AP - 55

GENERAL CORRESPONDENCE

YEAR(S):

2006

AEC AMERICAN
ENVIRONMENTAL
CONSULTING, LLC

May 26, 2006

Mr. Stephen Weathers
Duke Energy Field Services, LP
370 17th Street, Suite 2500
Denver, CO 80202

Re: Stage 1 Abatement Plan Proposal for the RR Ext Pipeline Release in Lea County, Unit C, Section 19 Township 20 South, Range 37 East **New Mexico Abatement Plan Number AP #55**

Dear Mr. Weathers:

This letter provides the Stage 1 Abatement Plan Proposal for the Duke Energy Field Services, LP (DEFS) RR Ext release site. The New Mexico Oil Conservation Division mandated that this site be governed by the abatement plan process.

The primary purpose of the Stage 1 Abatement Plan Proposal "shall be to design and conduct a site investigation that will adequately define site conditions, and provide the data necessary to select and design an effective abatement option." (20.6.2.4106.C of the New Mexico Administrative Code). The plan requirements, as set forth in the above referenced section, must include the following:

(1) Descriptions of the site, including a site map, and of site history including the nature of the discharge that caused the water pollution, and a summary of previous investigations;

(2) Site investigation workplan to define:

(a) site geology and hydrogeology, the vertical and horizontal extent and magnitude of vadose zone and ground-water contamination, subsurface hydraulic parameters including hydraulic conductivity, transmissivity, storativity, and rate and direction of contaminant migration, inventory of water wells inside and within one (1) mile from the perimeter of the three-dimensional body where the standards set forth in Subsection B of Section 20.6.2.4103 NMAC are exceeded, and location and number of such wells actually or potentially affected by the pollution; and

(b) surface-water hydrology, seasonal stream flow characteristics, ground-water/surface-water relationships, the vertical and horizontal extent and magnitude of contamination and impacts to surface water and stream sediments. The magnitude of contamination and impacts on surface water may be, in part, defined by conducting a biological assessment of fish, benthic macroinvertebrates and other wildlife populations. Seasonal variations should be accounted for when conducting these assessments.

(3) Monitoring program, including sampling stations and frequencies, for the duration of the abatement plan that may be modified, after approval by the secretary, as additional sampling stations are created;

(4) Quality assurance plan, consistent with the sampling and analytical techniques listed in Subsection B of Section 20.6.2.3107 NMAC and with Section 20.6.4.10 NMAC of the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20.6.4 NMAC), for all work to be conducted pursuant to the abatement plan;

(5) Site health and safety plan for all work to be performed pursuant to the abatement plan;

(6) A schedule for all Stage 1 abatement plan activities, including the submission of summary quarterly progress reports, and the submission, for approval by the secretary, of a detailed final site investigation report; and

(7) Any additional information that may be required to design and perform an adequate site investigation.

The document includes the information necessary to satisfy above requirements 1 and 2. The monitoring plan (Item 3) will be included in the Stage 1 Abatement Plan Addendum that will be prepared prior to initiating the Stage 2 work. Item 4 the Quality Assurance Plan, is attached as part of the site Sampling and Analysis Plan (SAP) included in Attachment 1. The Site Health and Safety Plan (Item 5) will be prepared upon the approval of this workplan prior to the initiation of site activities. The schedule, Item 6, will be included under separate cover upon approval of this workplan. Additional information, Item 7, will be prepared and transmitted as necessary throughout the duration of the project.

The program purpose and objectives and a background section are presented first. A description of the field program is presented next.

PURPOSE AND OBJECTIVES

The purpose of this program is to characterize the affected medium distribution and groundwater conditions beneath the RR Ext. study area at a level of detail sufficient to prepare a Stage 2 Abatement Plan. Specific objectives include:

1. Define the plume boundaries associated with the release.

2. Define the groundwater flow direction and gradient.

3. Evaluate the degree and extent of natural biodegradation processes on the hydrocarbon distribution.

4. Collect information on the physical and chemical properties of the subsurface materials.

5. Measure the hydraulic conductivity of the affected materials.

6. Evaluate potential air flow through the vadose and unsaturated materials.

BACKGROUND INFORMATION

The background topics include the release specifics, land use, topography and surface drainage, a regional geologic summary, and a summary of past site investigative activities. Each topic is discussed separately below.

Release Location, History and Volume

The study area is located in the northeastern quarter of the northwestern quarter (Unit C) of Section 19, Township 19 South, Range 37 East approximately 4.25 miles south and 2 miles west of the town of Monument in Lea County New Mexico (Figure 1). The approximate coordinates are 32.56234 degrees north and 103.29174 degrees west.

The release reportedly occurred on December13, 2005. Approximately 20 of the 30 released barrels were recovered by DEFS. The approximate extent of the spill is depicted on Figure 2 based upon GPS mapping completed by Environmental Plus Incorporated (EPI) of Eunice, New Mexico. The spill was limited to an approximate 475 square foot (0.011 acres) area. The spill did not migrate to any defined surface water feature.

Land Use

The RR Ext release site is in an isolated part of Lea County. There are no residences within 1 mile of the site, and the distance is probably much greater. The land is used for oil and/or gas extraction, conveyance and processing and stock grazing.

Topography and Surface Water Drainage.

The topography for the area surrounding the site is shown in Figure 3. The area lies on the northern flank of Monument draw approximately 1/2 mile from its center line (Figure 3). The area appears to fall gently to the south toward Monument Draw based upon the topographic map and site observations.

The surface drainages is poorly defined because of the porous nature of the surface and subsurface materials. The area also contains numerous shallow depressions that generally restrict overland surface water flow. Runoff to Monument Draw will be restricted to high intensity and/or long-duration precipitation events.

Regional Geology and Groundwater Flow

Information contained in Nicholson and Clebsch[1] indicates the following:

1. The materials consist of a thin veneer of dune sand that overlies sandy Quaternary alluvial deposits. Nicholson and Clebsch show the site outside the boundaries of the Ogallala Formation; however, the Quaternary alluvial deposits and the Ogallala Formation are composed of similar materials and probably possess similar permeabilities.

2. Bedrock beneath the site is at an elevation of 3,450 feet. The site elevation is approximately 3,530 feet (Figure 3) yielding an estimated unconsolidated material thickness of 80 feet.

3. The groundwater contour map in the Nicholson and Clebsch report indicates that the regional groundwater flow direction is to the southeast.

A copy of the map prepare by EPI showing the neighboring water wells is included in Figure 4. One well is shown within the 1,000 foot radius. An additional five wells are shown within one mile of the location. Well positions will be verified during the field program. Potential impacts on these wells will be evaluated as necessary during the preparation of the Stage 1 Abatement Plan Addendum.

Summary of Past Investigative Activities

Investigative activities are limited because of the recent nature of the spill. EPI completed an initial investigation in March 2006. The results of that investigation were transmitted to OCD by Mr. Iain Olness of EPI via electronic mail on April 19, 2006. The relevant text from that message is included verbatim below.

> Field analyses of samples collected during the advancement of the soil boring indicated the possibility that groundwater had impacted due to the release. Based on this, a temporary groundwater monitoring well was installed and a groundwater sample collected. Groundwater was encountered at approximately 30 feet below ground surface (bgs).

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[1] Nicholson, Alexander, Jr. and Clebsch, Alfred, Jr., 1961, Geology and Ground-Water Conditions in Southern Lea County New Mexico. New Mexico State Bureau of Mines and Mineral Resources, Ground-Water Report 6, 123 pp.

Soil samples collected during the advancement of the soil borings were submitted to Environmental Lab of Texas of Odessa, Texas for quantification of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and total xylenes (BTEX constituents), chlorides and sulfates. Analytical results for soil samples collected from soil boring SB-I indicated TPH concentrations ranged from 266 milligrams per kilogram (mg/Kg) at 15 feet bgs to 2,620 mg/Kg at 25 feet bgs. BTEX constituent concentrations ranged from 14.0 mg/Kg at 15 feet bgs to 233 mg/Kg at 25 feet bgs. Reported chloride concentrations ranged from 5.52 milligrams per kilogram (mg/Kg) at 25 feet bgs to 154 mg/Kg at 15 feet bgs, with an average concentration of 37.7 mg/Kg. Sulfate concentrations ranged from 13.9 mg/Kg at 10 feet bgs to 52.0 mg/Kg at 15 feet bgs, with an average concentration of 26.2 mg/Kg.

Reported TPH concentrations were above the NMOCD remedial threshold of 100 mg/Kg for this site for all sampling intervals. Benzene and BTEX constituent concentrations were reported above the NMOCD remedial threshold of 10 mg/Kg and 50 mg/Kg, respectively for samples collected at 25 and 30 feet bgs.

As field analyses of the soil samples indicated the presence of hydrocarbon impacts in all samples collected to groundwater, a temporary monitoring well was installed and a groundwater sample collected. The groundwater sample was submitted for quantification of BTEX constituents, sulfates and chlorides. However, due to the fact that the sample was preserved with hydrochloric acid, the sample could not be analyzed for chlorides.

Analytical results indicated the presence of hydrocarbons in the groundwater sample. Benzene concentrations were reported at 40,500 parts per billion (ppb), toluene concentrations were reported at 44,600 ppb, ethylbenzene concentrations reported at 5,170 ppb and total xylene concentrations reported at 14,500 ppb. All reported concentrations are above New Mexico Water Quality Control Commission (NMWQCC) Groundwater Standards. Sulfate concentrations for the groundwater sample were reported at 160 parts per million (ppm).

Table 1 summarizes the above information. The laboratory reports were previously provided by EPI to the OCD. The results indicate that both the soils from all intervals sampled and the groundwater exceed the applicable New Mexico Standards.

The materials were logged on the EPI boring log as a coarser poorly-graded (well sorted) sand with some gravel present. EPI personnel indicated that they encountered saturated materials at approximately 19 feet bgs.

PROPOSED PROGRAM COMPONENTS

The field program described in this section was designed to collect the data necessary to complete characterization of the site at a level that will fulfill the above objectives. The tasks include: 1) monitoring well installation, development and sampling, 2) well gauging and water table contouring; 3) physical property measurement; and 4) report preparation. Each task is described below. All proposed activities comply with the protocols included in the attached SAP.

Monitoring Well Installation

Six new monitoring wells will be installed, developed and sampled. The proposed well locations are shown on Figure 5. Well MW-1 will be installed in the probable up gradient (northeast) direction. MW-2 will be installed to the southeast out of the road footprint but as close to the original release point as possible. The remaining wells will be installed in the probable down gradient direction. The exact locations may be altered based upon subsurface obstacles, access constraints, or changed conditions such as a different groundwater flow component.

Each well will be drilled to a depth approximately 10 feet below the first evidence of saturated materials or to a maximum depth of 40 feet if no saturated materials are encountered. The borings will be advanced using hollow-stem auger. All drilling and installation procedures will be supervised by an experienced geologist or engineer with an appropriate background. Continuous soil samples will be collected from the surface to the top of the saturated zone. Each sample will be split into two sealable plastic bags. One set will be subjected to PID measurement. The second set will be placed in a ice-filled cooler. Soil samples from the most impacted zones will be submitted for analyses for benzene, toluene, ethylbenzene and xylenes (BTEX) and for total petroleum hydrocarbons in the gasoline range (GRO) and the diesel range (DRO).

Fifteen feet of 2-inch, threaded, factory-slotted Schedule 40 PVC will be placed in the well. The annular space will then be backfilled with artificially-graded sand to a minimum depth of 2 feet above the top of the slotted PVC interval. The remaining annular space will then be backfilled with hydrated bentonite. Wells will be allowed to set a minimum of 24 hours prior to development to allow the grout to set.

The surface completion for each well will included an above-ground well protector and a minimum 2 foot by 2 foot concrete pad. Well completion forms will be prepared for each well and included in the addendum report. The coordinates and elevation of each well will be measured by a licensed surveyor.

Two additional hand borings will be advanced in the surface stained area shown by EPI to the southeast of the release location (Figure 5). Boring logs detailing, lithology, staining and odor will be prepared for each location. The borings will be advance to refusal by manual techniques (approximately 5 feet). Additional machine-aided characterization will be completed as necessary either during this program or during a subsequent program.

Well Gauging And Water Table Contouring;

The depth to water will be measured in each well to the nearest 0.01 foot a minimum of 24 hours following installation to ensure that the water table has fully equilibrated. A water table map will be prepared based upon the data collected. The map will include the water table elevations, a set of water table contours and indications of groundwater flow directions.

Monitoring Well Development, Purging And Sampling,

Each new well will be developed using a dedicate bailer or a submersible pump depending upon the volume of water present and the potential well-production rate. Well development will be completed when a minimum of 10 casing volumes of water are removed and the field parameters of temperature, pH and conductivity for the last three casing volumes are stable. In the event the well cannot be continuously purged, it will be bailed dry a minimum of one time.

A well will not be developed and sampled if free product is present after installation. A well will not also not be sampled if free product enters the well during its development.

A minimum of three casing volumes will then be purged from each well using a dedicated bailer. The field parameters temperature, pH, conductivity and dissolved oxygen will be measured after the collection of each casing volume. The wells will be considered stable with the temperature and conductivity stabilize within 10 percent and pH readings remain within 0.2 pH units for three consecutive readings.

Each new well will be sampled using the dedicated bailer following the stabilization of the parameters. Unfiltered samples will be collected from each well. The unfiltered samples will be analyzed for BTEX, GRO and DRO.

A field duplicate, matrix spike, matrix spike duplicate (MS/MSD) and a trip blank will be used to evaluated quality control. The field duplicate will be collected from a well with detectable constituents so that the relative percentage difference can be calculated. The MS/MSD sample will be collected from a well containing probably unimpacted groundwater. The laboratory will provide the trip blank. The trip blank and the field duplicate will both be analyzed for BTEX.

All development and purge water will be disposed of at the DEFS Linam Ranch facility. All cuttings generated during the drilling process will be stockpiled and sampled and then disposed of in an appropriate fashion. Unaffected cuttings will be thin spread.

Physical Property Measurement

The final field activity will be to measure the physical properties of the saturated materials. Slug tests will be completed on all six wells to estimate the saturated hydraulic conductivity.

Laboratory testing will also be conducted on one to three samples collected using a Shelby tube from the saturated zones from separate wells depending upon the heterogeneity of the materials. The samples will be analyzed by a soils laboratory for:

- Organic matter using ASTM D2974;
- Unified Soil Classification using ASTM D2487;
- Atterburg Limits using ASTM D4318 (as applicable);
- Particle analysis using ASTM D422; and
- Bulk density using ASTM D2937.

Measurement of the biodegradation indicators in the groundwater will be completed during the second sampling episode that will be completed the third quarter of 2006. Waiting until the second sampling episode allows the water to fully equilibrate from any disturbances caused by the drilling process. Also, installation of additional monitoring wells may be necessary to fully delineate the plume. Collecting the indicator samples from all wells at the same time following final plume delineation results in a more reliable assessment of bioremediation potential.

Finally, the following procedure will be followed in any well were free phase hydrocarbons (FPH) are measured either before or during development or purging:

- Water extraction will cease;
- No water sample will be collected;
- The FPH level will be measured several times to verify equilibration;
- A baildown test of the FPH will be completed; and
- A sample of the FPH will be collected for PIANO analyses.

REPORT PREPARATION

A report will be prepared to present the results of the field investigation and discuss important conclusions. The report will include the following components:

- A summary of the field methods used to install the wells and collect the data.
- A summary of the data collected during the field program.
- Interpretations of the data collected.
- Conclusions on groundwater flow direction and velocity.
- Recommendations (if any) for the completion of additional work prior to the preparation of the Stage 2 Abatement Plan.

All analytical laboratory reports, slug test analyses, boring logs, and well completion diagrams will be appended to the report. The report will also include recommendations for additional characterization activities and/or remediation components necessary to remediate the site.

Do not hesitate to contact me if you have any questions or comments on this document.

Respectfully Submitted,
AMERICAN ENVIRONMENTAL CONSULTING, LLC

Michael H. Stewart

Michael H. Stewart, P.E., C.P.G.
Principal Engineer
attachments

TABLES

Table 1 – Summary of Analytical Results from Samples Collected From Boring TMW by EPI (Collected 3/30/06)

Soil Sample Results

Sample Interval		Analytical Laboratory Results					
Top	Bottom	Benzene	Toluene	Ethylbenzene	Total Xylenes	Gasoline Range Organics	Diesel Range Organics
		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
		10				100 (total)	
1.5	2						
4.5	5	0.141	3.08	2.65	9.25	**476**	**283**
9.5	10	<0.100	5.86	4.99	15.9	**734**	**265**
14.5	15	0.115	3.83	2.3	7.77	**266**	**175**
19.5	20	0.861	12.0	5.45	16.2	**711**	**245**
24.5	25	**20.7**	83.1	36.3	92.9	**2330**	**295**
30	32	**14.0**	31.1	4.36	11.8	**374**	**26**

Notes: Blank cells denote interval that was not sampled.
Bold cells indicate exceedance of regulatory standard

Groundwater Sample (collected 3/30/06)

Benzene	Toluene	Ethylbenzene	Total Xylenes
(mg/l)	(mg/l)	(mg/l)	(mg/l)
10	750	750	620
40.5	44.6	5.17	14.5

Units were converted from the ug/l values described in the text.

FIGURES

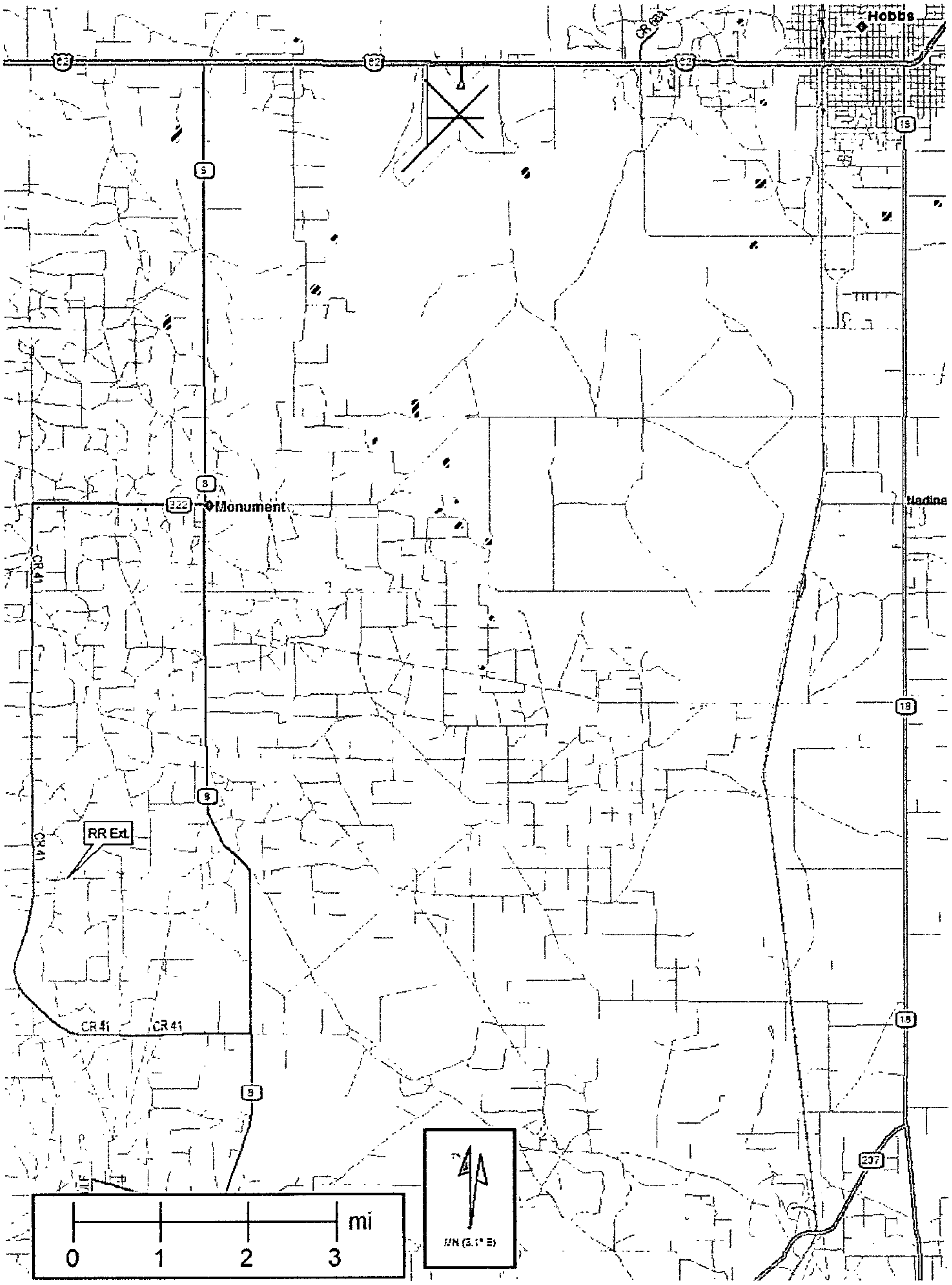

Figure 1 – Site Location

RR Ext. AP #55

Duke Energy Field Services

DRAWN BY: MHS

REVISED:

DATE: 5/06

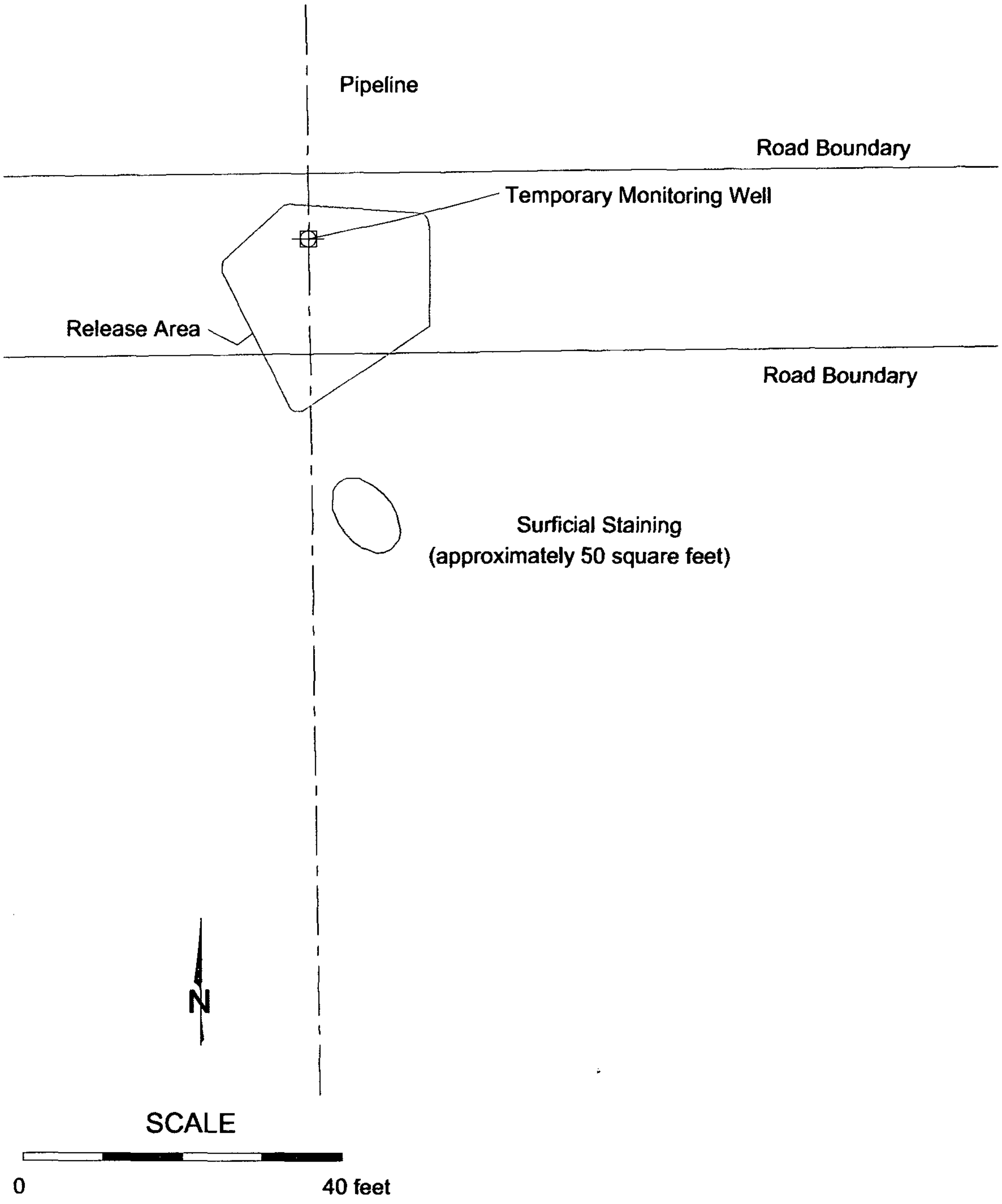

Figure 2 – Site Detail
RR Ext. AP #55

Duke Energy Field Services

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DATE: 5/06

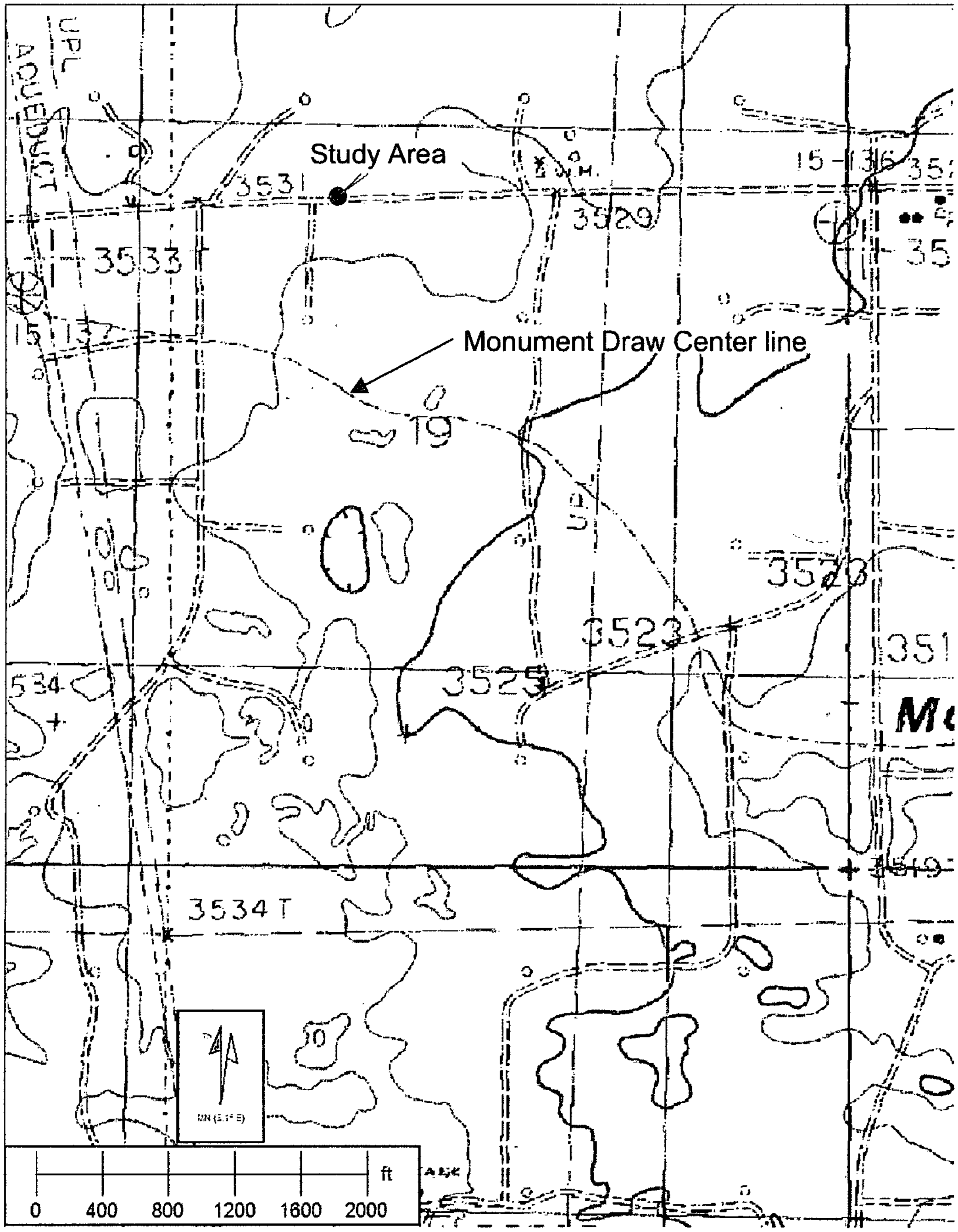

Figure 3 – Topographic Setting
RR Ext. AP #55

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DATE: 5/06

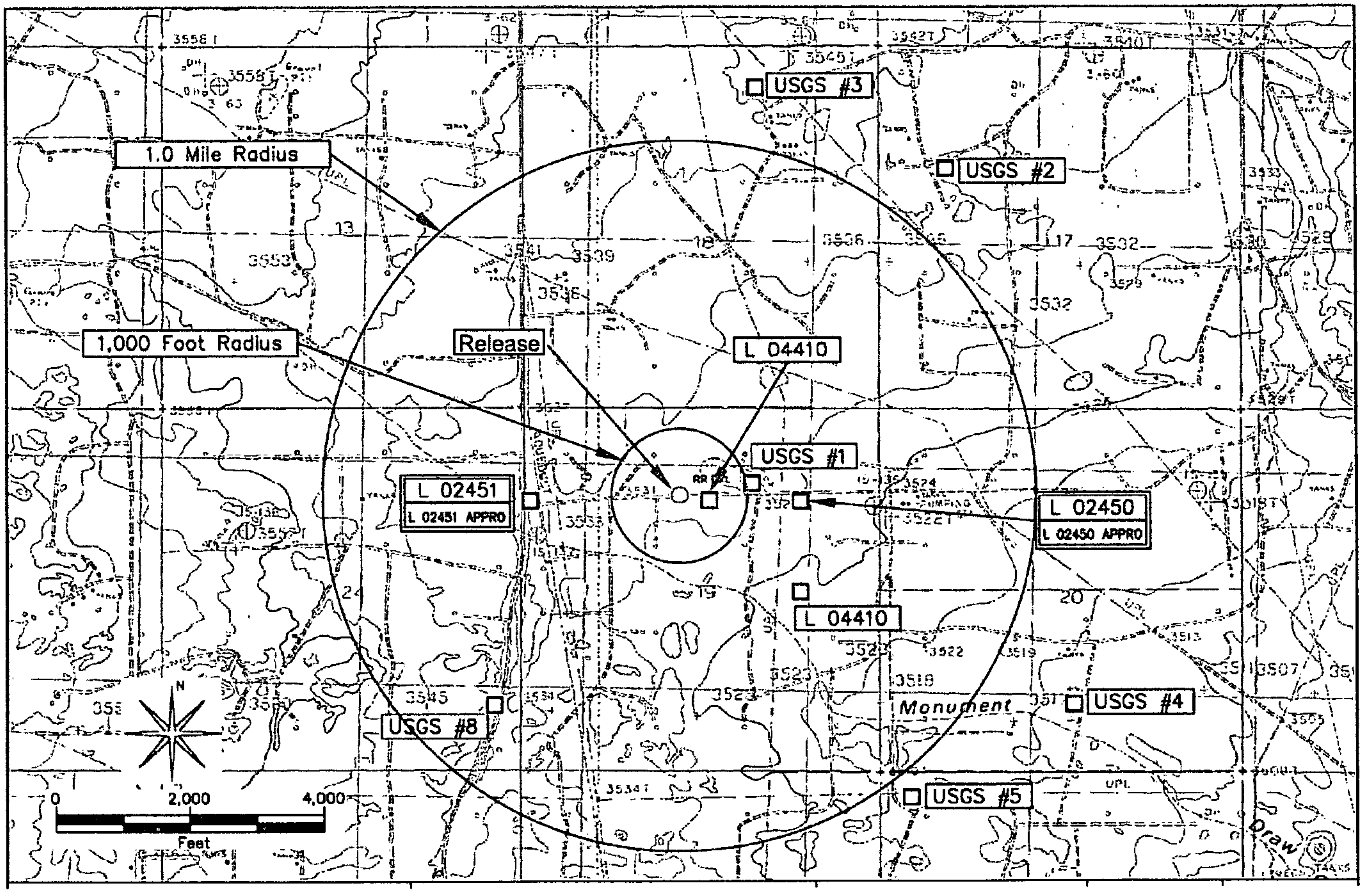

Figure 4 – Water Well Locations (From Environmental Plus)

RR Ext AP #55

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DATE: 5/06

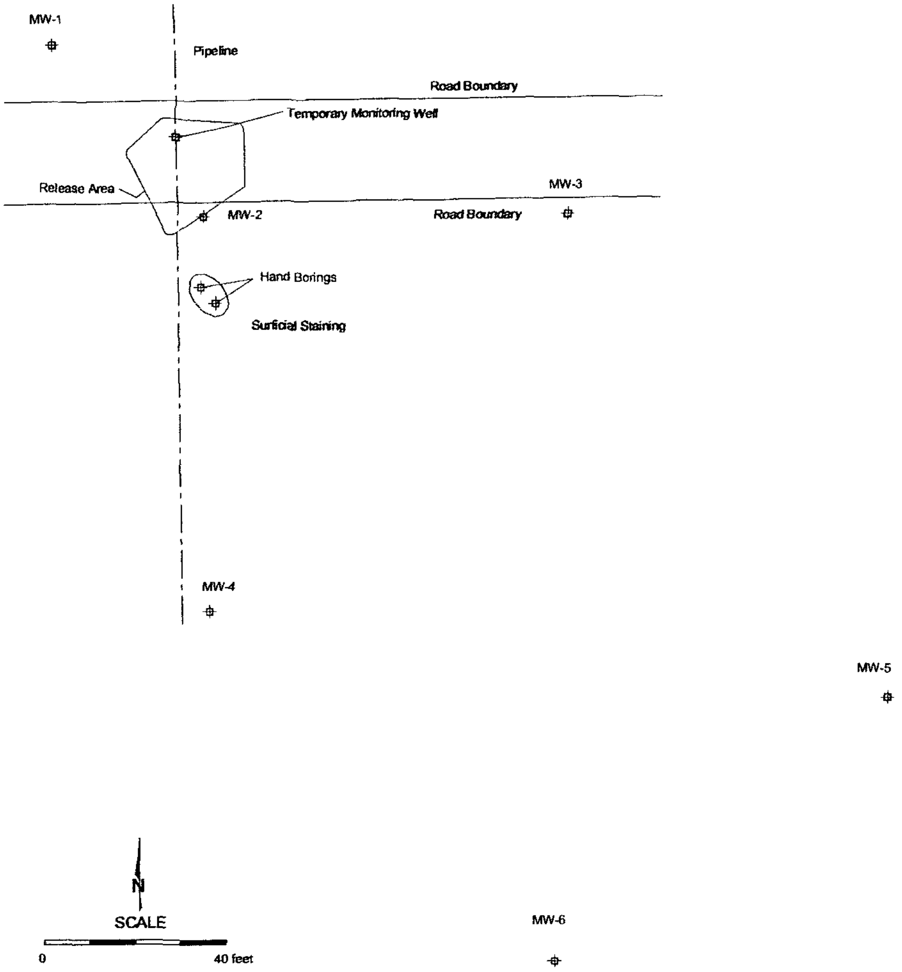

Figure 5 – Proposed Well Locations
RR Ext. AP #55

Duke Energy Field Services

DRAWN BY: MHS
REVISED:
DATE: 5/06

ATTACHMENT 1

SAMPLING AND ANALYSIS PLAN

SAMPLING AND ANALYSIS PLAN FOR THE RR EXT RELEASE SITE LEA COUNTY, NEW MEXICO

(Abatement Plan #55)

Prepared For

Duke Energy Field Services, LP
370 17th Street, Suite 900
Denver, CO 80202

Prepared By

American Environmental Consulting, LLP
6885 South Marshall, Suite 3
Littleton, Colorado 80128

May 2006

TABLE OF CONTENTS

1 INTRODUCTION

This Sampling and Analysis Plan (SAP) presents the well installation, soil and groundwater sampling procedures and quality assurance protocols that will apply to the RR Ext Release Site in Lea County New Mexico. This plan was prepared to fulfill the requirements for a quality assurance plan listed in 20.6.2.3107.B NMAC.

The purpose of this SAP is to provide adequate background information and protocols to ensure the consistent collection of representative data. The SAP includes specific protocols for several standard field tasks such as well installation, soil boring sampling, depth to water measurements, well purging, sample collection, sample labeling and shipping.

1.1 Background Information

The study is located in Unit C of Section 19, Township 20 South, Range 37 East approximately 4.25 miles south and 2 miles west of the town of Monument in Lea County New Mexico. The approximate coordinates are 32.56234 degrees north and 103.29174 degrees west.

The proposed workplan calls for the initial installation of 6 monitoring wells and the advancement of two additional hand borings. Additional wells and borings will be installed as necessary in a iterative fashion until the delineation activities are completed.

Anticipated site activities include installation, development and sampling of new monitoring wells, soil sampling during boring advancement, and routine groundwater monitoring. Other activities may be conducted that are not included in this SAP. Protocols for those activities will be included as required in the relevant documents.

The following sections are included in this document:

- Section 2 provides the monitoring well installation protocols;
- Section 3 presents the groundwater monitoring protocols; and
- Section 4 includes all protocols related to quality assurance.

2 MONITORING WELL INSTALLATION PROTOCOLS

This section includes the protocols to install, develop and sample new monitoring wells. The protocols include boring advancement and sampling, monitoring well installation and new monitoring well development and purging.

2.1 Boring Advancement And Sampling

Each new boring will be advanced using either auger or air rotary drilling. Water and drilling additives will not be used without the consent of the field supervisor. Drilling may include either continuous or discrete sampling. The drilling company will provide the equipment necessary to complete the sampling. The drill will be clean prior to entering the site. All equipment will remain on the established roads or DEFS right-of-way whenever possible.

All drilling and installation procedures will be supervised by an experienced geologist or engineer with appropriate experience in supervising well installation and compilation of boring logs.

Unless otherwise specified, each boring will be drilled to a depth approximately 10 feet below the first evidence of saturated materials or to a maximum depth of 40 feet if no saturated materials are encountered. Cuttings will be drummed or placed on plastic pending appropriate analysis. Unaffected cuttings can be thin spread over the drilling area. Affected cuttings should be disposed of based upon the results from the down-hole soil samples. Affected cuttings can be thin spread after receiving approval from the OCD.

Unless otherwise specified, samples will be collected on a regular basis (maximum separation of 5 feet) and screened for the presence of volatiles using a photoionization detector (PID). Samples will be placed in a sealed plastic bag and allow to stabilized for a minimum of 30 minutes prior to measurement. Care should be taken to keep the bags out of direct sunlight or a heat source (such as a car heater) to minimize the generation of water vapor.

The following procedure will be used if soil samples will be collected during the boring advancement.

1. The field supervisor will split each sample into two portions and place them in labeled bags.

2. The first bag will be used for measurement with a PID as described above.

3. The second bag will be placed in an ice-filled cooler for storage until boring advancement is completed.

4. After all of the samples have been measured, the appropriate sample(s) will be placed in a labeled laboratory sample jar. The unused samples can be placed with the rest of the drill cuttings.

Lithologic logs will be compiled for each boring based upon the cuttings and/or samples produced. The logs will include the following information:

- The boring/monitor well descriptor;
- The date the boring was installed;
- The soil sampling intervals;
- The resulting PID measurement;
- The locations of the samples submitted for laboratory analyses;
- The lithologic intervals;
- A description of each lithologic interval that includes:
    - The material type (with a unified soil classification descriptor)
    - The moisture content
    - The relative presence of hyrocarbons
- The depth where saturation was first noted;
- The total depth of the boring;
- A note on the intervals where slotted casing and granular materials were placed; and
- The field supervisor's name

All equipment will be decontaminated as necessary between each location using a steam cleaner or a hot power wash. Decontamination need will be based upon the affected state of the materials encountered.

2.2 Monitoring Well Installation

Unless otherwise specified, 15 feet of 2-inch, threaded, factory-slotted Schedule 40 PVC will be placed in the well (20 feet if no saturated materials are encountered). The annular space will then be backfilled with artificially-graded sand to a minimum depth of 2 feet above the top of the slotted PVC interval. The remaining annular space will then be backfilled with hydrated bentonite.

The surface completion for each well will included an aboveground well protector and a minimum 2 foot by 2 foot concrete pad. Well completion forms will be prepared for each well in included in the report.

2.3 New Monitoring Well Development And Purging

Each new well will be allowed to sit a minimum of 10 hours (overnight) before it is developed and sampled. Each new well will be developed using either a disposable bailer or a submersible pump. Well development will be completed when a minimum of 10 casing volumes of water is removed and the field parameters of temperature, pH and conductivity for the last three casing volumes are stable.

In the event the well cannot be continuously purged, it will be bailed dry a minimum of three times. The well will be allowed to recover a minimum of 75 percent prior to removing the next casing volume. Wells that recover at an extremely slow rate (less than 75 percent recovery in over 3 hours) will be developed on a case-by-case basis at the discretion of the field supervisor with the exact development scheme noted on the boring log.

Each new well will be sampled following development using a disposable bailer. Sampling will be completed (including purging) according to the protocols provided in Section 3 below. Any well that produces measurable free product either after construction or development will not be developed and sampled. Instead, a sample of the product will be collected if sufficient volume is available. The product sample will be submitted to an analytical laboratory for PIANO analysis.

3 GROUNDWATER MONITORING

This section provides the protocols that will be used in the SAP monitoring program. The protocols provided include depth to water measurements, monitor well purging and sampling, and sample labeling and packaging requirements.

Analytical suites will vary based upon specific task requirements. Analytical suites and methods will be provided in each work plan. Analytical methods must conform to the references 20.6.2.3107 B NMAC. Any analytical method that does not conform must be approved by OCD prior to its use.

3.1 Depth to Fluid Measurements

The depth to fluids (water and product if present) will be measured in all monitoring wells prior to beginning the well purging activities. Fluid levels will be obtained using an dual phase interface probe. The probe will be decontaminated between each well using a soap wash followed by a rinse with distilled water.

Water levels will be measured on north edge of the casing stick-up or to the historic measurement point if not on the north side of the casing. The well number and the depth to water and product (if present) will be recorded in a bound field notebook. The data can then be subsequently transferred to individual data sheets as necessary.

3.2 Monitor Well Purging and Sampling

Prior to sampling, monitoring wells will be purged to promote collection of representative groundwater samples. Some wells may produce so little water that bailing them dry is the only way to develop them. Wells with measurable product will not be developed and sampled unless otherwise specified.

The equipment anticipated to be necessary to conduct well stabilization and groundwater sampling activities includes the following:

- A meter capable of measuring temperature, pH and conductivity;
- Instrument manual(s) for each instrument;
- Conductivity and pH standard solutions for instrument calibration;
- Spare batteries, pH probes and other spare parts;
- A separate thermometer for backup and to check temperature probes;
- Disposable plastic cups for sample collection and measurement;
- Containers for purge water;
- Submersible pump for development; and
- Disposable bailers for sampling.

Purging of the monitoring wells will be completed using either a submersible pump or a or disposable bailer. New nylon or polypropylene rope will be used with the bailer for each well. A bailer will be slowly lowered into the water column to avoid agitation of the well water and possible loss of volatile constituents and/or entrainment of sediment.

A minimum of three casing volumes of water will be removed prior to sampling. The casing volume will be calculated by first calculating the height of the water column in the well using the measured depth to water and the total well depth. The total gallons of water per well casing can then be calculated by multiplying the water column height by, 0.67 for 4-inch wells, and by 0.163 for 2-inch wells.

The field measurement of temperature, pH and conductivity will commence after the removal of a minimum one casing volume. The measurements will be made using a instrument that is calibrated for pH on a daily basis. The field parameters will then be measured after purging the second and third casing volumes and at a minimum interval of ½ casing volume thereafter. Bailing will continue until the field parameters have stabilized in accordance with the following criteria:

- Temperature +/- 10 percent for three successive measurements;
- pH +/- 0.2 standard units for three successive measurements; and
- Conductivity +/- 10 percent for three successive measurements.

Wells that bail down but recover rapidly will be bailed down a minimum of one time and allowed to recover a minimum of 50 percent prior to the removal of the next casing volume. Field parameters will be collected and measured just prior to the completion of bailing.

In the case of very low-yield wells, the well will be purged once to dryness. A sample will be collected after the well recovers (overnight if necessary). The exact sampling protocol should be documented in the field notebook and transferred to the sampling sheets.

Samples will be collected and containerized in the order of volatilization sensitivity (e.g. volatiles, then semivolatiles, then metals then inorganics). Samples will be collected using a disposable bailer.

The following information will be recorded in the field logbooks and/or field for each groundwater sample:

- Well number;
- The time the well was sampled;
- Well sampling equipment used; and
- Total amount of water removed from the well during well sampling activities.

In addition to this general information, the following information will also be recorded for each water sample obtained for field parameter evaluation:

- Time of collection of water samples;
- Volume of water removed prior to the collection of the samples;
- Number of casing volumes removed prior to collection of the samples;
- Description of samples (i.e. turbidity, color, odor, foreign matter, etc.); and
- Field parameter results including temperature, conductivity, and pH.

In addition to the specific well development information, general information including weather conditions, field personnel and other personnel onsite, etc. will also be recorded in the field notebook. A chain-of-custody form will be prepared for all of the samples in accordance with Section 3.3.3 below.

3.3 Sample Labeling and Packaging

This section describes the procedures that will be followed to ensure that the samples are properly labeled, packaged for shipment and transmitted using chain of custody procedures. Each activity is described separately below.

3.3.1 Sample Labeling

A sample label will be affixed to all sample containers sent to the laboratory. This label will be completed with the following information written in indelible ink:

- Project name and location
- Sample location
- Sample identification number
- Date and time of sample collection
- Preservative used
- Sample collector's name and initials
- Filtering (if applicable)
- Type of sample (grab or composite)
- Analysis required

If a sample is split with another party, sample labels with identical information will be attached to each sample container.

3.3.2 Sample Packaging

After labeling, each sample will placed in a cooler containing ice to maintain the sample temperature at or below 4° C. All BTEX samples will be placed in a cooler that contains the trip blank. Packaging materials such as "bubble wrap" will be placed as necessary to minimize the potential for breakage.

Sample coolers will either remain with the field personnel or will be stored in a secure location until they are shipped. The ice in the cooler should be checked on a regular basis to ensure that the samples remain cool.

3.3.3 Chain of Custody Procedures

Sample custody procedures will be used to maintain and document sample integrity during collection, transportation, storage, and analysis. A sample is considered to be in custody if one of the following statements apply:

- It is in a person's physical possession or view; or
- It is in a secure area with restricted access; or
- It is placed in a container and secured with an official seal such that the sample cannot be reached without breaking the seal.

Samples and their corresponding documents will be maintained in the custody of authorized personnel from the time they are collected until they are delivered to either the courier for shipping or directly to the analytical laboratory. Field team members will be responsible for proper sample handling and documentation procedures that will allow the possession and handling of individual samples to be traced from the time of their collection to laboratory receipt.

Chain-of-custody record procedures provide an accurate written record that traces the possession of individual samples from the time of their collection in the field to the time of acceptance at the laboratory. The chain-of-custody record will also be used as a record of the samples collected and the analysis requested. Laboratory-specific chain-of-custody records may be used during the site investigation. Information that the field personnel will record on the chain-of-custody record include the:

- Project name and number;
- Sampling location;
- Name and signature of sampler(s);
- Destination of samples (laboratory name);
- Sample identification number;
- Date and time of collection;
- Number and type of containers filled;
- Analysis requested;
- Sample turnaround time;

- Sample matrix;
- Preservatives used;
- Filtering (if applicable);
- Designated MS/MSD samples; and
- Signatures of individuals involved in custody transfer (including date and time of transfer).

Chain-of-custody records initiated in the field will be signed by the field personnel. One chain-of custody record will be completed for each sample shipment. Additional pages may be used when the number of samples collected exceeds the number of lines available on the initial chain-of-custody record.

The completed form will be inserted into a plastic bag and taped to the inside of the cooler used for sample transport if the samples are to be shipped via courier. Signed airbill receipts will serve as evidence of custody transfer between field personnel and the courier and between the courier and the laboratory. Copies of the chain-of-custody record and the airbill will be retained and filed by field personnel prior to shipment.

Custody seals will be used when the coolers are to be shipped by courier to ensure that no tampering occurs. Custody seals will not be necessary if the samples are being transported by the field personnel directly from the location to the analytical laboratory. The seals will be signed and dated prior to placing them on the coolers. The tape will be placed such that the seal must be broken to gain access to the contents of the shipping container.

4 Quality Assurance Procedures

The principal objective of any sampling and analysis program is to obtain accurate and representative environmental samples and to provide valid analytical data. The quality of data will be assessed through the use of Quality Control (QC) sampling performed on a regularly scheduled basis. Laboratory QC samples will also be analyzed, as per analytical method protocols, to evaluate whether laboratory procedures and analysis have been completed properly. For this project, the types of QC samples collected and analyzed are defined and their role in the production of QC data discussed in the following sections.

4.1 Field Quality Control Samples

QC samples are collected in the field and used to evaluate the validity of the field sampling effort. Field QC samples are collected for laboratory analysis to check sampling and analytical precision, accuracy, and representativeness. The following sections discuss the types and purposes of field QC samples that will be collected for this project. Matrix spike (MS) and matrix spike duplicate (MSD) samples are also included in the following discussion because they are collected in the field, even though they are actually laboratory QC samples.

4.1.1 Field Duplicates

Field duplicate samples are two samples collected at the same time and from the same source that are submitted as separate samples to one laboratory for analysis. Field duplicates evaluate the consistency (for precision) of the overall sampling and analytical system.

Field duplicates will be collected at a rate of one duplicate for every 20 samples; however, a minimum of one sample will be collected per monitoring event. Field duplicates are analyzed for the same parameters as the field samples collected during the event. Field duplicates will be sampled from randomly-selected locations. Field duplicate samples will be collected, numbered, packaged, and sealed in the same manner as other samples; they will be submitted blind to the laboratory.

Field duplicate results are used to evaluate the precision of the analysis by calculating the RPD. Field duplicate limits for precision are arbitrarily set, using best professional judgment, at 25 percent for water matrices.

4.1.2 Split Samples

Split samples are used to evaluate interlaboratory analytical precision and accuracy. Split samples are collected and analyzed like field duplicates, except that they are sent to a laboratory other than the primary laboratory used for field analysis.

Split samples will not be collected for each monitoring episode. They may be selectively collected and analyzed if QC problems are suspected.

4.1.3 Matrix Spike and Matrix Spike Duplicates

The suitability of an analytical method for a particular environmental sample matrix is evaluated by analyzing two identically spiked samples, an MS and an MSD sample. An MS is the analysis of a known concentration of target analytes added to an aliquot of the field sample. To minimize errors, the field samples will not be spiked in the field; instead, the sample will be spiked when it is prepared for analysis at the laboratory. MSs and MSDs measure the efficiency of all of the steps of the analytical method in recovering target analytes from an environmental sample matrix. The percent recoveries will be calculated for each of the spiked analytes and used to evaluate analytical accuracy. The RPD between spiked samples will be calculated to evaluate precision. For inorganic analysis, a matrix duplicate is analyzed in place of a MSD; precision is based on this duplicate and the original analysis.

One MS/MSD sample will be collected for BTEX evaluation per monitoring event. An additional sample BTEX volume will be collected for MS/MSD for water samples.

4.2 Field Blanks

During the collection of field samples, and when the laboratory tests the samples, contamination can be introduced from many external sources. In an attempt to discern these potential sources of contamination, several types of field blanks may be collected and analyzed including source water blanks, trip blanks, and equipment rinsate blanks. The applicability of each of these blanks and their effect on the analytical data are discussed in the following sections.

All blank sample results should remain below the method detection limit for each analyte of interest. If any contaminant (except common laboratory contaminants) is present in any of the blank samples, associated field samples containing the same contaminant must be qualified as not detected if the concentration in the field sample is less than five times the concentration found in the blank. The same criterion of qualification applies to the presence of the following common laboratory contaminants when they are present in the associated field sample at less than 10 times the concentration found in the blank sample: methylene chloride, acetone, 2-butanone, and phthalate esters.

4.2.1 Trip Blanks

The purpose of a trip blank is to demonstrate that contamination is not originating from sample containers and that field samples are not contaminated during transit. A trip blank originates at the laboratory as a 40-milliliter vial (typically used for VOC analysis) that is filled completely with reagent grade (that is, organic-free) water. The trip blanks are then transported to the site with the empty sample containers used for sample collection. The trip blanks are stored at the site until the proposed field samples have been collected. One trip blank will accompany each sample transport container containing field water samples for BTEX analysis back to the laboratory for analysis. The trip blank is not opened until it is returned to the laboratory at the time of analysis. The trip blanks are analyzed only for BTEX because these constituents have the greatest potential for cross-contamination.

4.2.2 Source Water Blanks

Source water blanks consist of the water used in detergent wash and steam cleaning decontamination activities. A domestic water source will be used for decontamination and well construction during this project. This water may be obtained at taps or fire hydrants. Source water blanks will be collected if the quality of the water is suspect or if chemical composition of the water must be assessed.

4.2.3 Equipment Rinsates

The equipment rinsate demonstrates whether the cleaning and decontamination procedure is effective in removing contaminants that may remain after collecting field samples. An equipment rinsate is a sample collected after a sample collection device is subjected to standard decontamination procedures. Contamination in the equipment rinsate indicates that the cleaning procedure is ineffective so cross-contamination can occur.

Equipment rinsates will be collected on an as-needed basis if contamination is suspected. Equipment rinsates will not be collected when dedicated or disposable equipment is used. An equipment rinsate will also not be required for the electric tape used for water level measurements provided that it is cleaned between each measurement and is not used to sound the wells.

Appropriate water for the intended analysis will be poured over or through the sample collection device, collected in a sample container, and sent blind to the laboratory for analysis. For organic parameters, analytically certified, organic-free, high performance liquid chromatography (HPLC)-grade water or equivalent will be used. For inorganic parameters, metal-free (that is, deionized or distilled) water will be used; it will be obtained from the laboratory conducting the analysis.

New GW Case

VonGonten, Glenn, EMNRD

From: Price, Wayne, EMNRD
Sent: Thursday, April 06, 2006 1:00 PM
To: VonGonten, Glenn, EMNRD
Subject: FW: DEFS RR Ext. (Ref. #130040)
Attachments: Initital C-141.pdf; Initital C-141.tif

Please put this on your list. Possible AP

From: Iain Olness [mailto:iolness@envplus.net]
Sent: Thursday, March 30, 2006 3:44 PM
To: Price, Wayne, EMNRD; Johnson, Larry, EMNRD
Cc: Lynn Ward (DEFS); Steve Weathers (DEFS)
Subject: DEFS RR Ext. (Ref. #130040)

Dear Mr. Price/Mr. Johnson:

This is to inform you that it is suspected, based on field analyses conducted during the advancement of a soil boring, that groundwater has been impacted by pipeline liquids due to a release from the above-referenced site. A temporary well was installed and a groundwater sample collected to determine if groundwater has been impacted, and if it has been impacted, determine the magnitude of the impact. Upon receipt of the analytical results for the groundwater sample, copies of the results will be forwarded to you. Attached is a copy of the Initial C-144 for your reference.

Should you have any questions or concerns, please feel free to contact me at (505) 394-3481 or via e-mail at iolness@envplus.net.

Sincerely,

ENVIRONMENTAL PLUS, INC.

Iain A. Olness, P.G.
Technical Manager

Scanned by McAfee e250 Appliance

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 October 10, 2003

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: Duke Energy Field Services, LP	Contact: Lynn Ward/Polo Rondon
Address: 10 Desta Dr., Suite 400-W, Midland, TX 79705	Telephone No.: 432/620-4207 or 505/390-5704
Facility Name: BR Ext Low Pressure Gathering Line	Facility Type: Low Pressure Gathering Pipeline

Surface Owner	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County: Lea County
NW/4	19	20S	37E					Lat 32.56234 degrees Long -103.29174 degrees

Latitude 32.56234 Longitude -103.29174

NATURE OF RELEASE

Type of Release: Pipeline Liquids Release	Volume of Release: 30 bbls	Volume Recovered: 20 bbls
Source of Release: 4 inch steel low pressure pipeline	Date and Hour of Occurrence: 12/13/05, unknown	Date and Hour of Discovery: 12/13/05 @ 11:15 am MST
Was Immediate Notice Given? ☑ Yes ☐ No ☐ Not Required	If YES, To Whom? Larry Johnson, NMOCD, Hobbs, NM	
By Whom? Kevin Uribe	Date and Hour: 12/13/05 @ 3:15 pm MST	
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.*

Internal corrosion from normal daily operations caused degradation of the pipeline steel and a release of 30 bbls of condensate. The release was discovered at 11:15 am MST. The pipeline was depressurized and a clamp used to terminate the release. Verbal notification was made by Lynn Ward to Larry Johnson of the NMOCD in Hobbs, NM. The line has been taken out of service and scheduled for replacement.

Describe Area Affected and Cleanup Action Taken.*

Duke Energy Field Services LP will contract with Environmental Plus, Inc. out of Eunice, NM to delineate and remediate the release site. The release will be remediated consistent with the NMOCD guidance for the remediation of spills. Remedial goals will be determined based on the depth to groundwater and a remediation plan will be developed and submitted to the NMOCD for approval prior to remedial activities.

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: Lynn Ward	OIL CONSERVATION DIVISION	
Printed Name: Lynn Ward	Approved by District Supervisor:	
Title: Sr. Environmental Specialist	Approval Date:	Expiration Date:
E-mail Address: lwward@duke-energy.com	Conditions of Approval:	Attached ☐
Date: 1/3/06 Phone: 432/620-4207		

NEW MEXICO ENERGY, MINERALS and
NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

April 27, 2006

Mr. Stephen Weathers, PG
Duke Energy Field Services, LP
370 17th Street, Suite 2500
Denver, Colorado 80202

RE: Abatement Plan Requirement
RR Ext. Release Site
Section 19-T20S-R37E
Lea County, New Mexico

Dear Mr. Weathers:

A review of the information provided by Duke Energy Field Services, LP from the preliminary investigation conducted at the above referenced release site has been evaluated by the New Mexico Oil Conservation Division (OCD). The OCD has concluded that a Stage 1 Abatement Plan pursuant to Rule 19 NMAC 15.1.19 will be required to further investigate the extent of the impact to the vadose zone and groundwater. A Stage 2 Abatement Plan can then be developed for mitigation of any impact to groundwater that the Stage 1 investigation may develop. Please be advised that the OCD has designated this Abatement Plan as AP-55 and henceforth should be referenced on all correspondence pertaining to this site.

If Duke Energy Field Services, LP has any questions contact Mr. Jack Ford at (505) 476-3489 or Mr. Ben Stone at (505) 476-3474.

Sincerely,

Wayne Price
Chief, Environmental Bureau
Oil Conservation Division

WP/wjf

cc: OCD Hobbs District Office

Ford, Jack, EMNRD

From: Price, Wayne, EMNRD
Sent: Tuesday, April 25, 2006 1:19 PM
To: Ford, Jack, EMNRD
Subject: FW: Duke Energy Field Services RR Ext. Release Site (Ref. #130040)
Attachments: Figure 1.pdf; Figure 2.pdf; Figure 3.pdf; Figure 4.pdf; RR Ext. Soil Analytical Results.pdf; RR Ext. GW Analytical Results.pdf; TMW 3-30-06.pdf; SB-1.pdf; Initital C-141.tif; Initital C-141.pdf

Jack, would you please issue a requirement for an abatement plan rule 19 and put this case in RBDMS as an AP.

From: Iain Olness [mailto:iolness@envplus.net]
Sent: Wednesday, April 19, 2006 4:36 PM
To: Price, Wayne, EMNRD
Cc: Ford, Jack, EMNRD; Johnson, Larry, EMNRD; Steve Weathers (DEFS)
Subject: Duke Energy Field Services RR Ext. Release Site (Ref. #130040)

Dear Mr. Price:

This is to inform the NMOCD of an impact to groundwater discovered during delineation activities at the above-referenced site. On December 13, 2005, a release of approximately 30 barrels of pipeline liquids occurred with approximately 20 barrels recovered (reference attached C-141) On March 30, 2006, a soil boring (SB-1) was advanced through the release area to delineate the vertical extent of impacts due to the release. Field analyses of samples collected during the advancement of the soil boring indicated the possibility that groundwater had impacted due to the release. Based on this, a temporary groundwater monitoring well was installed and a groundwater sample collected. Groundwater was encountered at approximately 30 feet below ground surface (bgs).

Soil samples collected during the advancement of the soil borings were submitted to Environmental Lab of Texas of Odessa, Texas for quantification of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and total xylenes (BTEX constituents), chlorides and sulfates. Analytical results for soil samples collected from soil boring SB-1 indicated TPH concentrations ranged from 266 milligrams per kilogram (mg/Kg) at 15 feet bgs to 2,620 mg/Kg at 25 feet bgs. BTEX constituent concentrations ranged from 14.0 mg/Kg at 15 feet bgs to 233 mg/Kg at 25 feet bgs. Reported chloride concentrations ranged from 5.52 milligrams per kilogram (mg/Kg) at 25 feet bgs to 154 mg/Kg at 15 feet bgs, with an average concentration of 37.7 mg/Kg. Sulfate concentrations ranged from 13.9 mg/Kg at 10 feet bgs to 52.0 mg/Kg at 15 feet bgs, with an average concentration of 26.2 mg/Kg.

Reported TPH concentrations were above the NMOCD remedial threshold of 100 mg/Kg for this site for all sampling intervals. Benzene and BTEX constituent concentrations were reported above the NMOCD remedial threshold of 10 mg/Kg and 50 mg/Kg, respectively for samples collected at 25 and 30 feet bgs.

As field analyses of the soil samples indicated the presence of hydrocarbon impacts in all samples collected to groundwater, a temporary monitoring well was installed and a groundwater sample collected. The groundwater sample was submitted for quantification of BTEX constituents, sulfates and chlorides. However, due to the fact that the sample was preserved with hydrochloric acid, the sample could not be analyzed for chlorides.

Analytical results indicated the presence of hydrocarbons in the groundwater sample. Benzene concentrations were reported at 40,500 parts per billion (ppb), toluene concentrations were reported at 44,600 ppb, ethylbenzene concentrations reported at 5,170 ppb and total xylene concentrations reported at 14,500 ppb. All reported concentrations are above New Mexico Water Quality Control Commission (NMWQCC) Groundwater Standards. Sulfate concentrations for the groundwater sample were reported at 160 parts per million (ppm).

Should you have any questions or concerns, please feel free to contact me at (505) 394-3481 or via e-mail at iolness@envplus.net. Mr. Steve Weathers can be reached at (303) 605-1718 or via e-mail at swweathers@duke-energy.com. All official correspondence should be directed to Mr. Steve Weathers at:

Mr. Steve Weathers, Environmental Manager
Duke Energy Field Services
370 17th Street, Suite 2500
Denver, CO 80202

Sincerely,

ENVIRONMENTAL PLUS, INC.

Iain A. Olness, P.G.
Technical Manager

P.O. Box 1558
Eunice, NM 88231

(505) 394-3481
(505) 394-2601 (fax)

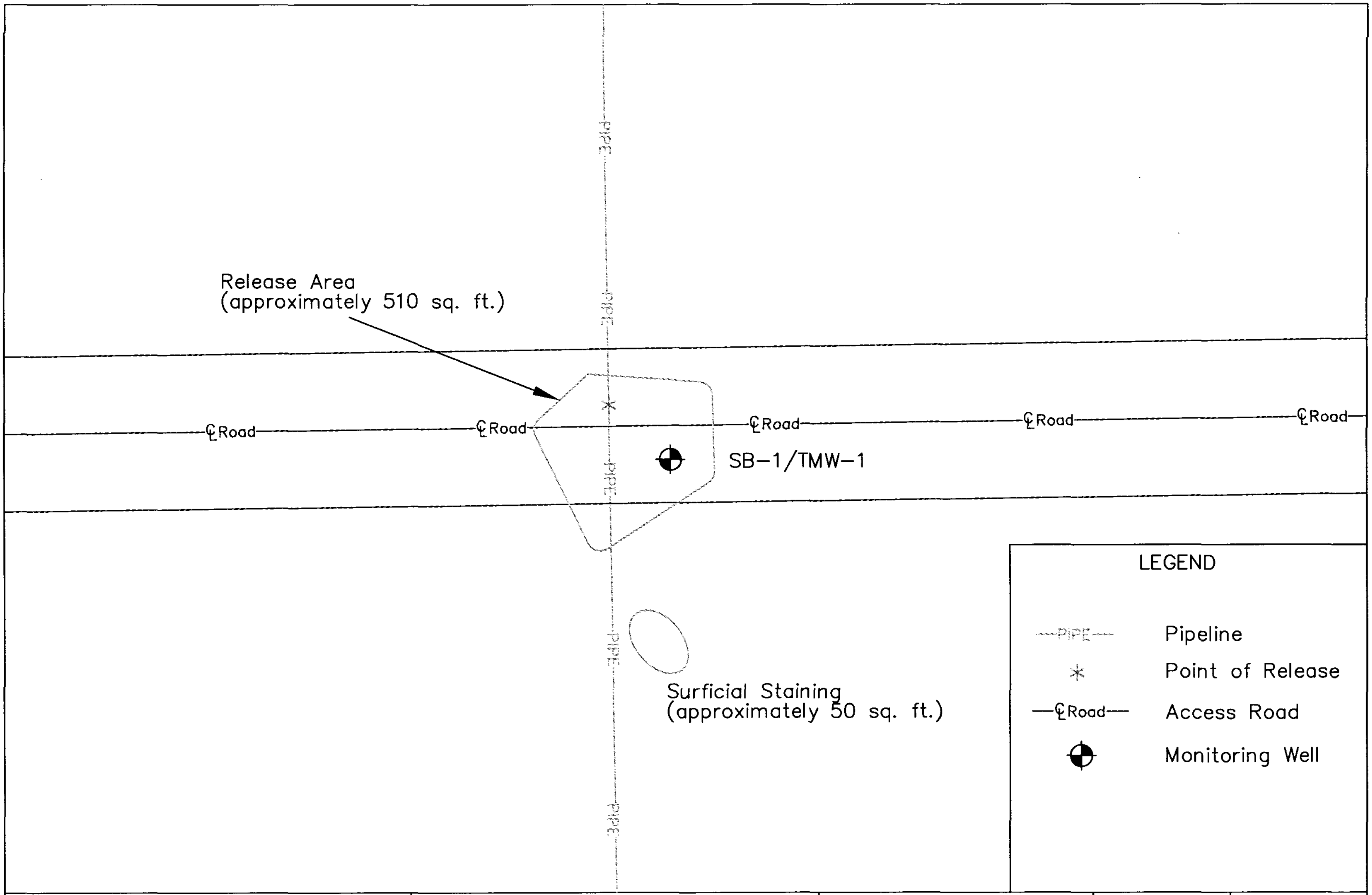

Figure 4
Soil Boring/Temporary Monitoring
Well Location Map
Duke Energy Field Services
RR Ext.

Lea County, New Mexico
NE 1/4 of the NW 1/4, Sec. 19, T20S, R37E
N 32° 33' 44.42" W 103° 17' 30.26"
Elevation: 3,532 feet amsl

DWG By: Iain Olness
April 2006

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Feet

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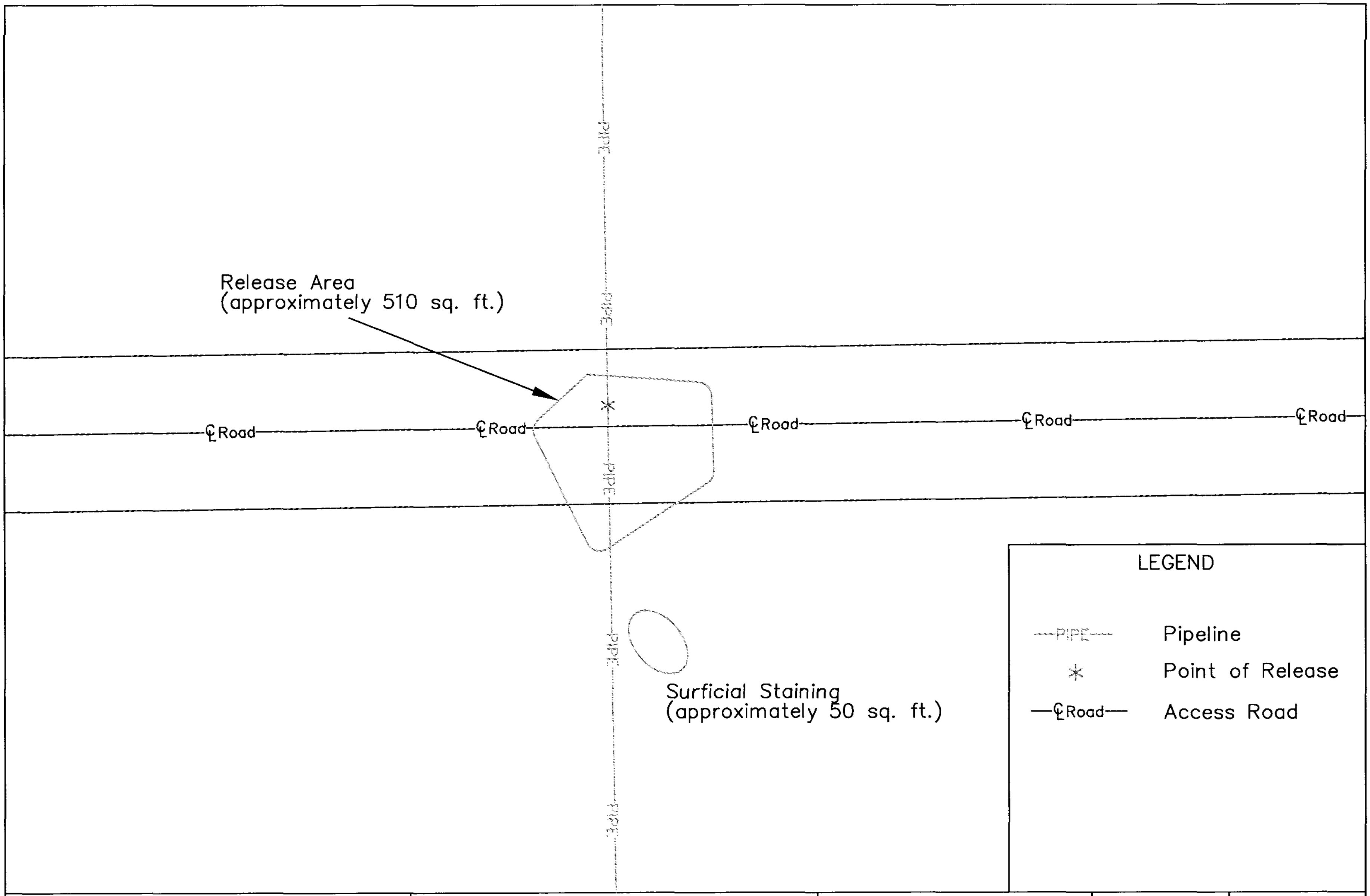
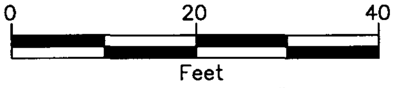


Figure 3
Site Map
Duke Energy Field Services
RR Ext.

Lea County, New Mexico
NE 1/4 of the NW 1/4, Sec. 19, T20S, R37E
N 32° 33' 44.42" W 103° 17' 30.26"
Elevation: 3,532 feet amsl

DWG By: Iain Olness
April 2006

REVISED:



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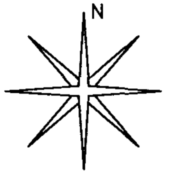

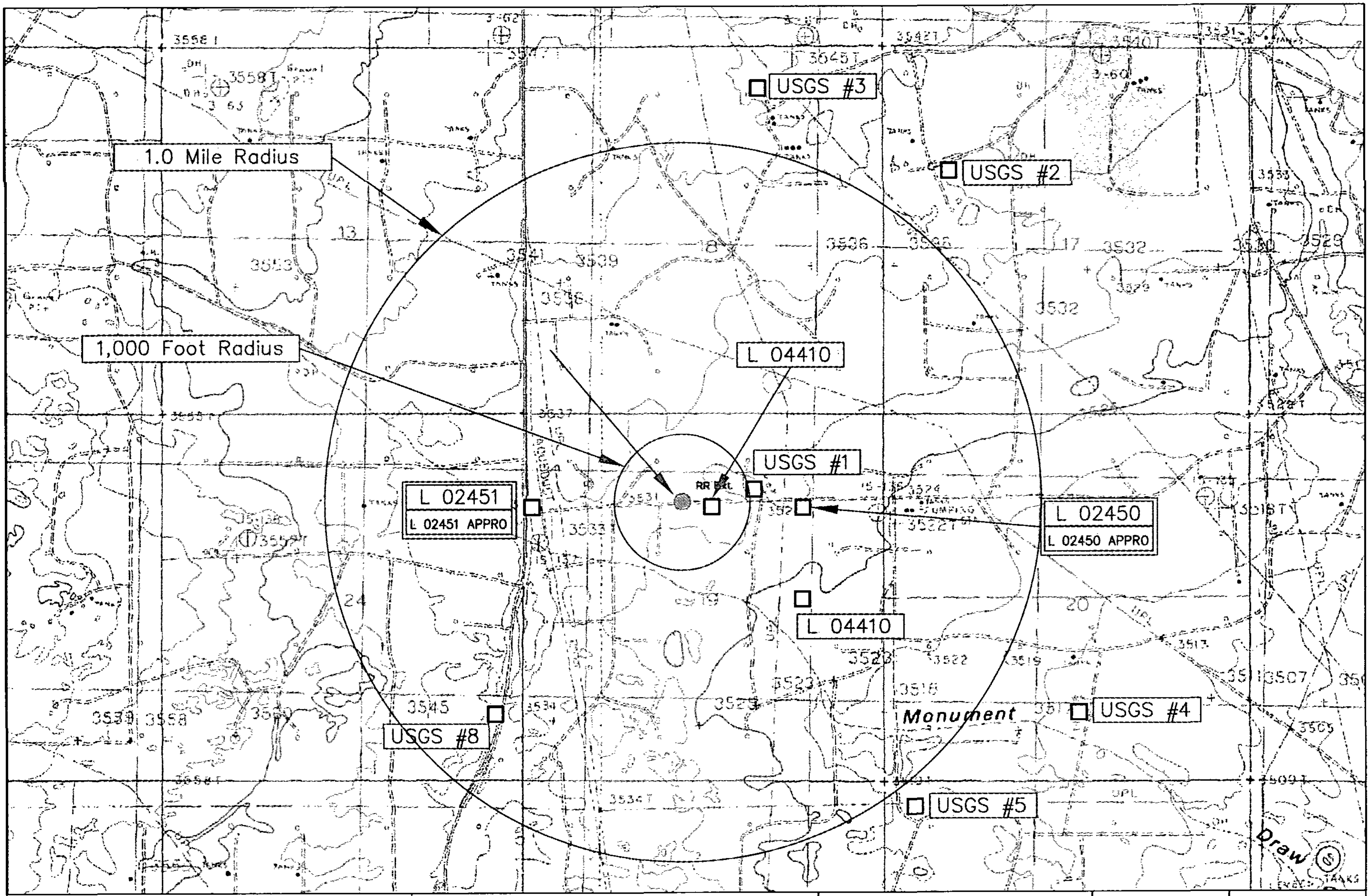

Figure 2
Site Location Map
Duke Energy Field Services
RR Ext.

Lea County, New Mexico
NE 1/4 of the NW 1/4, Sec. 19, T20S, R37E
N 32° 33' 44.42" W 103° 17' 30.26"
Elevation: 3,532 feet amsl

DWG By: Iain Olness
April 2006

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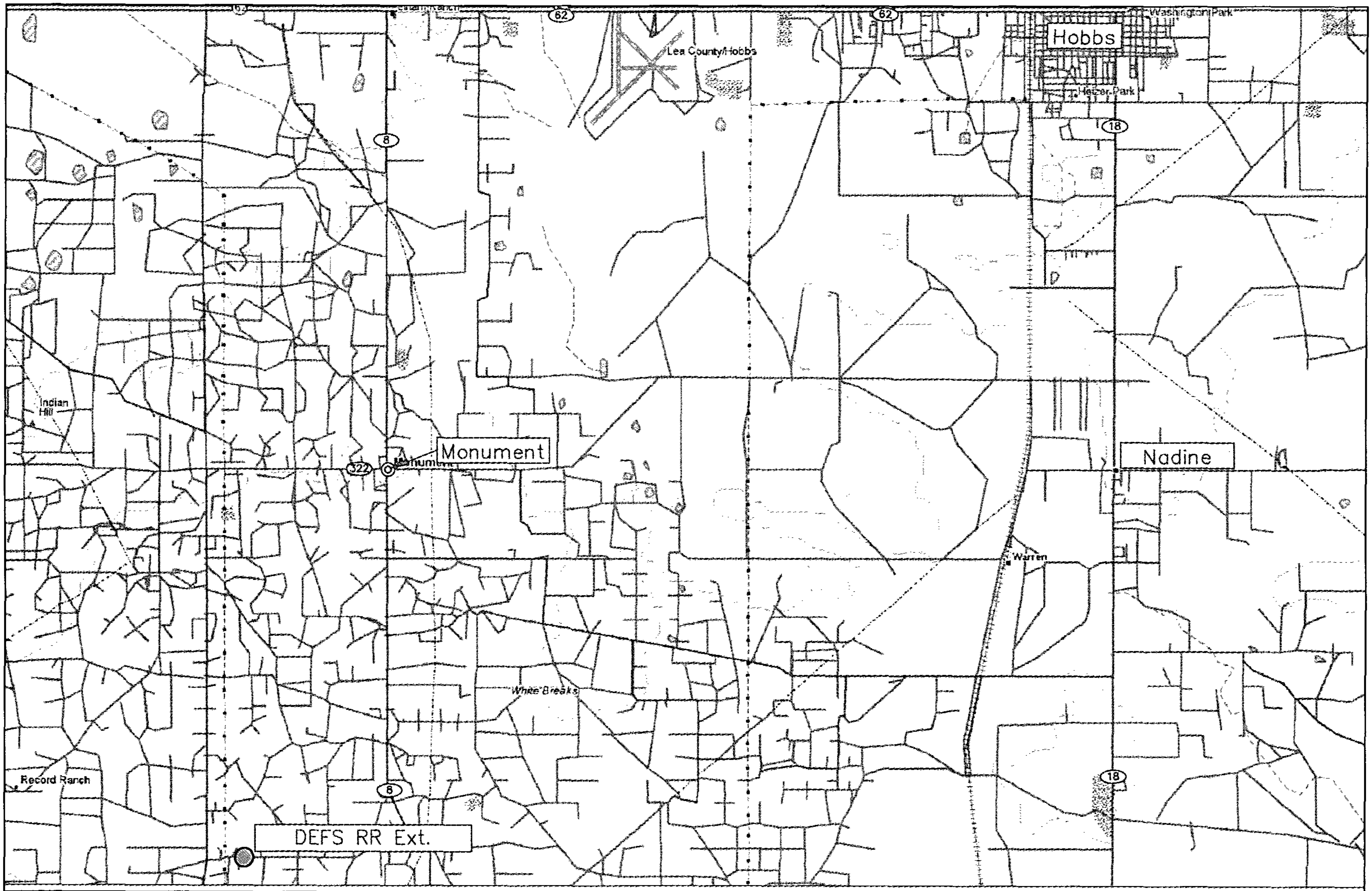

Figure 1
Area Map
Duke Energy Field Services
RR Ext.

Lea County, New Mexico
NE 1/4 of the NW 1/4, Sec. 19, T20S, R37E
N 32° 33' 44.42" W 103° 17' 30.26"
Elevation: 3,532 feet amsl

DWG By: Iain Olness
April 2006

REVISED:

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1 of 1