND MINIMIZE CRUSHING AND DUST GENERATION.

STORAGE: STORE IN NON-HAZARDOUS MATERIALS CONTAINERS.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

WHEN WORKING WITH OR AROUND FINELY GROUND OR CRUSHED MATERIAL LESS THAN 120 MESH, (125mm), WEAR RESPIRATORY PROTECTION. WEAR RESPIRATORY PROTECTION WHEN AIRBORNE DUST IS VISIBLE OR EXCEEDS .05mg/m^3. SEEK PROFESSIONAL ADVICE PRIOR TO RESPIRATOR SELECTION. WEAR GLOVES AND PROTECTIVE CLOTHING TO PREVENT IRRITATION TO EXPOSED SKIN WHEN HANDLING LOOSE MATERIAL. WETTING FINE MATERIAL SUBSTANTIALLY REDUCES DUST GENERATION.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: SOLID GRANULES

APPEARANCE AND ODOR: WHITE TO CREAM COLORED ODORLESS GRANULES

VAPOR PRESSURE: NOT APPLICABLE

SPECIFIC GRAVITY: 1.5 - 1.7

BULK DENSITY: 1.57 - 1.87

WATER SOLUBILITY: INSOLUBLE

DESICCANT AND ABSORBENT: ACTIVE

NON COMBUSTIBLE

MELTING POINT: +/- 2520°F

BOILING POINT: NOT APPLICABLE

OSHA PEL's: NONE ESTABLISHED

ACGHI TLV: NONE ESTABLISHED

NIOSH REL (TWA): NONE ESTABLISHED (use .05mg/m^3 for chrystaline silica)

IDLH LEVEL: NONE ESTABLISHED

SECTION 10: STABILITY AND REACTIVITY

STABILITY: (pH) 2 -12

HAZARDOUS DECOMPOSITION: NONE

REACTIVITY: PASSIVE ION EXCHANGER, NO VIOLENT REACTIVITY

SECTION 11: TOXICOLOGICAL INFORMATION

NO KNOWN OR DOCUMENTED TOXICOLOGICAL EFFECTS

SECTION 12: ECOLOGICAL INFORMATION

NO ECOLOGICAL CONCERNS KNOWN

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSE OF AS NON-HAZARDOUS MATERIAL OR RECYCLE AS SOIL AMENDMENT

SECTION 14: TRANSPORTATION INFORMATION

TRANSPORT IN ENCLOSED CONTAINERS TO PREVENT DUST AND WIND DISPERSION

DISCLAIMER: Judgements as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, American Absorbents Natural Products Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for the application to the purchaser's intended purpose or for the consequences of its use.

NALCO

MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 7396 WATER STABILIZATION

Emergency Telephone Number
Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

SECTION 01 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: NALCO 7396 WATER STABILIZATION
DESCRIPTION: An aqueous solution of pyrophosphate

NFPA 704M/HMIS RATING: 1/1 HEALTH 0/0 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 02 COMPOSITION AND INFORMATION ON INGREDIENTS

Our hazard evaluation of the ingredient(s) under OSHA's Hazard Communication Rule, 29 CFR 1910.1200 has found none of the ingredient(s) hazardous.

SECTION 03 HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:
CAUTION: May cause irritation to skin and eyes. Avoid contact with skin, eyes and clothing. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

PRIMARY ROUTES OF EXPOSURE: Eye, Skin

EYE CONTACT: Can cause irritation.
SKIN CONTACT: May cause irritation with prolonged contact.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 04 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes. Call a physician.
SKIN: Flush with water for 15 minutes.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 05 FIRE FIGHTING MEASURES

FLASH POINT: None

EXTINGUISHING MEDIA: Not applicable

SECTION 06 ACCIDENTAL RELEASE MEASURES

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (800) I-M-ALERT or (800) 462-5378.

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 15.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 15.

SECTION 07 HANDLING AND STORAGE

Storage : Keep container closed when not in use.

SECTION 08 EXPOSURE CONTROLS AND PERSONAL PROTECTION

RESPIRATORY PROTECTION: Respiratory protection is not normally needed.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a positive pressure, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles when attaching feeding equipment, doing maintenance or handling product. Examples of impermeable gloves available on the market are neoprene, nitrile, PVC, natural rubber, viton and butyl (compatibility studies have not been performed).

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 09 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Light yellow	FORM: Liquid	
SOLUBILITY IN WATER:	Completely	
SPECIFIC GRAVITY:	1.72 @ 70 Degrees F	ASTM D-1298
pH (NEAT) =	11.5	ASTM E-70
FREEZE POINT:	Less than 20 Degrees F	ASTM D-1177
BOILING POINT:	235 Degrees F @ 760 mm Hg	ASTM D-86
FLASH POINT:	None	

NOTE: These physical properties are typical values for this product.

NALCO CHEMICAL COMPANY ONE NALCO CENTER • NAPERVILLE, ILLINOIS 60563-1198

SECTION 10 STABLILITY AND REACTIVITY

INCOMPATIBILITY: None known

SECTION 11 TOXICOLOGICAL INFORMATION

TOXICITY STUDIES: Toxicity studies have been conducted on this product.
The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = 2,908 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS): LD50 = Greater than 7,940 mg/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):
SKIN IRRITATION INDEX DRAIZE RATING: 1.0/8.0

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):
EYE IRRITATION INDEX DRAIZE RATING: 17.3/110.0

HUMAN HAZARD CHARACTERIZATION: Based on our hazard characterization, the potential human hazard is: LOW

SECTION 12 ECOLOGICAL INFORMATION

BIOCHEMICAL OXYGEN DEMAND (5-day BOD): 0

CHEMICAL OXYGEN DEMAND (COD): Less than 100 mg/L

AQUATIC DATA:

96-hour static acute LC50 to Bluegill Sunfish = 420 ppm

96-hour static acute LC50 to Rainbow Trout = 450 ppm

If released into the environment, see CERCLA in Section 15.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION: Based on our Hazard Characterization, the potential environmental hazard is: LOW.

SECTION 13 DISPOSAL CONSIDERATIONS

DISPOSAL: If this product becomes a waste, it meets the criteria of a hazardous waste as defined under the Resources Conservation and Recovery Act (RCRA) 40 CFR 261. Hazardous Waste D002.

As a hazardous liquid waste, it must be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to a licensed industrial waste landfill (Hazardous Waste Treatment, Storage and Disposal facility). A hazardous liquid waste can also be deep-well injected in accordance with local, state, and federal regulations.

SECTION 14 TRANSPORTATION INFORMATION

PROPER SHIPPING NAME/HAZARD CLASS MAY VARY BY PACKAGING, PROPERTIES, AND MODE OF TRANSPORTATION. TYPICAL PROPER SHIPPING NAMES FOR THIS PRODUCT ARE:

ALL TRANSPORTATION MODES	:	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
UN/ID NO	:	UN 3266
HAZARD CLASS - PRIMARY	:	8 - CORROSIVE
PACKING GROUP	:	III
IMDG PAGE NO	:	8147-1
IATA PACKING INSTRUCTION	:	CARGO: 820
IATA CARGO AIRCRAFT LIMIT	:	60 L (MAX NET QUANTITY PER PACKAGE)
FLASH POINT	:	NONE
TECHNICAL NAME(S)	:	TETRAPOTASSIUM PYROPHOSPHATE
RQ LBS (PER PACKAGE)	:	NONE
RQ COMPONENT(S)	:	NONE

SECTION 15 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:
Based on our hazard evaluation, this product is not hazardous.

CERCLA/SUPERFUND, 40 CFR 117, 302:
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
This product does not contain ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):
This product does not contain ingredients on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):
The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

FOOD AND DRUG ADMINISTRATION (FDA):
Federal Food, Drug and Cosmetic Act:
When use situations necessitate compliance with FDA regulations, this product is acceptable under 21 CFR 176.170 - components of paper and paperboard in contact with aqueous and fatty foods.

U. S. DEPARTMENT OF AGRICULTURE (USDA):
USDA Inspection and Grading Programs - Food Safety and Inspection Service:
This product is authorized by USDA for use in federally inspected meat and poultry plants. Authorized use is under category G2 and G7. The following limitations apply: phosphate concentration cannot exceed 10 ppm as phosphate ion.

NATIONAL SANITATION FOUNDATION (ANSI/NSF STANDARD 60):
This product has received NSF/International certification under ANSI/NSF Standard 60 in the Corrosion and Scale Control category under the official chemical name of Tetrapotassium Pyrophosphate. Maximum product application dosage is 20 mg/l. Only products manufactured at Plant 1 USA and whose container label bears the ANSI/NSF Mark may be used in potable water treatment applications.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
Consult Section 13 for RCRA classification.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 (formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, Sec. 111 (40 CFR 60), Sec. 112 (40 CFR 61, 1990 Amendments), Sec. 611 (40 CFR 82, CLASS I and II Ozone depleting substances):
This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:
This product does not contain any chemicals which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS:
This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:
The following ingredient(s) are disclosed for compliance with State Right To Know Laws:

Tetra potassium pyrophosphate (phosphate as PO4 348)	7320-34-5
Water	7732-18-5

SECTION 16 OTHER INFORMATION

None

SECTION 17 USER'S RESPONSIBILITY

Our Risk Characterization is being determined.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 18 REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (CD-ROM version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (CD-ROM version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, Ohio (CD-ROM version), Micromedex, Inc., Englewood, CO.

Shepard's Catalog of Teratogenic Agents (CD-ROM version), Micromedex, Inc., Englewood, CO.

Suspect Chemicals Sourcebook (a guide to industrial chemicals covered under major regulatory and advisory programs), Roytech Publications (a Division of Ariel Corporation), Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle,

Washington (CD-ROM version), Micromedex, Inc., Englewood, CO.

PREPARED BY: William S. Utley, PhD., DABT, Manager, Product Safety
DATE CHANGED: 08/11/1998 DATE PRINTED: 03/28/1999