3R-417

Groundwater Monitor Well Installation Report

Date: 3/2010

Enterprise Products™

ENTERPRISE PRODUCTS PARTNERS L.P.
ENTERPRISE PRODUCTS OPERATING LLC

ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

July 1, 2010

Return Receipt Requested – 7009 2820 0002 5082 5804

District Copy
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Mr. Jim Griswold
Senior Hydrologist
Environmental Bureau
ENMRD/Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Groundwater Monitor Well Installation Report
Enterprise Field Services, LLC
CPS-1989 Cathodic Protection Well
OCD Case# 3RP-417

Dear Mr. Griswold:

Enterprise Field Services, LLC (Enterprise) is currently investigating groundwater conditions at the former location of the Enterprise cathodic protection station CPS-1989. Low pH artesian groundwater discharges were observed from the cathodic protection well at this location during March 2008, and the well was ultimately removed from service during November 2009. On November 24, 2009, the New Mexico Oil Conservation Division (OCD) requested that Enterprise Field Services, LLC (Enterprise) submit a work plan for investigation of groundwater conditions at the former well location. This work plan was submitted to the OCD on December 11, 2009, and was approved by the OCD in correspondence dated December 21, 2009.

The attached report documents installation of three monitor wells at the site. The wells were installed at three different depth intervals identified as permeable zones by e-logging of the well boreholes. One monitor well (MW-1), installed in the shallowest permeable zone, produces only limited amounts of groundwater. This well is being evaluated to determine if it is capable of yielding representative groundwater samples due to potential construction problems encountered during installation of the well, or if the aquifer at is location is very low yield. The remaining wells (MW-2 and MW-3) are under artesian conditions, and appear to be capable of yielding representative groundwater samples.

Enterprise is currently evaluating and preparing reports from the initial monitoring events conducted at the site. This will be reported to the OCD as soon as possible, and will include an evaluation of monitoring results and recommendations for future actions. Please do not hesitate to contact me at (713) 381-2286, or drsmith@eprod.com, if you have any questions regarding this report.

P.O. Box 4324
Houston, Texas 77210-4324
713.381.6500

1100 Louisiana Street
Houston, Texas 77002-5227
www.eppip.com

Mr. Jim Griswold
Re: Enterprise CPS-1989
July 1, 2010

Sincerely,
Enterprise Field Services, LLC

David R. Smith, P.G.
Sr. Environmental Scientist

/bjm
Enclosure

cc: w/ copy
Leonard Lowe
Environmental Bureau
ENMRD/Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Brandon Powell
Environmental Specialist
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

Robert Genualdi
District Supervisor
NM Office of the State Engineer
100 Gossett Dr., Suite A
Aztec, NM 87410

Jim Lovato
Petroleum Engineer
Bureau of Land Management
1235 La Plata Highway, Suite A
Farmington, NM 87401

w/o copy
Cindy Gray
Senior Scientist
Souder, Miller & Associates
612 E. Murray Dr.
Farmington, NM 87499

ENTERPRISE FIELD SERVICES, LLC
CPS 1989 FORMER CATHODIC PROTECTION STATION
NMOCD CASE # 3RP-417
GROUNDWATER MONITORING WELLS INSTALLATION REPORT
SAN JUAN COUNTY, NEW MEXICO
MARCH 2010 (Rev. 06/03/10)

SMA
Souder, Miller & Associates • P.O. Box 248 • Farmington, NM 87499
(505) 325-5667 • fax (505) 327-1496

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1.0 EXECUTIVE SUMMARY

On behalf of Enterprise Field Services, LLC (Enterprise), Souder, Miller & Associates (SMA) supervised the construction of three groundwater monitoring wells at the former CPS 1989 cathodic protection well site, herein referred to as CPS 1989, located in the NE ¼ NE ¼ (Unit Letter A), Section 13, Township 28 North, Range 10 West, N.M.P.M., San Juan County, New Mexico. Field work was performed from February 9, 2010 through March 25, 2010. Figures 1 and 2 illustrate the regional orientation of the site.

Three groundwater monitoring wells MW-1 (150' well), MW-2 (280' well) and MW-3 (500' well) were completed at the site. Figure 3 depicts the site layout.

2.0 INTRODUCTION

This report details the drilling, construction, air lifting development, and initial field screening activities for the three groundwater monitoring wells completed at the CPS 1989 cathodic protection well site. SMA performed the work pursuant to contract between the Enterprise and SMA, in accordance with the December 11, 2009 Work Plan approved by the New Mexico Oil Conservation Division (NMOCD) on December 21, 2009. The Work Plan and NMOCD approval documents are included in Appendices A and B.

3.0 OBJECTIVES

After NMOCD approval of the proposed Work Plan, and to fulfill an NMOCD directive, the groundwater monitoring wells were drilled to determine if the acidic groundwater found in the original CPS 1989 cathodic protection well has migrated beyond the immediate CPS 1989 wellbore.

4.0 BACKGROUND

On March 7, 2008, it was discovered that the Enterprise cathodic protection station CPS-1989 was producing water under artesian conditions. The pH of the water discharge was measured to determine if it was the source of corrosion observed on the surface well controls. After confirmation of the low pH of the discharge, reportedly a pH of 2.0, the NMOCD was notified of the release on March 18, 2008. The OCD assigned Case # 3R-417 to the site, and requested an investigation of the source of the discharge. In the interim, a system was installed to capture the water discharge for proper disposal. The last samples of the water discharge prior to plugging and abandonment of the well were obtained on September 29, 2009, and October 30, 2009. The pH of the discharged water measured at these sampling events was 3.1 and 3.3, respectively.

The OCD has postulated that the coke breeze utilized in the construction of CPS-1989 is the suspected source of the low pH water, and directed Enterprise to plug and abandon the well after all of the coke breeze had been removed from the well. From the time of the initial OCD notification until P&A work started, the water was collected on site, neutralized and then trucked to a permitted SWD

well for proper disposal. SMA was contracted to monitor and supervise the plugging and abandonment operations. A-Plus Well Service was contracted to provide the rig and crew based on their plugging experience.

The CPS 1989 well was 500 feet deep. Difficulties were encountered during the coke breeze and anode removal at a depth of 242 feet. The operations were stopped at that depth due to unstable downhole conditions. The NMOCD granted a conditional approval to plug and abandon the well at that depth provided that Enterprise drill groundwater monitoring well(s) to determine if the low pH groundwater is migrating.

5.0 REGIONAL GEOLOGY

The project setting is in the central portion of the San Juan Basin southeast of Bloomfield, New Mexico. The well site is adjacent to the Munoz Canyon arroyo and is situated on the east alluvial bank of the arroyo. The site is located on and the wells are drilled into the slightly easterly dipping Nacimiento Sandstone. The Nacimiento Sandstone is of upper Paleocene age and is composed of brown and grey sandstones with some greenish and grey shales.

6.0 APPROACH

SMA's approach for the project was to use standard water well designs, materials specifications and drilling methods. Modifications were made to the Health and Safety Plan to address the potential for encountering low pH water under artesian conditions. SMA contracted Hydrogeologic Services, Inc. (HGS) of Albuquerque, NM to drill and complete the three groundwater monitoring wells. Drilling with air rotary technology was the original approach. However, unstable subsurface conditions below the surface casing necessitated a change, with the concurrence of NMOCD, to standard mud rotary drilling methods to stabilize the boreholes.

7.0 GROUNDWATER MONITORING WELL DRILLING AND INSTALLATION

From February 9, 2010 to March 4, 2010, HGS, under SMA supervision, advanced three groundwater monitoring wells. Three groundwater monitoring wells were drilled and installed at the site ultimately utilizing a closed loop mud rotary drilling technique. The following sections discuss methods and procedures that were utilized during the drilling and installation of all three monitoring wells.

General sequence of operations:

1. Move in drilling rig, water storage tanks, and miscellaneous equipment.
2. Haul water from commercial sources.
3. Spud well, drill to conductor casing depth.
4. Set conductor casing.

5. Cement conductor casing to surface. (Conductor casing on MW-1 also serves as surface casing)
6. Drill to surface casing depth.
7. Set surface casing with 50 ft of cement on bottom, Quick Grout to 10 ft, then cement to ground surface. (MW-2 and MW-3 only)
8. Drill to total depth (TD) with 7 7/8" bit.
9. Run open hole geophysical logs (MW-3 deep well only).
10. Run 4" production casing to total depth with appropriate screen interval and sediment sump.
11. Place 10/20 silica sand pack from TD to 5 ft above top of screen.
12. Place 10 ft of 3/8" Hole Plug (bentonite pellets) on top of sand pack.
13. Place Quick Grout to 50 ft below surface.
14. Place cement to surface on top of Quick Grout.
15. Air lift well to develop well to remove any drilling contamination.

7.1 WATER HAULING AND DRILLING FLUID DISPOSAL

Water hauling for drilling and cementing activities was performed by Three Rivers Trucking of Farmington, New Mexico. Fresh water was transported to the site from Bloomfield, New Mexico. Waste drilling fluids from the closed loop drilling system were transported by various Farmington, New Mexico area contractors' vacuum trucks. The solid drill cuttings were disposed at properly permitted landfarm facilities, Industrial Ecosystems, Inc. and Envirotech. The liquid portion was disposed at the Key Energy Services water disposal facility. Disposal manifests are attached in the Appendices.

7.2 LITHOLOGIC LOGGING

SMA conducted all lithologic logging activities. Lithological sample descriptions consisted of general mineralogy and sample characteristics including color, grain size, grain shape, degree of cementation, and acid response.

Lithological descriptions are located on "Geophysical, Lithological & Well Construction Diagrams" attached in Appendix C.

7.5 OPEN HOLE GEOPHYSICAL LOGGING

After the production casing borehole TD was reached in MW-3, Jet West of Farmington, New Mexico performed open hole geophysical logging of the well. The open hole geophysical logging suite included Gamma Ray, Bulk Density, Neutron, Temperature, Electric Resistivity. Since MW-3 was the deepest well, the geophysical logs from MW-3 are also used to represent the shallower MW-2 and MW-1 wells. Geophysical logs are included as part of Appendix C.

Screened intervals were initially selected based on the geophysical logs and approved by NMOCD in an e-mail dated February 19, 2010.

8.0 CONSTRUCTION DETAILS SPECIFIC TO EACH GROUNDWATER MONITORING WELL

8.1 SUMMARY OF PLANNED VS. ACTUAL WELL CONSTRUCTION DETAILS

Due to field conditions encountered and results of geophysical well logs, changes were necessary to the construction details of the NMOCD approved Work Plan. All changes were discussed with NMOCD representatives and Enterprise personnel before implementation.

MW-1	Drilling Method	Total Depth	Surface Casing Size	Surface Casing Depth	8" PVC Depth	4 " PVC Depth	Screened Interval
Proposed	Air Rotary	130'	10 ¾"	30'	NA	130'	105' to 125'
Actual	Mud Rotary	149'	8 5/8"	40'	NA	149'	104' to 134'

NOTE: MW-1 was initially drilled with air rotary to 140'; downhole instability and formation sloughing caused this well to be re-drilled and cleaned out with mud rotary. The 4" casing was then set.

MW-2	Drilling Method	Total Depth	Surface Casing Size	Surface Casing Depth	8" PVC Depth	4 " PVC Depth	Screened Interval
Proposed	Air Rotary	275'	13 3/8"	30'	150'	275'	250' to 270'
Actual	Mud Rotary	290'	12 ¾"	60'	160'	277'	227' to 267'

MW-3	Drilling Method	Total Depth	Surface Casing Size	Surface Casing Depth	8" PVC Depth	4 " PVC Depth	Screened Interval
Proposed	Air Rotary	500'	13 3/8"	30'	290'	500'	475' to 495'
Actual	Mud Rotary	495'	12 ¾"	60'	322'	495'	405' to 455'

8.2 CONSTRUCTION DETAILS FOR MONITORING WELL MW-1 INSTALLATION SPECIFIC DETAILS

MW-1: From February 9, 2010 to February 10, 2010, monitoring well MW-1 was drilled with air rotary drilling technology. A 12 ¼" borehole was drilled to a depth

of 40 ft and the 8 5/8" 16.96 lb/ft conductor casing was cemented from total depth (TD) to ground surface. The 7 7/8" borehole for the production casing was drilled to a depth of 140 feet. The borehole collapsed from below the conductor casing and was temporarily abandoned for later re-entry. On February 12, 2010, NMOCD verbally approved a change to a closed loop mud rotary drilling system. A Revised Work Plan was submitted to NMOCD February 16, 2010, reflecting that change and subsequently approved. February 24, 2010 through February 25, 2010, the 7 7/8" production casing borehole was re-drilled to 140 feet with mud and cleaned out to TD. The well was then constructed with 4 inch inside diameter schedule 40 PCV well casing, a 15 foot sediment sump from 149 ft to 134 ft, 30 ft of 0.010 slotted schedule 40 PVC well screen from 134 to 104 ft. The filter pack consisting of10/20 Colorado Silica Sand was then placed by tremmie pipe from total depth to five feet above the well screen. 5 ft of Hole Plug was placed above the sand pack, Quick Grout was placed from the top of the Hole Plug to 50 ft, and cement was then placed from 50 ft to ground surface.

8.3 CONSTRUCTION DETAILS FOR MONITORING WELL MW-2 INSTALLATION SPECIFIC DETAILS

MW-2: From February 25, 2010 to March 3, 2010 the MW-2 monitoring well was drilled and constructed. The conductor casing borehole was drilled with 16" bit to a depth of 60 ft. The 12 ¾" conductor casing was set at 60 ft and cemented. The 12 ¼" surface casing borehole was drilled to a depth of 160 ft, the 8" PVC casing was set to 160 ft, cement was placed at the bottom 50 ft, Quick Grout was placed from the top of the cement to 10 ft, and cement was then placed from 10 ft to ground surface. The 7 7/8" production casing borehole was drilled to a depth of 280 ft. The 4" production casing was run to a depth of 277 ft. A sediment sump was placed from 277 ft to 267 ft, a 40 ft section of 0.010" screened pipe was placed from 267 ft to 227 ft. 10/20 mesh sand was placed from TD to 5 ft above the screen (TD to 222 ft), 10 ft of Hole Plug was placed above the sand pack, Quick Grout was placed from the top of the Hole Plug to 50 ft (212 to 50 ft), cement was then placed from 50 ft to ground surface.

8.4 CONSTRUCTION DETAILS FOR MONITORING WELL MW-3 INSTALLATION SPECIFIC DETAILS

MW-3: From February 10, 2010 to February 23, 2010, the MW-3 monitoring well was drilled and constructed. The conductor casing borehole was drilled with a 16" bit to a depth of 60 ft. The 12 ¾" conductor casing was set at 60 ft and cemented. The hole was drilled to TD of 495 ft with a 7 7/8" drill bit. The well was then open-hole logged by Jet West from TD to 60 ft.

The 12 ¼" surface casing borehole was reamed from 60 ft to 290 ft, the 8" PVC casing was run (the casing settled into the soft hole and came to rest at 322 ft) and cement was placed at the bottom 50 ft, Quick Grout was placed from the top of the cement to 10 ft, and cement was then placed from 10 ft to ground surface.

The 7 7/8" production casing borehole was cleaned out from 322 ft to TD of 495 ft. The 4" production casing was run to a depth of 495 ft. A sediment sump was placed from 495 ft to 455 ft, and a 50 ft section of 0.010" screened pipe was placed from 455 ft to 405 ft. 10/20 mesh sand was placed from TD to 5 ft above the screened interval (TD to 400 ft), 10 ft of Hole Plug was placed above the sand pack, Quick Grout was placed from the top of the Hole Plug to 60 ft (385 to 60 ft), and cement was then placed from 60 ft to ground surface.

9.0 OPERATIONAL DIFFICULTIES ENCOUNTERED

The initial work plan was devised using the air rotary method to drill the various boreholes for the 3 monitoring wells. The drilling was started on MW-1 with air rotary. The 12 ¼" conductor casing borehole was drilled to a pre-determined depth of 30 ft. The driller indicated that at the depth of 30 ft, the borehole was still in unstable alluvial sand. The decision was made to drill to 40 ft and set the 8 5/8" casing at that depth. The borehole was drilled to 40 ft and cemented to surface.

A 7 7/8" bit was then used to drill the production casing borehole to the pre-determined depth of 130 ft, as the drilling progressed, it was noted that the borehole below the 8 5/8" casing may be collapsing. The TD of 140 ft was reached and the borehole was sloughing in. During the efforts to keep the borehole open, air from the drilling was noted as breaching the surface, evident as small bubbles in standing water on the ground 10 to 15 ft from the well. The drilling operations were halted and the drill bit was pulled from the well. A conference call was set up including; HGS, SMA, OCD, SMA and Enterprise. The decision was made to temporarily abandon the borehole until the proper equipment was brought to location to drill the remaining boreholes with drilling mud. MW-1 was also to be re-entered with drilling mud. Subsequent conductor boreholes were drilled to 60 ft and all boreholes were drilled with drilling mud. No further borehole instability problems were encountered.

10.0 GEOLOGIC, GEOPHYSICAL AND HYDROLOGIC INTERPRETATION

The wells are drilled into the Nacimiento Sandstone with a water-bearing zone identified in each of the wells. Refer to the open-hole electric log in the Appendices. The MW-1 has a water-bearing zone from 105 ft to 138 ft. This zone is a low permeability, low pressure and low volume water zone. The lithological sample analysis shows the sand to be light brown fine to coarse sand with some grey shale zones.

The MW-2 represents the water-bearing zone from 232 ft to 273 ft. The lithological sample analysis shows the sand to be light grey fine to coarse sand. This zone has enough pressure to produce artesian flow. The flow has been measured at approximately 13 gallons of water per hour to surface. The shut-in pressure of this well builds to 19 psi surface gauge pressure.

The MW-3 has a water-bearing zone from 410 ft to 456 ft. The lithological sample analysis shows the sand to be light grey fine to coarse sand. This zone has enough pressure to produce artesian flow. The flow has been measured at approximately 84 gallons of water per hour to surface. The shut-in pressure of this well builds to 34 psi surface gauge pressure.

11.0 CONCLUSIONS

Based on the data obtained during drilling, construction, and development of MW1, MW2, and MW3, the monitoring wells drilled do not exhibit the low pH water production that was present in the original CPS 1989 well. The water-bearing intervals noted as present in the CPS 1989 and evident in the e-logs run, appear to correlate to the water-bearing intervals encountered in the three monitoring wells at equivalent depths. Both MW2 and MW3 are considered artesian, producing water to surface under pressure. MW1 does not exhibit that characteristic and recharges very slowly.

12.0 RECOMMENDATIONS

The wells will be monitored and sampled in accordance with the NMOCD approved workplan. Contingent on rates of recovery and water chemistry results during planned monitoring events, replacement of MW1 may be appropriate.

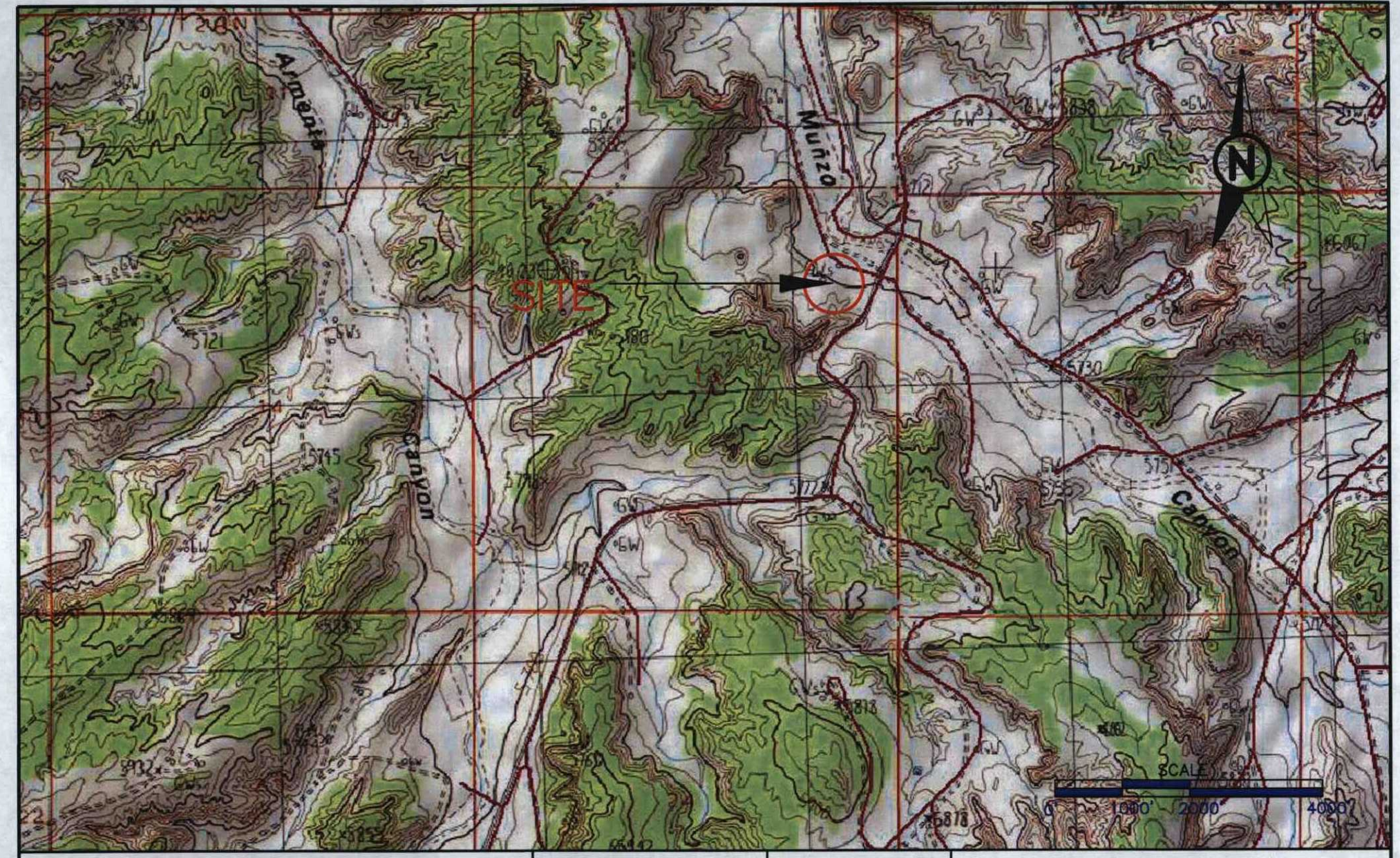
Figures

SMA
Civil / Environmental
Scientists & Engineers

612 E. MURRAY DR. PH. (505) 325-5667
FARMINGTON, NM 87401 FAX (505) 327-1496

APPROVED: LD	DATE: 01/19/10
DRAWN BY: TLONG	DATE: 01/19/10
REVISIONS BY:	DATE:
PROJECT #5119748	FIGURE: 2

AERIAL PHOTOGRAPH
CPS 1989
ENTERPRISE, LLC.
NE ¼ NE ¼ (UNIT LETTER A)
SECTION 13, T 28N R10W
BLOOMFIELD, NEW MEXICO

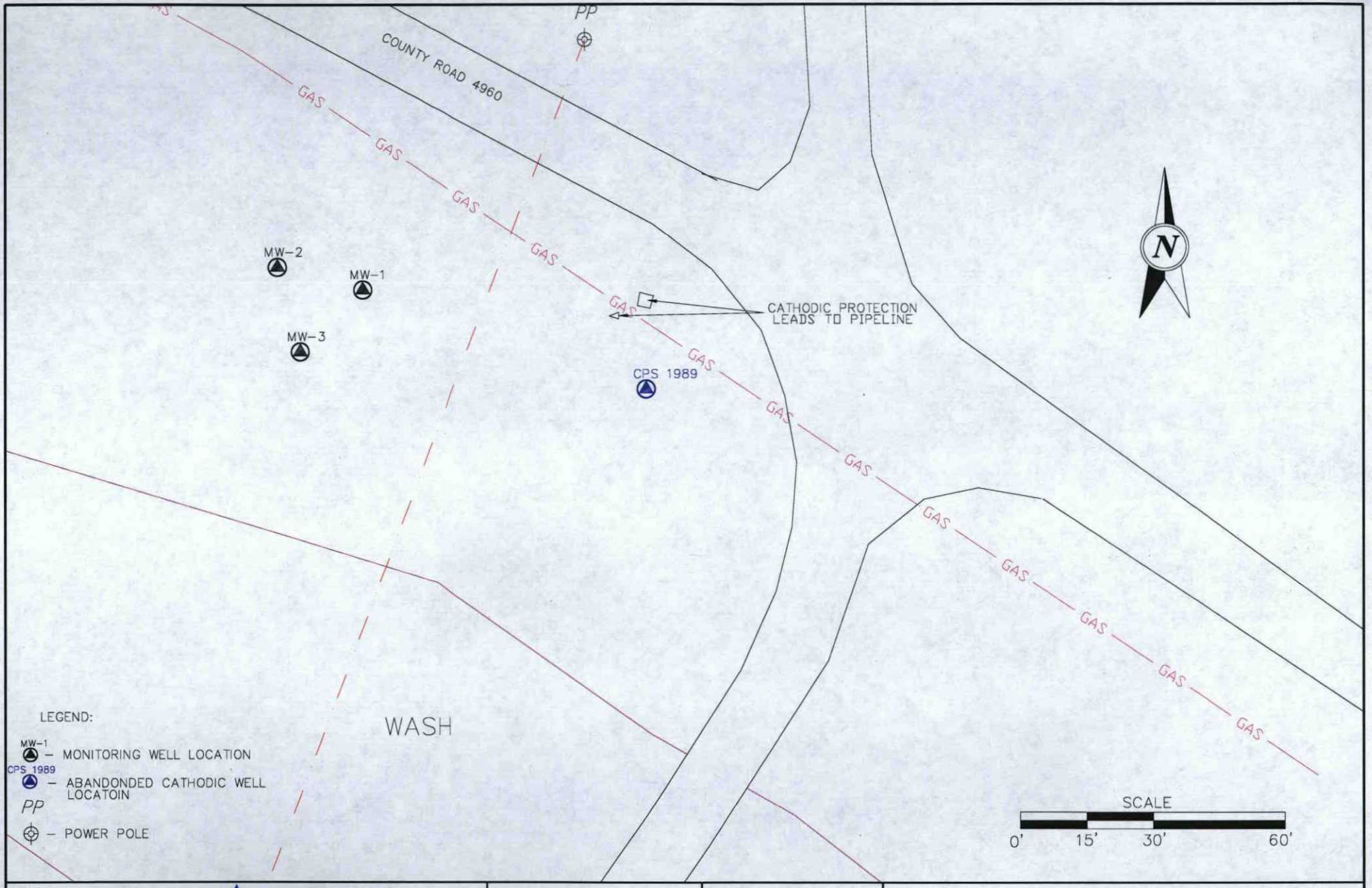


SMA
Civil / Environmental
Scientists & Engineers

612 E. MURRAY DR. PH. (505) 325-5667
FARMINGTON, NM 87401 FAX (505) 327-1496

APPROVED: LD	DATE: 04/02/10
DRAWN BY: TLONG	DATE: 04/02/10
REVISIONS BY:	DATE:
PROJECT #5119748	FIGURE: 1

VICINITY MAP
ENTERPRISE, LLC.
CPS 1989
NE ¼ NE ¼ (UNIT LETTER A)
SECTION 13, T 28N R10W
BLOOMFIELD, NEW MEXICO



SMA
Civil / Environmental
Scientists & Engineers
612 E. MURRAY DR.
FARMINGTON, NM 87401
PH. (505) 325-5667
FAX (505) 327-1496

APPROVED: LDIEDE	DATE: 4/1/10
DRAWN BY: TLONG	DATE: 4/1/10
REVISIONS BY:	DATE:
PROJECT #5119748	FIGURE: 3

SITE MAP
ENTERPRISE, LLC.
CPS 1989
NE 1/4 NE 1/4 SECTION 13 T28N R10W
SAN JUAN COUNTY, NEW MEXICO

Appendix A: Approved Work Plan

Enterprise Products™

ENTERPRISE PRODUCTS PARTNERS LP
ENTERPRISE PRODUCTS OPERATING LLC
ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

December 11, 2009

Federal Express No.
8689 3269 5120

Mr. Jim Griswold
Environmental Bureau Chief
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Proposed Groundwater Investigation Work Plan
Enterprise Field Services, LLC
CPS-1989 Cathodic Protection Well
OCD Case #3R0417

Dear Mr. Griswold:

On November 24, 2009, the New Mexico Oil Conservation Division (OCD) requested that Enterprise Field Services, LLC (Enterprise) provide a work plan for investigation of groundwater conditions at the site referenced above. This correspondence provides our proposed work plan for this investigation.

Enterprise is currently evaluating the occurrence of low pH water at cathodic protection well CPS-1989. Damage to well head controls due to corrosion was discovered by Enterprise personnel on March 6, 2008. After it was determined that the source of the equipment corrosion was a discharge of low pH (~2.0) groundwater, the OCD was notified on March 13, 2008.

Subsequent to this discovery, Enterprise implemented controls to prevent site access and to collect the low pH water discharge prior to offsite disposal. Investigations were then conducted to determine the characteristics and source of the groundwater discharge. On June 6, 2008, Enterprise notified the OCD that an attempt would be made to pump water from the well to determine if the low pH was localized to the well bore, or indicative of another source. This attempt was not successful due to casing obstructions in the cathodic well vent tube. This was reported to the OCD in the *CPS-1989 Cathodic Protection Well Investigation Report*, dated September 30, 2008. Enterprise did not believe that the well was the source of the low pH water, and requested that the OCD approve plugging and abandonment of the well.

P. O. BOX 4324
HOUSTON, TX 77210-4324
713.381.6500

1100 LOUISIANA STREET
HOUSTON, TX 77002-5227
www.epplp.com

A Notice of Intention of Plug and Abandon CPS-1989 was filed with the OCD on July 22, 2009. The OCD approved this request, contingent Enterprise on performing an investigation to determine the source of the low pH groundwater discharge. Plugging and abandonment of the well was initiated on November 3, 2009, and on November 20, 2009, the OCD was notified that drilling efforts had ceased due to the increasing loss of borehole integrity and inability to remove the anode beds. The OCD provided their approval to cease drilling operations at this time, and to begin plugging operations. Only approximately half of the 500' deep well was successfully plugged.

A site meeting was held on December 2, 2009 with OCD, Bureau of Land Management (BLM) and Enterprise representatives to determine how to best proceed, and evaluate locations for site monitor wells. Enterprise believes the attached work plan will allow determining the hydrogeologic conditions at this site, and the source of the low pH groundwater occurrence. We are also evaluating recent information regarding the coke breeze utilized in this well to determine if it is the potential source.

We appreciate the OCD assistance on this project, and will implement the investigations proposed in this work plan as soon as possible following OCD approval. Please do not hesitate to contact me at (713) 381-2286, or drsmith@epco.com if you have any questions.

Sincerely,

David R. Smith, P.G.
Sr. Environmental Scientist

/bjm
Attachments

cc: Glenn Von Gonten, NMOCD Santa Fe, NM
Charlie Perrin, NMOCD/Aztec, NM
Brandon Powell, NMOCD/Aztec, NM
Cindy Gray, Souder Miller and Associates
Scott Hall, BLM
Sherry Landon, BLM

WORK PLAN
EPCO CPS 1989 CATHODIC WELL
GROUNDWATER MONITORING PROGRAM

Introduction

Souder, Miller & Associates (SMA) is pleased to submit this groundwater monitoring work plan on behalf of Enterprise Products LLC for a site adjacent to the EPCO CPS 1989 Cathodic Well located in the NE ¼ NE ¼ (Unit Letter A), Section 13, Township 28 North, Range 10 West, N.M.P.M.

The objective of this work plan is to investigate if the subsurface acidic water found in the CPS 1989 well is localized at the CPS 1989 well bore or if the acidic water has been or is currently migrating. The intervals of the water-bearing zones will be identified and the groundwater from each groundwater interval will be analyzed. This work plan has been prepared for Enterprise in accordance with the verbal request from EPCO to SMA on December 1, 2009.

Task: Geologic Research, Permitting, ROW Acquisition and Pre Job Preparation

The following are the general project management tasks to be completed prior to any field work at the site:

Geologic Research, Permitting and ROW: SMA will conduct research on the local and regional geology and hydrogeology to determine possible sources of the acidic water and aquifer characteristics. SMA will contact the NMOCD, Bureau of Land Management (BLM), and the New Mexico State Engineers Office to obtain the required permit applications and initiate the permitting process for the groundwater monitoring wells. EPCO will review the status of all right-of-ways and easements that will be impacted by the drill site.

Health and Safety Plan: A site specific health and safety plan will be developed in accordance with Enterprise requirements. Particular attention will be given to address in the potential hazards related to low pH fluids. All persons on site during field activities will be required to participate in daily safety briefings and sign the site health and safety plan. These persons may include personnel from SMA, EPCO, New Mexico Oil Conservation Division (NMOCD) and any subcontractors.

Utility Clearance: SMA will notify New Mexico One Call to identify any underground utilities associated with this well site. The utility locating service will be notified at least three (3) days before proceeding with any invasive field work. SMA will also work with EPCO to ensure clearance from underground structures.

Task: Monitoring Well Installation, Construction and Completion

SMA proposes installing one set (nest) of groundwater monitoring wells in the location indicated by NMOCD personnel during the site walk December 2, 2009 (see attached site map). The nest will consist of a group of three wells in close proximity to each other and within 50 to 100 feet of the plugged CPS 1989 well in a presumed down gradient area. The wells in the nest will be drilled to estimated depths of; 130 feet, 275 feet and 500 feet below ground level. Samples of the drill cuttings will be collected at ten foot intervals for lithologic description (ASTM D 2488-93, *Standard Practice for Description and Identification of Soils*). The wells will be drilled and completed according to the following specifications:

The 130 foot well will be constructed with a 10 3/4" conductor pipe to approximately 30 feet bgs. The conductor pipe will be installed and cemented to the surface using tremmie pipe and cement and will be allowed to set for at least 12 hours. Then an eight inch borehole will be drilled to 130 feet bgs. A 4" PCV production casing will be constructed with 20 feet of 0.010-inch slot size screen with a five foot sediment sump at the bottom. A silica sand (10-20 grade) filter pack will be placed from total depth to five feet above the top of the screened interval. A ten-foot bentonite pellet seal will be placed and hydrated above the filter pack. The annular space above the bentonite will be sealed with cement grout.

The 275 foot well will be constructed with a 13 3/8" steel conductor pipe to approximately 30 feet bgs. The conductor pipe will be installed and cemented to the surface using tremmie pipe and cement, allowed to set for at least 12 hours. Then a 10 3/4" borehole will be drilled through the cement to 150 feet bgs and an 8" PVC surface casing will be cemented to the surface and allowed to set for 12 hours.

A 7 7/8" borehole will be drilled to 275 feet bgs and the 4" PVC production casing will be constructed with 20 feet of 0.010-inch slot size screen with a five foot sediment sump at the bottom. A silica sand (10-20 grade) filter pack will be placed from total depth to five feet above the top of the screened interval, followed by a one-foot fine-grained silica sand filter pack seal. A five-foot bentonite pellet seal will be placed and hydrated above the filter pack. The annular space above the bentonite will be sealed with cement grout.

The 500 foot well will be constructed with a 13 3/8" steel conductor pipe to approximately 30 feet bgs. The conductor pipe will be installed and cemented to the surface. After the cement sets for at least 12 hours, a 10 3/4" borehole will be drilled to 290 ft bgs and an 8" PVC surface casing will be installed and cemented to the surface.

A 7 7/8" borehole will be drilled through the 8" casing to 500 feet bgs and the 4" PVC production casing will be constructed with 20 feet of 0.010-inch slot size screen with a five foot sediment sump at the bottom. A silica sand (10-20 grade) filter pack will be placed from total depth to five feet above the top of the well screen, followed by a one-foot fine-grained silica sand filter pack seal. A five-foot bentonite pellet seal will be placed and hydrated above the filter pack. The annular space above the bentonite will be sealed with bentonite followed by cement grout to surface.

After each well is completed, a 4'X4' reinforced concrete pad will be poured followed by a protective above-ground completion to be secured with a locking device.

Monitoring Well Development Procedures: Upon completion of all groundwater monitoring wells, the subcontracted drilling company will develop the wells using an airlift method until turbidity is minimized or until ten well volumes have been purged. All purged water generated during development activities will be stored in a frac tank for later disposal at a properly permitted facility.

Site and Well Surveying: All monitoring well locations will be surveyed to the nearest 0.1 feet with a total station or GPS survey equipment, referenced to a permanent control point or site benchmark with established UTM coordinates. Elevations of the top of the PVC well casing on the monitoring wells will be surveyed to the nearest 0.02 feet relative to the site benchmark using an auto level. All well coordinates (x, y, z) will be included in the Groundwater Investigation Report. Elevations will be referenced to the closest USGS benchmark or a National Geodetic Survey (NGS) monument so

that actual elevations relative to a sea level datum are provided. Depth to groundwater will be measured from the permanent mark.

Task: Data Analysis and Interpretation

Samples of water encountered in the drilling operation will be field tested on-site for pH. At completion of drilling, Open Hole Logs will be run to identify the water-bearing intervals within each well.

Task: Monitoring Well Installation Report

SMA will prepare a report for submittal to NMOCD, including a discussion of drilling and sampling activities, well construction details and field analytical results. The report will include the following site maps:

- Site location map referenced to USGS Quadrangle map
- Site map

The report will include the following tables:

- x, y, and z coordinates of monitoring well heads
- Elevations of ground water intervals
- Field analytical results for pH
- Results of ground water laboratory analyses

Appendices will include:

- Boring logs with drill cuttings-based lithologic descriptions
- Open hole electric logs
- Monitoring well completion diagrams
- Laboratory analytical reports

Task: Quarterly Groundwater Monitoring

SMA will collect samples for quarterly monitoring from each well in the nest.

Monitoring Well Sampling Procedures: The wells will be gauged for depth to groundwater prior to sampling. After purging a minimum of three well bore volumes using a Grundfos pump or similar equipment, decontaminated between the sampling of each well, SMA will collect groundwater samples using a clean bailer. .

All groundwater sample containers will be labeled with the date and time, sealed with evidence (custody) tape, and stored on ice for transport to the qualified laboratory. One groundwater sample will be collected from each well for laboratory analysis.

Waste Water Disposal Procedure: Water purged from monitoring wells for sampling will be contained in appropriately labeled 55-gallon drums and securely stored on site for future disposal. The water in the drums will be disposed at an appropriately permitted facility, with the waste water disposal manifest provided in the quarterly report.

Ground Water Analytical Methods: Groundwater samples will be analyzed for pH, Conductivity, Alkalinity, Hardness, Total Dissolved Solids (TDS), and Cat ion/Anion Analysis.

Task: Quarterly Groundwater Monitoring Reporting

Quarterly Monitoring Reports: A report will be prepared for each quarterly monitoring event to document monitoring activities.
The monitoring reports will include the following maps:

- Site location map referenced to USGS Quadrangle map
- Site map

The reports will include the following tables:

- Results of groundwater analyses
- Elevations of groundwater

Appendices of the report will include:

- Sampling protocols
- Laboratory reports
- Documentation and manifests for purge water disposal
- x, y, and z coordinates of monitoring well heads
- Results of groundwater analyses, if applicable
- Elevation of groundwater and surface water, if applicable

Proposed Schedule of Activities

Research, Permitting, and Pre Job Preparation: Initiated within 10 working days following NMOCD approval of this workplan and approval by Enterprise Products, LLC.

Drilling, Completion, and Well Development: Site prep and mobilization within 15 working days after NMOCD workplan approval and BLM approval of ROW.

Monitoring Well Installation Report: A report will be prepared to document the installation of the nest of monitoring wells and the findings of the initial investigation. Such report will be prepared within 45 days after completion of the installation to allow time for receipt of laboratory analytical results.

Quarterly Groundwater Monitoring: If appropriate based on the findings of the initial investigation during drilling, quarterly monitoring of the groundwater will be scheduled.

Attachment:

Site Map with proposed location of the three monitoring well nest


APPROXIMATE
NEST LOCATION
CPS 1989
WELL LOCATION
© 2009 Europa Technologies
© 2009 Google
Pointer 13 S 246342.72 m E 4061771.36 m N elev 5695 ft
Streaming 100%
Eye alt 6868 ft

Appendix B: NMOCD Approvals and Correspondence

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor
Joanna Prukop
Cabinet Secretary
Jim Noel
Deputy Cabinet Secretary

Mark Fesmire
Director
Oil Conservation Division

December 21, 2009

RECEIVED DEC 2 8 2009

Mr. David R. Smith
Senior Environmental Scientist
EPCO, Inc., EHS&T
2727 North Loop West
Houston, Texas 77008-1044

Re: Approval of Groundwater Investigation Workplan
CPS-1989 Cathodic Protection Well (3RP-417)
Unit Letter A, Section 13, Township 28 North, Range 10 West, NMPM
San Juan County, New Mexico

Mr. Smith,

The Oil Conservation Division (OCD) approves the investigation workplan from Enterprise Products (EPCO) dated December 11, 2009 with respect to sulfur contaminated and acidic groundwater previously found to be emanating from an EPCO cathodic protection well at the location cited above. This preliminary investigative effort includes sampling of three (3) monitoring wells which are to be installed in the immediate area of the recently abandoned cathodic protection well. Each monitoring well is intended to access a distinct vertical interval of isolated groundwater.

OCD's approval is contingent upon the following additional conditions not otherwise addressed in the workplan:

- The OCD District 3 office in Aztec shall be notified at least 48 hours before any field activities are undertaken.

- The drilling contractor shall contain any low pH or high sulfate groundwater which may appear at the surface.

- The final length and positioning of the screened intervals in each of the three monitoring wells shall be determined based upon observations made during the drilling process including information gathered from any geophysical logging.

- If additional groundwater zones are identified during drilling or logging, EPCO shall isolate and monitor water quality in those zones.

- EPCO shall make field measurements of pH and conductivity of any water which may appear at surface during drilling, water collected during well development or purging, and upon splits of the water samples submitted for laboratory analysis.

The objective of this effort is to begin to determine the source and spatial extents of the impacted groundwater. OCD may require undertake additional investigation and corrective action based on the

results of this preliminary investigation. If groundwater with a pH of less than 6.0 or with a concentration of sulfates greater than 600 milligrams per liter is further identified during the investigation, the OCD will require EPCO to submit a workplan for initial remediation and further investigation within 30 days of discovery.

OCD's approval of this investigation workplan does not relieve EPCO of its responsibility to comply with all other applicable rules or regulations, including those of the Office of the State Engineer and the Bureau of Land Management. If you have any questions, please feel free to contact me at (505) 476-3465 or by email at *jim.griswold@state.nm.us*.

Sincerely,

Jim Griswold
Senior Hydrologist

JG/jg

cc: Brandon Powell, OCD District 3
Scott Hall, BLM Farmington Office
Cindy Gray, Souder Miller & Assoc.

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

Form C-144 CLEZ
July 21, 2008

For closed-loop systems *that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure*, submit to the appropriate NMOCD District Office.

Closed-Loop System Permit or Closure Plan Application

(that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure)

Type of action: ☒ Permit ☐ Closure

Instructions: Please submit one application (Form C-144 CLEZ) per individual closed-loop system request. For any application request other than for a closed-loop system that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure, please submit a Form C-144.

Please be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.

Operator: Enterprise Field Services, LLC OGRID #:

Address: 1100 Louisiana Street Houston, TX 77002-5227

Facility or well name: CPS #1989, Monitor Wells located near the Burlington, McClanahan #18 Well

API Number: 30-045-07513 (McClanahan #18) OCD Permit Number:

U/L or Qtr/Qtr Unit A, NE NE Section 13 Township 28 N Range 10W County: San Juan

Center of Proposed Design: Latitude 36° 39' 58.61" Longitude 107° 50' 28.63" NAD: ☐ 1927 ☐ 1983

Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.

☒ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC

Operation: ☒ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent) ☐ P&A

☒ Above Ground Steel Tanks or ☐ Haul-off Bins

3.

Signs: Subsection C of 19.15.17.11 NMAC

☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers

☐ Signed in compliance with 19.15.3.103 NMAC

4.

Closed-loop Systems Permit Application Attachment Checklist: Subsection B of 19.15.17.9 NMAC

Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC

☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC

☒ Closure Plan (Please complete Box 5) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Previously Approved Design (attach copy of design) API Number:

☐ Previously Approved Operating and Maintenance Plan API Number:

5.

Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only: (19.15.17.13.D NMAC)

Instructions: Please indentify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.

Disposal Facility Name: Industrial Ecosystems Inc. Disposal Facility Permit Number: NM-01-0010-B

Disposal Facility Name: Basin Disposal Disposal Facility Permit Number: NM-01-005

Will any of the proposed closed-loop system operations and associated activities occur on or in areas that *will not* be used for future service and operations?

☒ Yes (If yes, please provide the information below) ☐ No

Required for impacted areas which will not be used for future service and operations:

☐ Soil Backfill and Cover Design Specifications - - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC

☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

6.

Operator Application Certification:

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): David R. Smith, P.G. Title: Senior Environmental Scientist

Signature: Date: 1/27/10

e-mail address: drsmith@eprod.com Telephone: (713) 381-2286

7.
OCD Approval: ☐ Permit Application (including closure plan) ☒ Closure Plan (only)

OCD Representative Signature: _____ **Approval Date:** _____

Title: _____ **OCD Permit Number:** _____

8.
Closure Report (required within 60 days of closure completion): Subsection K of 19.15.17.13 NMAC

Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.

☐ **Closure Completion Date: 12-10-2009**

9.
Closure Report Regarding Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:

Instructions: Please indentify the facility or facilities for where the liquids, drilling fluids and drill cuttings were disposed. Use attachment if more than two facilities were utilized.

Disposal Facility Name: **EnviroTech** Disposal Facility Permit Number: **NM-01-0011**

Disposal Facility Name: **Basin Disposal** Disposal Facility Permit Number: **NM-01-005**

Were the closed-loop system operations and associated activities performed on or in areas that *will not* be used for future service and operations?

☐ Yes (If yes, please demonstrate compliance to the items below) ☒ No **(Monitor wells to be drilled adjacent to this site, Re-vegetation to be done after completion of THAT project as per BLM requirements)**

Required for impacted areas which will not be used for future service and operations:

☐ Site Reclamation (Photo Documentation)
☐ Soil Backfilling and Cover Installation
☐ Re-vegetation Application Rates and Seeding Technique

10.
Operator Closure Certification:

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): _____ Title: _____

Signature: _____ Date: _____

e-mail address: _____ Telephone: _____

ENTERPRISE FIELD SERVICES, LLC.
Closed-Loop System Plan: Monitor Well Drilling

In accordance with Rule 19.15.17 NMAC, the following plan describes the general Design, Operating & Maintenance, and Closure of the proposed Closed-Loop systems for these wells.

Closed-Loop Design Plan:
The Closed-Loop System will consist of one or more temporary above-ground steel tank(s) or waste pit(s) suitable for holding all cuttings and fluids circulated from the well during the planned rig operations. The tank(s) will be of sufficient volume to maintain a safe free-board between disposal of the liquids and solids from rig operations. Additional design considerations include:

1. This Closed-Loop System will not use a drying pad, temporary pit, below-grade tank or sump.
2. The closed loop pit will include a manifold or cyclone for air drilling.
3. Fencing is not required for an above-ground closed-loop system.
4. It will be signed in compliance with 19.15.17.11.C NMAC.
5. A frac tank will be on location to store fresh or KCl water.
6. Tanks will be placed on active and disturbed areas of the well location and within the existing ROW footprint.

Closed-Loop Operating Plan:
The Closed-Loop System will be operated and maintained: to contain liquids and solids, to aid in the prevention of contamination of fresh water sources, in order to protect public health and the environment. The following steps will be followed to attain this goal:

1. The free liquids in the steel tank(s) will be vacuumed out and disposed of at one of the following facilities depending on the proximity of the well and the disposal volumes: Auga Moss – Pretty Lady (Permit 30-045-30922); Basin Disposal (Permit: NM-01-0005); Sunco Disposal #1 (NM 01-009) or T-N-T Environmental (NM 01-008).
2. Solids in the Closed-Loop tank will be vacuumed out and disposed of at one of the following facilities depending on the proximity of the well and the disposal volumes: Envirotech (Permit Number NM-01-0011); Industrial Ecosystems Inc (Permit NM 1-10-B) or T-N-T Environmental (NM 01-008) on a periodic basis as necessary to prevent over topping.
3. No hazardous waste, miscellaneous solid waste or debris will be discharged into or stored in the tank(s). Only fluids or cuttings intrinsic to, used or generated by rig operations will be placed or stored in the tank(s).
4. The Division District office will be notified immediately of the discovery of compromised integrity of the Closed-Loop System. Upon discovery of the compromised tank, repairs will be enacted immediately.
5. All of the above operations will be inspected each day and any irregularities will be recorded, signed and dated. During rig operations the inspection will be daily.

Closed-Loop Closure Plan:

The Closed-Loop System will be closed in accordance with 19.15.17.13.
This will be done by:

1. Each load or tank will be tested for pH. Any load testing less than six will be treated to reduce acidity before transport to any disposal facility.
2. Liquids will be hauled to one of the following facilities depending on the proximity of the disposal well and disposal volumes: Auga Moss – Pretty Lady (Permit 30-045-30922); Basin Disposal (Permit: NM-01-0005); Sunco Disposal #1 (NM 01-009) or T-N-T Environmental (NM 01-008).

3. Non Exempt fluids will be tested and transported Sunco Disposal #1 (NM 01-009) or T-N-T Environmental (NM 01-008).
4. Solids and sludge will be transported to an approved facility: Envirotech (Permit Number NM-01-0011); Industrial Ecosystems Inc (Permit NM 1-10-B) or T-N-T Environmental (NM 01-008) as reasonable as possible after the rig activities.
5. Removal of the tank(s) from the well location after the rig activities has been completed.
6. At the time of well abandonment, the site will be reclaimed and re-vegetated per BLM requirements as allowed by the NMOCD/BLM memorandum of understanding.

Loren Diede

From: Powell, Brandon, EMNRD [Brandon.Powell@state.nm.us]
Sent: Friday, February 19, 2010 8:37 AM
To: Smith, David; Griswold, Jim, EMNRD
Cc: Sartor, Rodney; Fernald, Donald; Seale, Runell; Cindy Gray (Souder Miller); Loren Diede (SMA)
Subject: RE: CPS-1989 / Recommended Monitor Well Screening Intervals

David-

Good Morning

We have reviewed the logs. You may proceed with SMA's proposed screening intervals.

Thank You
Brandon Powell
Environmental Specialist
New Mexico Oil Conservation
1000 Rio Brazos Rd, Aztec NM 87410
Office: (505) 334-6178 ext. 15
E-mail: Brandon.Powell@state.nm.us

From: Smith, David [mailto:DRSmith@eprod.com]
Sent: Friday, February 19, 2010 5:51 AM
To: Powell, Brandon, EMNRD; Griswold, Jim, EMNRD
Cc: Sartor, Rodney; Fernald, Donald; Seale, Runell; Cindy Gray (Souder Miller); Loren Diede (SMA)
Subject: CPS-1989 / Recommended Monitor Well Screening Intervals

Brandon, I have attached the geophysical log from the CPS-1989 site. SMA has made the following recommendations for the monitor well screening intervals:

MW1 shallow will be TD at 145', surface casing to remain the same, screened interval 105 - 135 followed by a 10' sump

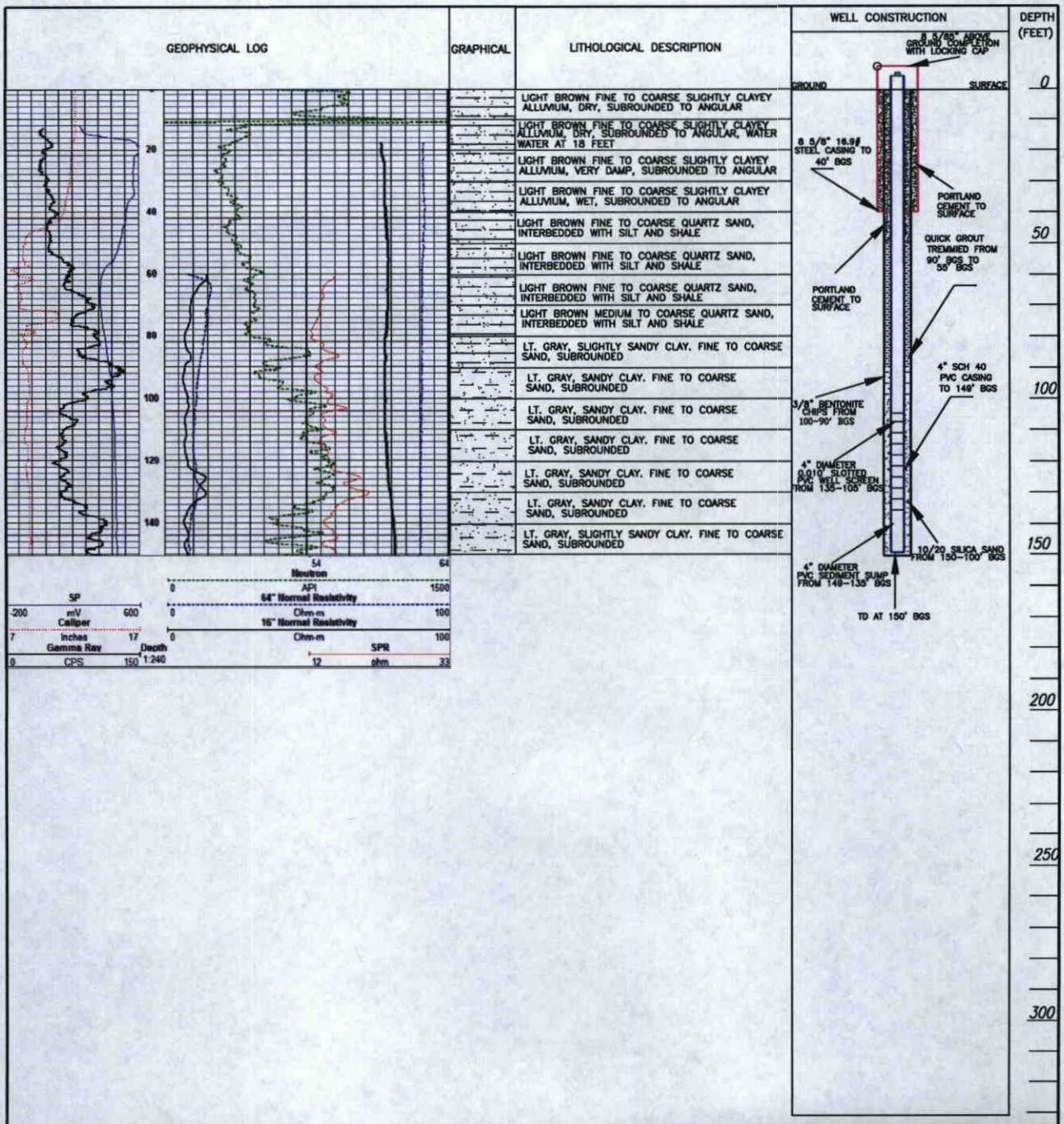
MW2 mid-depth well TD at approx 290, surface casing to 160' to ensure separation vertically from MW1, planned screened interval 230 - 270' followed by a 20' sump, screened interval may be adjusted to 235 - 275'

MW3 deep well TD will be 495', surface casing to 300' to ensure isolation from MW2, planned screened interval 405 - 455' followed by a 40' sump. Reason for deep sump is that hole has already TD at 495 but screened interval only needed to 455' indicated by logs.

I have reviewed the log, and these recommendations look appropriate to me. If the OCD has no comments, I recommend we proceed according to SMA's recommendations. Thanks.

David R. Smith, P.G.
Senior Environmental Scientist
Enterprise Products Operating LLC
1100 Louisiana, Rm 13.037
Houston, TX 77002-5227
Office: (713) 381-2286
Mobile: (713) 501-8136
Email: drsmith@eprod.com

Appendix C: Geophysical, Lithological & Well Construction Diagrams



CONSTRUCTION DETAILS

BORE HOLE: 12 1/4" TO 40 BGS
CONDUCTOR CASING: 8 5/8" 16.96# STEEL TO 40' BGS
CEMENT: PORTAND CEMENT TREMMIED TO SURFACE
BORE HOLE: 7 7/8" TO 149' BGS
PRODUCTION CASING: 4 " SCHEDULE 40 TO 149' BGS;
SEDIMENT SUMP:149'-135' BGS; 4" SCHEDULE 40 PVC
WELL SCREEN: 105'-135'; 4" 0.010' SLOTTED
FILTER PACK: 10/20 COLORADO SILICA SAND FROM TOTAL DEPTH TO 100' BGS
BENTONITE SEAL: 3/8" BENTONITE CHIPS TO 100-90' BGS
ANNULAR SEAL: QUICK GROUT FROM 90-55' BGS
SANITARY SEAL: PORTLAND CEMENT FROM 55' BGS TO SURFACE
SURFACE COMPLETION: 8 5/8" STEEL CASING WITH LOCKING CAP

DATE STARTED: 2/9/20 AND 2/24/10
DATE COMPLETED: 2/25/10
DRILLING COMPANY: HYDROGEOLOGIC SERVICES, INC.
RIG TYPE: SS 30K
DRILLER: KEVIN JONES

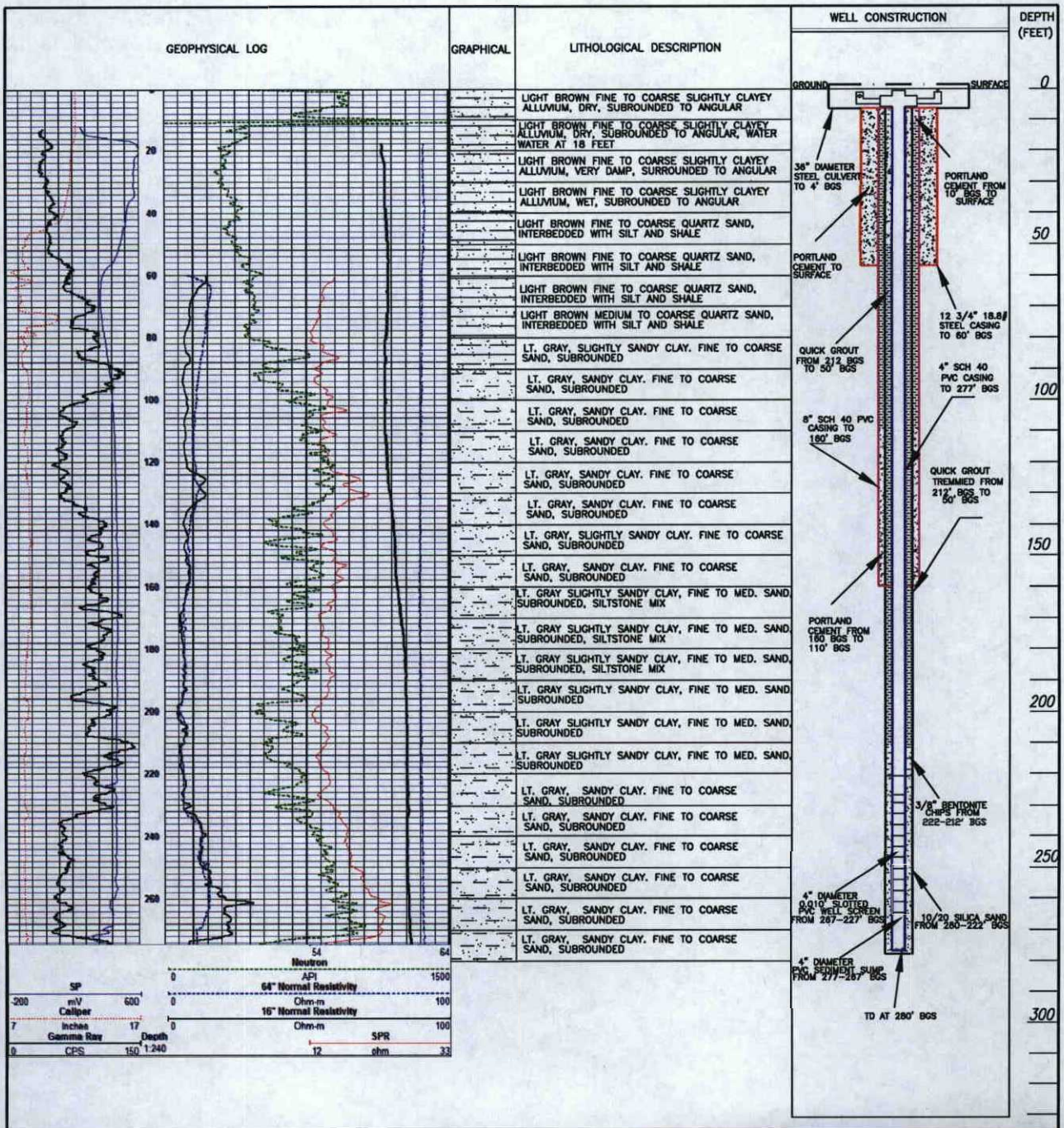
SITE LOCATION:
NE ¼ NE ¼ (UNIT LETTER A), SECTION 13, TOWNSHIP 28 NORTH, RANGE 10 WEST
SAN JUAN COUNTY, NEW MEXICO

NOTES:
LITHOLOGICAL DESCRIPTIONS COMPLETED BY THOMAS LONG AND LOREN DIEDE

DRAWN: TLONG	DATE: 3/30/10
REVISED: TLONG	REVISION: 4/5/10
APPROVED: LD	DATE: 4/5/10

SMA
Civil / Environmental Scientists & Engineers
612 E. MURRAY DR. PH. (505) 325-5667
FARMINGTON, NM 87401 FAX (505) 327-1496

GEOPHYSICAL, LITHOLOGICAL AND WELL CONSTRUCTION DIAGRAM
ENTERPRISE CPS 1989 WELL SITE
MW-1



CONSTRUCTION DETAILS

BORE HOLE: 16" TO 60' BGS
CONDUCTOR CASING: 12 3/4" 18.8# STEEL TO 60' BGS
CEMENT: PORTAND CEMENT TREMMIED TO SURFACE
BORE HOLE: 12 3/4" TO 165' BGS
SURFACE CASING: 8" SCHEDULE 40 PVC TO 160 BGS
CEMENT: TREMMIED TO SURFACE
BORE HOLE: 7 7/8" TO 280' BGS
PRODUCTION CASING: 4 " SCHEDULE 40 TO 277' BGS;
SEDIMENT SUMP:277'-267' BGS; 4" SCHEDULE 40 PVC
WELL SCREEN: 267'-227'; 4" 0.010' SLOTTED
FILTER PACK: 10/20 COLORADO SILICA SAND FROM TOTAL DEPTH TO 222' BGS
BENTONITE SEAL: 3/8" BENTONITE CHIPS TO 222-212' BGS
ANNULAR SEAL: QUICK GROUT FROM 212-50' BGS
SANITARY SEAL: PORTLAND CEMENT FROM 50' BGS TO SURFACE
SURFACE COMPLETION: 4" PVC T WITH VALVE AND PRESSURE GUAGE INSTALLED BELOW GRADE IN A 36" DIAMETER CULVERT

DRAWN: TLONG	DATE: 3/30/10
REVISED: TLONG	REVISION: 4/5/10
APPROVED: LD	DATE: 4/5/10

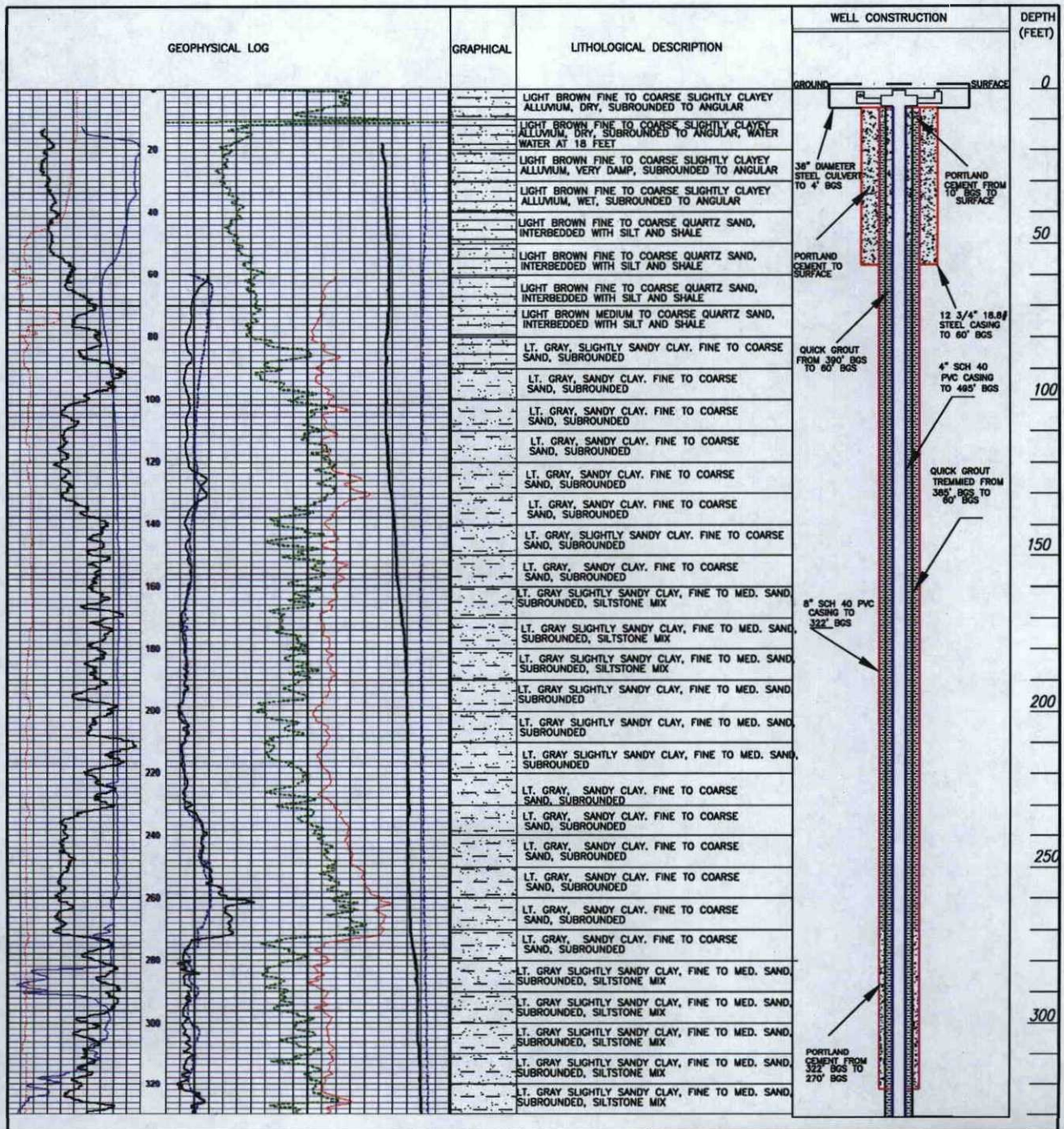
DATE STARTED: 2/25/10
DATE COMPLETED: 3/3/10
DRILLING COMPANY: HYDROGEOLOGIC SERVICES, INC.
RIG TYPE: SS 30K
DRILLER: KEVIN JONES

SITE LOCATION:
NE ¼ NE ¼ (UNIT LETTER A), SECTION 13, TOWNSHIP 28 NORTH, RANGE 10 WEST
SAN JUAN COUNTY, NEW MEXICO

NOTES:
LITHOLOGICAL DESCRIPTIONS COMPLETED BY THOMAS LONG AND LOREN DIEDE

SMA
Civil / Environmental Scientists & Engineers
612 E. MURRAY DR. PH. (505) 325-5667
FARMINGTON, NM 87401 FAX (505) 327-1496

GEOPHYSICAL, LITHOLOGICAL AND WELL CONSTRUCTION DIAGRAM
ENTERPRISE CPS 1989 WELL SITE
MW-2



CONSTRUCTION DETAILS

BORE HOLE: 18" TO 60' BGS
CONDUCTOR CASING: 12 3/4" 18.8# STEEL TO 60' BGS
CEMENT: PORTAND CEMENT TREMMIED TO SURFACE
BORE HOLE: 12 3/4" TO 322' BGS
SURFACE CASING: 8" SCHEDULE 40 PVC TO 322' BGS
CEMENT: TREMMIED TO SURFACE
BORE HOLE: 7 7/8" TO 495' BGS
PRODUCTION CASING: 4 " SCHEDULE 40 TO 495' BGS;
SEDIMENT SUMP:495'-455'; 4" SCHEDULE 40 PVC
WELL SCREEN: 455'-405'; 4" 0.010' SLOTTED
FILTER PACK: 10/20 COLORADO SILICA SAND FROM TOTAL DEPTH TO 395' BGS
BENTONITE SEAL: 3/8" BENTONITE CHIPS TO 385-395' BGS
ANNULAR SEAL: QUICK GROUT FROM 385-60' BGS
SANITARY SEAL: PORTLAND CEMENT FROM 60' BGS TO SURFACE
SURFACE COMPLETION: 4" PVC T WITH VALVE AND PRESSURE GUAGE INSTALLED BELOW GRADE IN A 36" DIAMETER CULVERT

DRAWN: TLONG	DATE: 3/19/10
REVISED: TLONG	REVISION: 4/5/10
APPROVED: LD	DATE: 4/5/10

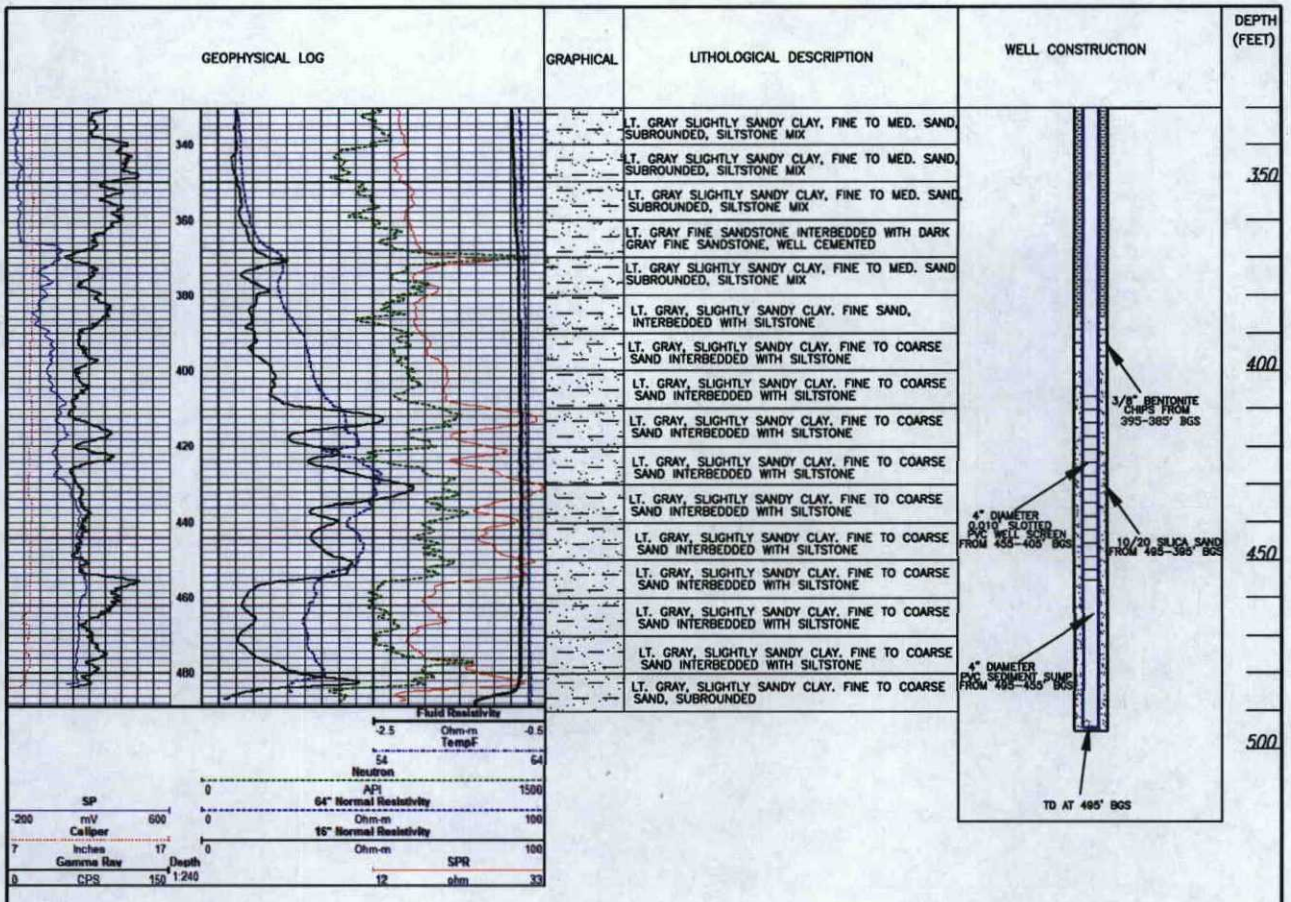
DATE STARTED: 2/12/10
DATE COMPLETED: 2/23/10
DRILLING COMPANY: HYDROGEOLOGIC SERVICES, INC.
RIG TYPE: SS 30K
DRILLER: KEVIN JONES

SITE LOCATION:
NE ¼ NE ¼ (UNIT LETTER A), SECTION 13, TOWNSHIP 28 NORTH, RANGE 10 WEST
SAN JUAN COUNTY, NEW MEXICO

NOTES:
LITHOLOGICAL DESCRIPTIONS COMPLETED BY THOMAS LONG AND LOREN DIEDE

SMA
Civil / Environmental Scientists & Engineers
612 E. MURRAY DR. PH. (505) 325-5667
FARMINGTON, NM 87401 FAX (505) 327-1496

GEOPHYSICAL, LITHOLOGICAL AND WELL CONSTRUCTION DIAGRAM
ENTERPRISE CPS 1989 WELL SITE
MW-3



CONSTRUCTION DETAILS

BORE HOLE: 18" TO 60' BGS
CONDUCTOR CASING: 12 3/4" 18.8# STEEL TO 60' BGS
CEMENT: PORTAND CEMENT TREMMIED TO SURFACE
BORE HOLE: 12 3/4" TO 322' BGS
SURFACE CASING: 8" SCHEDULE 40 PVC TO 322' BGS
CEMENT: TREMMIED TO SURFACE
BORE HOLE: 7 7/8" TO 495' BGS
PRODUCTION CASING: 4 " SCHEDULE 40 TO 495' BGS;
SEDIMENT SUMP:495'-455'; 4" SCHEDULE 40 PVC
WELL SCREEN: 455'-405'; 4" 0.010" SLOTTED
FILTER PACK: 10/20 COLORADO SILICA SAND FROM TOTAL DEPTH TO 395' BGS
BENTONITE SEAL: 3/8" BENTONITE CHIPS TO 385-395' BGS
ANNULAR SEAL: QUICK GROUT FROM 385-60' BGS
SANITARY SEAL: PORTLAND CEMENT FROM 60' BGS TO SURFACE
SURFACE COMPLETION: 4" PVC T WITH VALVE AND PRESSURE GUAGE INSTALLED BELOW GRADE IN A 36" DIAMETER CULVERT

DRAWN: TLONG	DATE: 3/19/10
REVISED: TLONG	REVISION: 4/5/10
APPROVED: LD	DATE: 4/5/10

DATE STARTED: 2/12/10
DATE COMPLETED: 2/23/10
DRILLING COMPANY: HYDROGEOLOGIC SERVICES, INC.
RIG TYPE: SS 30K
DRILLER: KEVIN JONES

SITE LOCATION:
NE ¼ NE ¼ (UNIT LETTER A), SECTION 13, TOWNSHIP 28 NORTH, RANGE 10 WEST
SAN JUAN COUNTY, NEW MEXICO

NOTES:
LITHOLOGICAL DESCRIPTIONS COMPLETED BY THOMAS LONG AND LOREN DIEDE

SMA
Civil / Environmental Scientists & Engineers
612 E. MURRAY DR. PH. (505) 326-5667
FARMINGTON, NM 87401 FAX (505) 327-1496

GEOPHYSICAL, LITHOLOGICAL AND WELL CONSTRUCTION DIAGRAM
ENTERPRISE CPS 1989 WELL SITE
MW-3

Appendix D: Disposal Records

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-138
Revised March 12, 2007

*Surface Waste Management Facility Operator and Generator shall maintain and make this documentation available for Division inspection.

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

1. **Generator Name and Address:** Bill to: Souder Miller

   Enterprise Field Services, LLC

2. **Originating Site:**

   CPS 1989 MW

3. **Location of Material (Street Address, City, State or ULSTR):**

   NE/NE, Sec, 13, T 28N, R10W, San Juan NM

   3/3/10 - 80 bbls (2nd)
   2/26/10 - 80 bbls
   2/23/10 - 80 bbls
   2/19/10 - 80 bbls
   2/18/10 - 80 bbls

4. **Source and Description of Waste:**

   Bentonite drilling mud and drill cuttings

   Estimated Volume _____ yd³ / bbls Known Volume (to be entered by the operator at the end of the haul) _____ yd³ / bbls

5. **GENERATOR CERTIFICATION STATEMENT OF WASTE STATUS**

I, **Loren Diede** representative or authorized agent for **Enterprise Field Services** do hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulato determination, the above described waste is: (Check the appropriate classification)

☐ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non exempt waste.

☒ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Che the appropriate items)

☒ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description in Box 4)

GENERATOR 19.15.36.15 WASTE TESTING CERTIFICATION STATEMENT FOR LANDFARMS

I, _____, representative for _____ do hereby certify that representative samples of the oil field waste have been subjected to the paint filter test and tested for chloride content and that the samples have been found to conform to the specific requirements applicable to landfarms pursuant to Section 15 of 19.15.36 NMAC. The results of the representative sample are attached to demonstrate the above-described waste conform to the requirements of Section 15 of 19.15.36 NMAC.

5. **Transporter:**
   PACE/SCAT Hot Wash Veh Job # 5114798

OCD Permitted Surface Waste Management Facility

Name and Facility Permit #: **JFJ Landfarm/Industrial Ecosystems, Inc. NM01-0010B**

Address of Facility: **49, CR 3150 Aztec, NM 87410**

CL = 940
ph = 6

Method of Treatment and/or Disposal:

☐ Evaporation ☐ Injection ☐ Treating Plant ☒ Landfarm ☐ Landfill ☐ Other

Waste Acceptance Status:

☒ **APPROVED** ☐ **DENIED (Must Be Maintained As Permanent Record)**

PRINT NAME: Chris Hopkins TITLE: admin DATE: 2/18/10

SIGNATURE: _____ TELEPHONE NO.: 505-632-1782

Surface Waste Management Facility Authorized Agent

Phone: 505-632-1786, FAX : 505-632-1876, Email ; trucklogin@industrialecosystems.com

QUANTA

Key Energy Services Inc.
Disposal/ Water
Remit to: PO BOX 201858 DALLAS, TX 75320-1858

D184220

WT NUMBER D184220

WT Date 02-23-10
S M T W T F S

☐ Brine Water Sale ☐ Fresh Water Sale ☑ Disposal

Water Facility/ Disposal Name Key Disposal Disposal Asset # 5120001

County/ Parish S.J. State NM RRC #

Customer Name	Lease (origin of Disposal Fluid)
Snyder Miller	CPS 1989

Trucking Company 3 Rivers Delivery Ticket # 410794

Load	Truck (Asset #)	BBLS	Time	Driver Name (Print)	Signature
1	121	40	3:45 ☐AM ☐PM	Cody Hackenhull	Cody Hackenhull
2			☐AM ☐PM		
3			☐AM ☐PM		
4			☐AM ☐PM		
5			☐AM ☐PM		

Additional load description Caliche Dee Dee

☐ H2S _____PPM ☑ No H2S ☐ Waste Oil ____bbls
☐ Black ☐ Solid Content _____% ☐ Non Exempt
☐ White Water __Light __ Med ___Heavy

☐ Clean Produced Field Saltwater
☑ Frac Flowback Water (Regular Frac Job)
☐ Washpit Fluid (No Mud or Solids)
☐ Gelled Workover or Frac Fluid
☐ Other_____
☐ Workover Brine or Dirty Saltwater
☐ Reserve Pit Fluid (No Mud or Solids)
☐ Frac Flowback Water (fiber Frac Job)
☐ Tank Bottoms/ Oil Based Mud

BBLS (Qty)	Price per BBL	Extended Amount
40	.85	$ 34.00

Sub Total $ 34.00
Sales Tax
Total

DWT-010

40

ENVIROTECH, INC.

FACSIMILE TRANSMITTAL SHEET

TO: Lisa	FROM: April E Pohl
COMPANY#: SMA	DATE: 5-7-10
FAX NUMBER: 505-327-1496	TOTAL NO. OF PAGES INCLUDING COVER: 4
PHONE NUMBER: 505-325-5667	RE: RECEIVALS FOR LAND FARM 2 SMA 03117-0016

Hello Lisa:

Attached are the Bills of Lading for EPCO 1989. The material was inadvertently put in LF 3 on February 10 and 11, 2010. Once the error was discovered the material was transferred to LF 2 and chloride, paint filter test was run. Those tests were not charged to SMA.

If you have any questions please feel free to call the cell phone listed below.

April E Pohl

Land Farm Administrator

505-320-6431 cell

Fax 632-1865

envirotech

Bill of Lading

MANIFEST # 35132

PHONE: (505) 632-0615 • 5796 U.S. HIGHWAY 64 • FARMINGTON, NEW MEXICO 87401

DATE 2-10-10 JOB# 03117-0016

LOAD NO.	COMPLETE DESCRIPTION OF SHIPMENT						TRANSPORTING COMPANY			
	POINT OF ORIGIN	DESTINATION	MATERIAL	GRID	YDS	BBLS	COMPANY	TRK#	TIME	DRIVER SIGNATURE
1	SMA CPS 19819 Enterprise	LF III	Drill sand	E11	- 25		Pace	1301	1711	Roger Nixon
		transferred to LF2 cell F12		E12	- 25	50				
	<298 - test ran - no charge									ENTERED FEB 11 2010

RESULTS: N/A

CHLORIDE TEST

PAINT FILTER TEST

LANDFARM EMPLOYEE: Gary Robinson

NOTES: Souder miller & Ass. Enterprise nonexempt

"I certify the material hauled from the above location has not been added to or mixed with, and is the same material received from the above mentioned Generator, and that no additional materials have been added."

NAME Roger Nixon COMPANY SCAT SIGNATURE Roger Nixon

COMPANY CONTACT _____ PHONE _____ DATE 2-10-10

ACCENT Printing • Form 28-1212

2/4 05-07-2010 03:45:56 p.m. Line 1 1111

envirotech

Bill of Lading

2-11-10

MANIFEST # 35338 08117-0016

PHONE: (505) 632-0615 • 5796 U.S. HIGHWAY 64 • FARMINGTON, NEW MEXICO 87401

DATE 2/11/10 JOB# [redacted]

LOAD NO.	COMPLETE DESCRIPTION OF SHIPMENT						TRANSPORTING COMPANY			
	POINT OF ORIGIN	DESTINATION	MATERIAL	GRID	YDS	BBLS	COMPANY	TRK#	TIME	DRIVER SIGNATURE
1	Enterprise SMA CPS	LF III	AirDrill Sand	FR	8	—	Pace	1301	1325	
2	1989	transferred to LF2		F12	8					
	<298 - test ran - no charge									nonexempt

RESULTS:

CHLORIDE TEST	
PAINT FILTER TEST	

LANDFARM EMPLOYEE: Gary Lobato

NOTES: ENTERED FEB 16 2010

"I certify the material hauled from the above location has not been added to or mixed with, and is the same material received from the above mentioned Generator, and that no additional materials have been added."

NAME Virgil Tsosie COMPANY Pace SIGNATURE

COMPANY CONTACT Roger Nixon PHONE 486-1443 DATE 2-11-10

ACCENT Printing • Form 28-1212

3/4 05-07-2010 03:46:11 p.m. Line 1 1111

envirotech

Bill of Lading

MANIFEST # 35179

PHONE: (505) 632-0615 • 5796 U.S. HIGHWAY 64 • FARMINGTON, NEW MEXICO 87401

DATE 2-16-10 JOB# 03117-0016

LOAD NO.	COMPLETE DESCRIPTION OF SHIPMENT						TRANSPORTING COMPANY			
	POINT OF ORIGIN	DESTINATION	MATERIAL	GRID	YDS	BBLS	COMPANY	TRK#	TIME	DRIVER SIGNATURE
1	EPCO SMACPS1584	LF-II	Drill mud	S-13	—	70	King Vac	207	17:35	Terry Rhoades
						70				

RESULTS: only test billed

<298	CHLORIDE TEST	1
	PAINT FILTER TEST	1

LANDFARM EMPLOYEE:

NOTES: nonexempt

ENTERED FEB 17 2010

"I certify the material hauled from the above location has not been added to or mixed with, and is the same material received from the above mentioned Generator, and that no additional materials have been added."

NAME TERRY RHOADES COMPANY IEI SIGNATURE

COMPANY CONTACT DOUG DAVIS PHONE (505) 860-3151 DATE 2/16/10

ACCENT Printing • Form 28-1212

4/4 05-07-2010 03:46:26 p.m. Line 1 1111

Appendix E: Selected Site Photographs

Photo 1: View of drilling operations.

Photo 2: View of surface casing installation.

Photo 3: View of drilling surface casing cementing operations.

Photo 4: View of production casing installation.

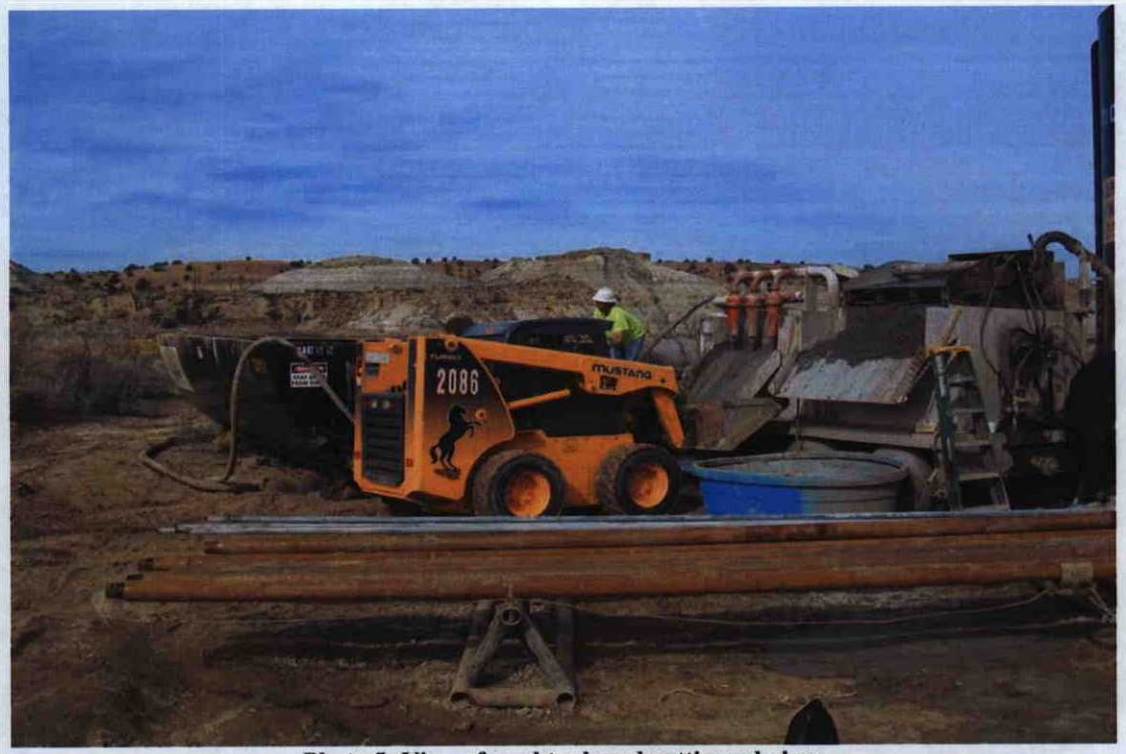


Photo 5: View of mud tank and cuttings shaker.

Photo 6: View of drilling operations.

Photo 7: View of cementing operations.

Photo 8: View of the air lifting well development.

Photo 9: View of surface completion for MW-1.

Photo 10: View of of the below grade well head completion for MW-2.

Photo 11: View of the below grade well head completion for MW-3.

Photo 12: View of the below grade well vault security.