3R - 430

RP WORKPLAN

02/10/2010

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TETRA TECH

Environmental Work Plan for Monitoring Well Installation and Groundwater Sampling

Wilmuth No. 1
API No. 30-045-1037
San Juan Basin, Aztec, New Mexico

Prepared for:

ConocoPhillips Company

Risk Management and Remediation
420 South Keeler Avenue
Bartlesville, OK 74004
(918) 661-0935 office

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February 2010

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1.0 PURPOSE AND NEED

This document presents the scope of work to be performed at the ConocoPhillips Company; Wilmuth No. 1 natural gas well site (Site) associated with ConocoPhillips exploration and production operations in the San Juan Basin area of New Mexico. The surface owners of the Site are Keith and Barbara Barnes.

This work is being conducted as follow-up to the discovery of discolored soils and groundwater seeping into the excavation during a line tie in procedure at the Site. All work will follow New Mexico Oil Conservation Division (OCD) guidelines. The OCD is located at 1220 South St. Francis Drive, Santa Fe, NM 87505.

This document does not describe the preparation of risk analyses or the implementation of remedial activities that could potentially occur simultaneously with monitoring efforts at the site in the future. Specific plans covering those potential activities will be prepared separately if necessary.

2.0 SITE HISTORY

Chronologies of activities previously performed at the Site are presented below. The proposed scope of work for the Site is presented following the chronology section.

2.1 Site Activities

The following table summarizes activities that have occurred at the Site regarding the response to the December 22, 2009 discovery of groundwater seeping into and excavated area where discolored soils were found during a line tie in procedure.

DATE	ACTIVITY
December 22, 2009	ConocoPhillips company notified Brandon Powell and Kelly Roberts of the OCD about groundwater seeping into two excavated areas on Site where discolored soils had been found during line tie in procedures. The type, volume and origin of the initial release are unknown. Groundwater samples were collected from the two areas and analyzed by Envirotech of Farmington, NM for benzene, toluene, ethylbenzene and total xylenes (BTEX), total petroleum hydrocarbons (TPH) and Chloride. Analytical results indicate that groundwater impacts could be present.
December 23, 2009	Soil samples were collected from the two excavated areas where soil discoloration was present and were analyzed by Envirotech for BTEX, TPH and Chloride. Analytical data indicates that the soil did contain hydrocarbons.
January 4, 2010	Soil samples and groundwater samples were collected and analyzed by Envirotech for BTEX, TPH and Chloride. Groundwater analytical results indicate that groundwater impacts could be present.
January 7, 2010	C-141 Release Notification and Corrective Action form was submitted to the OCD by ConocoPhillips

3.0 SCOPE OF WORK

The Scope of Work for Site activities is described below. Work conducted at the Site will consist of field preparation prior to the start of work (Section 3.1); a Site investigation (Section 3.2) consisting of soil boring advancement and soil sample collection (Section 3.2.1); soil boring completion to groundwater monitoring wells (Section 3.2.2); proper handling and disposal of investigation-derived waste (Section 3.2.3); and groundwater monitoring (Section 3.2.4). Reporting is discussed in Section 3.3, the preliminary exposure pathway assessment (PEPA) prepared by Tetra Tech for ConocoPhillips internal use is described in Section 3.4, and quality assurance/quality control (QA/QC) is discussed in Section 4.0. References can be found in Section 5.0. **Figure 1** is a Site location map, **Figure 2** displays the Site layout and proposed locations of groundwater monitoring wells to be installed, and **Figure 3** is a typical groundwater monitoring well completion diagram. Appendices follow the Figures and include:

- **Appendix A** – Completed C-141 Release Notification and Corrective Action Form
- **Appendix B** – Soil Boring and Monitoring Well Completion Log Forms
- **Appendix C** – Groundwater Sampling Field Forms
- **Appendix D** – Site Contacts List

3.1 Pre Field Work Preparation

The proposed groundwater monitoring well location map (**Figure 2**) will be reviewed and approved by ConocoPhillips Risk Management and Remediation personnel and San Juan Business Unit personnel. Once these well locations have been approved, New Mexico One-Call will be contacted to perform a utility locate within a 250 foot radius from the Wilmuth No. 1 wellhead. Additionally, monitoring well installation permits will be acquired by WDC Exploration and Wells of Peralta, NM (WDC), and a site specific Health and Safety Plan (HASP) will be prepared by Tetra Tech prior to the start of field work.

3.2 Site Investigation

3.2.1 Soil Boring Advancement and Soil Sample Collection

The subject Site is scheduled to have four (4) soil borings completed into two-inch diameter groundwater monitoring wells in order to define the groundwater flow direction and to determine the extent, if any, of petroleum hydrocarbon-impacts to groundwater. Borings will be advanced until auger refusal is met or until a sufficient depth into groundwater is achieved. Depth to groundwater at the Site is expected to be found at a depth of approximately four (4) feet below ground surface (bgs).

Prior to the start of drilling operations, each boring location will be pre-cleared in order to insure that no underground utilities within the Site will be damaged by drilling equipment. Pre-clearing of each boring will be performed using a hand auger to advance three (3) holes to encompass an area approximately ten (10) inches in diameter and five (5) feet deep or until groundwater is reached. If hand auger refusal is encountered, Riley Industrial of Farmington, NM will be called in to perform pre-clearing activities using a vacuum truck and water pressure. Two soil samples will be collected from the vadose zone to just above the water table with a hand auger during the advancement of each boring, while the lithology of the borehole will be recorded to the total depth of the boring using split spoon sampling once groundwater has been reached. The soil samples collected from the vadose zone will be field screened with a photo-ionization organic vapor detector (PID) using the heated headspace method. The results will be recorded on the boring log, and the soil sample with the highest PID reading as well as the sample collected from directly above the groundwater interface will be submitted to Southern Petroleum Laboratories of Houston, TX to be analyzed for the following parameters:

- Volatile Organic Compounds (VOCs), EPA Method 8260B
- Semivolatile Organic Compounds (SVOCs), EPA Method 8270C
- Total petroleum hydrocarbons (TPH), EPA Method 418.1
- Total metals, EPA Methods 6010/6020/7470A/7471A
- General chemistry (as described in 40 CFR 136.3), including alkalinity, bromide, chloride, fluoride, orthophosphate, sulfate, nitrate/nitrite, pH, and specific conductance.

During the first regularly scheduled quarterly groundwater monitoring event covered under this work plan, an expanded baseline groundwater parameter list will be submitted for laboratory analysis. Constituents of concern (COCs) detected in groundwater at concentrations above the New Mexico Water Quality Control Commission (NMWQCC) Groundwater Quality Standards during the first quarterly groundwater monitoring event will be carried forward for analyses in subsequent quarterly groundwater monitoring events. If all COCs are below NMWQCC groundwater quality standards after eight (8) consecutive quarters of groundwater monitoring, ConocoPhillips will request a No Further Action status for this Site.

The baseline parameter list for groundwater includes analyses of the following parameters:

- VOCs, EPA Method 8260B
- SVOCs, EPA Method 8270C
- TPH, gasoline range organics (GRO), EPA Method 8015B
- TPH, diesel range organics (DRO), EPA Method 8015B
- Dissolved metals, EPA Methods 6010/6020/7470A/7471A

- General chemistry (as described in 40 CFR 136.3), including alkalinity, bromide, chloride, fluoride, orthophosphate, sulfate, nitrate/nitrite, pH, specific conductance, TDS, and hardness (various methods)

3.2.2 Groundwater Monitoring Well Construction

Enviro-Drill will be utilized as the drilling contractor at the Site, and drilling operations will be supervised by Tetra Tech personnel. Groundwater monitoring wells will be constructed using two 2-inch diameter polyvinyl chloride casing and at least 15 feet of screen (approximately 10 feet of the screen to be installed below the water table). The installed groundwater monitoring wells will contain a filter pack to 2-feet above the top of the screen, with a sand collar above the filter pack. A 2-foot bentonite seal will be placed on top of the sand collar, followed by cement grouting to the land surface. Each well will be completed with a locking, stick-up mounted well head set in a 3-foot by 3-foot concrete pad (**Figure 3**). The ground water monitoring wells will be developed using a surge block and bailer or purge pump, and the wells will be incorporated into a quarterly groundwater monitoring program.

3.2.3 Investigation Derived Waste

All well development water will be containerized in on-Site wastewater disposal tanks. Soil cuttings will be placed on polyethylene sheeting and will be covered in the event of precipitation during field activities. Once each soil boring is complete, a representative sample of soil cuttings from each soil boring will be field screened using a PID and will be spread on-Site if the results are less than 100 ppm. In the event that soil cutting PID results are greater than 100 ppm, soil cuttings will be containerized and transported by Envirotech to the Envirotech Soil Remediation Facility (or other ConocoPhillips-approved waste disposal facility) located along Angel Peak Road, approximately 16 miles south of Bloomfield, NM.

3.2.4 Groundwater Monitoring

Quarterly groundwater sampling will be conducted in March, June, September and December 2010 at the Site. A dedicated, disposable bailer will be used to purge and sample each well. A groundwater sample will be collected once depth to groundwater, specific conductance, pH, dissolved oxygen, and temperature are determined to have stabilized (within a 10% margin) or once three well volumes have been purged. Records of each sampling event will be kept on Tetra Tech groundwater sampling forms and in a bound field notebook. Groundwater samples will be containerized in bottles supplied by SPL Laboratories of Houston, Texas or other ConocoPhillilps-approved laboratories. The groundwater samples will be placed on ice in a cooler under chain of custody documentation and submitted to SPL (or other ConocoPhillips-approved laboratory) for analysis. Groundwater samples will be shipped by overnight courier.

3.3 Reporting

Quarterly groundwater monitoring reports will be prepared for the Site. The first quarterly report will include a summary of the groundwater monitoring well installation and a brief narrative of the sampling events. In general, the quarterly reports will include the date(s) the events occurred, copies of sampling field forms from each sampling event, copies of laboratory chain-of-custody documentation and results, laboratory quality assurance/quality control (QA/QC) documentation, tabulated groundwater elevations, soil results and groundwater concentration/elevation maps, a generalized cross section, and a summary of key findings. Starting with the second quarterly report, the groundwater elevations and groundwater analytical results from the previous quarter(s) will be tabulated with the results from the current quarter.

Based on the extent of groundwater impacts determined by laboratory analysis, Site characterization and interpretation of analytical data by Tetra Tech, it is possible that the frequency of groundwater monitoring events may change. If the groundwater monitoring schedule is revised at any time, the OCD will be notified.

A C-141 form (Release Notification and Corrective Action) was completed and submitted to OCD for the Site by ConocoPhillips on January 7, 2010.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

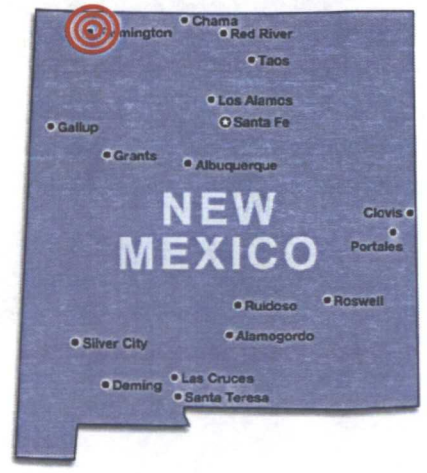
A quality assurance evaluation will be conducted by the analytical laboratory on collected samples to check for accuracy, precision and reliability of each reported analyte concentration. Sample spiked-matrix batch samples will be analyzed to determine the accuracy of laboratory results. Quality assurance documentation will be provided on the laboratory report. In addition, at least one duplicate groundwater sample will be obtained during sampling activities. Results of the duplicate sample analysis will be reported with the groundwater results table contained in the quarterly report.

FIGURES

FIGURE 1.

Site Location Map

ConocoPhillips Company
Wilmuth No. 1
Aztec, NM



ConocoPhillips Company
Wilmuth No. 1 Site
Location

Latitude: 36.864630° N
Longitude: -107.963910° W

N

ConocoPhillips

TETRA TECH, INC.

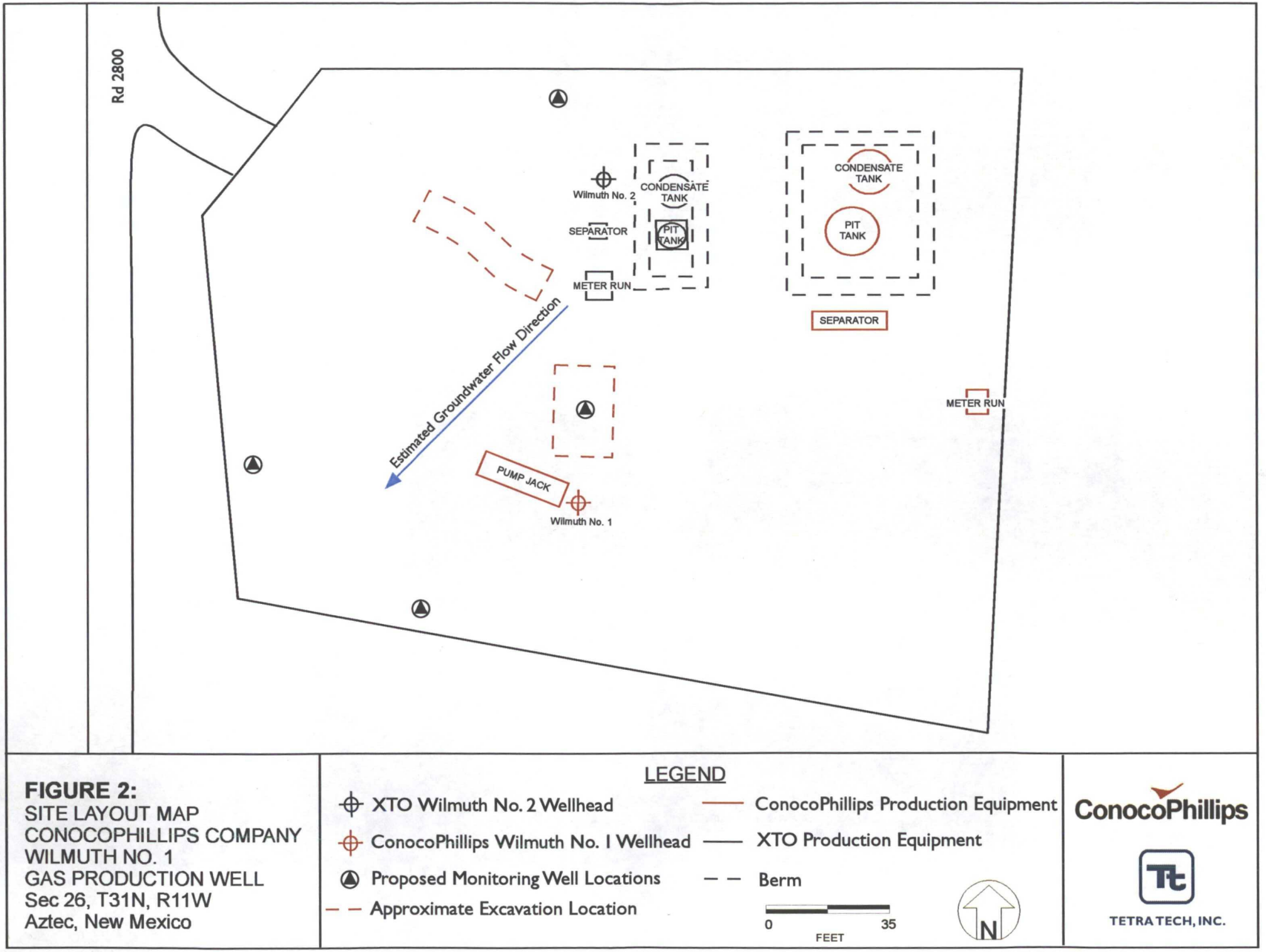


FIGURE 2:
SITE LAYOUT MAP
CONOCOPHILLIPS COMPANY
WILMUTH NO. 1
GAS PRODUCTION WELL
Sec 26, T31N, R11W
Aztec, New Mexico

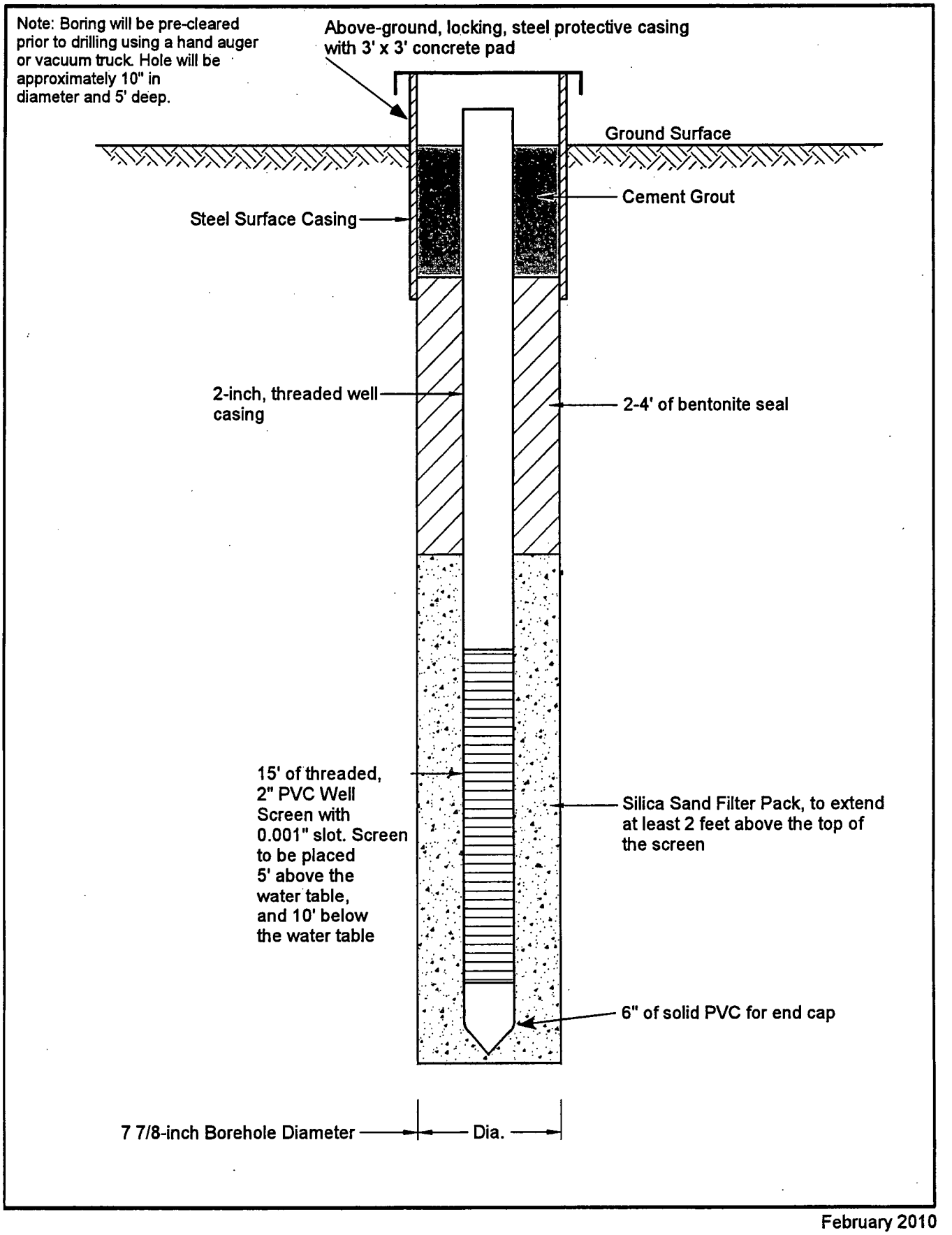


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Figure 3
Typical Monitoring Well Completion Diagram

APPENDIX A

Completed C-141 Release Notification and Corrective Action Form

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 **Burlington Resources, a wholly owned subsidiary of ConocoPhillips Company**		Contact **Gwen R. Frost**	
Address **3401 E. 30th St., Farmington, NM 87402**		Telephone No. **505-326-9549**	
Facility Name **Wilmuth #1**		Facility Type **Gas Well**	API # **30-045-10370**
Surface Owner **Private**	Mineral Owner **Private**		Lease No. **Fee**

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
N	**26**	**T31N**	**R11W**	**800'**	**South**	**1500'**	**West**	**San Juan**

Latitude 36.864630 ° N **Longitude** 107.963910 ° W

NATURE OF RELEASE

Type of Release – **Unknown**	Volume of Release – **Unknown**	Volume Recovered – **0 BBL**
Source of Release: **Unknown**	Date and Hour of Occurrence **Unknown**	Date and Hour of Discovery **12/22/09 – 1:00 p.m.**
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? **OCD - Brandon Powell via phone/email OCD – Kelly Roberts via email**	
By Whom? **Gwen Frost**	Date and Hour – **12/22/09 – 1:15 p.m.**	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.* During a line tie in on the Wilmuth #1 location, COPC encountered discolored soil and noticed water beginning to seep into the excavation. Soil & water samples were collected & analyzed for TPH by USEPA Method 8015, BTEX by USEPA Method 8021, and Chlorides. Analytical laboratory results from Envirotech Inc., for the soil and water are attached.

Describe Area Affected and Cleanup Action Taken.* NMOCD has requested COPC to further investigate the site. COPC will submit a site investigation workplan to NMOCD.

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: Gwen R. Frost	OIL CONSERVATION DIVISION	
Printed Name: **Gwen R. Frost**	Approved by District Supervisor:	
Title: **Environmental Engineer**	Approval Date:	Expiration Date:
E-mail Address: **gwendolynne.frost@conocophillips.com**	Conditions of Approval:	Attached ☐
Date: **1/07/2010** Phone: **505-326-9549**		

APPENDIX B

Soil boring and Monitoring Well Completion Log Forms

Lithology Record

Project/Client: ______________________

Borehole: ______________ **Method:** ______________

Geologist: ______________________

Date: ______________________

Driller: ______________________

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Page ___ of ___

Interval (ft.)	Group Name and Description	USCS Class	Color	Moisture Content	Consistency of Cohesive Soils (Clay)	Density of Non-Cohesive Soils (Sand)	Angularity/Shape of Particles	Cementation & Type	Structure	Dry Strength	Plasticity	Additional Information	% Rec. (ft/ft)
 Blow Ct. Sample: Y N Analytes: Time:	PID:			dry damp moist wet sat.	v. soft soft firm (stiff) hard v. hard	v. loose loose m. dense dense v. dense	angular subangular subrounded rounded flat elongated	none weak moderate strong CHOOSE: Calcareous OR Silicious	stratified laminated fissured slickensided blocky lensed homogenous interbedded	none low medium high v. high	nonplastic low medium high		
 Blow Ct. Sample: Y N Analytes: Time:	PID:			dry damp moist wet sat.	v. soft soft firm (stiff) hard v. hard	v. loose loose m. dense dense v. dense	angular subangular subrounded rounded flat elongated	none weak moderate strong CHOOSE: Calcareous OR Silicious	stratified laminated fissured slickensided blocky lensed homogenous interbedded	none low medium high v. high	nonplastic low medium high		
 Blow Ct. Sample: Y N Analytes: Time:	PID:			dry damp moist wet sat.	v. soft soft firm (stiff) hard v. hard	v. loose loose m. dense dense v. dense	angular subangular subrounded rounded flat elongated	none weak moderate strong CHOOSE: Calcareous OR Silicious	stratified laminated fissured slickensided blocky lensed homogenous interbedded	none low medium high v. high	nonplastic low medium high		
 Blow Ct. Sample: Y N Analytes: Time:	PID:			dry damp moist wet sat.	v. soft soft firm (stiff) hard v. hard	v. loose loose m. dense dense v. dense	angular subangular subrounded rounded flat elongated	none weak moderate strong CHOOSE: Calcareous OR Silicious	stratified laminated fissured slickensided blocky lensed homogenous interbedded	none low medium high v. high	nonplastic low medium high		

TETRA TECH, INC.

Well Completion Diagram

Well ID MW-

Job Name _____

Job No. _____ Date _____

Project Manager _____

Well I.D. _____

Field Geologist _____

Driller _____

Equipment _____

Materials

_____ Pounds _____ Filter Pack

_____ Pounds _____ Bentonite Seal

_____ Gallons _____ Grout

_____ Pounds _____ Concrete

_____ Feet of native fill/ slough

_____ Feet of _____ inch _____ pvc _____ Blank Casing

_____ Feet of _____ inch _____ Slotted Screen

_____ Feet of _____ Outer Casing

_____ Feet of _____ Sump/ Silt Trap

Placement Method _____

Notes _____

_____

Development

Method _____

Date _____

Amount Purged _____ gallons

Notes _____

_____

Stickup (feet): approx. 3 ft.

Steel Casing

Other:

Casing:

_____ ft. to _____ ft.

_____ inch diameter Borehole:

_____ ft. to _____ ft.

Outer Casing:

_____ ft. to _____ ft.

Concrete: approx. 4' well pads

_____ ft. to _____ ft.

Grout:

_____ ft. to _____ ft.

Bentonite Seal:

_____ ft. to _____ ft.

Filter Pack:

_____ ft. to _____ ft.

Slotted Screen:

_____ ft. to _____ ft.

Native fill/ slough:

_____ ft. to _____ ft.

8 inch diameter Borehole:

_____ ft. to _____ ft.

Sump/ Silt Trap:

_____ ft. to _____ ft.

APPENDIX C

Groundwater Sampling Field Forms

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WATER SAMPLING FIELD FORM

Project Name _____ Page _____ of _____

Project No. _____

Site Location _____

Site/Well No. MW - _____ Coded/ Replicate No. _____ Date _____

Weather _____ Time Sampling Began _____ Time Sampling Completed _____

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface _____ MP Elevation _____

Total Sounded Depth of Well Below MP _____ Water-Level Elevation _____

Held _____ Depth to Water Below MP _____ Diameter of Casing 2"

Wet _____ Water Column in Well _____ Gallons Pumped/Bailed Prior to Sampling _____

Gallons per Foot _____

Gallons in Well _____ Sampling Pump Intake Setting (feet below land surface) _____

Purging Equipment Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	DO %	ORP (mV)	Volume (gal.)

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative

Remarks _____

Sampling Personnel _____

Well Casing Volumes

Gal./ft.	1 ¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 ½" = 0.10	2 ½" = 0.24	3" ½ = 0.50	6" = 1.46

APPENDIX D

Site Contacts List

Site Contacts

Name	Affiliation	Work Phone	Cell Phone
Kelly Blanchard	Tetra Tech, Inc.	505-237-8440	505-975-2563
Ana Moreno	Tetra Tech, Inc.	505-237-8440	505-440-8640
Christine Mathews	Tetra Tech, Inc.	505-237-8440	505-269-0088
Cassie Brown	Tetra Tech, Inc.	505-881-3188	505-401-3971
Brandon Powell	New Mexico Oil Conservation Division District 3 (Aztec)	505-334-6178, x 15	505-320-0200
Glenn Von Gonten	New Mexico Oil Conservation Division District 4 (Santa Fe)	505-476-3488	
Bryan Nydoske	WDC Exploration and Wells District Manager	505-865-5222	505-991-3578
April Pohl	Envirotech Landfarm Administrator - Soil Disposal	505-632-0615	505-320-6431
David Brackney (or GW Riley or Bill McPherson)	Riley Industrial - Day lighting	505-327-4947	
Gwen Frost	ConocoPhillips San Juan Business Unit	505-326-9549	505-215-3121
Joni Clark	ConocoPhillips PTRRC	505.326-9701	
Terry Lauck	ConocoPhillips Risk Management and Remediation Site Manager	918-661-0935	918-815-0556
Jim Kennedy	ConocoPhillips Field Manager	505-599-3487	505-486-1915
Brandon Ferrari	ConocoPhillips MSO	505-324-2761(pager)	505-486-6933
Pat Bent	ConocoPhillips San Juan Business Unit Stop Work Assistance	505-326-9887	505-320-1696