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REPORTS

DATE:

3/4/2004

LinkEnergy

RISK ASSESSMENT

AND

SITE CLOSURE PROPOSAL

MONUMENT 6" GATHERING
LINK REF: #2002-10197 IR-399

UL-A NE¼ OF THE NE¼ OF SECTION 5 T20S R37E

1 MILE SOUTH OF MONUMENT

LEA COUNTY, NEW MEXICO

LATITUDE: N32° 36' 32.381" **LONGITUDE: W103° 15' 55.502"**

MARCH 4, 2004

PREPARED BY: JCG

Environmental Plus, Inc.

2100 Avenue O

P.O. Box 1558

Eunice, NM 88231

Phone: (505)394-3481

FAX: (505)394-2601

NOT APPROVED BY LARRY JOHNSON.

March 4, 2004

Mr. Larry Johnson
New Mexico Oil Conservation Division
1625 North French
Hobbs, New Mexico 88240

Subject: Link Monument 6" Gathering 2002-10197 - Risk Assessment and Site Closure Proposal

Dear Mr. Johnson:

Environmental Plus, Inc. (EPI), on behalf of Mr. Frank Hernandez, Link Energy LLC, submits the attached "**Risk Assessment and Closure Proposal**" for the above referenced crude oil release site located on land owned by Delores and Leroy Davis. The site is located in UL-A of Section 5 T20S R37E. The geographic location is N32° 36' 32.381" and W103° 15' 55.502". The site is located 1 mile south of Monument, Lea County, New Mexico. Ground water level beneath this site has been measured to be 33-ft below ground surface (bgs). The site matrix ranking for this site is 40 based on <50-ft depth to ground water and the presence of three domestic water wells within 250-ft of the release location.

The remedial action proposal for this site is to excavate to a depth of 10-ft and dispose of soil within an area projected (utilizing "Surfer" software) to be impacted by TPH contamination. A 2-ft compacted clay barrier will be installed over the contaminated soil left in-place below the 10-ft bgs excavation depth. A VADSAT Risk Assessment has been performed for this site incorporating conservative data parameters. The results of this VADSAT modeling indicate that the proposed placement of an impermeable layer above the zone of contamination will eliminate the risk of contaminant migration to the water table.

If there are any questions please call Mr. Ben Miller, or myself, at our office or at 505-390-0288 and 505-390-9804, respectively, or Mr. Frank Hernandez at 505-631-3095. All official written communications should be addressed to:

Mr. Frank Hernandez
Link Energy, LLC
5805 E. Highway 80, Midland, Texas 79701
Midland, TX 79702

Sincerely,

John Good
EPI – Environmental Consultant

cc: Ed Martin, NMOCD-Environmental Bureau
Jeff Dan, Link Energy, LLC
Frank Hernandez, Link Energy, LLC
Ben Miller, EPI Vice President and General Manager
Sherry Miller, EPI President
Pat McCasland, EPI Technical Manager
file

ENVIRONMENTAL PLUS, INC.

Table of Contents

1.0 Introduction and Background

Environmental Plus, Inc., Eunice, NM (EPI) was notified by EOTT Energy Pipeline, LP, now Link Energy LLC (LINK), on July 22, 2002 regarding a remediation project located at a release site along LINK's "Monument 6-inch" gathering pipeline. The release is historical in nature (prior to 1982) and of unknown origin. LINK became aware of the release at this site when the property owner called and asked for an investigation of the site due to a continued lack of vegetative growth in the suspect area(s). EPI commenced the initial phases of site investigation and characterization on July 23, 2002. The visibly affected surface area(s) were visually delineated utilizing GPS technology. A 14,000-ft^2 area (A) is located north of the horse arena and a 4,000-ft^2 area (B) is located within the horse arena area *(Plate 3, Attachments)*. The initial C141 Form was submitted to the New Mexico Oil Conservation Division (NMOCD) – Hobbs District Office on 24-July-02.

This risk assessment and site remediation/closure proposal addresses the site characterization, ground water investigation and results, VADSAT risk assessment model and a proposal to close the site with the installation of an impermeable clay barrier above in-place soil contaminated above NMOCD remedial goals. The site is 1-mile south of Monument, Lea County, NM, and is located on residential property owned and occupied by Leroy and Delores Davis. To date, the following site-specific investigation activities have been conducted by EPI:

- GPS demarcation of the release site and relevant surface features *(Plates 3 and 5, Attachments)*.
- Drilling and sampling of 20 boreholes (BH1 – BH20) down to 20-ft below ground surface (bgs) within and at the extents of the visibly affected surface area *(Plate 4 – Attachments)*. These boreholes were drilled and sampled during the period July 29 – August 5, 2002.
- Extension of BH6 from 20-ft to 33-ft bgs on August 29, 2002. A sample of the 33-ft bgs bore cuttings was collected and submitted for lab analysis. Due to the presence of water and visible indications of hydrocarbon contamination at this level, a ground water monitoring well (MW1) was installed at this location (BH6), developed and sampled on September 3, 2002. Mr. William Olson, NMOCD – Environmental Bureau was notified of possible ground water impact at this site on September 3, 2002.
- An approved "Preliminary Ground Water Investigation Plan" was submitted to NMOCD – Environmental Bureau on September 9, 2002. Under this plan, four additional ground water monitoring wells (MW2 – MW5) were installed and developed *(Plate 7, Attachments)*.
- The ground water investigation of the site was conducted by EPI during the period September 3, 2002 through December 16, 2003. The investigation consisted of quarterly ground water sampling of Monitor Wells 1-5 for six consecutive calendar quarters. Quarterly ground water samples were analyzed for TPH and BTEX. The initial quarterly sampling analysis (November 11, 2002) for MW1 also included a complete hazardous constituent screening analysis, i.e. Volatiles, Heavy Metals, Cations, Anions, PCB's and TDS.
- Submittal to the NMOCD-Environmental Bureau of a report entitled "Preliminary Ground Water Contamination Investigation Results" on January 26, 2004. This report provided the analytical results of EPI's six consecutive quarterly sampling events of the five ground water monitoring wells installed at the site for the ground water investigation, in addition to the analytical results of NMOCD's split-sampling of the Dec-03 sampling event. EPI requested and received approval (February 3, 2004) to cease the ground water investigation/monitoring phase of this project. Results of the investigation indicate that no ground water impact has resulted from the crude petroleum release at this site. NMOCD granted permission to remove the

monitor wells from the site and to commence with the soil remediation phase of the project *(Page 22, Attachments).*

2.0 Site Description

2.1 Site Location

The "Monument 6-inch 72202" site is located in UL-A (NE¼ of NE¼); Section 5; T20S; R37E. The Latitude and Longitude coordinates are: 32°36'33"N; 103°15'56"W. Specifically, the site is located along the eastern extents of the front yard of the residential property owned by Delores and Leroy Davis. This property is located on the southwest corner of the intersection of SR8 and CR45, 1-mile south of Monument, NM. *(see attachments, Plates 1 and 2)*

2.2 Geohydrology

The United States Geological Survey (USGS) Ground-Water Report 6, "Geology and Ground-Water Conditions in Southern Lea County, New Mexico," A. Nicholson and A. Clebsch, 1961, describes the near surface geology of southern Lea County as an intergrade of the Quaternary Alluvium (QA) sediments, i.e., fine to medium sand, with the mostly eroded Cenozoic Ogallala (CO) formation. Typically, the QA and CO formations in the area are capped by a thick interbed of caliche and generally overlain by sandy soil. The release site is located in the eastern extent of the Laguna Valley physiographic subdivision, described by Nicholson & Clebsch as an area "covered almost entirely by dune sand which is stable or semi-stable over most of the area." The thickness of the sand cover ranges from a few inches to as much as 20-feet in drift areas.

The subsurface at the site is composed of sandy clay material down to the 20-ft bgs interval. This material is dark brown towards the surface and becomes a lighter brown as the depth increases. Based on the extended boring of BH6, there appears to be a fairly hard rock layer overlying the aquifer at the 20-ft to 30-ft interval. Ground water occurs at 30-ft bgs and extends to 43-ft bgs where the "Red Bed" formation is encountered. The "Red Bed" formation consists of dark red clay that corresponds to the Triassic Dockum Formation that serves as the lower confining strata for the Ogallala Aquifer north of the site and for the "Quaternary Fill" alluvial deposits that serve as an aquifer in this area.

2.3 Ecology

The area is typical of the Upper Chihuahuan Desert Biome consisting primarily of hummocky sand hills covered with Harvard Shin Oak (Querqus harvardi) interspersed with Honey Mesquite (Prosopis glandulosa) along with typical desert grasses, flowering annuals and flowering perennials. Mammals represented, include Orrd's and Merriam's Kangaroo Rat, Deer Mouse, White Throated Wood Rat, Cottontail Rabbit, Black Tailed Jackrabbit, Mule Deer, Bobcat, Red Fox and Coyote. Reptiles, Amphibians, and Birds are numerous and typical of area. A survey of Listed, Threatened, or Endangered species was not conducted.

2.4 Area Water Wells and/or Surface Water Features

There are three water wells on the Davis property. Water Well #1 serves as a domestic supply well for the Davis residence and is 200-ft (bearing 228°) from MW1. Water well #2 is utilized for stock watering and landscape irrigation. Water well #2 is located 261-ft (bearing 237°) from MW1. Water well #3 is utilized for stock watering and landscape irrigation. Water well #3 is

located 271-ft (bearing 253°) from MW1. A water well (windmill) is located 492-ft (bearing 114°) from MW1 on property owned by Jimmy Cooper. This windmill driven water well is utilized to provide water for a stock watering tank. *(Plate 5, Attachments).*

The NM State Engineers' Office water well database records contain a record for one of the Davis' water wells (L9779) and the Cooper windmill (L10069). The Davis well is shown to have a depth to water of 40-ft bgs and the windmill is shown to a have a depth to water of 22-ft bgs. The actual measured depth to water at the five installed monitor wells (MW1-MW5) is ~33-ft bgs. The actual depth to water at the windmill was not measured but is presumed to be <30-ft bgs.

There are no surface water bodies within 1000-ft of the site.

3.0 NMOCD Site Ranking

Contaminant delineation and site characterization done at this site indicate that the chemical parameters of the soil and ground water were characterized consistent with the characterization and remediation/abatement goals and objectives set forth in the New Mexico Oil Conservation Division (NMOCD) approved "***General Work Plan for Remediation of E.O.T.T. Pipeline Spills, Leaks and Releases in New Mexico, July 2000***" and the NMOCD guidelines published in the following documents:

- ***Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993)***
- ***Unlined Surface Impoundment Closure Guidelines (February 1993)***

1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water
Depth to GW <50 feet: *20 points*	**If <1000' from water source, or; <200' from private domestic water source: *20 points***	**<200 horizontal feet: *20 points***
Depth to GW 50 to 99 feet: *10 points*		**200-1000 horizontal feet: *10 points***
Depth to GW >100 feet: 0 points	**If >1000' from water source, or; >200' from private domestic water source: *0 points***	**>1000 horizontal feet: *0 points***
Ground Water Score = 20	**Wellhead Protection Score = 20**	**Surface Water Score= 0**
Site Rank (1+2+3) = 20 + 20 + 0 = 40 points (for soil 0-30'bgs)		

Total Site Ranking Score and Acceptable Remedial Goal Concentrations			
Parameter	**20+ (soil 0 – 30' bgs)**	10	0
Benzene[1]	**10 ppm**	10 ppm	10 ppm
BTEX[1]	**50 ppm**	50 ppm	50 ppm
TPH	**100 ppm**	1000 ppm	5000 ppm
[1]100 ppm field VOC headspace measurement may be substituted for lab analysis			

Acceptable thresholds for **contaminants/constituents of concern** (CoCs), i.e., TPH^{8015m}, Benzene, and the mass sum of Benzene, Toluene, Ethyl Benzene, and total Xylene (BTEX), was determined based on the NMOCD Ranking Criteria as follows:

- Depth to Ground water, i.e., distance from the lower most acceptable concentration to the ground water.

- Wellhead Protection Area, i.e., distance from fresh water supply wells.
- Distance to Surface Water Body, i.e., horizontal distance to all down gradient surface water bodies.

Based on the proximity of the site to protectable area water wells, surface water bodies, and depth to ground water from the lower most contamination, the NMOCD ranking score for the site is 40 points with the soil remedial goals highlighted in the Site Ranking Matrix presented on the previous page.

4.0 Subsurface Soil Investigation

The initial subsurface soil analyses were accomplished on 29-July-02 with the drilling and sampling of twenty boreholes (BH1 – BH20) within and beyond the extents of the two visibly affected release sites (A and B; *Plates 3-5, Attachments*). Samples from the boreholes were taken at 2-ft, 5-ft, 10-ft, 15-ft and 20-ft intervals. Boring depth was stopped at the 20-ft interval because of low VOC levels (0.4 – 2.3 ppm) determined in the field utilizing Portable Ionization Detection (PID) technology. Upon receipt of the laboratory analytical results (TPH^{8015M} and $BTEX^{8021B}$) for all of the soil samples, it was noted that one area within the site, delineated by boreholes 9, 6 and 2, would need further consideration due to TPH levels above the 100 mg/kg remedial goal at the 20-ft bgs level. The BH6 location was selected because of elevated TPH concentration at the 20-ft interval. Initially, the assumed water level at this site was approximately 40-ft bgs, as per the records obtained from the NM State Engineers Office. A new borehole was drilled adjacent (~3-ft) to BH6. EPI intended to bore down as far as 35-ft bgs to see if non-contaminated soil could be obtained at some level within the 20-ft to 35-ft interval. A hard, rocky layer was encountered just beyond the 20-ft interval extending to nearly 30-ft bgs. Immediately upon penetrating the rock layer, the auger quickly penetrated to 33-ft producing mud with a hydrocarbon odor and visual staining. A sample of the mud tailings was collected and submitted for lab analysis. Analytical results indicated TPH^{8015M} of 134-mg/kg (primarily DRO) and trace $BTEX^{8021B}$ levels above the .025 mg/kg detection limit (ethylbenzene - 0.026- mg/kg; p/m xylene - 0.110- mg/kg). This borehole was extended to 43-ft bgs (top of red bed formation) and converted to a ground water monitor well (MW1).

The NMOCD-Environmental Bureau was immediately notified of possible ground water impact at this site and a "Preliminary Ground Water Contamination Investigation and Delineation Plan" was prepared by EPI, submitted and approved (September 24, 2002). Under this plan, four additional ground water monitor wells were installed (MW2 – MW5) on October 2-3, 2002. Soil samples were collected from each of the monitor well borings at 5-ft intervals down to 30-ft bgs. Analytical results for the monitor well soil samples were non-detectable for TPH and BTEX.

The analytical results of the soil samples for the initial 20 boreholes and the "non-detect" results of the subsequent 5 monitor wells were utilized to create a "Surfer" projection of the horizontal and vertical extents of TPH contamination above 100-mg/kg throughout the site. This "Surfer" projection is presented in three-dimensional and two-dimensional format *(Plates 10 and 11, Attachments).* A summary table of the borehole analytical results *(Plates 6 and 7)* and graphical representations *(Plates 8 and 9)* of the soil analytical data are provided in the attachments.

5.0 Ground Water Investigation

Within the scope of the Preliminary Ground Water Contamination Investigation and Delineation Plan approved by NMOCD-Environmental Bureau on September 24, 2002, five ground water monitor wells (MW1-MW5) were initially installed to quantify the possible hydrocarbon contamination in the ground water beneath the release location. The monitor wells were installed and developed as per NMOCD guidelines. The monitor wells were constructed of 2-inch Schedule 40 PVC, completed to 43-ft bgs

and slotted 10-ft below ground water level and 5-ft above ground water level. The PVC casing of each monitor well was sealed with an expanding casing seal, and each well was vaulted with a locked, steel vault set in concrete 4" below the surface level.

Under this plan, the five ground water monitoring wells were installed within the surface contamination area, as projected utilizing the "Surfer" software, and were sampled on a quarterly basis through the 4th quarter of 2003. Monitor Well #1 was sampled at the time of its installation (9-3-02) and analyzed for TPH and BTEX. the four additional monitor wells (two up-gradient and two down-gradient) were installed and developed at the site subsequent to the initial sampling of MW-1 *(Plate 12, Attachments).* Quarterly sampling of the five monitor wells in the project commenced in November-2002 and continued through December-2003.

Analytical results for the quarterly ground water samples of the monitor wells did not indicate detectable levels of TPH and/or BTEX above the NM Water Quality Control Commission Ground Water Standards. In addition to TPH/BTEX, the November-2002 sample for MW-1 was analyzed for volatile organics, heavy metals and inorganic cations/anions. The only parameter in this analysis that was above Safe Drinking Water Standards was mercury, which displayed a concentration of 0.004 mg/L. MW-1 was subsequently analyzed for mercury during the following quarterly sampling (3-6-03), the result of which indicated an undetectable level (<0.0005 mg/L) for mercury. A summary table of the sampling results for the entire ground water investigation is included as *Plate 13* in the Attachments.

The analytical results of the six consecutive quarterly ground water sampling events for the five monitor wells in the project did not indicate levels of hydrocarbon ground water contamination above the NM Water Quality Control Commission Ground Water Standards. EPI requested, on behalf of LINK Energy LLC, that the ground water investigation phase of this remediation project be deemed "complete", and that no further ground water investigation for this project be required. This request was approved by the NMOCD-Environmental Bureau on February 3, 2004 *(Page 23, Attachments).*

6.0 VADSAT Risk Assessment

A conservative Risk Assessment of vertical hydrocarbon migration for this site was generated utilizing the American Petroleum Institute's VADSAT 3.0 software. Although the soil sampling protocol for this site does not indicate a presence of Benzene above a 0.025 mg/kg detection level, it is the chemical species utilized to run the risk assessment because it is the lightest and fastest migrating of the chemical choices VADSAT offers. VADSAT calculates the Mean Infiltration Rate based on annual precipitation minus a runoff coefficient and the evaporation rate. This number must be positive, so VADSAT does not truly reflect the infiltration rate of arid and semi-arid areas such as southeast NM where the evaporation rate exceeds the precipitation rate. The mean depth to water (30-ft bgs) from the lowest contaminant level was set at 0.4572 m (18-inches). The TPH concentration at the lowest level was set at 134 mg/kg.

Two assessments were run for this site: one with no clay barrier present and one with a clay barrier present. Other than the presence of the clay barrier, the input parameters for each assessment are identical. The downstream receptors were set at 1-meter, 10-meters and 100-meters (X=1 X=10 X=100). The transverse offset (Y value) was set at 0-meters, and the depth into the aquifer (Z value) was set at 0.

The results of the computer risk assessment modeling for the site without a clay barrier in place indicate that benzene, if present, would reach the top of the aquifer directly under the site in approximately 10-years at a peak concentration of 0.958 mg/L. From this peak concentration in the year 2014, the concentration would decline to a level of 2.46×10^{-29} mg/L in the year 3004. The

computer risk assessment modeling of the site with the clay barrier in place shows a flat-line of 0 values for the 1000-year period modeled, thus the contaminant migration would never reach the aquifer.

The input data and the data generated by the VADSAT program are included in the Attachments (pages 25-28). This data includes the input parameters of the two models and the data points generated for a 1000-year span. *Plate 15* is the graphical representation of both assessment models that were generated.

7.0 Soil Remediation and Closure Proposal

Based upon the VADSAT Risk Assessment model for this site which predicts no ground water impact with the placement of an impermeable layer over the contaminated area(s) of the project site, LINK Energy proposes to remediate and close this site with a combination of excavation/disposal of near-surface contaminated soils and immobilization of deeper contaminated soils with a clay barrier installation. LINK Energy proposes to remediate this site through the following steps *(refer to Plate 17, page 28 Attachments)*:

- Excavate approximately 1300-yd^3 of soil from the near-surface (2-ft bgs) within the original visually affected areas A and B *(Plates 3-5, Attachments).* Approximately 400-yd^3 of contaminated soil taken from the 5500-ft^2 area associated with BH6/MW1 will be disposed of at Link's Lea Station land farm. The remaining 900-yd^3 will be low TPH impacted soil and will be stockpiled for use as backfill (described below).
- The 5500-ft^2 deep-contaminated area associated with Boreholes 1, 2, 5, 6 and 9 *(cross-hatch area, Plate 17, Attachments)* will be further excavated from the 2-ft bgs level down to 10-ft bgs. This contaminated soil (~1600-yd^3) will be disposed of at Link's Lea Station land farm. Once this 10-ft bgs excavation is completed, the perimeter of the hole will be evaluated for TPH to determine if adequate overlap for a clay barrier installation has been achieved. If required, the excavation will be expanded laterally to provide adequate overlap.
- Upon confirmation of an adequate overlap area, the 2-ft compacted clay barrier will be installed over the contaminated soil left in-place in the 10-ft to 30-ft bgs interval. The clay barrier will be placed in two stages, 1-ft thickness in each stage. After each 1-ft layer of clay is placed, it will be compacted and tested for compaction percentage by Pettigrew and Associates, Hobbs, NM.
- After the clay barrier is installed (occupying the 8-ft to 10-ft interval) and certified for compaction, the 900-yd^3 of stockpiled soil will be placed on top of the clay barrier. This volume of backfill will fill the excavation up to the 3½-ft level, leaving adequate space on top for placement of clean topsoil. Approximately 1630-yd^3 of clean topsoil and 488-yd^3 of clay will be required for completion of the project.
- As regards the two contaminated areas associated with Boreholes 15 and 16; Link proposes that these two areas be left in place and that no barrier system be installed above them. The BH15 area shows a measurable TPH concentration of 157 mg/kg at the 10-ft bgs interval; and the BH16 area shows a measurable TPH concentration of 132 mg/kg at the 20-ft interval. It is Link's opinion that both of these contaminated areas are marginal in nature and pose no threat to the ground water.
- Once the 2-ft to 3½-ft topsoil layer in "Area A" has been replaced with sandy-loam suitable for growing grass, it will be contoured and smoothed. This area will be seeded with a type of grass agreeable to Mr. and Mrs. Davis. The excavated soil in "Area B", inside the horse arena, will be replaced with a soil material that will be agreeable to Mr. and Mrs. Davis.

Attachments:

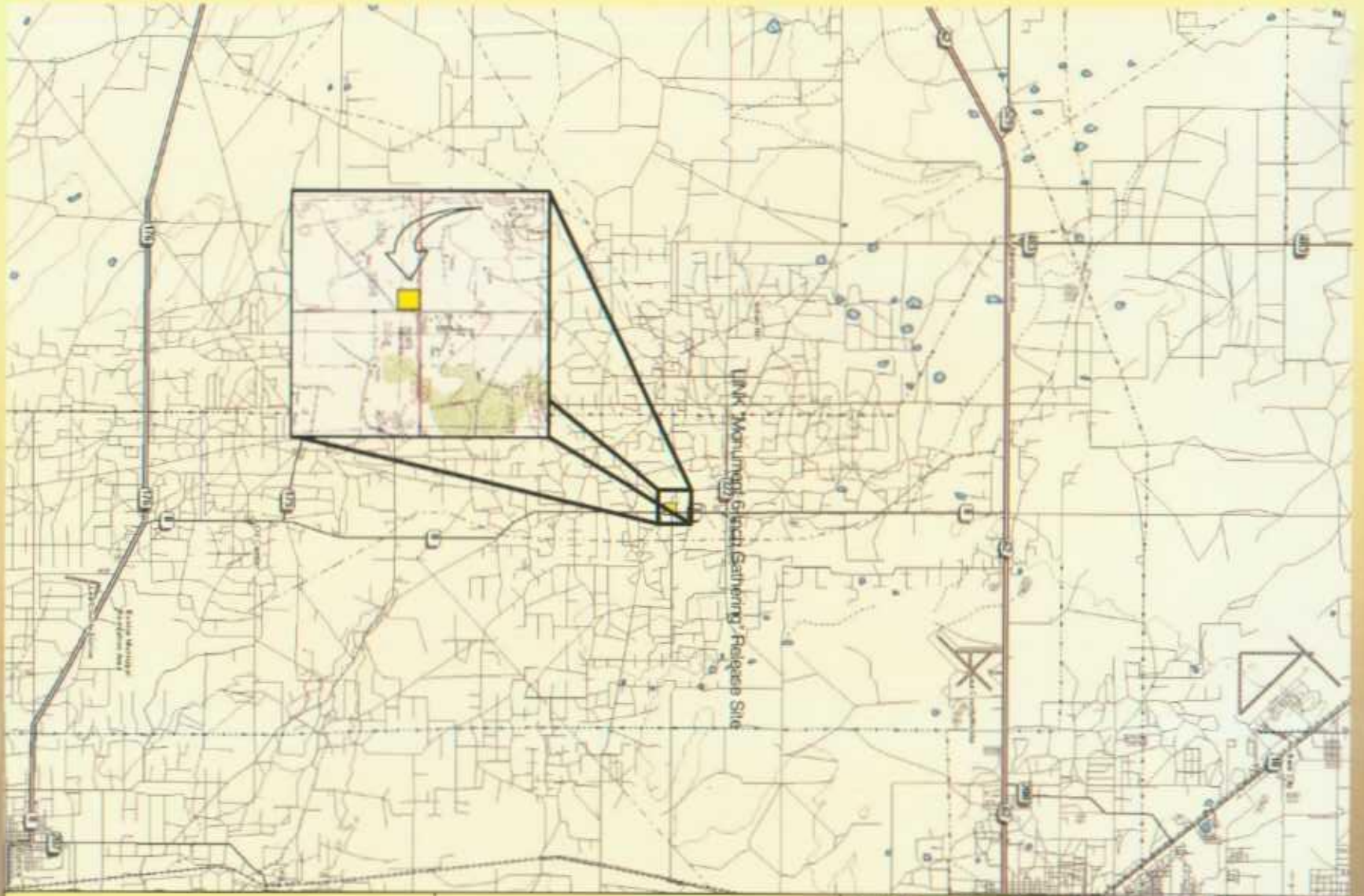


Plate 1 - Release Site Location
LINK Energy LLC - Monument 6-Inch
2002-10197

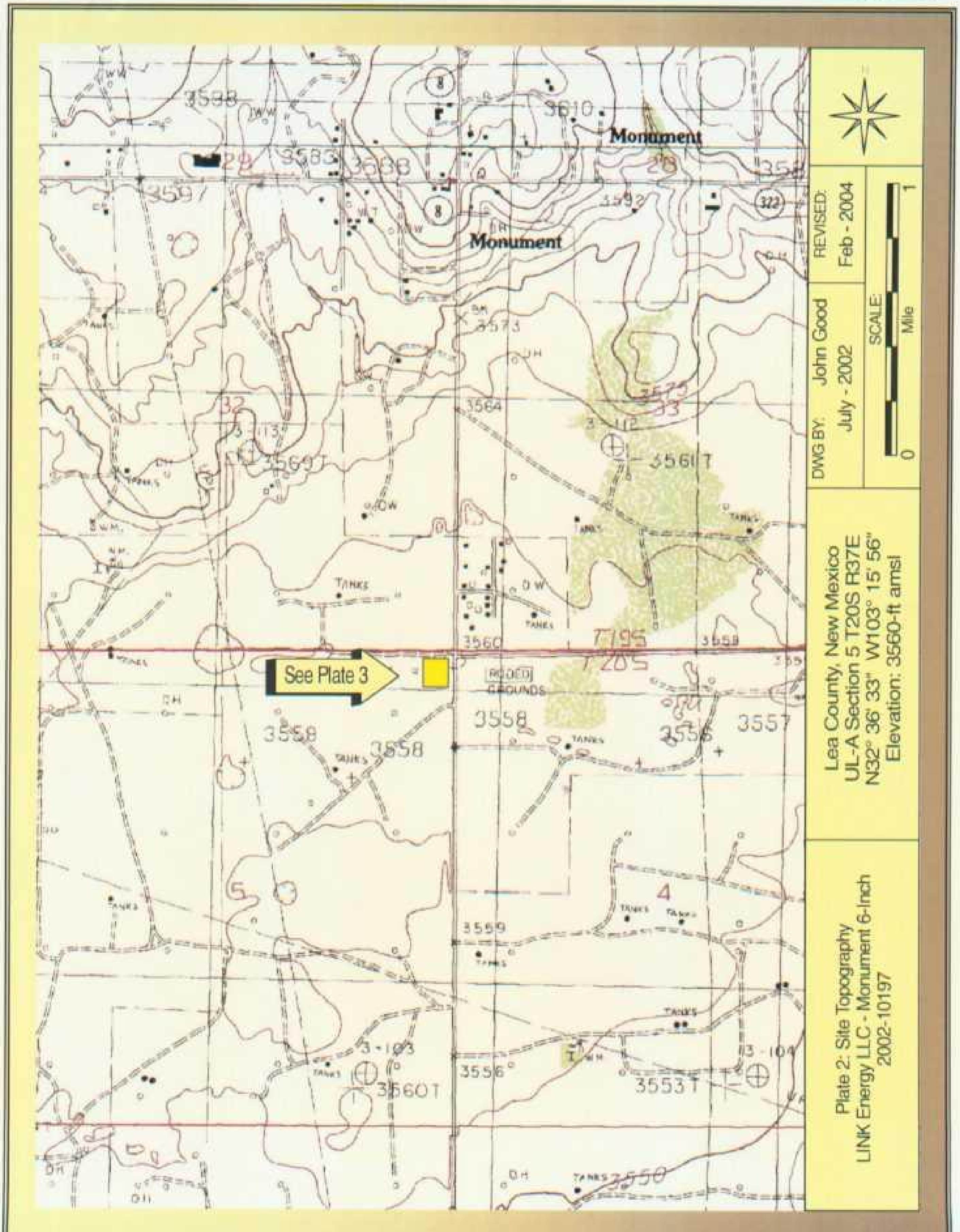
Lea County, New Mexico
UL-A Section 5 T20S R37E
N32° 36' 33" W103° 15' 56"
Elevation: 3560-ft amsl

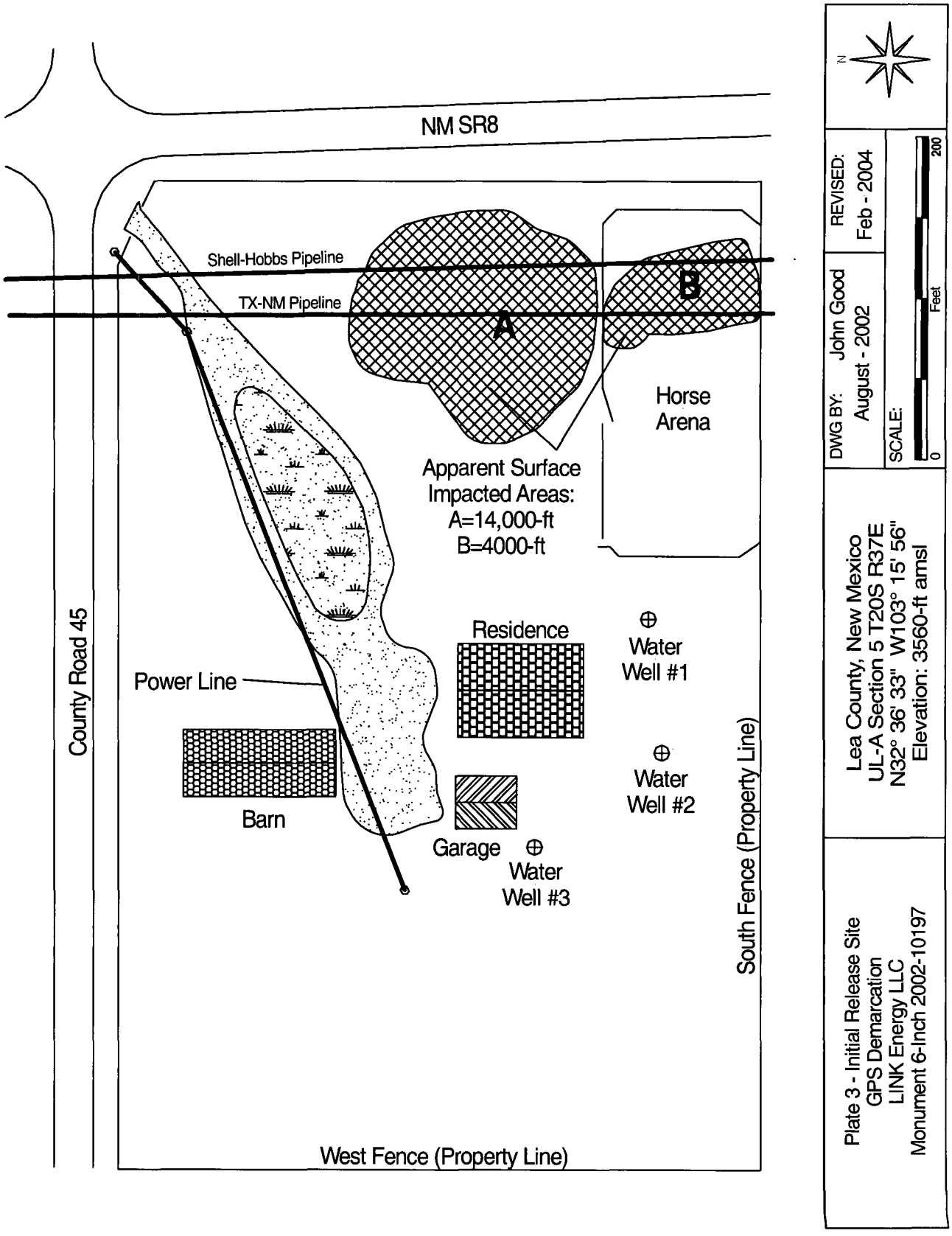
DWG BY: John Good
September - 2002

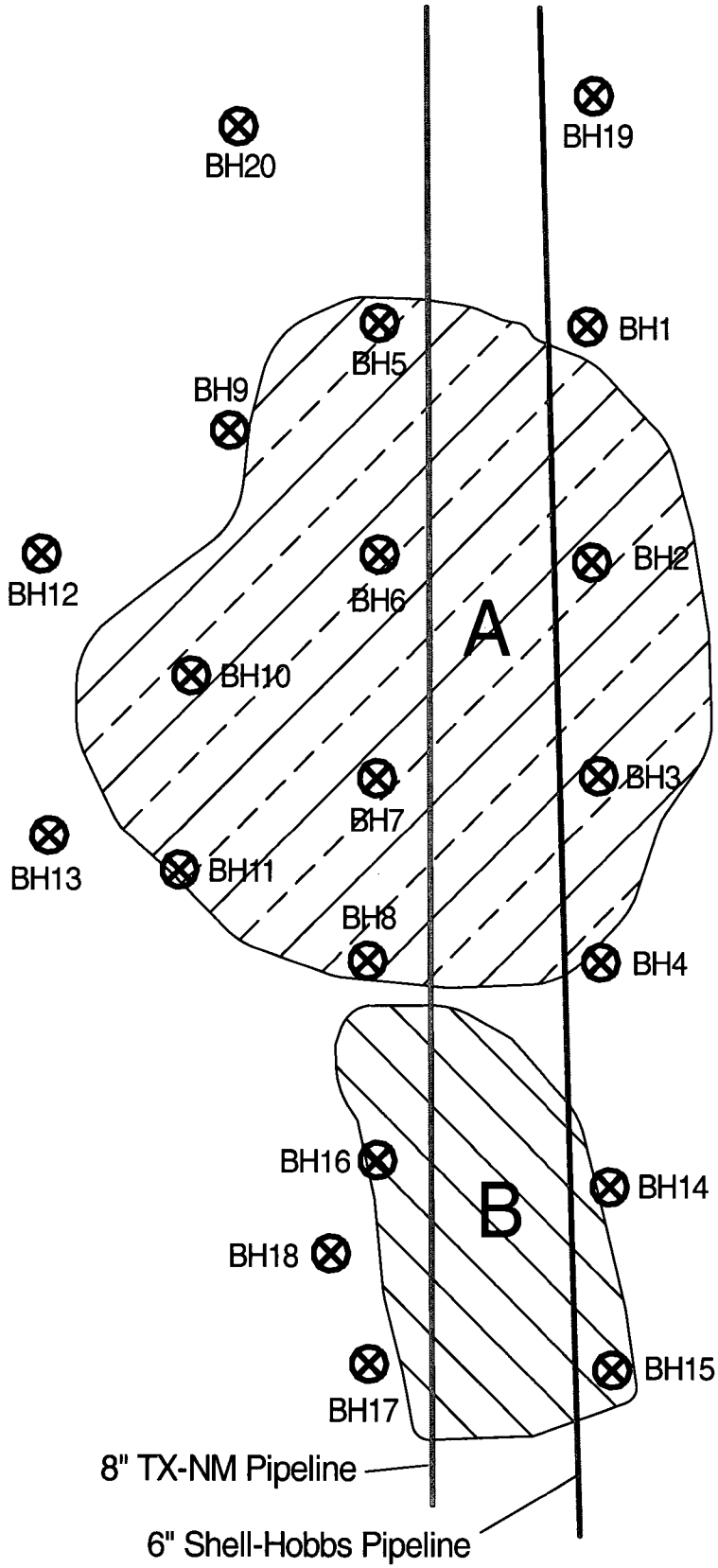
REVISED:
Feb - 2004

SCALE:
0 Miles 5

SHEET
1 of 1


Monument
Monument
See Plate 3
DWG BY: John Good
July - 2002
REVISED: Feb - 2004
SCALE:
0
1
Mile
Lea County, New Mexico
UL-A Section 5 T20S R37E
N32° 36' 33" W103° 15' 56"
Elevation: 3560-ft amsl
Plate 2: Site Topography
LINK Energy LLC - Monument 6-Inch
2002-10197


NM SR8
Shell-Hobbs Pipeline
TX-NM Pipeline
A
B
Horse Arena
Apparent Surface Impacted Areas:
A=14,000-ft
B=4000-ft
Residence
Water Well #1
Power Line
Water Well #2
Barn
Garage
Water Well #3
County Road 45
South Fence (Property Line)
West Fence (Property Line)
N
REVISED: Feb - 2004
DWG BY: John Good August - 2002
SCALE: 0 200 Feet
Lea County, New Mexico
UL-A Section 5 T20S R37E
N32° 36' 33" W103° 15' 56"
Elevation: 3560-ft amsl
Plate 3 - Initial Release Site
GPS Demarcation
LINK Energy LLC
Monument 6-Inch 2002-10197



N

DWG BY: John Good
August - 2002

REVISED:
Feb - 2004

SCALE: 1" = 36.61'

0 20 Feet 80

Lea County, New Mexico
UL-A Section 5 T20S R37E
N32° 36' 33" W103° 15' 56"
Elevation: 3560-ft amsl

Plate 4 - GPS Locations of
Boreholes 1-20
LINK Energy LLC
Monument 6-Inch 2002-10197

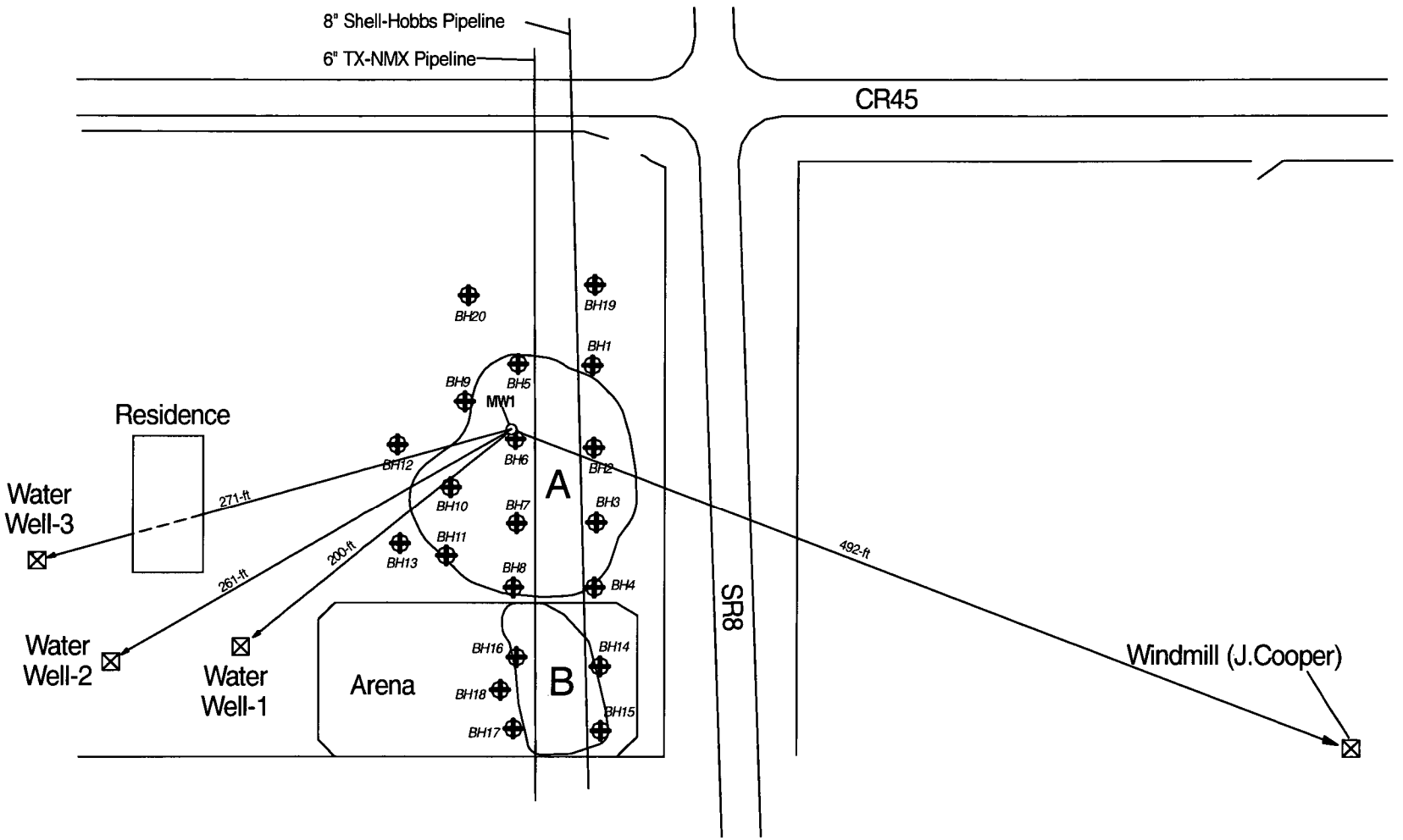


Plate 5 - Ex[amded GPS Map Showing Water Well Locations LINK Energy LLC Monument 6-Inch 2002-10197	Lea County, New Mexico UL-A Section 5 T20S R37E N32° 36' 33" W103° 15' 56" Elevation: 3560-ft amsl	DWG BY: John Good September - 2002 SCALE: 1" = 92.88' 0 Feet 200	REVISED: Feb - 2004 N

Plate 6 – Analytical Results for Boreholes 1-10

LINK Energy LLC Monument 6" - #2002-10197 (Boreholes 1-10)													
	Bold	cells indicate values in excess of the NMOCD remedial action guideline thresholds: TPH = 100 mg/Kg; Benzene = 10 mg/Kg; BTEX = 50 mg/Kg											
Borehole	Interval (ft-bgs[1])	LITHOLOGY	SAMPLE ID#	VOC[2] ppm	GRO[3] mg/Kg	DRO[4] mg/Kg	TPH[5] mg/Kg	BTEX[6] mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl Benzene mg/Kg	m,p-Xylene mg/Kg	o-Xylene mg/Kg
1	2	Dark Brown Sand	SEM672902BH1-2	3.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Light Brown Sand	SEM672902BH1-5	4.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand	SEM672902BH1-10	1.5	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sandy Clay	SEM672902BH1-15	0.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sandy Clay	SEM672902BH1-20	1.2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
2	2	Dark Brown Sand	SEM672902BH2-2	1.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM672902BH2-5	1.2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand	SEM672902BH2-10	1.3	10	552	**562**	0.125	0.025	0.025	0.025	0.025	0.025
	15	Course Brown Sand	SEM672902BH2-15	1.3	10	31	41	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand & Rock	SEM672902BH2-20	0.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
3	2	Dark Brown Sand	SEM672902BH3-2	2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM672902BH3-5	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Light Brown Sand	SEM672902BH3-10	1.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand	SEM672902BH3-15	1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM672902BH3-20	0.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
4	2	Dark Brown Sand	SEM672902BH4-2	1.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand & Rock	SEM672902BH4-5	2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Flint Rock	SEM672902BH4-10	1.6	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand & Rock	SEM672902BH4-15	2	10	17	27	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand & Rock	SEM672902BH4-20	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
5	2	Dark Brown Sand	SEM673002BH5-2	3.4	10	92	**102**	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM673002BH5-5	0.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Flint Rock	SEM673002BH5-10										
	15	Light Brown Sand & Rock	SEM673002BH5-15	1.7	10	94	**104**	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand & Rock	SEM673002BH5-20	1.5	10	30	40	0.125	0.025	0.025	0.025	0.025	0.025
6	2	Dark Brown Sand	SEM673002BH6-2	0.9	10	606	**616**	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM673002BH6-5	0.4	10	94	**104**	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand & Rock	SEM673002BH6-10	0.7	10	78	88	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand & Rock	SEM673002BH6-15	34.8	671	1380	**2051**	0.178	0.025	0.025	0.025	0.071	0.032
	20	Light Brown Sand & Rock	SEM673002BH6-20	4.1	318	1120	**1438**	0.125	0.025	0.025	0.025	0.025	0.025
	33	Light Brown Mud	SEM682902BH6-33		31	103	**134**	0.211	0.025	0.025	0.026	0.110	0.025
7	2	Dark Brown Sand	SEM673002BH7-2	3.4	14	76	90	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM673002BH7-5	1.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand & Rock	SEM673002BH7-10	1.5	19	69	88	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand & Rock	SEM673002BH7-15	0.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Brown Sand	SEM673002BH7-20	0.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
8	2	Dark Brown Sand	SEM673002BH8-2	0.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Light Brown Sand	SEM673002BH8-5	0.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand & Rock	SEM673002BH8-10	0.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand	SEM673002BH8-15	0.6	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand & Rock	SEM673002BH8-20	0.2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
9	2	Dark Brown Sand	SEM673102BH9-2	0.7	18	568	**586**	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM673102BH9-5	2.8	10	134	**144**	0.125	0.025	0.025	0.025	0.025	0.025
	10	Light Brown Sand & Rock	SEM673102BH9-10	2.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand	SEM673102BH9-15	2.1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand & Rock	SEM673102BH9-20	2.2	10	11	21	0.125	0.025	0.025	0.025	0.025	0.025
10	2	Dark Brown Sand	SEM673102BH10-2	3.1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM673102BH10-5	2.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand & Rock	SEM673102BH10-10	1.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand & Rock	SEM673102BH10-15	2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand & Rock	SEM673102BH10-20	1.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025

[1] bgs = below ground surface [2] VOC = Volatile Organic Constituents; (note: 100 ppm Isobutylene calibration gas = 101 ppm)

[3] GRO - Gasoline Range Organics (Detection Limit = 10 mg/Kg) [4] DRO - Diesel Range Organics (Detection Limit = 10 mg/Kg) [5] TPH - Total Petroleum Hydrocarbon (GRO+DRO)

[6] BTEX = Sum of CoC's (Detection Limit = 0.025 mg/Kg) Note: Reported detection limits are considered "de minimus" values and are not displayed but included in the TPH and BTEX summations.

Plate 7 – Analytical Results for Boreholes 11-20

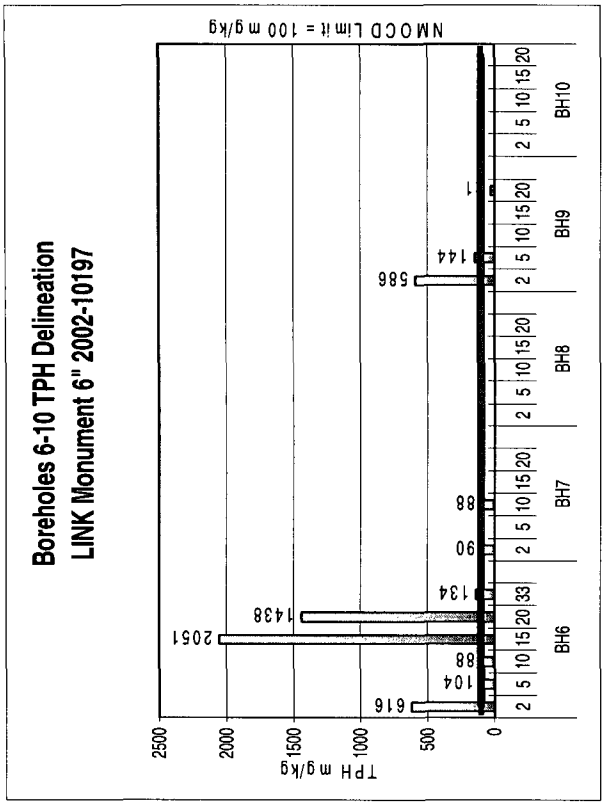
LINK Energy LLC Monument 6" - #2002-10197 (Boreholes 11-20)													
	Bold	cells indicate values in excess of the NMOCD remedial action guideline thresholds: TPH = 100 mg/Kg; Benzene = 10 mg/Kg; BTEX = 50 mg/Kg											
Borehole	Interval (ft-bgs1)	LITHOLOGY	SAMPLE ID#	VOC[2] ppm	GRO[3] mg/Kg	DRO[4] mg/Kg	TPH[5] mg/Kg	BTEX[6] mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl Benzene mg/Kg	m,p-Xylene mg/Kg	o-Xylene mg/Kg
11	2	Dark Brown Sand	SEM673102BH11-2	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Dark Brown Sand	SEM673102BH11-5	2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sandy Clay	SEM673102BH11-10	2.1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand	SEM673102BH11-15	1.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM673102BH11-20	1.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
12	2	Dark Brown Sand	SEM673102BH12-2	1.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Light Brown Sand	SEM673102BH12-5	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand & Rock	SEM673102BH12-10	1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand	SEM673102BH12-15	1.6	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM673102BH12-20	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
13	2	Dark Brown Sand	SEM68102BH13-2	2.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Dark Brown Sand	SEM68102BH13-5	2.1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Dark Brown Sand	SEM68102BH13-10	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand & Rock	SEM68102BH13-15	1.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM68102BH13-20	1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
14	2	Brown Sand	SEM68102BH14-2	1.5	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM68102BH14-5	1.2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand & Rock	SEM68102BH14-10	1.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand	SEM68102BH14-15	0.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM68102BH14-20	0.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
15	2	Dark Brown Sand	SEM68102BH15-2	1.4	10	43	53	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM68102BH15-5	1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand	SEM68102BH15-10	1.1	10	157	**167**	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand & Rock	SEM68102BH15-15	0.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand & Rock	SEM68102BH15-20	0.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
16	2	Brown Sand	SEM68102BH16-2	2.4	10	13	23	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM68102BH16-5	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand	SEM68102BH16-10	1.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Dark Sandy Clay	SEM68102BH16-15	0.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Brown Sand	SEM68102BH16-20	1.1	10	132	**142**	0.125	0.025	0.025	0.025	0.025	0.025
17	2	Dark Brown Sand	SEM68502BH17-2	3.6	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM68502BH17-5	4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand	SEM68502BH17-10	3.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Light Brown Sand & Rock	SEM68502BH17-15	2.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM68502BH17-20	2.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
18	2	Dark Brown Sand	SEM68502BH18-2	1.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM68502BH18-5	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand	SEM68502BH18-10	1.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Brown Sand & Rock	SEM68502BH18-15	1	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM68502BH18-20	0.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
19	2	Dark Sand	SEM68502BH19-2	1.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Brown Sand	SEM68502BH19-5	1.2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand & Rock	SEM68502BH19-10	1.3	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Brown Sand	SEM68502BH19-15	0.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Brown Sand	SEM68502BH19-25	0.4	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
20	2	Dark Sand	SEM68502BH20-2	2	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	5	Light Brown Sand	SEM68502BH20-5	1.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	10	Brown Sand	SEM68502BH20-10	1.8	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	15	Brown Sand & Rock	SEM68502BH20-15	0.9	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025
	20	Light Brown Sand	SEM68502BH20-20	0.7	10	10	20	0.125	0.025	0.025	0.025	0.025	0.025

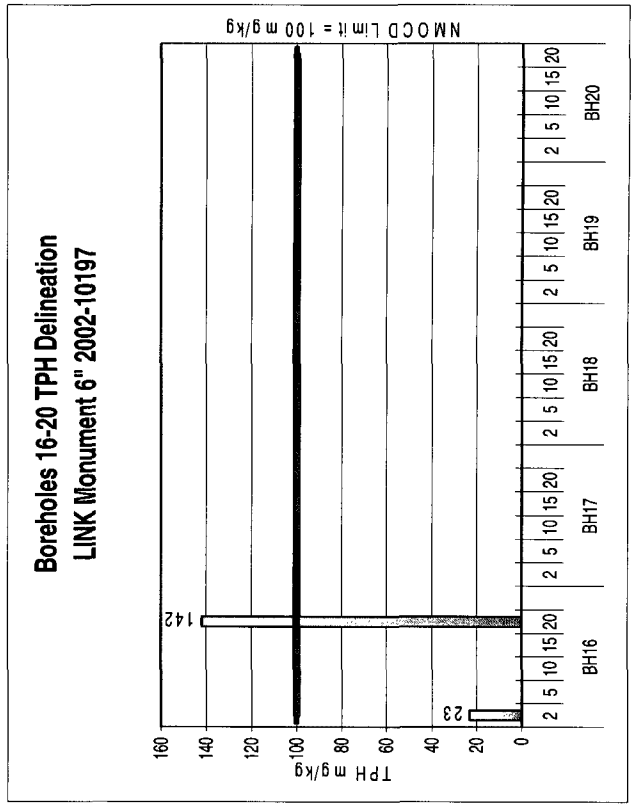
[1] bgs = below ground surface [2] VOC = Volatile Organic Constituents; (note: 100 ppm Isobutylene calibration gas = 101 ppm)

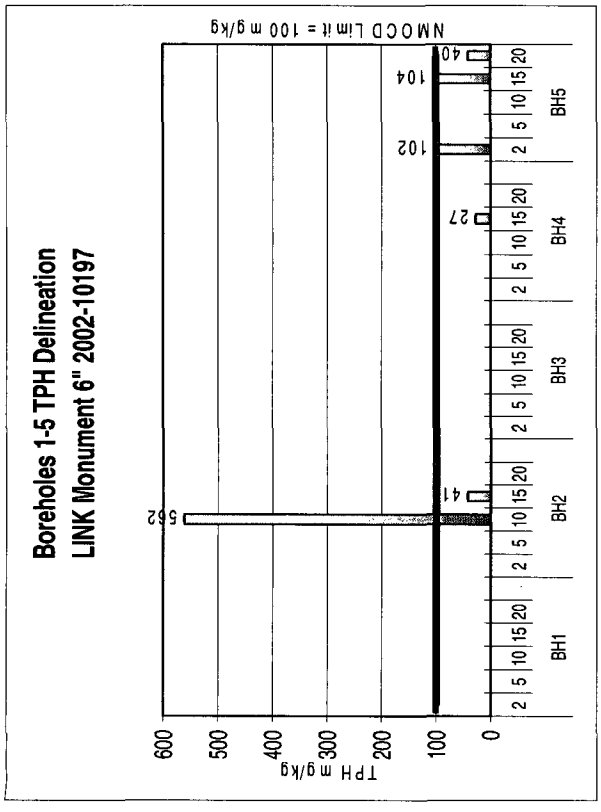
[3] GRO - Gasoline Range Organics (Detection Limit = 10 mg/Kg) [4] DRO - Diesel Range Organics (Detection Limit = 10 mg/Kg) [5] TPH - Total Petroleum Hydrocarbon (GRO+DRO)

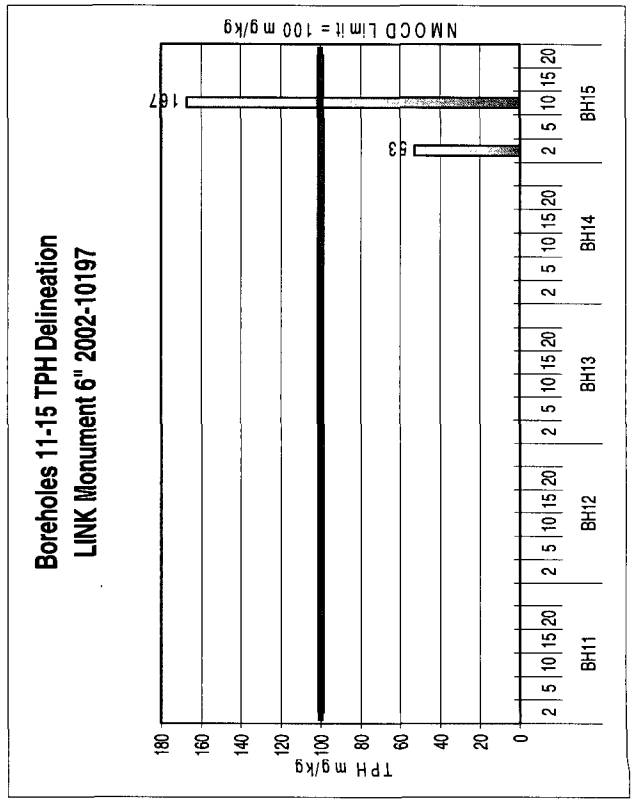
[6] BTEX = Sum of CoC's (Detection Limit = 0.025 mg/Kg) Note: Reported detection limits are considered "de minimus" values and are not displayed but included in the TPH and BTEX summations.

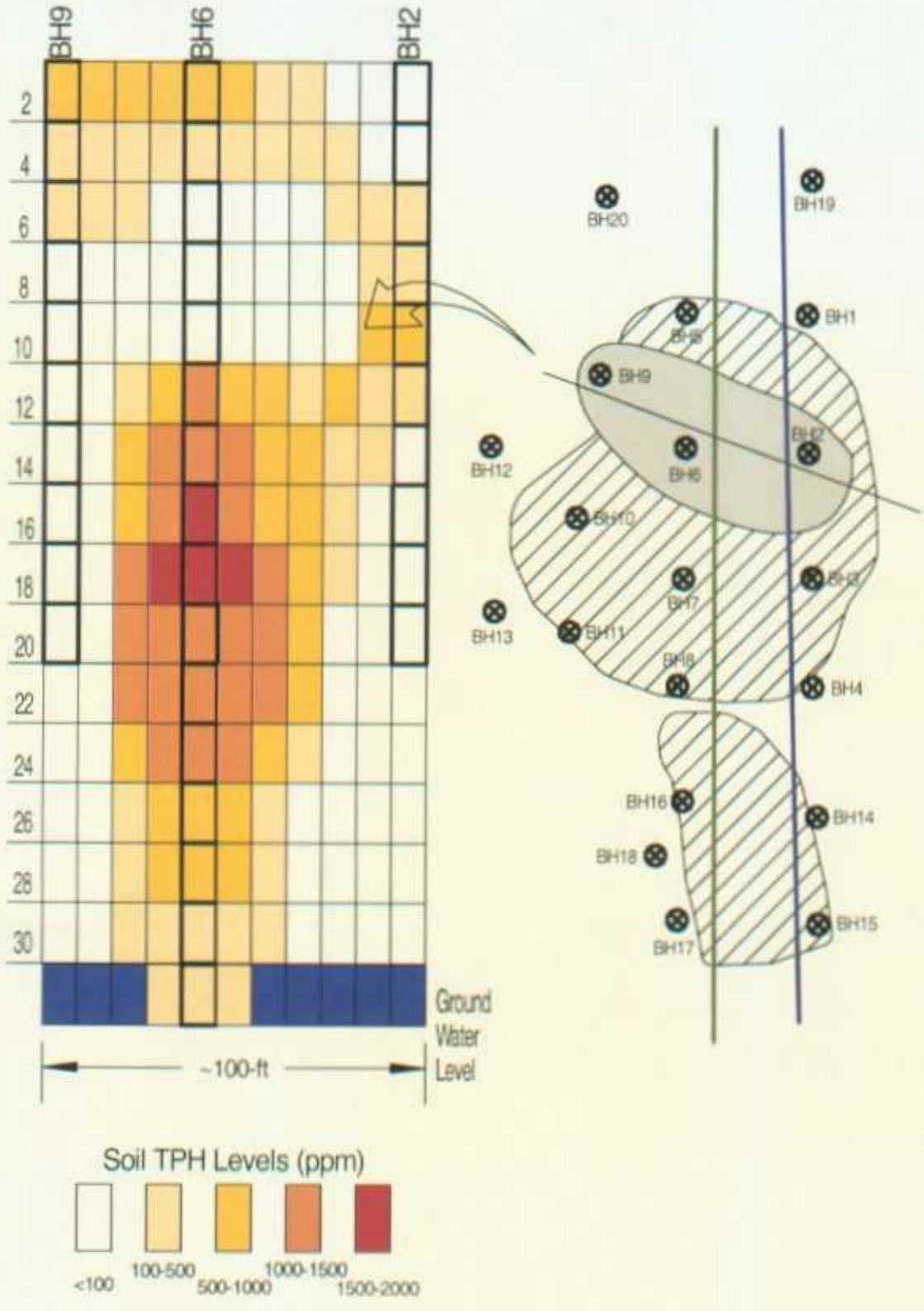
Plate 8 – TPH Analytical Results Charts for Boreholes 1-20











DWG BY: John Good August - 2002		REVISED: Feb - 2004
SCALE:	Lea County, New Mexico UL-A Section 5 T20S R37E N32° 36' 33" W103° 15' 56" Elevation: 3560-ft amsl	
Plate 9 - Vertical Cross-Section BH2 - BH6 - BH9 LINK Energy LLC Monument 6-Inch 2002-10197		

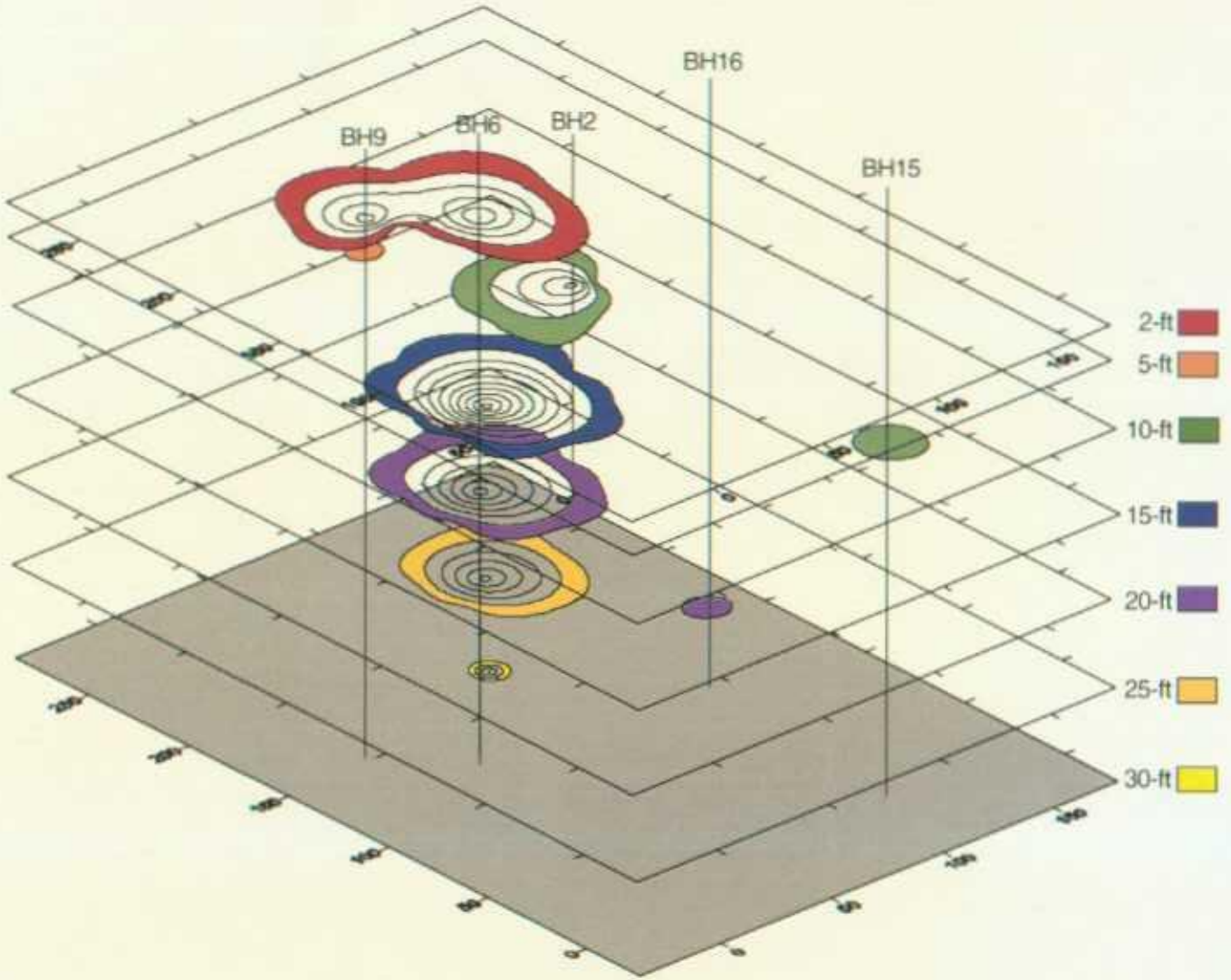
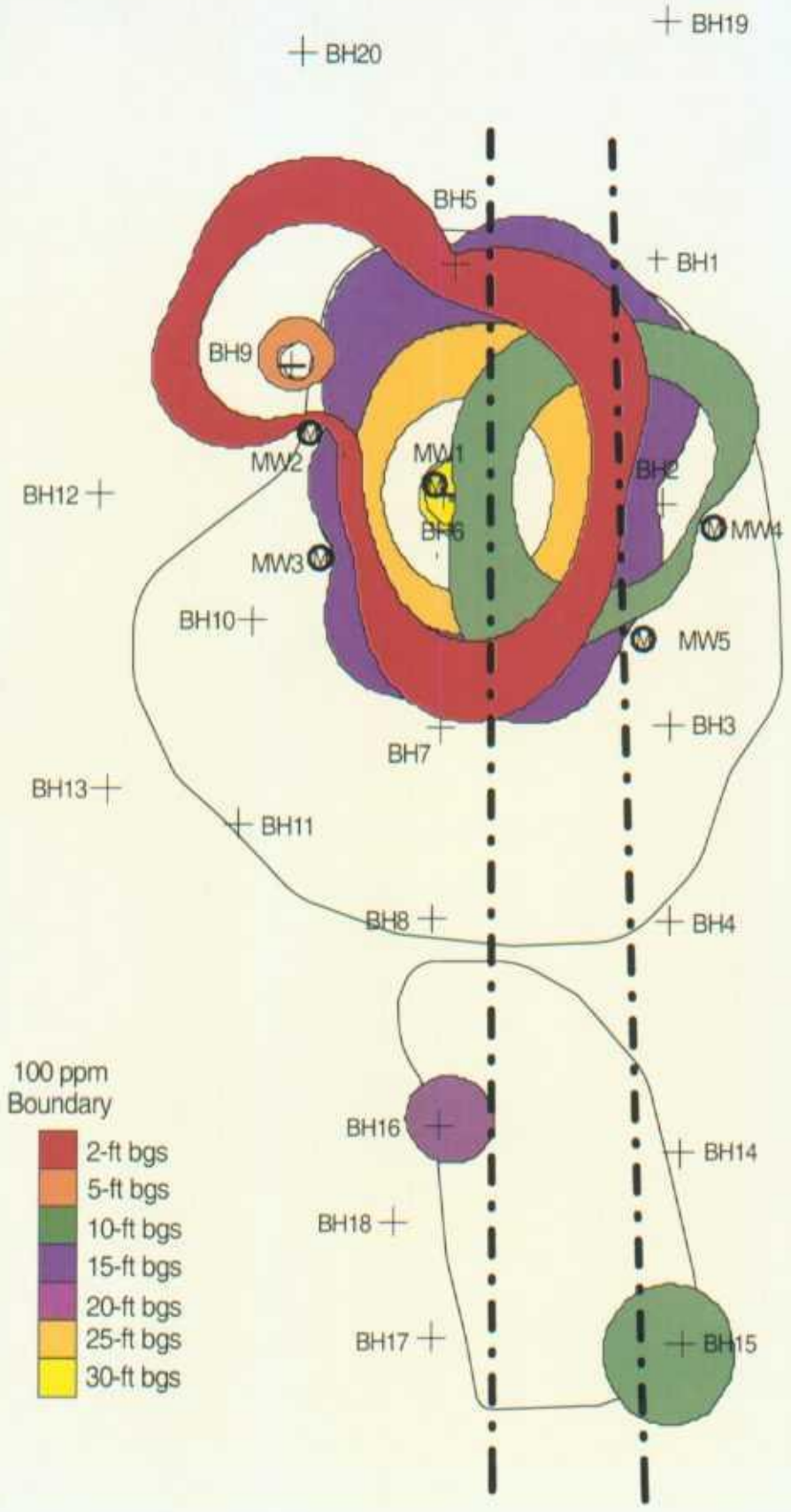


Plate 10 - 3D Surfer Projection 100-ppm TPH Contours LINK Energy LLC Monument 6-Inch 2002-10197	Lea County, New Mexico UL-A Section 5 T20S R37E N32° 36' 33" W103° 15' 56" Elevation: 3560-ft amsl	DWG BY: John Good August - 2002 SCALE:	REVISED: Feb - 2004



REVISED:

DWG BY: JCG
February - 2004

SCALE:
0
50
Feet

Lea County, New Mexico
UL-A Section 5 T20S R37E
N32° 36' 33" W103° 15' 56"
Elevation: 3560-ft amsl

Plate 11 - 2D Surfer Projection
100-ppm TPH Contours
LINK Energy LLC
Monument 6-Inch 2002-10197

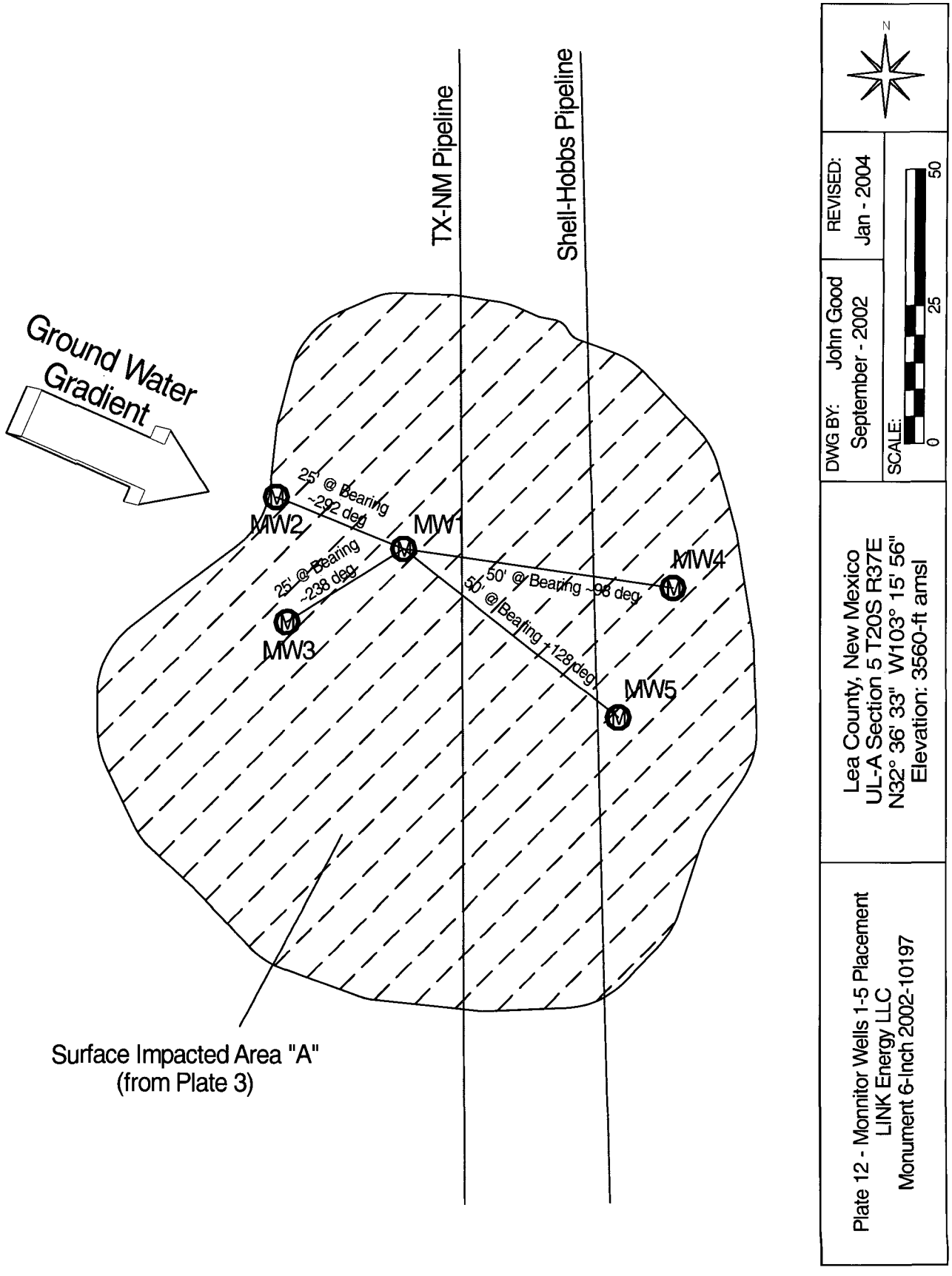

TX-NM Pipeline
Shell-Hobbs Pipeline
Ground Water Gradient
MW1
MW2
MW3
MW4
MW5
25' @ Bearing ~292 deg
25' @ Bearing ~238 deg
50' @ Bearing ~98 deg
50' @ Bearing ~128 deg
Surface Impacted Area "A"
(from Plate 3)
N
DWG BY: John Good
September - 2002
REVISED:
Jan - 2004
SCALE:
0
25
50
Lea County, New Mexico
UL-A Section 5 T20S R37E
N32° 36' 33" W103° 15' 56"
Elevation: 3560-ft amsl
Plate 12 - Monnitor Wells 1-5 Placement
LINK Energy LLC
Monument 6-Inch 2002-10197

Plate 13 – Ground Water Monitoring Results

Link Energy - Monument 6" (2002-10197) - Monitor Well Sampling Results Summary Table							
WELL #	DATE	TPH-DRO mg/L	TPH-GRO mg/L	BENZENE mg/L	TOLUENE mg/L	ETHYLBENZENE mg/L	XYLENES mg/L
MW_1	9/3/2002	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	11/11/2002	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	3/6/2003	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	4/17/2003			<0.001	<0.001	<0.001	<0.001
	8/11/2003	<0.50	<0.50	<0.001	<0.001	<0.001	<0.001
	10/8/2003			<0.001	<0.001	<0.001	<0.001
	12/16/2003			<0.001	<0.001	<0.001	<0.002
	12/16/2003*			<0.001	<0.001	<0.001	<0.001
MW_2	11/11/2002	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	3/6/2003	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	4/17/2003			<0.001	<0.001	<0.001	<0.001
	8/11/2003	<0.50	<0.50	<0.001	<0.001	<0.001	<0.001
	10/8/2003			<0.001	<0.001	<0.001	<0.001
	12/16/2003			<0.001	<0.001	<0.001	<0.002
	12/16/2003*			<0.001	<0.001	<0.001	<0.001
MW_3	11/11/2002	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	3/6/2003	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	4/17/2003			<0.001	<0.001	<0.001	<0.001
	8/11/2003	<0.50	<0.50	<0.001	<0.001	<0.001	<0.001
	10/8/2003			<0.001	<0.001	<0.001	<0.001
	12/16/2003			<0.001	<0.001	<0.001	<0.002
	12/16/2003*			<0.001	<0.001	<0.001	<0.001
MW_4	11/11/2002	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	3/6/2003	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	4/17/2003			<0.001	<0.001	<0.001	<0.001
	8/11/2003	<0.50	<0.50	<0.001	<0.001	<0.001	<0.001
	10/8/2003			<0.001	<0.001	<0.001	<0.001
	12/16/2003			<0.001	<0.001	<0.001	<0.002
	12/16/2003*			<0.001	<0.001	<0.001	<0.001
MW_5	11/11/2002	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	3/6/2003	<3.00	<3.00	<0.001	<0.001	<0.001	<0.001
	4/17/2003			<0.001	<0.001	<0.001	<0.001
	8/11/2003	<0.50	<0.50	<0.001	<0.001	<0.001	<0.001
	10/8/2003			<0.001	<0.001	<0.001	<0.001
	12/16/2003			<0.001	<0.001	<0.001	<0.002
	12/16/2003*			<0.001	<0.001	<0.001	<0.001
* - NMOCD Split samples (Analyzed by TraceAnalysis, Inc., Lubbock, TX							

Plate 14 – Hazardous Constituent Analysis of MW1 (11-11-02)

MW1	11/11/02
	mg/L
Barium	0.197
Cadmium	0.001
Chromium	0.011
Lead	<0.011
Selenium	<0.004
Silver	<0.002
Copper	0.015
Iron	5.97
Manganese	0.921
Mercury	0.004
Zinc	0.021
Cadmium	0.001
Chromium	<0.011
Lead	<0.011
Selenium	<0.004
Silver	<0.002

	3/6/03
	mg/L
	<0.0005

MW1	11/11/02
	mg/L
8082 PCB's	ND
8260B Volatiles	<0.001
8270C - BNA	<0.005
Bicarbonate	348
Carbonate	<0.10
Chloride	319
Hydroxide	<0.10
Sulfate	168
Fluoride	<0.02
Nitrate	<0.10
pH	6.78
TDS	1210
Calcium	171
Magnesium	34.1
Potassium	7.56
Sodium	135
Arsenic	<0.008

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

February 3, 2004

Mr. Jeffrey P. Dann
Link Energy, LLC
P.O. Box 4666
Houston, TX 77210-4666

Dear Mr. Dann:

The New Mexico Oil Conservation Division has received the report entitled "Preliminary Ground Water Contamination Investigation Results" for the Monument 6" 72202 gathering line, Link Energy ref: #2002-10197, dated January 26, 2004. Environmental Plus, Inc. submitted this report on behalf of Link Energy, LLC. In the NMOCD database this project is referenced as 1R-0399.

The above report requests that the groundwater investigation phase of the project be deemed complete so that the monitor wells may be removed. This request is approved with the following conditions:

1. The monitor wells are properly plugged according to NMOCD guidelines.
2. Soil remediation at the site (with landowner approval) commences and is continued until completed.
3. A final closure report for the site is submitted to NMOCD for approval.
4. The surface of the site is restored.

Pursuant to the above conditions, no further groundwater investigation will be required.

Please be advised that NMOCD approval does not relieve link Energy, LLC of responsibility should remaining contaminants pose a future threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve ~~Link Energy,~~ LLC of its responsibility to comply with any other federal, state or local laws and regulations.

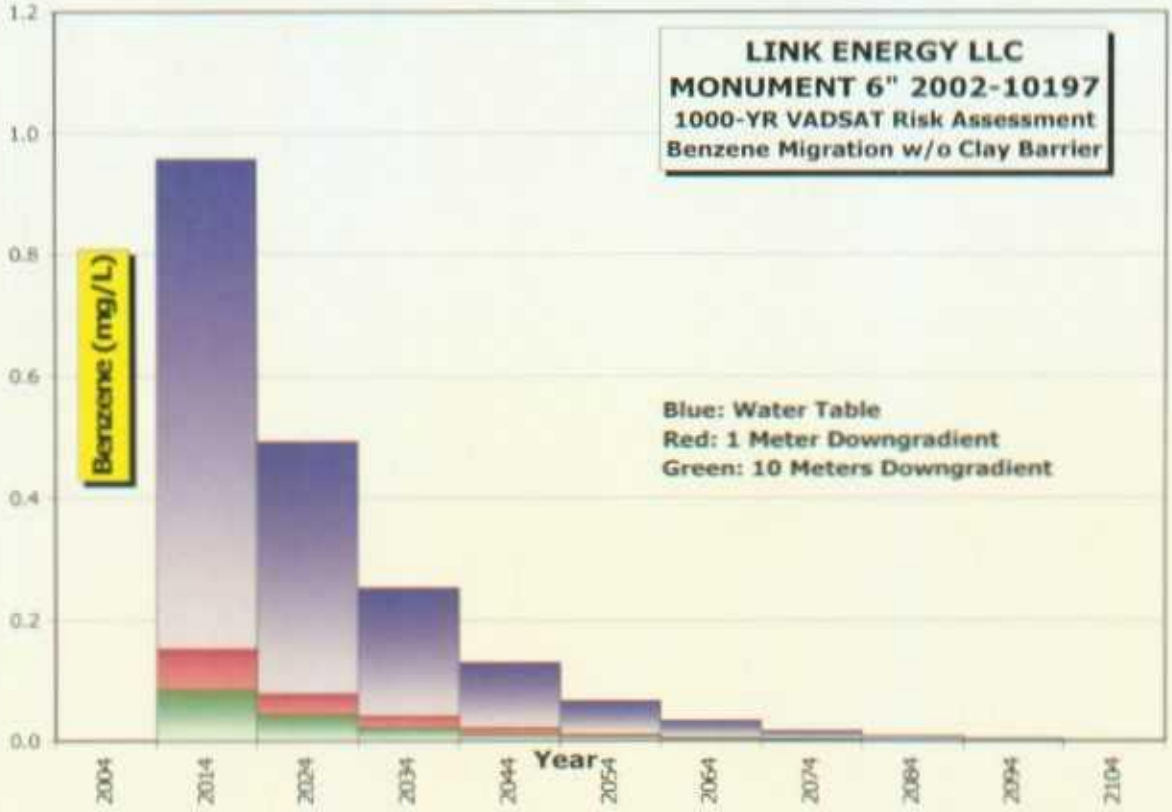
New Mexico Oil Conservation Division

Edwin E. Martin, Environmental Bureau

Cc: Larry Johnson, NMOCD - Hobbs
Pat McCasland, EPI Technical Manager
John Good, EPI Environmental Consultant

Oil Conservation Division * 1220 South St. Francis Drive * Santa Fe, New Mexico 87505
Phone: (505) 476-3440 * Fax (505) 476-3462 * http://www.emnrd.state.nm.us

Plate 15 – VADSAT Risk Assessments



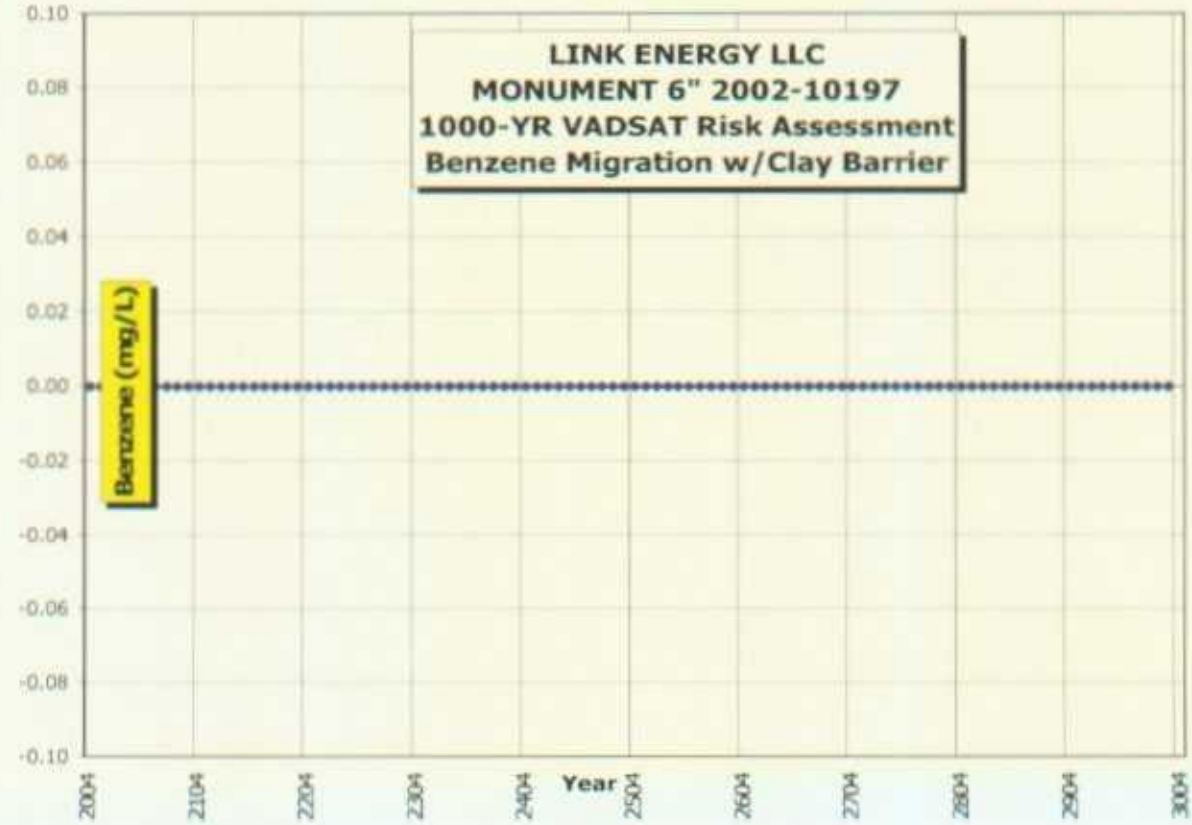


Plate 16 – VADSAT Data Table (no barrier)

Year	Water Table	1 Meter Down Gradient	10 Meter Down Gradient	100 Meter Down Gradient
2004	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2014	9.58E-01	1.52E-01	8.54E-02	3.16E-03
2024	4.93E-01	7.82E-02	4.39E-02	1.63E-03
2034	2.53E-01	4.13E-02	2.26E-02	8.36E-04
2044	1.30E-01	2.12E-02	1.16E-02	4.30E-04
2054	6.70E-02	1.06E-02	5.97E-03	2.21E-04
2064	3.45E-02	5.47E-03	3.07E-03	1.14E-04
2074	1.77E-02	2.81E-03	1.58E-03	5.85E-05
2084	9.12E-03	1.45E-03	8.13E-04	3.01E-05
2094	4.69E-03	7.44E-04	4.18E-04	1.55E-05
2104	2.41E-03	3.93E-04	2.15E-04	7.96E-06
2114	1.24E-03	2.02E-04	1.11E-04	4.09E-06
2124	6.38E-04	1.04E-04	5.69E-05	2.11E-06
2134	3.28E-04	5.35E-05	2.92E-05	1.08E-06
2144	1.69E-04	2.75E-05	1.50E-05	5.57E-07
2154	8.68E-05	1.41E-05	7.74E-06	2.86E-07
2164	4.46E-05	7.27E-06	3.98E-06	1.47E-07
2174	2.30E-05	3.74E-06	2.05E-06	7.58E-08
2184	1.18E-05	1.92E-06	1.05E-06	3.90E-08
2194	6.07E-06	9.63E-07	5.41E-07	2.00E-08
2204	3.12E-06	4.95E-07	2.78E-07	1.03E-08
2214	1.61E-06	2.55E-07	1.43E-07	5.30E-09
2224	8.26E-07	1.31E-07	7.36E-08	2.73E-09
2234	4.25E-07	6.74E-08	3.79E-08	1.40E-09
2244	2.18E-07	3.47E-08	1.95E-08	7.21E-10
2254	1.12E-07	1.78E-08	1.00E-08	3.71E-10
2264	5.78E-08	9.17E-09	5.15E-09	1.91E-10
2274	2.97E-08	4.72E-09	2.65E-09	9.81E-11
2284	1.53E-08	2.43E-09	1.36E-09	5.05E-11
2294	7.86E-09	1.25E-09	7.01E-10	2.59E-11
2304	4.04E-09	6.41E-10	3.60E-10	1.33E-11
2314	2.08E-09	3.30E-10	1.85E-10	6.86E-12
2324	1.07E-09	1.70E-10	9.54E-11	3.53E-12
2334	5.50E-10	8.73E-11	4.90E-11	1.82E-12
2344	2.83E-10	4.49E-11	2.52E-11	9.34E-13
2354	1.45E-10	2.31E-11	1.30E-11	4.80E-13
2364	7.48E-11	1.19E-11	6.67E-12	2.47E-13
2374	3.85E-11	6.11E-12	3.43E-12	1.27E-13
2384	1.98E-11	3.14E-12	1.77E-12	6.53E-14
2394	1.02E-11	1.62E-12	9.08E-13	3.36E-14
2404	5.23E-12	8.31E-13	4.67E-13	1.73E-14
2414	2.69E-12	4.27E-13	2.40E-13	8.89E-15
2424	1.38E-12	2.20E-13	1.24E-13	4.57E-15
2434	7.12E-13	1.13E-13	6.35E-14	2.35E-15
2444	3.66E-13	5.81E-14	3.27E-14	1.21E-15
2454	1.88E-13	2.99E-14	1.68E-14	6.22E-16
2464	9.68E-14	1.54E-14	8.64E-15	3.20E-16
2474	4.98E-14	7.91E-15	4.44E-15	1.65E-16
2484	2.56E-14	4.07E-15	2.29E-15	8.46E-17
2494	1.32E-14	2.09E-15	1.18E-15	4.35E-17

Year	Water Table	1 Meter Down Gradient	10 Meter Down Gradient	100 Meter Down Gradient
2504	6.77E-15	1.08E-15	6.05E-16	2.24E-17
2514	3.48E-15	5.53E-16	3.11E-16	1.15E-17
2524	1.79E-15	2.85E-16	1.6E-16	5.92E-18
2534	9.22E-16	1.46E-16	8.22E-17	3.05E-18
2544	4.74E-16	7.52E-17	4.23E-17	1.57E-18
2554	2.44E-16	3.87E-17	2.18E-17	8.06E-19
2564	1.25E-16	1.99E-17	1.12E-17	4.14E-19
2574	6.45E-17	1.02E-17	5.75E-18	2.13E-19
2584	3.32E-17	5.26E-18	2.96E-18	1.1E-19
2594	1.71E-17	2.71E-18	1.52E-18	5.64E-20
2604	8.77E-18	1.39E-18	7.83E-19	2.9E-20
2614	4.51E-18	7.16E-19	4.03E-19	1.49E-20
2624	2.32E-18	3.68E-19	2.07E-19	7.67E-21
2634	1.19E-18	1.89E-19	1.07E-19	3.94E-21
2644	6.14E-19	9.74E-20	5.48E-20	2.03E-21
2654	3.16E-19	5.01E-20	2.82E-20	1.04E-21
2664	1.62E-19	2.58E-20	1.45E-20	5.37E-22
2674	8.35E-20	1.33E-20	7.45E-21	2.76E-22
2684	4.29E-20	6.82E-21	3.83E-21	1.42E-22
2694	2.21E-20	3.51E-21	1.97E-21	7.3E-23
2704	1.14E-20	1.8E-21	1.01E-21	3.76E-23
2714	5.84E-21	9.27E-22	5.21E-22	1.93E-23
2724	3E-21	4.9E-22	2.68E-22	9.93E-24
2734	1.54E-21	2.52E-22	1.38E-22	5.11E-24
2744	7.94E-22	1.3E-22	7.09E-23	2.63E-24
2754	4.09E-22	6.66E-23	3.65E-23	1.35E-24
2764	2.1E-22	3.43E-23	1.88E-23	6.95E-25
2774	1.08E-22	1.76E-23	9.65E-24	3.58E-25
2784	5.56E-23	9.07E-24	4.96E-24	1.84E-25
2794	2.86E-23	4.66E-24	2.55E-24	9.46E-26
2804	1.47E-23	2.4E-24	1.31E-24	4.87E-26
2814	7.56E-24	1.23E-24	6.75E-25	2.5E-26
2824	3.89E-24	6.34E-25	3.47E-25	1.29E-26
2834	2E-24	3.26E-25	1.79E-25	6.62E-27
2844	1.03E-24	1.68E-25	9.19E-26	3.41E-27
2854	5.29E-25	8.63E-26	4.72E-26	1.75E-27
2864	2.72E-25	4.44E-26	2.43E-26	9.01E-28
2874	1.4E-25	2.28E-26	1.25E-26	4.63E-28
2884	7.19E-26	1.17E-26	6.43E-27	2.38E-28
2894	3.7E-26	6.04E-27	3.31E-27	1.23E-28
2904	1.9E-26	3.1E-27	1.7E-27	6.3E-29
2914	9.79E-27	1.6E-27	8.74E-28	3.24E-29
2924	5.03E-27	8.21E-28	4.5E-28	1.67E-29
2934	2.59E-27	4.22E-28	2.31E-28	8.58E-30
2944	1.33E-27	2.17E-28	1.19E-28	4.41E-30
2954	6.85E-28	1.12E-28	6.12E-29	2.27E-30
2964	3.52E-28	5.75E-29	3.15E-29	1.17E-30
2974	1.81E-28	2.96E-29	1.62E-29	6E-31
2984	9.31E-29	1.52E-29	8.32E-30	3.09E-31
2994	4.79E-29	7.82E-30	4.28E-30	1.59E-31
3004	2.46E-29	4.02E-30	2.2E-30	8.17E-32

VADSAT Version 3.0
A Monte Carlo Model for Assessing the Effects of Soil Contamination on Groundwater Quality

Developed by:
Environmental Systems and Technologies Inc.
Blacksburg, Virginia
Tel: 703-552-0685, Fax: 703-951-5307

For
The American Petroleum Institute
1995

PROJECT TITLE:**LINK MONUMENT 6" 2002-10197**

SOURCE AND CHEMICAL DATA ****

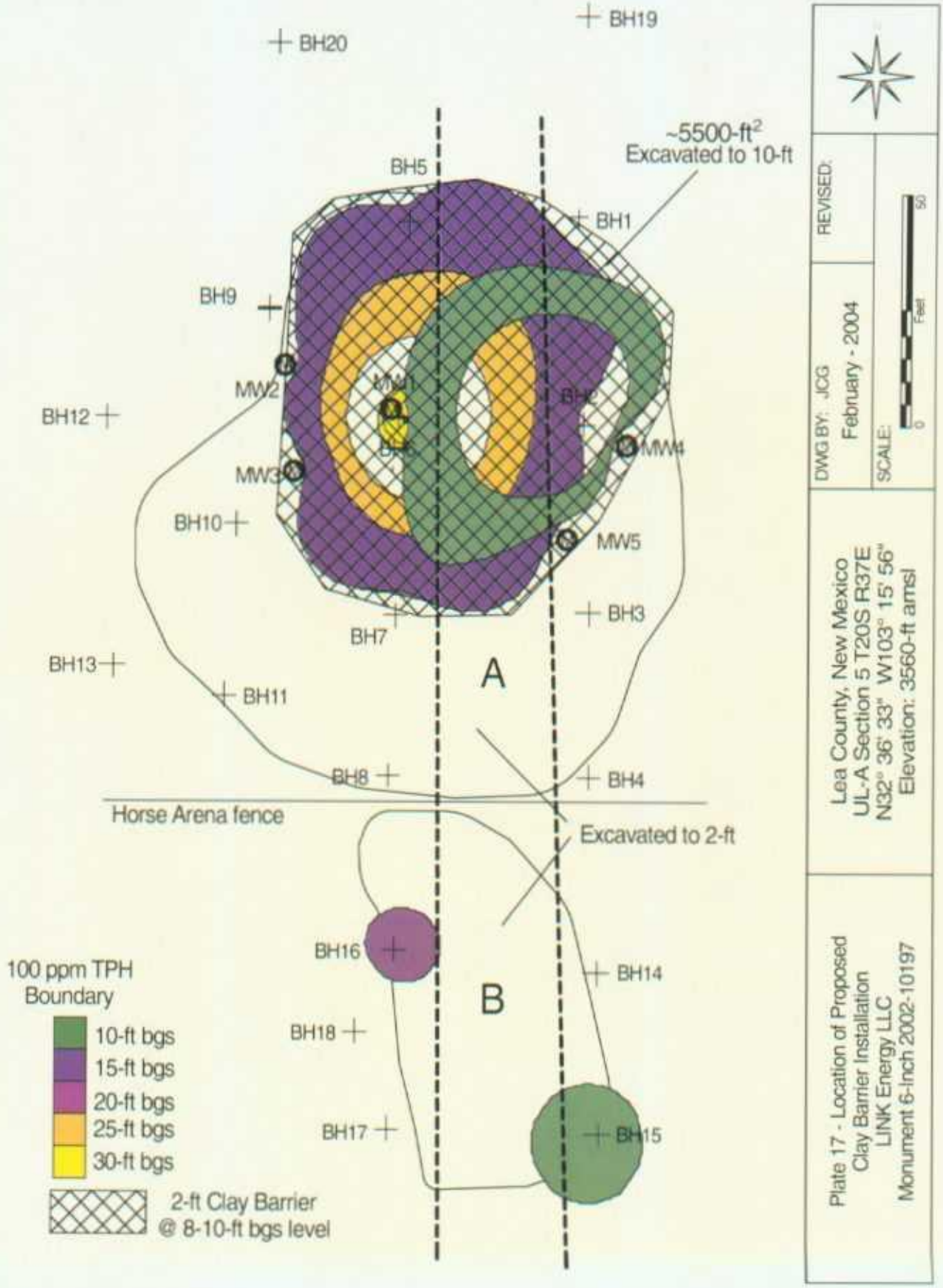
DEPTHM, MEAN THICKNESS OF WASTE ZONE (m)	=	6.09600
DEPSTD, STD.DEV. OF THICKNESS OF WASTE ZONE	=	0.00000
AREAM, MEAN WASTE ZONE AREA (m^2)	=	232.25999
STDA, STD.DEV. OF WASTE ZONE AREA	=	0.00000
RLWM, MEAN L/W RATIO (-)	=	1.00000
STDRLW, STD.DEV. OF L/W RATIO	=	0.00000
CVRTHM, MEAN VALUE OF COVER THICKNESS (m)	=	3.04800
CVRTHS, STD.DEV. OF COVER THICKNESS	=	0.00000
KOCM, MEAN ORG. CARBON PARTITION COEF (cm^3/g)	=	83.20000
STDKOC, STD.DEV. OF ORG.CARBON PARTITION COEF	=	0.00000
FMOLM, MEAN INIT.VOL.FRAC. OF CONTAMINANT(-)	=	0.00075
FMOLSTD, STD.DEV. OF VOL.FRAC. OF CONTAMINANT	=	0.00000
CMFM, MASS OF CONTAMINANT PER MASS OF WASTE(mg/kg)	=	0.10000
CMFSD, STD.DEV. OF MASS CONTAMINANT PER MASS WASTE	=	0.00000
HCCONM, HYDCARBON MASS FRAC. IN WASTE (mg/kg)	=	134.00000
HCCONS, STD OF HYDCARBON MASS FRAC. IN WASTE	=	0.00000
CHEMICAL SPECIES:		benzene
MOLW, MOLECULAR WT. OF CONTAMINANT (g/mole)	=	78.10000
AVERMW, AVG. MOL. WT. OF OILY WASTE (g/mole)	=	100.00000
RHO, DENSITY OF CONTAMINANT (g/cm^3)	=	0.87600

```
RHOG, AVERAGE DENSITY OF HYDROCARBON (g/cm^3)=      0.90000

SOL, AQUEOUS SOLUB. OF CONTAMINANT (g/m^3)    =  1790.00000

HENRYC, HENRY'S CONSTANT (-)                  =      0.23000

DIFFA, DIFFUSION COEF. IN FREE AIR (m^2/day)  =      0.77000

HYDROGEOLOGICAL PROPERTIES
--------------------------

** UNSATURATED ZONE INPUT PARAMETERS **
GAMMAM, MEAN UNSAT ZONE DECAY COEF (1/day)    =      0.00010
STDGAM, STD.DEV. OF UNSAT ZONE DECAY COEF     =      0.00000

UNFOCM, MEAN UNSAT ZONE ORGANIC CARBON FRACTION (-) =  0.00000
UNFOCS, STD.DEV. OF UNSAT ZONE ORGANIC CARBON FRAC. =  0.00000

FKSW, MEAN SAT. CONDUCTIVITY (m/day)          =      0.02900
STDFKS, STD.DEV. OF SAT. CONDUCTIVITY         =        0.000

DISTM, MEAN DEPTH TO GROUNDWATER (m)          =      0.45720
STDDST, STD.DEV. OF DEPTH TO GROUNDWATER      =      0.00000

UNPORM, MEAN VADOSE ZONE POROSITY (-)         =      0.38000
SUNPOR, STD.DEV. OF VADOSE ZONE POROSITY      =      0.00000

PARNM, MEAN VALUE OF VG PARAMETER N (-)       =      1.23000
SDPARN, STD.DEV. OF VG PARAMETER N            =      0.00000

RESWCM, MEAN RESIDUAL WATER CONTENT (-)       =      0.01110
RESWCS, STD.DEV. OF RESIDUAL WATER CONTENT    =      0.00000

ALFINM = 0, UNSAT DISPERSIVITY CALCULATED INTERNALLY
** SATURATED ZONE INPUT PARAMETERS **

LAMBW, MEAN SAT. ZONE DECAY COEFF. (1/day)    =      0.00010
SLAMB, STD.DEV. OF SAT. ZONE DECAY COEFF.     =      0.00000

PORM, MEAN SAT. ZONE POROSITY (-)             =      0.20000
STDPOR, STD.DEV. OF SAT. ZONE POROSITY        =      0.00000

FOCM, MEAN SAT. ZONE ORG. CARBON FRAC. (-)    =      0.00000
STDFOC, STD.DEV. SAT. ZONE ORG. CARBON FRAC.=        0.00000

ALRLTM, MEAN DISPERS, RATIO LONG/TRANSV. (-)  =      3.00000
SALRLT, STD.DEV. OF DISP. RATIO LONG/TRANSV.  =      0.00000

ALRTVM, MEAN DISPERS. RATIO TRANSV/VERT. (-)  =     87.00000
```

```
SALRTV, STD.DEV. OF DISP. RATIO TRANSV/VERT. =    0.00000

CONDS, SAT. HYDRAULIC COND. (m/day)          =    1.03000
SCONDS, STD.DEV. OF SAT HYDRAULIC COND.      =    0.00000

GRADS, HYDRAULIC GRADIENT (m/m)              =    0.02700
SGRADS, STD.DEV. OF HYDRAULIC GRADIENT       =    0.00000

HMEAN, MEAN AQUIFER THICKNESS (m)            =   15.24000
STDH, STD.DEV. OF AQUIFER THICKNESS          =    0.00000

QINM, MEAN INFILTRATION RATE (m/day)         =    0.00011
QINSTD, STD.DEV. OF INFILTRATION RATE        =    0.00000
```

LOCATION OF RECEPTORS:

	X (M)	Y (M)	Z (M)
RECEPTOR(1)	1.0	0.0	0.0
RECEPTOR(2)	10.0	0.0	0.0
RECEPTOR(3)	100.0	0.0	0.0


BH19
BH20
~5500-ft²
Excavated to 10-ft
BH5
BH1
BH9
MW2
MW1
BH12
BH2
MW4
MW3
BH10
MW5
BH3
BH7
BH13
A
BH11
BH8
BH4
Horse Arena fence
Excavated to 2-ft
BH16
BH14
B
BH18
BH17
BH15
100 ppm TPH Boundary
10-ft bgs
15-ft bgs
20-ft bgs
25-ft bgs
30-ft bgs
2-ft Clay Barrier @ 8-10-ft bgs level
REVISED:
DWG BY: JCG
February - 2004
SCALE:
50
Feet
0
Lea County, New Mexico
UL-A Section 5 T20S R37E
N32° 36' 33" W103° 15' 56"
Elevation: 3560-ft amsl
Plate 17 - Location of Proposed Clay Barrier Installation
LINK Energy LLC
Monument 6-Inch 2002-10197

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised March 17, 1999

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☑ Initial Report ☐ Final Report

Name of Company	Contact
Link Energy LLC	**Frank Hernandez**
Address	Telephone No.
P.O. Box 1660 Midland, TX 79702	**(505) 631-3095**
Facility Name	Facility Type
Monument 6" Gathering Pipeline	**Crude Oil Gathering Pipeline**

Surface Owner	Mineral Owner	Lease No.
Delores Davis (Nash)	**NA**	**NA**

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from South Line	Feet from West Line	Longitude	Latitude	County:
A	**5**	**20S**	**37E**	**5065**	**5171**	**W103° 15' 55.502"**	**N32° 36' 32.381"**	**Lea**

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Crude Oil Release and associated components	**Unknown bbl**	**0 bbl**
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
6" Steel Pipeline	**Historical; Prior to 1982**	
Was Immediate Notice Given? ☑ Yes ☐ No ☐ Not Required	If YES, To Whom? **NA**	
By Whom? **NA**	Date and Hour **NA**	
Was a Watercourse Reached? ☐ Yes ☑ No	If YES, Volume Impacting the Watercourse. **NA**	

If a Watercourse was Impacted, Describe Fully.*
NA

Describe Cause of Problem and Remedial Action Taken.*
Cause of release is unknown

Describe Area Affected and Cleanup Action Taken.*
18,108-ft^2 surface area visible affected. Site will be delineated and remediated.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: Frank Hernandez	**OIL CONSERVATION DIVISION**
Printed Name: **Frank Hernandez**	Approved by District Supervisor:
Title: **District Environmental Supv.**	Approval Date: / Expiration Date:
E-Mail **frank.hernandez@eott.com**	Conditions of Approval: ☐ Attached
Date: **7/24/02** Phone: **(505) 631-3095**	

LinkEnergy

Incident Date and NMOCD Notified?
NA

SITE:	Monument 6" Gathering Pipeline		Assigned Site Reference 2002-10197
Company:	Link Energy LLC		
Street Address:	5805 East Highway 80		
Mailing Address:	P.O. Box 1660		
City, State, Zip:	Midland, TX 79702		
Representative:	Frank Hernandez		
Representative Telephone:	(505) 631-3095		
Telephone:			
Fluid volume released (bbls):	Unknown	Recovered (bbls):	0
>25 bbls: Notify NMOCD verbally within 24 hrs and submit form C-141 within 15 days.			
5-25 bbls: Submit form C-141 within 15 days (Also applies to unauthorized releases of 50-500 mcf Natural Gas)			
Leak, Spill, or Pit (LSP) Name:	2002-10197		
Source of contamination:	6" Steel Pipeline		
Land Owner, i.e., BLM, ST, Fee, Other:	Delores Davis (Nash)		
LSP Dimensions:	260 x 120 (see Attachments)		
LSP Area:	18,108	-ft^2	
Location of Reference Point (RP):			
Location distance and direction from RP:			
Latitude:	N32° 36' 32.381"		
Longitude:	W103° 15' 55.502"		
Elevation above mean sea level:	3560	-ft amsl	
Feet from South Section Line:	5065		
Feet from West Section Line:	5171		
Location - Unit and 1/4 1/4:	UL- A	NE 1/4 of NE 1/4	
Location - Section:	5		
Location - Township:	20S		
Location - Range:	37E		
Surface water body within 1000' radius of Site:	0		
Surface water body within 1000' radius of Site:	0		
Domestic water wells within 1000' radius of Site:	1		
Domestic water wells within 1000' radius of Site:	0		
Agricultural water wells within 1000' radius of Site:	3		
Agricultural water wells within 1000' radius of Site:	0		
Public water supply wells within 1000' radius of Site:	0		
Public water supply wells within 1000' radius of Site:	0		
Depth (ft) from land surface to ground water (DG):	33		
Depth (ft) of contamination (DC):	30		
Depth (ft) to ground water (DG - DC = DtGW):	3		

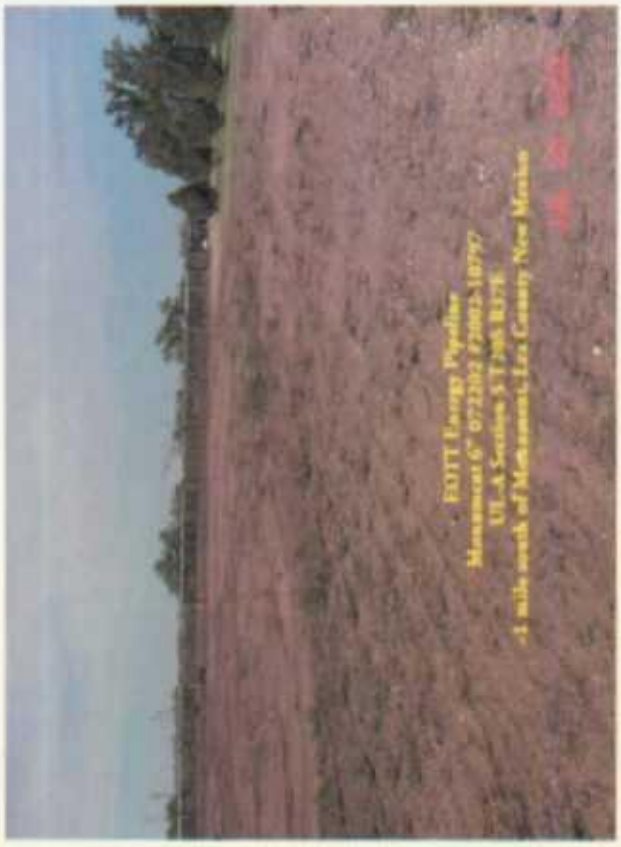
1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water Body
If Depth to GW <50 feet: *20 points*	If <1000' from water source, or, <200' from private domestic water source: *20 points*	<200 horizontal feet: 20 points
If Depth to GW 50 to 99 feet: *10 points*		200-100 horizontal feet: 10 points
If Depth to GW >100 feet: *0 points*	If >1000' from water source, or, >200' from private domestic water source: *0 points*	>1000 horizontal feet: 0 points
Ground water Score: 20	*Wellhead Protection Area Scor* 20	*Surface Water Score:* 0
Site Rank (1+2+3) = 40		

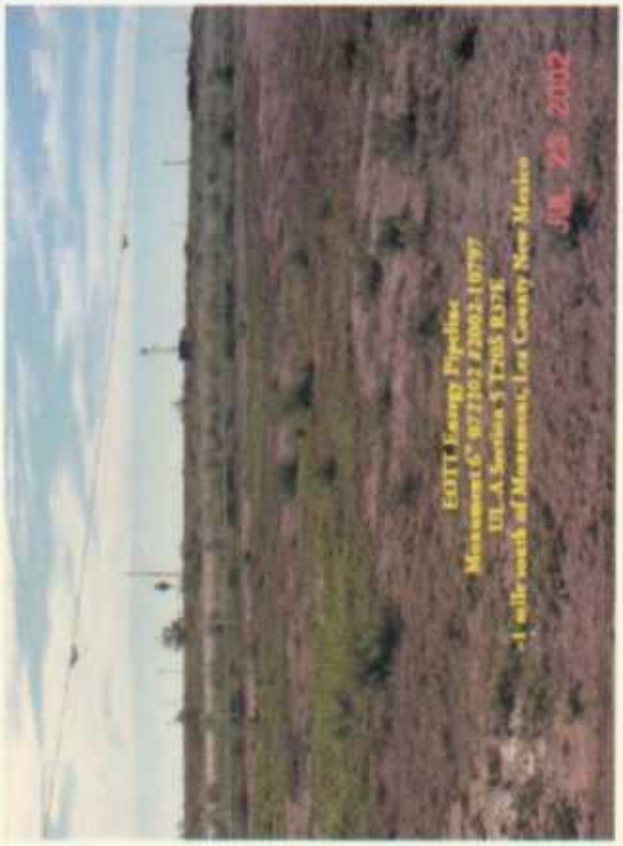
Total Site Ranking Score and Acceptable Concentrations

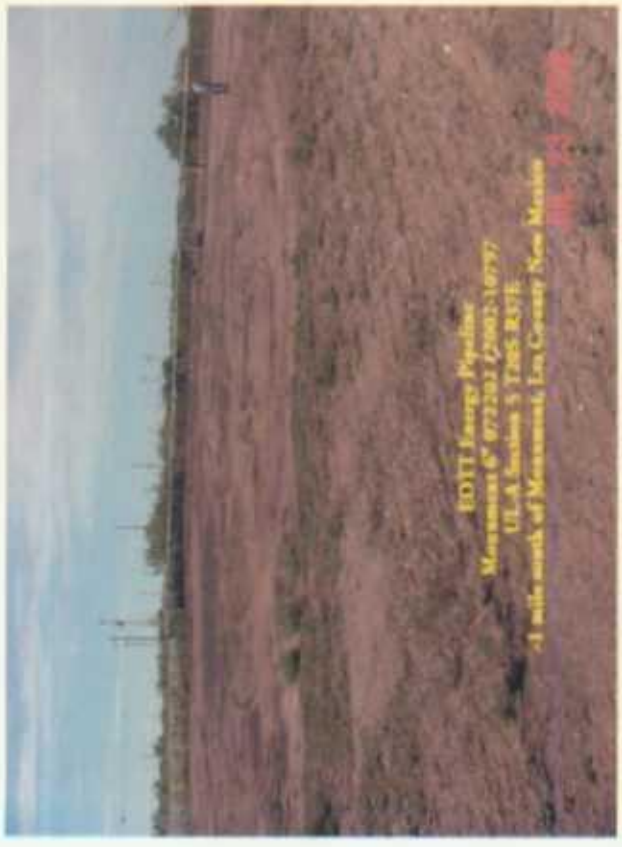
Parameter	20 or >	10	0
Benzene[1]	10 ppm	10 ppm	10 ppm
BTEX[1]	50 ppm	50 ppm	50 ppm
TPH	100 ppm	1000 ppm	5000 ppm

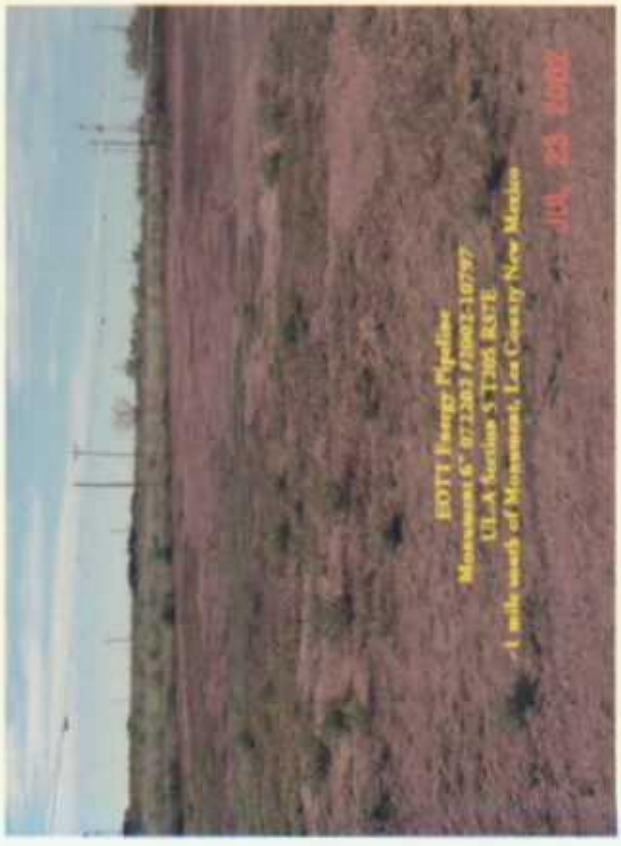
[1]100 ppm field VOC headspace measurement may be substituted for lab analysis

Site Photographs





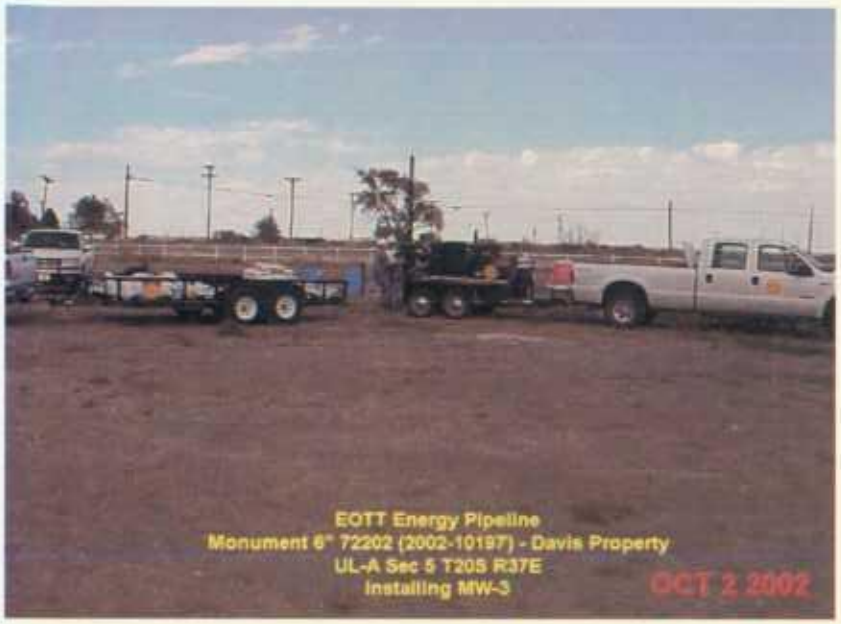





EOTT Energy Pipeline
Monument 6" 72202 (2002-10197)
Davis Property
UL-A Sec 5 T20S R37E
AUG 29 2002


EOTT Energy Pipeline
AUG 28 2002


EOTT Energy Pipeline
Monument 6" 72202 (2002-10197) - Davis Property
UL-A Sec 5 T20S R37E
MW-3 Installation
OCT 2 2002


EOTT Energy Pipeline
Monument 6" 72202 (2002-10197) - Davis Property
UL-A Sec 5 T20S R37E
Installing MW-3
OCT 2 2002


EOTT Energy Pipeline
Monument 6" 72202 (2002-10197) - Davis Property
UL-A Sec 5 T20S R37E
MW-1 with vault installed
OCT 2 2002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Monument 6" 72202 (2002-10197) - Davis Property
UL-A Section 5 T20S R37E
Installing MW-5
OCT 03 2002


EOTT Energy Pipeline
Monument 6" 72202 (2002-10197) - Davis Property
UL-A Sec 5 T20S R37E
MW-2 with vault installed
OCT 2 2002