### SITE CLOSURE REPORT

### QUAIL QUEEN SWD NO. 001 (QUAIL STATE SWD)

### EPI REF: #160030 NMOCD REF: 1RP #748

UL-O (SW<sup>1</sup>/4 OF THE SE<sup>1</sup>/4) OF SECTION 11, T 19 S, R 34 E ~ 18 MILE SOUTH SOUTHWEST OF BUCKEYE, LEA COUNTY, NEW MEXICO LATITUDE: N 32° 40' 10.5" LONGITUDE: W 103° 31' 43.0"

### **MARCH 2007**

### **PREPARED BY:**

ENVIRONMENTAL PLUS, INC. 2100 AVENUE O EUNICE, NEW MEXICO 88231

**PREPARED FOR:** 





		Site Closure Report	rt	
	Chesap	Chesapeake Operating, Inc Quail Queen SWD No. 001	Queen SWD No. 001	
		(Quail State SWD)	()	
		NMOCD Ref. 1RP #748; Ref. # 160030	lef. # 160030	
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**Distribution List** 

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Chesapeake Energy - Quail Queen SWD No. 001 (Quail State SWD) 160030

### **STANDARD OF CARE**

Site Closure Report Chesapeake Energy – Quail Queen SWD No. 001 (Quail State SWD) NMOCD Ref. 1RP #748; EPI Ref. #160030

The information provided in this report was collected consistent with the New Mexico Oil Conservation Division (NMOCD) *Guidelines for Remediation of Leaks, Spills and Releases* (August 13, 1993), the NMOCD *Unlined Surface Impoundment Closure Guidelines* (February, 1993) and Environmental Plus, Inc. (EPI) *Standard Operating Procedures and Quality Assurance/Quality Control Plan.* The conclusions are based on field observations and laboratory analytical reports as presented in the report. Recommendations follow NMOCD guidance and represent the professional opinions of EPI staff. These opinions were derived using currently accepted geologic, hydrogeologic and engineering practices at this time and location. The report was prepared or reviewed by a certified or registered professional with a background in engineering, environmental and/or natural sciences.

This report was prepared by:

Brandon Farrar Environmental Consultant

This report was reviewed by:

David P. Duncan Civil Engineer

3/23/07

<u>3/23/07</u>

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### **PROJECT SYNOPSIS**

Site Specific:

- Company Name: Chesapeake Operating, Inc.
- ♦ *Facility Name*: Quail Queen SWD No. 001 (Quail State SWD)
- ◆ *Project Reference:* NMOCD Ref: 1RP #748; EPI Ref: 160030
- Company Contact(s): Bradley Blevins
- Site Location: WGS84 N32° 40' 10.5"; W103° 31' 43.0"
- ♦ Legal Description: Unit Letter-O (SW¼ of the SE¼), Section 11, T 19 S, R 34 E
- General Description: Approximately 18-mile south southwest of Buckeye, New Mexico
- ♦ *Elevation:* ~3,972-ft amsl
- ◆ Land Ownership: State of New Mexico New Mexico State Land Office
- **EPI Personnel:** Project Consultant David P. Duncan

Site Foremen - Danny Deaton; Sebastian Romero

### **Release Specific:**

- *Product Released:* Produced water
- ♦ *Volume Released:* ~ 115-barrels
- ◆ *Volume Recovered:* ~ 55-barrels
- ♦ Time of Occurrence: 9-17-05
- ◆ Time of Discovery: 9-18-05 • *Release Source:* Lightening struck a 500-barrel fiberglass produced water tank
- ◆ Initial Surface Area Affected: Release Area ~ 16,500 ft<sup>2</sup>

### **Remediation Specific:**

- ♦ *Final Vertical extent of contaminates:* ~ 2-feet bgs
- ♦ *Water wells within 1,000-ft:* None
- ♦ Private domestic water sources within 200-ft: None
- ♦ Depth to Ground Water: ~ 76-ft bgs
- ♦ Surface water bodies within 1,000-ft: None
- ◆ *NMOCD Site Ranking Index:* Ten (10) points (>50-ft to top of water table and >1,000-ft from water source)
- ◆ *Remedial goals for Soil:* TPH 1,000 mg/Kg; BTEX 50 mg/Kg; Benzene 10 mg/Kg; Chloride residuals may not be capable of impacting groundwater above NMWQCC Groundwater Standards of 250 mg/L
- ♦ RCRA Waste Classification: Exempt
- Remediation Option Proposed: a) excavated soil impacted above NMOCD remedial goals disposed at Lea Landfill, Inc.; b) laboratory analyses confirmed removal of soil impacted above NMOCD remedial threshold goals in sidewalls and bottom of the excavations; c) back- filled excavated areas with caliche and sandy soil; d) graded release site to allow natural drainage of the area; and e) will seed areas outside the tank battery perimeter with a grass blend preferred by the BLM
- Treatment/Disposal Facility: Lea Landfill, Inc., Lea County, New Mexico
- ♦ Volume disposed: Approximately 2,234-yds<sup>3</sup>
- Project Completion Date: January 9, 2007

### 2.0 SITE AND RELEASE INFORMATION

- 2.1 Describe land use and pertinent geographic features within 1,000 feet of the site. Surface and mineral rights for the land surrounding the release site are owned by the State of New Mexico with management overseen by the New Mexico State Land Office. The area is an established oil field with production and injection wells, tank batteries, pipelines, lease roads and other petroleum related facilities. The surrounding land is leased to Snyder Ranches for livestock grazing.
- 2.2 Identify and describe the source or suspected source(s) of the release. Lightening struck a 500-barrel fiberglass produced water tank
- 2.3 What was the volume of the release? (if known): ~115 barrels of produced water
- 2.4 What was the volume recovered? (if known): ~ 55 barrels of produced water
- 2.5 When did the release occur? (if known): 9-17-05

### 2.6 Geological Description

The New Mexico Bureau of Mines and Mineral Resources Ground-Water Report 3, "Geology and Ground-Water Resources of Eddy County, New Mexico" G.E. Hendrickson and R.S. Jones, 1952, describes the near surface geology of southern Lea County as "an intergrade of the Quaternary Alluvium (QA) sediments, i.e., fine to medium sand, with the mostly eroded Cenozoic Ogallala (CO) formation. Typically, the QA and CO formations in the area are capped by a thick interbed of caliche and generally overlain by sandy soil."

The release site is located on the High Plains physiographic subdivision, described by Nicholson and Clebsch as an area that "is a flat, gently sloping plain, treeless, and marred only by slight undulations and covered with short prairie grass."

### 2.7 Ecological Description

The area is typical of the Upper Chihuahuan Desert Biome consisting primarily of sandy soil covered with short semi-arid grasses, interspersed with Honey Mesquite and forbs. Mammals represented, include Orrd's and Merriam's Kangaroo Rats, Deer Mouse, White Throated Wood Rat, Cottontail Rabbit, Black Tailed Jackrabbit, Mule Deer, Bobcat, Red Fox and Coyote. Reptiles, amphibians, and birds are numerous and typical of the area. A survey of Listed, Threatened or Endangered species was not conducted.

### 2.8 Area Groundwater

Information obtained from the New Mexico Office of the State Engineer's website and United States Geological Survey (USGS) database indicate groundwater in the unconfined aquifer at this site was projected to be > 76-ft below ground surface (bgs) (reference *Table 1*). On October 18, 2005 two soil borings (BH-1 and BH-2) were advanced to total depths of forty-five (45) and sixty-five (65) feet bgs, respectively, without encountering groundwater.

### 2.9 Area Water Wells

No public water supply wells are located within 1,000-feet of the release site (reference *Figure 2* and *Table 1*)

### 2.10 Area Surface Water Features

No surface water features exist within 1,000 feet of the release sight (reference *Figure 2*)

### 3.0 <u>NMOCD SITE RANKING</u>

Contaminant delineation and remedial work done at this site indicate chemical parameters of the soil and physical parameters of the groundwater were consistent with the characterization and remediation/abatement goals and objectives set forth in the following New Mexico Oil Conservation Division (NMOCD) publications:

- Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993)
- ♦ Unlined Surface Impoundment Closure Guidelines (February, 1993)
- Pit and Below-Grade Tank Guidelines (November, 2004)

Acceptable thresholds for contaminants/constituents of concern (CoC) were determined based on the NMOCD Ranking Criteria as follows:

- Depth to Groundwater (i.e., distance from the lower most acceptable concentration to groundwater);
- Wellhead Protection Area (i.e., distance from fresh water supply wells);
- Distance to Surface Water Body (i.e., horizontal distance to all down gradient surface water bodies).

Based on the proximity of the site to protectable area water wells, surface water bodies and depth to groundwater from the lower most contamination, the NMOCD ranking score for the site is ten (10) points with the soil remedial goals highlighted in the Site Ranking table presented below:

L GROUNDW	ATER		ELLHEAD CTION AREA		3. DISTANCE 10 SURFACE WATER
Depth to GW <5 20 points	0 feet:	If <1,000' fro	m water source, or	<200	horizontal feet: <i>0 points</i>
Depth to GW 50 feet: <i>10 points</i>	to 99	<pre>&lt;200' from p water source:</pre>	rivate domestic <i>20 points</i>	200- 10 pc	1,000 horizontal feet: p <i>ints</i>
Depth to GW >1 0 points	00 feet:		m water source, or rivate domestic <i>0 points</i>	>1,0 point	00 horizontal feet: 0 //
Site Rank (1+2+.	(3) = 10 + 0	) + 0 = <b>10 poi</b>	nts		
Total S	Site Rank	ing Score and A	Acceptable Remedia	Goal	Concentrations
<b>Ranking Score</b>	2	20 or >	10		0
Benzene <sup>1</sup>	1	0 ppm	10 ppm		10 ppm
BTEX <sup>1</sup>	5	0 ppm	50 ppm		50 ppm
ТРН	1	00 ppm	1,000 ppm		5,000 ppm

<sup>1</sup> A field soil vapor headspace measurement of 100 ppm can be substituted in lieu of laboratory analyses for benzene and BTEX.

### 4.0 EXCAVATED SOIL INFORMATION

Date excavated: June 14 - July 31, 2006; December 19 - December 21, 2007

*Total volume removed:* 2,234- yds<sup>3</sup>

4.2 Indicated soil treatment type:

Disposal
Land Treatment
Composting/Biopiling
Other ( )

*Name and location of treatment/disposal facility:* Lea Landfill, Inc., Lea County, New Mexico

### 5.0 **SAMPLING INFORMATION**

### 5.1 Briefly describe the field screening methods used to distinguish contaminated from uncontaminated soil.

During the advancement of two (2) soil boring (BH-1 and BH-2), soil samples were collected at two (2) feet and five (5) feet intervals initially, then at five (5) foot intervals to total depth of each boring (reference *Table 2*). Soil samples were analyzed in the field for organic vapor and chloride concentrations utilizing the methods described below:

Organic Vapor Concentrations – A portion of each soil sample was inserted into a self-sealing polyethylene bag to allow for volatilization of organic vapors. After allowed to equilibrate to  $\sim 70^{\circ}$  F, the soil sample was analyzed for organic vapor concentrations utilizing a MiniRae® Photoionization Detector (PID) equipped with a 10.6 electron volt (eV) lamp.

Chloride Concentrations – A LaMotte Chloride Test Kit was used for analyses of chloride concentrations.

Soil samples collected during the excavation of impacted material were analyzed for organic vapor and chloride concentrations utilizing the methods as described above (reference *Figure 3*).

### 5.2 Briefly describe the soil analytical sampling and handling procedures used.

Soil samples were collected during the advancement of two (2) soil borings utilizing a hollow core drill. Soil samples were collected at two (2) feet and five (5) feet intervals initially, then at five (5) foot intervals to total depth of the soil borings.

A portion of each soil sample collected was immediately labeled, put into laboratory containers and placed on ice for submittal to an independent laboratory for quantification of gasoline and diesel range organics (TPH); benzene, toluene, ethylbenzene and total xylenes (BTEX); and chloride concentrations. The remaining portion of each sample was analyzed in the field for chloride and organic vapor concentrations utilizing methods described in Section 5.0, *Sampling Information*, Subsection 5.1.

### 5.3 Discuss sample locations and provide rationale for their locations.

Soil Borings BH-1 and BH-2 were advanced to total depths of forty-five (45) and sixty-five (65) feet bgs, respectively. Both soil borings were located within the perimeter of the release area. Soil boring BH-1 was located within the most visible contaminated surface area while soil boring BH-2 was located near the outer edge of the release area perimeter. Locales were chosen to provide data on both vertical depth and lateral extent of impacted soil.

### 6.0 <u>ANALYTICAL RESULTS</u>

### 6.1 Describe the vertical and horizontal extent and magnitude of soil contamination.

Field analyses of soil samples collected from soil boring BH-1 indicated organic vapor concentrations ranged from 1.5 parts per million (ppm) at twenty (20) feet bgs to 4.4 ppm at two (2) feet bgs. Chloride concentrations ranged from 240 milligrams per Kilogram (Kg) at forty-five (45) feet bgs to 3,540 mg/Kg at two (2) feet bgs. Soil samples collected from soil boring BH-2 indicated organic vapor concentrations ranged from 1.1 ppm at twenty (20) feet bgs to 3.0 ppm at fifteen (15) feet bgs. Chloride concentrations ranged from 240 mg/Kg at sixty-five (65) feet bgs to 3,120 mg/Kg at two (2) feet bgs.

A review of Table 2, *Summary of Soil Boring Sample Field Analyses and Laboratory Analytical Results*, for soil samples collected from BH-1 indicated BTEX constituent concentrations were non-detectable (ND) at or above laboratory analytical method detection limits (MDL) from ground surface to two (2) feet bgs. While some constituents were detectable at five (5) feet bgs, total concentrations for BTEX (0.4486 mg/Kg) were below site remedial threshold goals of 50 mg/Kg. BTEX concentrations were ND at or above laboratory analytical MDL for BH-2 from ground surface to five (5) feet bgs. TPH concentrations were ND at laboratory analytical MDL for both BH-1 and BH-2 with the exception of BH-1 at two (2) feet bgs. The concentration of TPH (18.7 mg/Kg) at this depth was below site remedial threshold goals of 1,000 mg/Kg. Chloride concentrations for soil samples collected from BH-1 ranged from 214 mg/KG (15-ft bgs) to 3,710 mg/Kg (2-ft bgs) while BH-2 ranged from 172 mg/Kg (15-ft bgs) to 1,860 mg/Kg (2-ft bgs). The general trend indicated chloride concentrations diminished with vertical depth and horizontal distance.

During excavation of the release area, soil samples were collected from various locations for both laboratory and field analyses. Laboratory and field analytical procedures were identical to those utilized in the advancement of soil borings BH-1 and BH-2 as described previously. However, due to the low or non-detectable concentrations of BTEX and TPH constituents found in soil samples collected from BH-1 and BH-2, laboratory analytical tests were not conducted at locales were field analyses of organic vapor concentrations were below 100 ppm. Areas where organic vapor or chloride concentrations exceeded remedial threshold goals were excavated until the goals were met. However, final compliance with site remedial threshold goals for BTEX, TPH and chloride concentrations was determined by laboratory analytical data (reference *Table 3*).

Is surface soil contamination present at the site (i.e., soil in the uppermost two feet that is visibly stained, contaminated at greater than 10 ppm (PID) or hydrocarbon saturated)?

🗌 yes 🛛 🖾 no

If yes, attach a site map identifying extent(s) of surface soil contamination.

### 7.0 DISCUSSION

### 7.1 Discuss the risks associated with the remaining soil contamination:

Based on depth to groundwater (>76-ft bgs), chloride residual concentrations remaining in the soil should not be capable of impacting groundwater above NMWQCC Groundwater Standards of 250 mg/L. A review of Table 2, *Summary of Soil Boring Sample Field Analyses and Laboratory Analytical Results*, indicates chloride concentrations diminish with depth of soil boring BH-1 and BH-2.

- 7.2 Discuss the risks associated with the impacted groundwater: Not Applicable
- 7.3 Discuss other concerns not mentioned above: Not Applicable

### 8.0 <u>CONCLUSIONS AND RECOMMENDATIONS</u>

8.1 Recommendation for the site:

Site Closure Additional Groundwater Monitoring Corrective Action

8.2 Base the recommendation above on <u>Guidelines for Remediation of Leaks, Spills</u> and <u>Releases (August 13, 1993)</u>. Describe below how you applied the policy to support your recommendation. If closure is recommended, please summarize significant site investigative events and describe how site specific risk issues have been adequately addressed or minimized to acceptable low risk levels.

To determine the vertical extent of production fluid impacted soil, two (2) soil borings (BH-1 and BH-2)) were advanced within the perimeter of the release area on October 18, 2005. After compilation of field and laboratory analytical data as outlined in Article 4, *Subsurface Soil Investigation*, for soil borings BH-1 and BH-2, EPI submitted a *Site Characterization Report* to NMOCD on December 5, 2005 inclusive of Field Work, Analytical Data and Summary of the vertical and lateral extent of impacted soil within the release area.

EPI removed impacted soil from the release area from June 14 through July 31, 2006 and December 19, 2006 through December 21, 2006. Approximately 2,234 yds<sup>3</sup> of impacted soil were excavated from the release area with disposal at Lea Landfill, Inc. Due to existing tank battery facilities ( tankage, heater treaters, flow lines, SWD well head, road, etc.), the release area was divided into three (3) separate areas (reference Figures 5, 7, 8). After extracting impacted soil to a depth of approximately one (1) foot within the perimeter of the north release area, six (6) each soil samples were collected on June 15, 2006 and June 16, 2006 from the sidewalls of the excavation and analyzed in the field for organic vapor and chloride concentrations utilizing methods outlined in Section 4, Subsurface Soil Investigation. All twelve (12) soil samples indicated concentrations of organic vapors were below 100 ppm, but exceeded site remedial threshold goals for chloride concentrations of 250 mg/Kg. The bottom and sidewalls of the excavation were over-excavated due to high chloride concentrations. Thirteen (13) soil samples were collected from the bottom of the north area excavation on June 28, 2006 with ten (10) soil samples transported to an independent laboratory for analyses of chlorides. Field analyses of the thirteen (13) soil samples indicated organic vapors were below 100 ppm, but chloride concentrations exceeded site threshold goals of 250 mg/Kg. Laboratory analytical results of the ten (10) soil samples exceeded site threshold goals for chloride concentrations of 250 mg/Kg. Excavation of the north release site sidewalls continued from June 28 to July 5, 2006 as field analyses indicated elevated chloride concentrations. On July 6, 2006 four (4) Test Trenches were excavated to varying depths within the northern area release confines to delineate the vertical extent of chloride impacted soil (reference Figure 6). Soil samples collected from the four (4) Test Trenches were transported to an independent laboratory for analyses of chloride concentrations. Laboratory analytical data for Test Trench No.1 indicated four (4) samples collected at various depths (4-, 7-, 11- and 16-feet bgs) were above site remedial threshold goals of 250 mg/Kg. Soil samples collected from four (4) feet bgs in Test Trench Nos. 2, 3 and 4 were below site remedial threshold goals of 250 mg/Kg (reference *Table 3*). The chloride impacted soil associated with Test Trench No.1 may be attributed to historical releases from the adjacent disposal well. On July 7, 2006 twelve (12) soil samples were collected from the sidewalls of the northerly excavation site and transported to an independent laboratory for analyses of chloride concentrations. Both field analyses and laboratory analytical data confirmed the twelve (12) soil samples chloride concentrations exceeded site remedial threshold goals of 250 mg/Kg.

Excavation of the south and west release areas started on July 10 and concluded on July 31, 2006. During this interim, excavation also continued on the sidewalls of the north release area. Soil samples were collected from the sidewalls seven (7 ea.) and bottom four (4 ea.) of the south release area on July 14, 2006 and transported to an independent laboratory for analyses of chloride concentrations. Laboratory analytical data indicated the four (4) soil samples taken from the bottom of the south release area were below site remedial threshold goals of 250 mg/Kg while the seven (7) soil samples taken from the sidewalls exceeded site remedial threshold goals of 250 mg/Kg. On July 18, 2006 three (3) soil samples were collected from the bottom of the east release area and one (1) cross-reference soil sample collected from the sidewalls of the north release area. Laboratory analytical data from soil samples collected from the bottom of the east release area indicated chloride concentrations in EER-BH-2 (16 mg/Kg) and EER-BH-3 (250 mg/Kg) were at or below site remedial threshold goals of 250 mg/Kg while bottom hole soil sample EER-BH-1 (360 mg/Kg) exceeded that value. The cross-reference soil sample [SW-10A (2')] collected from the sidewall of the north release area showed a decrease in chloride concentrations from 1,020 mg/Kg to 430 mg/Kg due to excavation activities.

Based on analytical data from soil samples taken on September 14, 2006 chloride concentrations ranged from 224 mg/Kg (NSW-10A @ 2-ft bgs) to 2,751 mg/Kg (SSW-8A @ 2-ft bgs), additional contaminated soil was excavated from December 19 through December 21, 2006.

Backfilling of the excavation started on January 2 and ended on January 9, 2006. Approximately 1,274 yds<sup>3</sup> of caliche were transported from a BLM approved pit for use as backfill material. The use of caliche for backfill material was justified as the primary release area was located within the tank battery perimeter. A secondary area contiguous with the primary area was backfilled with an unknown quantity of sandy soil from nearby dunes and approximately 532 yds<sup>3</sup> of topsoil. The disturbed surface around the release area was graded to allow natural drainage. Although the sandy soil used to backfill the secondary area will enhance the growth of indigenous grasses and plants, the area will be seeded with a grass blend approved by the BLM.

### 8.3 If additional groundwater and monitoring is recommended, indicate the proposed monitoring schedule and frequency. Conduct quarterly monitoring until the NMOCD responds to this report. Not Applicable

8.4 If corrective action is recommended, provide a conceptual approach. Not Applicable

**FIGURES** 

















### Well Data

# Chesapeake Energy Quail Queen SWD No. 001 - (Quail State SWD); (NMOCD Ref: 1RP #748; EPI Ref: #160030)

Use
S61 X103 S61 ONA
Selection Selection
PRO 19S
PRO 192
PRO 195
OBS 19S
OBS 19S
S61
S61
S61
S61
19S
<b>6</b> 1
19S
S61
198 - 198 -
S61
19S
S61
19S
S61

Data obtained from the New Mexico Office of the State Engineer Website (http://iwaters.ose.state.nm.us.7001/iWATERS/wr\_RegisServlet1) and the USGS Website (http://waterdata.usgs.gov/nwis).

<sup>A</sup> = in acre feet per annum
 <sup>B</sup> = lin acre feet per annum
 <sup>B</sup> = Elvation interpolated from USGS topographical map based on referenced location.
 STK = Livestock
 OBS = Observation
 PRO = Prospecting or development of natural resources

quarters are 1=NW, 2=NE, 3=SW, 4=SE; quarters are biggest to smallest

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### Summary of Soil Boring Soil Sample Field Analyses and Laboratory Analytical Results

## Chesapeake Energy Quail Queen SWD No. 001 - (Quail State SWD); (NMOCD Ref: 1RP#; EPI Ref.#160030)

1         1	Soil Boring	Depth (feet)	Soil Status	Sample Date	PID Reading (ppm)	Field Chloride (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	m,p-Xylenes (mg/Kg)	o-Xylene (mg/Kg)	Total BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as Diesel) (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
5         18         0.466         2         450         0.0250         0.0050         0.0050	4	2		18-Oct-05	4.4	3540	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.0125	<10.0	18.7	18.7	3710
10         18.0e.05         5         400         5         400         5         400         5         400         5         6         5		5		18-Oct-05	2	450	<0.0250	0.0259	0.0657	0.2680	0.0890	0.4486	<10.0	<10.0	<20.0	652
15         18,0+0.6         2.3         400		10		18-Oct-05	5	400		1	-	;	1	1	1	-	-	133
20         18,0etod\$         15         400         400 <td></td> <td>15</td> <td></td> <td>18-Oct-05</td> <td>2.3</td> <td>480</td> <td>;</td> <td>:</td> <td>1</td> <td>:</td> <td>1</td> <td>;</td> <td>1</td> <td>;</td> <td>I</td> <td>214</td>		15		18-Oct-05	2.3	480	;	:	1	:	1	;	1	;	I	214
26       18.0et-65       2.3       3.00	1 Ha	20		18-Oct-05	1.5	400	1	:	1	1	1	1	-		:	
30         18-00-05         1.5         320		25		18-Oct-05	2.3	320	:	:	4	1	;	:	1			
35         18,0etd6         16         240         52		30		18-Oct-05	1.5	320	1	1	1	1	1	I	1	1	1	1
40         18.0ct/6         3.1         240         ···         ··		35		18-Oct-05	1.6	240	4	1		1	1	1	;	1	:	
45         18.0ct:05         3.5         240		40		18-Oct-05	3.1	240	1	-	1	:	1		1	;	:	-
2         1         18-0er-05         2.6         3.120         6.00250		45		18-Oct-05	3.5	240	1			;		-	-		1	-
5         18.0ct.05         2.3         1.280         <0.0250         <0.0250         <0.125         <10.0         <10.0         <20.0           16         18.0ct.05         2.2         640          -		2		18-Oct-05	2.6	3,120	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.125	<10.0	<10.0	<20.0	1860
		5		18-Oct-05	2.3	1,280	<0.0250	<0.0250	<0.0250	<0.0250	<0.0250	<0.125	<10.0	<10.0	<20.0	118
1518.0ct:053.05.00 $\cdots$ <td></td> <td>10</td> <td></td> <td>18-Oct-05</td> <td>2.2</td> <td>640</td> <td>1</td> <td>1</td> <td>1</td> <td>;</td> <td></td> <td>1</td> <td>-</td> <td>-</td> <td>1</td> <td>215</td>		10		18-Oct-05	2.2	640	1	1	1	;		1	-	-	1	215
20         18-0ct-05         11         500         ···		15		18-Oct-05	3.0	500	1	:	I	;	:	1	1	1		172
25       18-0ct-05       19       480		20		18-Oct-05	1.1	500	;	1		1	-	1				
3018. Oct-052.1480 $\cdots$ <td></td> <td>25</td> <td></td> <td>18-Oct-05</td> <td>1.9</td> <td>480</td> <td>:</td> <td>:</td> <td> </td> <td>;</td> <td>1</td> <td>I</td> <td>1</td> <td></td> <td>-</td> <td></td>		25		18-Oct-05	1.9	480	:	:		;	1	I	1		-	
35         18.0ct-05         1.4         400   -	ίnα	30		18-Oct-05	2.1	480	1	;		1	:	1	1	1	-	:
Oct-05         1.7         400 $$ <t< td=""><td>7-110</td><td>35</td><td></td><td>18-Oct-05</td><td>1.4</td><td>400</td><td>-</td><td>1</td><td>1</td><td>I</td><td>;</td><td>1</td><td>1</td><td>-</td><td>-</td><td></td></t<>	7-110	35		18-Oct-05	1.4	400	-	1	1	I	;	1	1	-	-	
Oct-05         15         400 $$ <th< td=""><td></td><td>40</td><td></td><td>18-Oct-05</td><td>1.7</td><td>400</td><td>;</td><td>:</td><td></td><td></td><td>;</td><td></td><td>1</td><td>1</td><td>:</td><td>1</td></th<>		40		18-Oct-05	1.7	400	;	:			;		1	1	:	1
Oct-05         0.9         400		45		18-Oct-05	1.5	400	-	-	1	;	:	:	-		-	:
Oct-05       0.2       320		50		18-Oct-05	0.9	400	:	1	1	I	:	1	1		-	:
Oct-05         0.3         240   <		55		18-Oct-05	0.2	320	1	1	-		-	1	-	1	-	1
Oct-05     0.2     240             100 <sup>3</sup> 10     10     50     50     1.000		60		18-Oct-05	0.3	240	1	-	:	-	1	-	-	1	-	:
100 <sup>3</sup> 10 50 1.000		65		18-Oct-05	0.2	240	1	1	-	1	1	T	-	-	ł	1
	Z	IMOCD Re	emedial Thresh	holds	$100^{3}$		10					50			000'1	2504

2... Not Analyzed
 <sup>4</sup> In lieu of laboratory analyse of benzene, toluene, ethylbenzene and total xylenes.
 <sup>4</sup> Chloride residuals may not be cupable of impacting local groundwaterabove the NMWQCCstandard of 250 mg/L

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### Summary of Excavation Soil Sample Field Analyses and Laboratory Analytical Results

### Chesapeake Energy Quail Queen SWD No. 001 - (Quail State SWD); (NMOCD Ref: 1RP#; EPI Ref.#160030)

Chloride (mg/Kg)	;	:	:		:		:	:		:	:	,	787	276	1,110	383	851	1.450	:	1	340	340	125	468	1	1.740	1.360
Chlo (mg	'	,				<u> </u>	<u>'</u>	' 	, 		,		7	14	11	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	96 	-	'		r,	~	7	-			
TPH (mg/Kg)	:	:		:	1	1	:	;	;	1	;	1	:	4	:	1.1	1	1	1	1	:	1	I	1		:	;
TPH (as Diesel) (mg/Kg)	:	1	:		1	1	1	E E				;			:		:		:		:	:		:	:	* -	
TPH (as gaseline) (mg/Kg)	:		1				1	5		:	1	:	;	;	1		:	:	:	;	;	a t	.,	:		:	:-
Total BTEX (mg/Kg)			:				:	:	;		1	a e	:	:	:	***	:	:	:	:	:	-	1			:	
Total Xylenes (mg/Kg)	;	1			1	-	1	;			1			-			:		:	:	;	1	:		* *		
Ethylbenzene (mg/Kg)	:	р Р		1	:		1 1	1		:	:	ь Р	:	:	:-	:	:	1		;		1		*	1		
Toluene (mg/Kg)	;	:	;	;	;	;	:	:	;	;	:	;	:	:	:	:	:	:	:	:	:	:	:	;	;	;	:
Benzene (mg/Kg)	1	:	-	:	:	;	1		4	:	:		:	:	:		:	:	;	;	:	;	:	:	:	:	
Field Chloride (mg/Kg)	1,280	1,120	720	1,640	2,240	4,000+	2,280	2,320	1,040	1,120	800	3,040	1,120	640	1,360	800	1,200	1,920	1,720	2,600	640	720	800	760	1,360	2,880	2,480
PID Reading (ppm)	36.6	36.4	6.7	10.1	15.4	4.5	36.1	29.0	35.7	33.4	27.7	26.6	26.4	25.3	28.9	30.2	28.4	31.3	26.3	25.7	17.8	22.5	20.8	28.8	33.2		1
Sample Date	15-Jun-06	15-Jun-06	15-Jun-06	15-Jun-06	15-Jun-06	15-Jun-06	16-Jun-06	16-Jun-06	16-Jun-06	16-Jun-06	16-Jun-06	16-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	28-Jun-06	05-Jul-06	05-Jul-06
Soil Status																											
Depth (feet)	1.5	1	-	-	-	-	-	-	-	I	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	4	7
Sample I.D.	I-WS	SW-2	SW-3	SW-4	SW-5	SW-6	2-WS	SW-8	6-WS	SW-10	SW-11	SW-12	BH-1 2'	BH-2 2'	BH-3 2'	BH-4 2'	BH-5 2'	BH-6 2'	BH-7 2'	BH-8 2'	BH-9 2'	BH-10 2'	BH-11 2'	BH-12 2'	BH-13 2'	TT-1 4'	TT-1 7'

### . Summarv of Excavation Soil Sample Field Analyses and Laboratory Analytical Results

### Chesapeake Energy Quail Queen SWD No. 001 - (Quail State SWD); (NMOCD Ref: 1RP#; EPI Ref.#160030)

Chloride (mg/Kg)	1,360	1.020	213	234	170	1.280	276	1,130	532	766	298	468	766	553	1.020	425	447	179	221	182	87.6	5.380	1.300	962	2,030	2,100	1,490
	1	-				_		-							1							<i>u</i> ,				~	_
TPH (mg/Kg)	;	) 	8		:	;		1		;	+	:	:	t t	:	1		:	:	1	;	;	;	:	;	1	
TPH (as Diesel) (mg/Kg)	;	;		1	:	:			;		:	:	4.7	:							:	:				:-	
TPH (as gasoline) (mg/Kg)	:		:							-	1	;		;	1	* *		;			2		:		-		1
Total BTEX (mg/Kg)	:			:	•	:						:		:									:				1
Total Xylenes (mg/Kg)	:	;	:	:					4.4		:									* *				* *			
Ethylbenzene (mg/Kg)	:	;				4 1	- +			;	;	1	:	:	••			:	:	:	F k				••		
Toluene (mg/Kg)	:	;		:	:					:	;	;	-		* *	3 7			• •	a t	ł	4		- 4			
Benzene (mg/Kg)	:	:	:	:	:	:			:	:	1	:	:	:	:	•		1	3	1		1			4		
Field Chloride (mg/Kg)	2,580	1,680	640	680	480	1,960	640	1,760	920	1,380	880	1,040	1,120	1,280	1,760	000'1	006	740	880	1,720	640	4,000	1,780	2,800	4,000	4,000	2,640
PID Reading (ppm)		:	4	1	1	:			1	:	;	1				1					-	1	4				)
Sample Date	05-Jul-06	05-Jul-06	05-Jul-06	05-Jul-06	05-Jul-06	7-Jul-06	14-Jul-06																				
Soil Status																											
Depth (feet)	11	16	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sample I.D.	TT-1 11'	TT-1 16'	TT-2 4'	TT-3 4'	TT-4 4'	SW-1 2'	SW-2 2'	SW-3 2'	SW-4 2'	SW-5 2'	SW-6 2'	SW-7 2'	SW-8 2'	SW-9 2'	SW-10 2'	SW-11 2'	SW-12 2'	SEE-BH-1 2'	SEE-BH-2 2'	SEE-BH-3 2'	SEE-BH-4 2'	SEE-SW-1 2'	SEE-SW-2 2'	SEE-SW-3 2'	SEE-SW-4 2'	SEE-SW-5 2'	SEE-SW-6 2'

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### Summary of Excavation Soil Sample Field Analyses and Laboratory Analytical Results

### Chesapeake Energy Quail Queen SWD No. 001 - (Quail State SWD); (NMOCD Ref: 1RP#; EPI Ref.#160030)

1 4 Judo	Soil Status	tus Sample Date	PUD Reading (ppm)	Field Chloride (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as Diesel) (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
Halloo         Sale         <		14-Jul-06	;	1,480	:	;	1	-		:	:	;	635
18.4a/06440<		18-Jul-06	<b>k</b> 1	840	1	с 1	1	:	;	;	4	:	360
18-14-16         ····         600         ·····         ·····         ·····         ·····         ·····         ······         ······         ······         ······         ·······         ·······         ··········         ·················         ····································	1	18-Jul-06	;	440	1	1	1		:				16
18-14-16         ····         900         ·····         ·····         ·····         ·····         ·····         ·····         ·····         ·····         ······         ······         ······         ······         ·······         ·······         ····································		18-Jul-06	;	660	1	1	,		1	-			250
31.Jau.Ge4.00 <td></td> <td>18-Jul-06</td> <td>1</td> <td>920</td> <td>;</td> <td></td> <td>1</td> <td></td> <td>:</td> <td></td> <td>1</td> <td>1</td> <td>430</td>		18-Jul-06	1	920	;		1		:		1	1	430
J-J-Ju-Go1.200 <td></td> <td>31-Jul-06</td> <td>:</td> <td>4,000</td> <td>:</td> <td>:</td> <td>ţ</td> <td>+ -</td> <td>:</td> <td></td> <td>:</td> <td>1</td> <td>5,050</td>		31-Jul-06	:	4,000	:	:	ţ	+ -	:		:	1	5,050
J1Julo6          2.080  .		31-Jul-06	:	1,200		;		1	-		:	1	606
145m(01.7m(0		31-Jul-06	:	2,080		;		1	-	:	:	1	647
145ep(6)1.2.00 <td>n sit</td> <td></td> <td>;</td> <td>1,760</td> <td>;</td> <td>;</td> <td>1</td> <td>1</td> <td></td> <td></td> <td>:</td> <td></td> <td>2.223</td>	n sit		;	1,760	;	;	1	1			:		2.223
145eptid2.720 <td>n Sit</td> <td></td> <td>:</td> <td>1,240</td> <td>;</td> <td></td> <td></td> <td>1</td> <td>:</td> <td></td> <td>\$ \$</td> <td>1</td> <td>1.264</td>	n Sit		:	1,240	;			1	:		\$ \$	1	1.264
145ep61.200<	ln sit		;	2,720	;	:	1	:	:		1	:	2.751
$145$ $\cdots$ $1.160$ $\cdots$ <td>In sit</td> <td></td> <td></td> <td>1,200</td> <td></td> <td>;</td> <td>1</td> <td></td> <td>:</td> <td>-</td> <td>5 1</td> <td>:</td> <td>1.088</td>	In sit			1,200		;	1		:	-	5 1	:	1.088
14 Sep 06 $1.532$ $1$	In sit		:	1,160	;	:	1		;	-			1,280
14 Sep 06720 <td>In sit</td> <td></td> <td>;</td> <td>1,552</td> <td>;</td> <td>:</td> <td>1</td> <td>:</td> <td>P</td> <td>:</td> <td></td> <td>*</td> <td>1.552</td>	In sit		;	1,552	;	:	1	:	P	:		*	1.552
14.5ep06          1.280	In sit		;	720	1	:	1	;	:	:	:	1	656
14-Sep 06880 <td>In sit</td> <td></td> <td>:</td> <td>1,280</td> <td>-</td> <td>;</td> <td></td> <td></td> <td>:</td> <td>:</td> <td></td> <td>;</td> <td>1.568</td>	In sit		:	1,280	-	;			:	:		;	1.568
14-Sep 06 $\cdots$ 480 $\cdots$ <td>In sit</td> <td></td> <td></td> <td>880</td> <td>-</td> <td>;</td> <td>;</td> <td>2</td> <td>:</td> <td></td> <td></td> <td></td> <td>926</td>	In sit			880	-	;	;	2	:				926
$14 \cdot \text{sp} \cdot 06$ $\cdots$ $1.200$ $\cdots$ <td>In sit</td> <td></td> <td>;</td> <td>480</td> <td></td> <td></td> <td>1</td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>224</td>	In sit		;	480			1		1				224
$19-\text{Dec.}06$ $\cdots$ $1,280$ $\cdots$ <t< td=""><td>In sit</td><td></td><td></td><td>1,200</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td>1.136</td></t<>	In sit			1,200					-				1.136
$19-\text{Dec.}06$ $\cdots$ $1.120$ $\cdots$ <t< td=""><td>Excava</td><td></td><td>;</td><td>1,280</td><td>1</td><td>;</td><td></td><td>:</td><td>-</td><td></td><td></td><td></td><td>:</td></t<>	Excava		;	1,280	1	;		:	-				:
$19$ -Dec.06 $\cdots$ $1.000$ $\cdots$	Excava		;	1,120	1		1	1	:	1	:	;	
$19-\text{Dec.}06$ $\cdots$ $2.00$ $\cdots$	Excava		;	1,000	-	:	1			-	k k	:	
J9-Dec.06          1.200 <t< td=""><td>Excava</td><td></td><td>1</td><td>2,000</td><td>1</td><td>:</td><td>1</td><td></td><td>;</td><td>-</td><td></td><td>:</td><td>:</td></t<>	Excava		1	2,000	1	:	1		;	-		:	:
$19-Dec.06$ $\cdots$ $1.200$ $\cdots$	Excava		1	1,200	-	;	;		1		:	:	
$19$ -Dec.06 $\cdots$ $600$ $\cdots$ <	Excava		;	1,200	;	:	;		:	:	1	:	
19-Dec-06          560  .	In sit		-	600	,	:	;		:			:	916
19-Dec-06          1.080	In sit		1	560	: -				1				911
100 <sup>3</sup> 10         50         1.000	In sit		;	1,080	1				-				928
	Thres	holds	100 <sup>3</sup>		10				50			1,000	$250^{4}$

Bolded values are in excess of the NMOCD Remediation Thresholds

<sup>2</sup> - -: Not Analyzed

<sup>3</sup> In lieu of laboratory analyes of benzene, toluene, ethylbenzene and total xylenes. <sup>4</sup> Chloride residuals may be capable of impacting local groundwaterabove NMWQCC Groundwater Standard of 250 mg/L BH= Bottom Hole: TT = Test Trench, SW = Sidewall; SEE = Southeast Excavation; EER =Excavation cast of the road; SSW = South Sidewall; NSW = North Sidewall

### **APPENDICES**

### **APPENDIX I**

### LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY FORMS



### Analytical Report

### **Prepared for:**

Iain Olness Environmental Plus, Incorporated P.O. Box 1558 Eunice, NM 88231

Project: Chesapeake/ Quail State SWD Project Number: 160030 Location: UL-O, Sect. 11, T 19 S, R 34 E

Lab Order Number: 5J19010

Report Date: 11/02/05

Environmental Plus, Incorporated	Project:	Chesapeake/ Quail State SWD	Fax: 505-394-2601
P.O. Box 1558	Project Number:	160030	Reported:
Eunice NM, 88231	Project Manager:	Iain Olness	11/02/05 14:11

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH-1 2'	5J19010-01	Soil	10/18/05 12:45	10/19/05 14:10
BH-1 5'	5J19010-02	Soil	10/18/05 12:59	10/19/05 14:10
BH-1 10'	5J19010-03	Soil	10/18/05 13:10	10/19/05 14:10
BH-1 15'	5J19010-04	Soil	10/18/05 13:20	10/19/05 14:10
BH-2 2'	5J19010-11	Soil	10/18/05 14:43	10/19/05 14:10
BH-2 5'	5J19010-12	Soil	10/18/05 14:47	10/19/05 14:10
BH-2 10'	5J19010-13	Soil	10/18/05 15:00	10/19/05 14:10
BH-2 15'	5J19010-14	Soil	10/18/05 15:10	10/19/05 14:10

Environmental Plus, Incorporated
P.O. Box 1558
Eunice NM, 88231

Project: Chesapeake/ Quail State SWD Project Number: 160030 Project Manager: Iain Olness Fax: 505-394-2601

**Reported:** 11/02/05 14:11

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### Organics by GC

**Environmental Lab of Texas** 

		Reporting							
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
BH-1 2' (5J19010-01) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EJ51903	10/19/05	10/20/05	EPA 8021B	
Toluene	ND	0.0250	"	н	и	"	н	*1	
Ethylbenzene	ND	0.0250	"	н	"	"	н	74	
Xylene (p/m)	ND	0.0250	"		11	"	n	51	
Xylene (o)	ND	0.0250	"	11	"	"	n 	••	
Surrogate: a,a,a-Trifluorotoluene		102 %	80-1	20	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.0 %	80-1	20	n	n	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EJ51913	10/19/05	10/20/05	EPA 8015M	
Diesel Range Organics >C12-C35	18.7	10.0	н	**		11	11	"	
Total Hydrocarbon C6-C35	18.7	10.0	и	11		11	"	"	
Surrogate: 1-Chlorooctane		87.6 %	70-1	130	n	n	"	"	
Surrogate: 1-Chlorooctadecane		84.4 %	70-1	130	"	"	"	"	
BH-1 5' (5J19010-02) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EJ51903	10/19/05	10/19/05	EPA 8021B	
Toluene	0.0259	0.0250	"		"	"	п	**	
Ethylbenzene	0.0657	0.0250	н	н	**	11	н	11	
Xylene (p/m)	0.268	0.0250	н	11	*	"	и	**	
Xylene (0)	0.0890	0.0250	и	и 			11	11	
Surrogate: a,a,a-Trifluorotoluene		89.8 %	80-1	20	"	n	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	80-1	20	"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EJ51913	10/19/05	10/20/05	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	н	"	u	"			
Total Hydrocarbon C6-C35	ND	10.0	н .	н.	ч		"	łt	
Surrogate: 1-Chlorooctane		89.0 %	70-1	130	"	"	"	"	
Surrogate: 1-Chlorooctadecane		76.8 %	70-1	130	"	"	"	"	
BH-2 2' (5J19010-11) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EJ51903	10/19/05	10/20/05	EPA 8021B	
Toluene	ND	0.0250	н	п	**	"	"	н	
Ethylbenzene	ND	0.0250	и	"	**	"	11	*1	
Xylene (p/m)	ND	0.0250	и		"	"			
Xylene (o)	ND	0.0250	N		"	"	н	u	
Surrogate: a,a,a-Trifluorotoluene		96.8 %	80-1	20	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.0 %	80-1	20	"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EJ51913	10/19/05	10/20/05	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	н	**	
Total Hydrocarbon C6-C35	ND	10.0	"	"	u 	"		N	
Environmental Lab of Texas			The res	sults in this r	enort apply to	the samples an	abzed in accord	ance with the samples	

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety,

with written approval of Environmental Lab of Texas.

Page 2 of 10

Environmental Plus, Incorporated P.O. Box 1558	Project: Chesapeake/ Quail State SWD Project Number: 160030							Fax: 505-394-2601 <b>Reported:</b> 11/02/05 14:11	
Eunice NM, 88231	Project Manager: Iain Olness								
		O	rganics by	y GC					
Environmental Lab of Texas									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BH-2 2' (5J19010-11) Soil									
Surrogate: 1-Chlorooctane		93.0 %	70-1.	30	EJ51913	10/19/05	10/20/05	EPA 8015M	
Surrogate: 1-Chlorooctadecane		78.6 %	70-1.	30	"	"	"	"	
BH-2 5' (5J19010-12) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EJ51903	10/19/05	10/20/05	EPA 8021B	
Toluene	ND	0.0250	"	"	**	**	н	н	
Ethylbenzene	ND	0.0250	"	"	"	"	u	**	
Xylene (p/m)	ND	0.0250		"	"	"	н		
Xylene (o)	ND	0.0250	"	"		**	н	**	
Surrogate: a,a,a-Trifluorotoluene		99.0 %	80-1.	20	"	"	n	"	
Surrogate: 4-Bromofluorobenzene		104 %	80-1.	20	"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EJ51913	10/19/05	10/20/05	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"		н	11	"		
Total Hydrocarbon C6-C35	ND	10.0	"	11	н	11	9	"	
Surrogate: 1-Chlorooctane	-	82.0 %	70-1.	30	"	"	"	"	
Surrogate: 1-Chlorooctadecane		76.4 %	70-1.	30	"	"	"	"	

Environmental Lab of Texas

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The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

Environmental Plus, Incorporated	Project: Chesapeake/ Quail State SWD	Fax: 505-394-2601		
P.O. Box 1558	Project Number: 160030	Reported:		
Eunice NM, 88231	Project Manager: Iain Olness	11/02/05 14:11		

### General Chemistry Parameters by EPA / Standard Methods

### **Environmental Lab of Texas**

		Reporting							
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BH-1 2' (5J19010-01) Soil									
Chloride	3710	50.0	mg/kg	100	EJ52107	10/20/05	10/21/05	EPA 300.0	
% Moisture	6.1	0.1	%	1	EJ51912	10/19/05	10/20/05	% calculation	
BH-1 5' (5J19010-02) Soil									
Chloride	652	10.0	mg/kg	20	EJ52107	10/20/05	10/21/05	EPA 300.0	
% Moisture	4.7	0.1	%	1	EJ51912	10/19/05	10/20/05	% calculation	
BH-1 10' (5J19010-03) Soil									
Chloride	133	5.00	mg/kg	10	EK50206	10/31/05	11/02/05	EPA 300.0	
BH-1 15' (5J19010-04) Soil									
Chloride	214	10.0	mg/kg	20	EK50206	10/31/05	11/02/05	EPA 300.0	
BH-2 2' (5J19010-11) Soil									
Chloride	1860	25.0	mg/kg	50	EJ52107	10/20/05	10/21/05	EPA 300.0	
% Moisture	9.9	0.1	%	1	EJ51912	10/19/05	10/20/05	% calculation	
BH-2 5' (5J19010-12) Soil									
Chloride	814	10.0	mg/kg	20	EJ52107	10/20/05	10/21/05	EPA 300.0	
% Moisture	7.9	0.1	%	1	EJ51912	10/19/05	10/20/05	% calculation	
BH-2 10' (5J19010-13) Soil									
Chloride	215	10.0	mg/kg	20	EK50206	10/31/05	11/02/05	EPA 300.0	
BH-2 15' (5J19010-14) Soil									
Chloride	172	10.0	mg/kg	20	EK50206	10/31/05	11/02/05	EPA 300.0	

Environmental Lab of Texas

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**Reported:** 11/02/05 14:11

#### **Organics by GC - Quality Control**

**Environmental Lab of Texas** 

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ51903 - EPA 5030C (GC)										
Blank (EJ51903-BLK1)				Prepared &	Analyzed:	10/19/05				
Benzene	ND	0.0250	mg/kg wet							
Toluene	ND	0.0250	"							
Ethylbenzene	ND	0.0250								
Xylene (p/m)	ND	0.0250								
Xylene (o)	ND	0.0250	"							
Surrogate: a,a,a-Trifluorotoluene	37.0		ug/kg	40.0		92.5	80-120			
Surrogate: 4-Bromofluorobenzene	35.9		"	40.0		89.8	80-120			
LCS (EJ51903-BS1)				Prepared &	: Analyzed:	10/19/05				
Benzenc	0.0423	0.00100	mg/kg wet	0.0500		84.6	80-120			
Toluene	0.0476	0.00100	"	0.0500		95.2	80-120			
Ethylbenzene	0.0539	0.00100	"	0.0500		108	80-120			
Xylene (p/m)	0.0997	0.00100	"	0.100		99.7	80-120			
Xylene (o)	0.0544	0.00100	0	0.0500		109	80-120			
Surrogate: a,a,a-Trifluorotoluene	38.1		ug/kg	40.0		95.2	80-120			
Surrogate: 4-Bromofluorobenzene	35.9		"	40.0		89.8	80-120			
Calibration Check (EJ51903-CCV1)				Prepared: 1	0/19/05 Ai	nalyzed: 10	/20/05			
Benzene	42.0		ug/kg	50.0		84.0	80-120			
Foluene	48.4		"	50.0		96.8	80-120			
Ethylbenzene	59.3		н	50.0		119	80-120			
Xylene (p/m)	109		"	100		109	80-120			
Xylene (0)	59.7		"	50.0		119	80-120			
Surrogate: a,a,a-Trifluorotoluene	38.2			40.0		95.5	80-120			
Surrogate: 4-Bromofluorobenzene	38.8		"	40.0		97.0	80-120			
Matrix Spike (EJ51903-MS1)	Sou	rce: 5J19002	-07	Prepared &	Analyzed:	10/19/05				
Benzene	1.11	0.0250	mg/kg dry	1.30	ND	85.4	80-120			
Toluene	1.27	0.0250	"	1.30	ND	<b>9</b> 7.7	80-120			
Ethylbenzene	1.48	0.0250	"	1.30	ND	114	80-120			
Xylene (p/m)	2.73	0.0250	"	2.60	ND	105	80-120			
Kylene (0)	1.44	0.0250	"	1.30	ND	111	80-120			
Surrogate: a,a,a-Trifluorotoluene	40.5		ug/kg	40.0	-	101	80-120			
Surrogate: 4-Bromofluorobenzene	39.9		"	40.0		99.8	80-120			

Environmental Lab of Texas

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Fax: 505-394-2601

**Reported:** 11/02/05 14:11

#### **Organics by GC - Quality Control**

**Environmental Lab of Texas** 

		Reporting		Spike	Source	0/88~	%REC	000	RPD	37
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch EJ51903 - EPA 5030C (GC)										
Matrix Spike Dup (EJ51903-MSD1)	Sour	ce: 5J19002	-07	Prepared:	0/19/05 Ai	nalyzed: 10	/20/05			
Benzene	1.22	0.0250	mg/kg dry	1.30	ND	93.8	80-120	9.38	20	
Toluene	1.37	0.0250	11	1.30	ND	105	80-120	7.20	20	
Ethylbenzene	1.53	0.0250		1.30	ND	118	80-120	3.45	20	
Xylene (p/m)	3.12	0.0250	н	2.60	ND	120	80-120	13.3	20	
Xylene (0)	1.56	0.0250		1.30	ND	120	80-120	7.79	20	
Surrogate: a,a,a-Trifluorotoluene	37.8		ug/kg	40.0		94.5	80-120	-		
Surrogate: 4-Bromofluorobenzene	39.8		"	40.0		99.5	80-120			
Batch EJ51913 - Solvent Extraction (GC	2)									
Blank (EJ51913-BLK1)				Prepared &	Analyzed:	10/19/05				
Gasoline Range Organics C6-C12	ND	10.0	mg/kg wet							
Diesel Range Organics >C12-C35	ND	10.0	"							
Total Hydrocarbon C6-C35	ND	10.0	"							
Surrogate: 1-Chlorooctane	41.6		mg/kg	50.0		83.2	70-130			
Surrogate: 1-Chlorooctadecane	42.5		"	50.0		85.0	70-130			
LCS (EJ51913-BS1)				Prepared &	z Analyzed:	10/19/05				
Gasoline Range Organics C6-C12	415	10.0	mg/kg wet	500		83.0	75-125			
Diesel Range Organics >C12-C35	414	10.0	"	500		82.8	75-125			
Total Hydrocarbon C6-C35	829	10.0	"	1000		82.9	75-125			
Surrogate: 1-Chlorooctane	48.3		mg/kg	50.0		96.6	70-130			
Surrogate: 1-Chlorooctadecane	53.8		"	50.0		108	70-130			
Calibration Check (EJ51913-CCV1)				Prepared: 1	0/19/05 Ai	nalyzed: 10	/20/05			
Gasoline Range Organics C6-C12	469		mg/kg	500		93.8	80-120			
Diesel Range Organics >C12-C35	443			500		88.6	80-120			
Total Hydrocarbon C6-C35	912		н	1000		91.2	80-120			
Surrogate: 1-Chlorooctane	54.9			50.0		110	70-130			
Surrogate: 1-Chlorooctadecane	52.1		"	50.0		104	70-130			

Environmental Lab of Texas

**Reported:** 11/02/05 14:11

#### **Organics by GC - Quality Control**

**Environmental Lab of Texas** 

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Allatyte	Result	Limit		Level	Result	/orcec	Latits		Lunn	THOLES
Batch EJ51913 - Solvent Extraction (GC)										
Matrix Spike (EJ51913-MS1)	Sou	rce: 5J19007-	-01	Prepared &	Analyzed:	10/19/05				
Gasoline Range Organics C6-C12	427	10.0	mg/kg dry	512	ND	83.4	75-125			
Diesel Range Organics >C12-C35	426	10.0	"	512	ND	83.2	75-125			
Total Hydrocarbon C6-C35	853	10.0		1020	ND	83.6	75-125			
Surrogate: 1-Chlorooctane	50.8		mg/kg	50.0		102	70-130			
Surrogate: 1-Chlorooctadecane	52.6		"	50.0		105	70-130			
Matrix Spike Dup (EJ51913-MSD1)	Sou	rce: 5J19007-	-01	Prepared &	Analyzed:	10/19/05				
Gasoline Range Organics C6-C12	429	10.0	mg/kg dry	512	ND	83.8	75-125	0.467	20	
Diesel Range Organics >C12-C35	412	10.0		512	ND	80.5	75-125	3.34	20	
Total Hydrocarbon C6-C35	841	10.0	"	1020	ND	82.5	75-125	1.42	20	
Surrogate: 1-Chlorooctane	50.2		mg/kg	50.0		100	70-130			
Surrogate: 1-Chlorooctadecane	51.4		"	50.0		103	70-130			

Environmental Lab of Texas

Environmental Plus, Incorporated	Project:	Chesapeake/ Quail State SWD	Fax: 505-394-2601
P.O. Box 1558	Project Number:	160030	Reported:
Eunice NM, 88231	Project Manager:	Iain Olness	11/02/05 14:11

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ51912 - General Preparation (Pre	p)									
Blank (EJ51912-BLK1)				Prepared:	10/19/05	Analyzed: 10	)/20/05			
% Solids	100		%							
Duplicate (EJ51912-DUP1)	Sou	ırce: 5J18008-0	1	Prepared:	10/19/05	Analyzed: 10	)/20/05			
% Solids	89.1		%		89.2			0.112	20	
Duplicate (EJ51912-DUP2)	Sou	ırce: 5J19008-0	2	Prepared:	10/19/05	Analyzed: 10	)/20/05			
% Solids	92.2		%		91.9			0.326	20	
Batch EJ52107 - Water Extraction										
Blank (EJ52107-BLK1)				Prepared:	10/20/05	Analyzed: 10	)/21/05			
Chloride	ND	0.500	mg/kg							
LCS (EJ52107-BS1)				Prepared:	10/20/05	Analyzed: 10	)/21/05			
Chloride	8.90		mg/L	10.0		89.0	80-120			
Calibration Check (EJ52107-CCV1)				Prepared:	10/20/05	Analyzed: 10	)/21/05			
Chloride	9.05		mg/L	10.0		90.5	80-120			
Duplicate (EJ52107-DUP1)	Sou	ırce: 5J19009-0	1	Prepared:	10/20/05	Analyzed: 10	)/21/05			
Chloride	360	10.0	mg/kg		407			12.3	20	
Batch EK50206 - Water Extraction										
Blank (EK50206-BLK1)				Prepared:	10/31/17	Analyzed: 1	/02/05			
Chloride	ND	0.500	mg/kg							

Environmental Lab of Texas

Environmental Plus, Incorporated	Project:	Chesapeake/ Quail State SWD	Fax: 505-394-2601
P.O. Box 1558	Project Number:	160030	Reported:
Eunice NM, 88231	Project Manager:	Iain Olness	11/02/05 14:11

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

#### **Environmental Lab of Texas**

Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
			Prepared: 1	0/31/17 A	nalyzed: 11	/02/05			
8.58		mg/L	10.0		85.8	80-120			
			Prepared: 1	0/31/17 A	nalyzed: 11	/02/05			
8.46		mg/L	10.0		84.6	80-120			
Sou	rce: 5J19010-(	03	Prepared: 1	0/31/17 A	nalyzed: 11	/02/05			
130	5.00	mg/kg		133			2.28	20	
	8.58 8.46 Sou	Result     Limit       8.58     8.46       Source: 5J19010-4	Result Limit Units   8.58 mg/L   8.46 mg/L   Source: 5J19010-03	ResultLimitUnitsLevelPrepared: 18.58mg/L10.0Prepared: 18.46mg/L10.0Source: 5J19010-03Prepared: 1	Result     Limit     Units     Level     Result       Prepared:     10/31/17     A       8.58     mg/L     10.0       Prepared:     10/31/17     A       8.46     mg/L     10.0       Source:     5J19010-03     Prepared:     10/31/17	Result     Limit     Units     Level     Result     %REC       Prepared: 10/31/17 Analyzed: 11       8.58     mg/L     10.0     85.8       Prepared: 10/31/17 Analyzed: 11       8.46     mg/L     10.0     84.6       Source: 5J19010-03	Result     Limit     Units     Level     Result     %REC     Limits       Prepared:     10/31/17     Analyzed:     11/02/05       8.58     mg/L     10.0     85.8     80-120       Prepared:     10/31/17     Analyzed:     11/02/05       8.46     mg/L     10.0     84.6     80-120       Source:     5J19010-03     Prepared:     10/31/17     Analyzed:     11/02/05	Result     Limit     Units     Level     Result     %REC     Limits     RPD       Prepared:     10/31/17     Analyzed:     11/02/05     11/02/05     10/00     85.8     80-120     10/00 <td>Result     Limit     Units     Level     Result     %REC     Limits     RPD     Limit       Prepared:     10/31/17     Analyzed:     11/02/05     1</td>	Result     Limit     Units     Level     Result     %REC     Limits     RPD     Limit       Prepared:     10/31/17     Analyzed:     11/02/05     1

Environmental Lab of Texas

Environmental Plus, Incorporated	Project:	Chesapeake/ Quail State SWD	Fax: 505-394-2601
P.O. Box 1558	Project Number:	160030	Reported:
Eunice NM, 88231	Project Manager:	Iain Olness	11/02/05 14:11

#### **Notes and Definitions**

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Ciley D. Kune Date:

Jeanne Mc Murrey, Inorg. Tech Director James L. Hawkins, Chemist/Geologist Sandra Sanchez, Lab Tech.

11/2/2005

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-563-1800.

Environmental Lab of Texas

Report Approved By:

Raland K. Tuttle, Lab Manager

Peggy Allen, QA Officer

Celey D. Keene, Lab Director, Org. Tech Director

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See Notes ANALYSIS REGUES HA9 <<< ABHTO d l D l Hď ("JOS) SETARLUS (ID) SEGINOTHO × × × × × × × Maros H91 BISO8 XETB × 15:18 15:26 15:00 15:10 15:23 14:43 15:47 16:00 TIME 14:47 15:44 SAMPLING 18-Oct-05 DATE Attn: lain Olness Eunice, NM 88231 P.O. Box 1558 BILTO PRESERV. REHTO ICE/COOF × × × × × × × × × × P.O. Box 1558, Eunice, NM 88231 ACID/BASE :язнто BERNDGE MATRIX CRUDE OIL 7105 RETAWETER **ABTAW GNUORD** UL-0, Sect. 11, T 19 S, R 34 E 505-394-3481 / 505-394-2601 # CONTAINERS Eunice New Mexico 88231 Environmental Plus, Inc. G G G 5 G G G 5 G Ű G)RAB OR (C)OMP. Chesapeake Energy Quall State SWD John Robinson P.O. BOX 1558 lain Olness SAMPLE I.D. (505) 394-3481 FAX: (505) 394-2601 160030 2100 Avenue O, Eunice, NM 88231 BH-2 (25') BH-2 (10') BH-2 (15') BH-2 (20') BH-2 (30') BH-2 (35') 9 BH-2 (40') 10 BH-2 (45') BH-2 (5') BH-2 (2') EPI Project Manager

EPI Sampler Name Project Reference

LAB I.D.

3

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EPI Phone#/Fax#

City, State, Zip

**Client Company** 

Facility Name

-ocation

Mailing Address

Company Name

NOTES: Analyze subsequent samples for chloride until two consecutive samples are below 250 mg/kg. Only Analyze BH-2 (60') and BH-2 (65') for TPH and BTEX if analytical results for BH-2 (5') indicate TPH >1,000 ppm, benzene >10 ppm and/or BTEX >50 ppm.

E-mail results to: joiness@envplus.net

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Page 2 of 3

Chain of Custody Form

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<b>Client Company</b>		Chesapeake Energy									F	\				N. AND CONTROL OF	w zosław				
Facility Name		Quail State SWD			l									*******							
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<b>Project Reference</b>		0				1			•	D.d	Bo	P.O. Box 1558			10000000	1.10 <b>0</b> 00	ti da	4		Mariari adikaka	
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-22 2	2 <b> BH-2 (55')</b>		ļ	<b> </b>	<b> </b>			<b> </b>	<b> </b>	Ě		18-Oct-05	14:47		┢	×	Ļ		┢	<u> </u>	
-23 3	3 <b>BH-2 (60')</b>					Ĩ			-	Ľ		18-Oct-05	15:00	×	×	×			See	See Notes	
-24 4	4 BH-2 (65')		ច	+		9		H	Η	×	Ц	18-Oct-05	15:10	×	×	X			See	See Notes	
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Page 3 of 3

# Environmental Lab of Texas Variance / Corrective Action Report – Sample Log-In

Client:	EPI
Date/Time:	10/19/05 2:15
Order #:	534010
Initials:	CIL

# Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	50 c
Shipping container/cooler in good condition?	Mes 1	No	
Custody Seals intact on shipping container/cooler?	YES	No	Not present
Custody Seals intact on sample bottles?	(CES)	No	Not present
Chain of custody present?	Yes	No	
Sample Instructions complete on Chain of Custody?	Yes	No	
Chain of Custody signed when relinquished and received?	YES	No	
Chain of custody agrees with sample label(s)	Yes	No	
Container labels legible and intact?	Yes	No	
Sample Matrix and properties same as on chain of custody?	(es)	No	
Samples in proper container/bottle?	Yes	No	
Samples properly preserved?	Yes	No	
Sample bottles intact?	Yes	No	
Preservations documented on Chain of Custody?	Yes	No	{
Containers documented on Chain of Custody?	Yes	No	
Sufficient sample amount for indicated test?	Xes	No	
All samples received within sufficient hold time?	Tes	No	
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

.

# Variance Documentation:

Contact Person: Regarding:	Date/Time:	Contacted by:	ugun gang gan digan di Pangda
Corrective Action Taken:		ama aman da kanan da kanan ang kananan da kanan	
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# Analytical Report

## **Prepared for:**

Iain Olness Environmental Plus, Incorporated P.O. Box 1558 Eunice, NM 88231

Project: Chesapeake/ Quail State SWD Project Number: 160030 Location: UL-O, Sect. 11, T 19 S, R 34 E

Lab Order Number: 6G07013

Report Date: 07/14/06

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH-1 2' ·	6G07013-01	Soil	06/28/06 08:10	07/07/06 11:20
BH-2 2'	6G07013-02	Soil	06/28/06 08:15	07/07/06 11:20
BH-3 2'	6G07013-03	Soil	06/28/06 08:30	07/07/06 11:20
BH-4 2'	6G07013-04	Soil	06/28/06 08:40	07/07/06 11:20
BH-5 2'	6G07013-05	Soil	06/28/06 08:50	07/07/06 11:20
BH-6 2'	6G07013-06	Soil	06/28/06 09:30	07/07/06 11:20
BH-9 2'	6G07013-07	Soil	06/30/06 13:05	07/07/06 11:20
BH-10 2'	6G07013-08	Soil	06/30/06 13:30	07/07/06 11:20
BH-11 2'	6G07013-09	Soil	06/30/06 13:45	07/07/06 11:20
BH-12 2'	6G07013-10	Soil	06/30/06 14:00	07/07/06 11:20

Page 1 of 5

# General Chemistry Parameters by EPA / Standard Methods

**Environmental Lab of Texas** 

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BH-1 2' (6G07013-01) Soil				Dilution	Datch	ricpareu	Analyzeu	Memou	Notes
Chloride	787	20.0 mg	y/kg Wet	2	EG61005	07/10/06	07/11/06	SW 846 9253	
BH-2 2' (6G07013-02) Soil									
Chloride	276	20.0 mg	ykg Wet	2	EG61005	07/10/06	07/11/06	SW 846 9253	
BH-3 2' (6G07013-03) Soil									
Chloride	1110	20.0 mg	g/kg Wet	2	EG61005	07/10/06	07/11/06	SW 846 9253	
BH-4 2' (6G07013-04) Soil									
Chloride	383	20.0 mg	y/kg Wet	2	EG61005	07/10/06	07/11/06	SW 846 9253	
BH-5 2' (6G07013-05) Soil			<b>.</b>						
Chloride	851	20.0 mg	/kg Wet	2	EG61005	07/10/06	07/11/06	SW 846 9253	
BH-6 2' (6G07013-06) Soil									
Chloride	1450	20.0 mg	/kg Wet	2	EG61005	07/10/06	07/11/06	SW 846 9253	
BH-9 2' (6G07013-07) Soil									
Chloride	340	20.0 mg	/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
BH-10 2' (6G07013-08) Soil								_	
Chloride	340	20.0 mg	/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
BH-11 2' (6G07013-09) Soil									
Chloride	425	20.0 mg	/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
BH-12 2' (6G07013-10) Soil									
Chloride	468	20.0 mg	/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	

Environmental Lab of Texas

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

Page 2 of 5

## General Chemistry Parameters by EPA / Standard Methods - Quality Control Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EG61005 - General Preparatio	n (WetChen	1)								
Blank (EG61005-BLK1)			-	Prepared:	07/10/06	Analyzed	: 07/11/06			
Chloride	ND	20.0 m	ng/kg Wet							
LCS (EG61005-BS1)				Prepared	& Analyze	d: 07/11/	)6			
Chloride	84.0		mg/kg	100		84.0	80-120			
Matrix Spike (EG61005-MS1)	Sou	arce: 6G0701	1-30	Prepared:	07/10/06	Analyzed	: 07/11/06			
Chloride	489	20.0 m	ng/kg Wet	500	0.00	97.8	80-120		~	
Matrix Spike Dup (EG61005-MSD1)	Sou	irce: 6G0701	1-30	Prepared:	07/10/06	Analyzed	: 07/11/06			
Chloride	489	20.0 m	ng/kg Wet	500	0.00	97.8	80-120	0.00	20	
Reference (EG61005-SRM1)				Prepared	& Analyze	d: 07/11/0	)6			
Chloride	52.1		mg/kg	50.0		104	80-120		-	
Batch EG61006 - General Preparation	n (WetChem	ı)		<u></u>						
Blank (EG61006-BLK1)				Prepared:	07/10/06	Analyzed	: 07/13/06			
Chloride	ND	20.0 m	ig/kg Wet							
LCS (EG61006-BS1)				Prepared a	& Analyze	d: 07/13/0	)6			
Chloride	84.0		mg/kg	100		84.0	80-120			
Matrix Spike (EG61006-MS1)	Sou	rce: 6G07014	4-04	Prepared:	07/10/06	Analyzed	: 07/13/06			
Chloride	1450	20.0 m	ig/kg Wet	· · · · · · · ·	1020	86.0	80-120			
Matrix Spike Dup (EG61006-MSD1)	Sou	Irce: 6G07014	4-04	Prepared:	07/10/06	Analyzed	; 07/13/06			
Chloride	1450		g/kg Wet		1020	86.0	80-120	0.00	20	

Environmental Lab of Texas

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Page 3 of 5

## General Chemistry Parameters by EPA / Standard Methods - Quality Control Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EG61006 - General Prepar	ation (WetCher	n)							·	
Reference (EG61006-SRM1)				Prepared	& Analyze	ed: 07/13/0	06			
Chloride	50.0		mg/kg	50.0		100	80-120			

Environmental Lab of Texas

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Environmental Lab of Texas.

Page 4 of 5

#### Notes and Definitions

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- LCS Laboratory Control Spike
- MS Matrix Spike
- Dup Duplicate

Kalandk stub Report Approved By:

Raland K. Tuttle, Lab Manager Celey D. Keene, Lab Director, Org. Tech Director Peggy Allen, QA Officer Jeanne Mc Murrey, Inorg. Tech Director LaTasha Cornish, Chemist Sandra Sanchez, Lab Tech.

7-

Date:

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Environmental Lab of Texas

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Page 5 of 5

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<b>Environmental Plus, Inc.</b>	2100 Avenue O, Eunice, NM 88231 (505) 394-3481 FAX: (505) 394-26	Company Name	EPI Project Manager	<b>Mailing Address</b>	City, State, Zip	EPI Phone#/Fax#	<b>Client Company</b>	Facility Name	Location	<b>Project Reference</b>	<b>EPI Sampler Name</b>			LAB I.D.	CHONDAN	10	62-	Ş	La la	-0S	90	er.	₽ F	<del>ر</del>	- - - - -		Sampher Belinquished	shed by:	Delivered by:	

Page 1 of 2

Chain of Custody Form Page 2 of 2

# **Environmental Plus, Inc.**

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# Environmental Lab of Texas Variance / Corrective Action Report – Sample Log-In

Client	EPI
Date/Time:	r/1/06 11:20
Order #:	6407013
Initials:	

# Sample Receipt Checklist

\_\_\_\_\_

Temperature of container/cooler?	Yes	No	0.5	С
Snipping container/cooler in good condition?		No		
Custody Seals intact on shipping container/cooler?	Yes	Na	(Tot preser	রা
Custody Seals intact on sample bottles?	(TES)	No	Not preser	nt 🗌
Chain of custody present?	635	Na		
Sample Instructions complete on Chain of Custody?	1 235	No		
Chain of Custody signed when relinquished and received?	tes 1	No		
Chain cf custody agrees with sample labe!(s)	1 Xas 1	No		
Container labels legible and intact?	P=6	No	1	
Sample Matrix and properties same as on chain of custody?	ASS	No	1	
Samples in procer container/bottle?	1 Pes 1	No		•
Samples properly preserved?	1 des 1	No		
Sample bottles intact?	1 235 1	No	1	
Preservations documented on Chain of Custody?	1 2=5 1	No	1	
Containers documented on Chain of Custody?	Yas I	No	1	
Sufficient sample amount for indicated test?	des 1	No	1	
All samples received within sufficient hold time?	Yes	Na	1	
VOC samples have zero headspace?	Yes	No	Hot Applica	The
Containers documented on Chain of Custody? Sufficient sample amount for indicated test? All samples received within sufficient hold time?		No No No		

Other observations:

# Variance Documentation:

Contact Person: Regarding:	Date/Time:	Contacted by:
· · · · · · · · · · · · · · · · · · ·		

Corrective Action Taken:



# Analytical Report

# **Prepared for:**

Iain Olness Environmental Plus, Incorporated P.O. Box 1558 Eunice, NM 88231

Project: Chesapeake/ Quail State SWD Project Number: 160030 Location: UL-O, Sect. 11, T 19 S, R 34 E

Lab Order Number: 6G07014

Report Date: 07/17/06

Environmental Plus, Incorporated P.O. Box 1558 Eunice NM, 88231 Project: Chesapeake/ Quail State SWD Project Number: 160030 Project Manager: Iain Olness

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TT-1 4'	6G07014-01	Soil	07/05/06 08:10	07/07/06 11:20
TT-1 7'	6G07014-02	Soil	07/05/06 08:45	07/07/06 11:20
TT-1 11'	6G07014-03	Soil	07/05/06 09:30	07/07/06 11:20
TT-1 16'	6G07014-04	Soil	07/05/06 14:30	07/07/06 11:20
TT-2 4'	6G07014-05	Soil	07/06/06 08:50	07/07/06 11:20
TT-3 4'	6G07014-06	Soil	07/06/06 10:30	07/07/06 11:20
TT-4 4'	6G07014-07	Soil	07/06/06 13:30	07/07/06 11:20

#### General Chemistry Parameters by EPA / Standard Methods

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
TT-1 4' (6G07014-01) Soil									
Chloride	1740	20.0	mg/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
TT-1 7' (6G07014-02) Soil									
Chloride	1360	20.0	mg/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
TT-1 11' (6G07014-03) Soil									
Chloride	1360	20.0	mg/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
TT-1 16' (6G07014-04) Soil							ü i i		
Chloride	1020	20.0	mg/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
TT-2 4' (6G07014-05) Soil									
Chloride	213	20.0	mg/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
TT-3 4' (6G07014-06) Soil									
Chloride	234	20.0	mg/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	
TT-4 4' (6G07014-07) Soil							<u></u>		
Chloride	170	20.0	mg/kg Wet	2	EG61006	07/10/06	07/13/06	SW 846 9253	

Environmental Lab of Texas

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EG61006 - General Preparation (	WetChem)									
Blank (EG61006-BLK1)				Prepared: (	07/10/06 A	nalyzed: 07	//13/06			
Chloride	ND	20.0	mg/kg Wet	-						
LCS (EG61006-BS1)				Prepared 8	z Analyzed:	07/13/06				
Chloride	84.0		mg/kg	100		84.0	80-120			
Matrix Spike (EG61006-MS1)	Sou	rce: 6G07014	-04	Prepared: (	07/10/06 A	nalyzed: 07	/13/06			
Chloride	1450	20.0	mg/kg Wet	500	1020	86.0	80-120			
Matrix Spike Dup (EG61006-MSD1)	Sou	rce: 6G07014	-04	Prepared: (	07/10/06 A	nalyzed: 07	/13/06			
Chloride	1450	20.0	mg/kg Wet	500	1020	86.0	80-120	0.00	20	
Reference (EG61006-SRM1)				Prepared 8	analyzed:	07/13/06				
Chloride	50.0		mg/kg	50.0		100	80-120			

Environmental Lab of Texas

#### Notes and Definitions

DET A	nalyte DETECTED
-------	-----------------

- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- LCS Laboratory Control Spike
- MS Matrix Spike
- Dup Duplicate

Report Approved By: Raland K Junk

Date: 7/17/2006

Raland K. Tuttle, Lab Manager Celey D. Keene, Lab Director, Org. Tech Director Peggy Allen, QA Officer Jeanne Mc Murrey, Inorg. Tech Director LaTasha Cornish, Chemist Sandra Sanchez, Lab Tech.

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If you have received this material in error, please notify us immediately at 432-563-1800.

Environmental Lab of Texas

<u>Chain of Custody Form</u> LAB ELT	ANALYSIS REQUEST												s) s= ) s=(	тен 801 снгояп рн тсгр ттсгр ттсгр на		X	X				×				let				
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	0			لمر	Щ			Attn: lain Olness	P.O. Box 1558	Eunice, NM 88231	SAMPLING			DATE	05-Jul-06	05-Jul-06	05-Jul-06	05-Jul-06	06-Jul-06	06-Jul-06	06-Jul-06				E-mail results to: iolness@envplus.net NOTES:	<u>N</u> 0	alacta haves		
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lus, Inc.	Environmental Plus, Inc	lain Olness	P.O. BOX 1558	Eunice New Mexico 88231	505-394-3481 / 505-394-	Chesapeake Energy	Quail State SWD	UL-O, Sect. 11, T 19 S, R 34 E	30	Sebastian Romero			E I.D.												Teger Le Or	Per No	OL: Lou	Sample Cool & Intact	
Thental Plus Eunice, NM 88231 FAX: (505) 394-2601	Envir			Eunic	505-3	Chesa	Quail		160030				SAMPLE I.D.		TT-1 (4')	TT-1 (7')	3 TT-1 (11')	4 TT-1 (16')	5 TT-2 (4')	TT-3 (4')	TT-4 (4')				2 2		ROOML		
Environmental Plus, Inc. 2100 Avenue O, Eunice, NM 88231 (505) 394-3481 FAX: (505) 394-2601	e a	EPI Project Manager	Mailing Address	City, State, Zip	EPI Phone#/Fax#	Client Company	Facility Name	Location	<b>Project Reference</b>	EPI Sampler Name			LAB I.D	Product of	-	тт <u>2</u> тт	.^	<u>-64 4</u> [TT	-75G 5 TT	-D(0 6 TT	7TT 7	8	6	10	le la	Retimutation by:	MG		

Page 1 of 1

# Environmental Lab of Texas Variance / Corrective Action Report – Sample Log-In

Olient:	EPI	
Date/Time:	7/1/06 11:20	
Order #:	6GOMQA	
Initials:		

# Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	15,0 CI
Shipping container/cooler in good condition?	100	No	
Custody Seals intact on shipping container/cooler?	Yes	No	Not present
Custody Seals intact on sample bottles?	Yes	Na	Horpresent
Chain of custody present?	1 XES	No 1	ļ ļ
Sample Instructions complete on Chain of Custody?	235	No	
Chain of Custody signed when relinquished and received?		No	
Chain of custody agrees with sample label(s)	1 2005	Na	
Container labels legible and intact?	XES7	No	
Sample Matrix and properties same as on chain of custody?	Yes	No	
Samples in proper container/bottle?	1231	No	· ·
Samples properly preserved?	1 2 SS	No	
Sample bottles intact?	235 1	No	
Preservations documented on Chain of Custody?	1253	Na	
Containers documented on Chain of Custody?	123	No	
Sufficient sample amount for indicated test?	1735	No	
All samples received within sufficient hold time?	1 (735)	No	1
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

Contact Person: Regarding:	Variance Documentation: Date/Time:	Contacted by:
Corrective Action Taken:		



# Analytical Report

# **Prepared for:**

Iain Olness Environmental Plus, Incorporated P.O. Box 1558 Eunice, NM 88231

Project: Chesapeake/ Quail State SWD Project Number: 160030 Location: UL-O, Sect. 11, T 19 S, R 34 E

Lab Order Number: 6G10009

Report Date: 07/13/06

Environmental Plus, Incorporated P.O. Box 1558 Eunice NM, 88231 Project: Chesapeake/ Quail State SWD Project Number: 160030 Project Manager: Iain Olness

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-1 2'		Soil	07/07/06 08:10	07/10/06 09:55
SW-2 2'	6G10009-02	Soil	07/07/06 08:45	07/10/06 09:55
SW-3 2'	6G10009-03	Soil	07/07/06 09:30	07/10/06 09:55
SW-4 2'	6G10009-04	Soil	07/07/06 14:30	07/10/06 09:55
SW-5 2'	6G10009-05	Soil	07/07/06 08:50	07/10/06 09:55
SW-6 2'	6G10009-06	Soil	07/07/06 10:30	07/10/06 09:55
SW-7 2'	6G10009-07	Soil	07/07/06 13:30	07/10/06 09:55
SW-8 2'	6G10009-08	Soil	07/07/06 13:45	07/10/06 09:55
SW-9 2'	6G10009-09	Soil	07/07/06 14:05	07/10/06 09:55
SW-10 2'	6G10009-10	Soil	07/07/06 14:45	07/10/06 09:55
SW-11 2'	6G10009-11	Soil	07/07/06 15:10	07/10/06 09:55
SW-12 2'	6G10009-12	Soil	07/07/06 15:40	07/10/06 09:55

## General Chemistry Parameters by EPA / Standard Methods

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SW-1 2' (6G10009-01) Soil							*		
Chloride	1280	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-2 2' (6G10009-02) Soil									
Chloride	276	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-3 2' (6G10009-03) Soil									
Chloride	1130	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-4 2' (6G10009-04) Soil									
Chloride	532	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-5 2' (6G10009-05) Soil									
Chloride	766	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-6 2' (6G10009-06) Soil									
Chloride	298	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-7 2' (6G10009-07) Soil									
Chloride	468	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-8 2' (6G10009-08) Soil									
Chloride	766	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-9 2' (6G10009-09) Soil									
Chloride	553	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-10 2' (6G10009-10) Soil									
Chloride	1020	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	
SW-11 2' (6G10009-11) Soil									
Chloride	425	20.0	mg/kg Wet	2	EG61014	07/10/06	07/11/06	SW 846 9253	

Environmental Lab of Texas

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit Unit	5 Diluti	on Batch	Prepared	Analyzed	Method	Notes
SW-12 2' (6G10009-12) Soil								
Chloride	447	20.0 mg/kg	Wet 2	EG61014	07/10/06	07/11/06	SW 846 9253	

Environmental Lab of Texas

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EG61014 - Water Extraction							6		
Blank (EG61014-BLK1)			Prepared:	07/10/06 A	nalyzed: 07	//11/06			
Chloride	ND	20.0 mg/kg Wet							
LCS (EG61014-BS1)			Prepared &	k Analyzed	: 07/11/06				
Chloride	84.0	mg/kg	100		84.0	80-120			
Matrix Spike (EG61014-MS1)	Sour	ce: 6G10009-06	Prepared:	07/10/06 A	nalyzed: 07	//11/06			
Chloride	766	20.0 mg/kg Wet	500	298	93.6	80-120			
Matrix Spike Dup (EG61014-MSD1)	Sour	ce: 6G10009-06	Prepared: (	07/10/06 A	nalyzed: 07	/11/06			
Chloride	776	20.0 mg/kg Wet	500	298	95.6	80-120	1.30	20	
Reference (EG61014-SRM1)			Prepared 8	k Analyzed	: 07/11/06				
Chloride	50.0	mg/kg	50.0		100	80-120			

Environmental Lab of Texas

#### Notes and Definitions

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- LCS Laboratory Control Spike
- MS Matrix Spike
- Dup Duplicate

Raland K Junts Date:

7/13/2006

Raland K. Tuttle, Lab Manager Celey D. Keene, Lab Director, Org. Tech Director Peggy Allen, QA Officer Jeanne Mc Murrey, Inorg. Tech Director LaTasha Cornish, Chemist Sandra Sanchez, Lab Tech.

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If you have received this material in error, please notify us immediately at 432-563-1800.

Environmental Lab of Texas

Report Approved By:

Chain of Custody Form	Γ	ANALYSIS REQUEST				······································					······						НАЧ															
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s, Inc.	1	Environmental Plus, Inc	ess	X 1558	Eunice New Mexico 88231	-3481 / 505-394-:	Chesapeake Energy	Quail State SWD	UL-O, Sect. 11, T 19 S, F		Sebastian Romero				D.													Port L. OC		5 100,55		-1
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Environmental Plus, Inc.	2100 Avenue O, Eunice, NM 88231 (505) 394-3481   £AX: (505) 394-26	Company Name	EPI Project Manager	Mailing Address	City, State, Zip	EPI Phone#/Fax#	<b>Client Company</b>	Facility Name	Location	Project Reference	EPI Sampler Name				LAB I.D.	NUN Y	Induce :		7 7	62	- 20 A	- CO 5	-00 6	2 1/2-	8 XQ-	6 62-		quished)	Relinquished by:	gur Ch	Defivéred by:	

Page 1 of 2

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2100 Avenue O, Eunice, NM 88231

P.O. Box 1558, Eunice, NM 88231

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Chain of Custody Form

	ANALYSIS REQUEST											ВТЕХ 80218 ТРН 8015М СНLОRIDES (CI) SULFATES (SO <sub>4</sub> <sup>-</sup> ) PH OTHER >>> PAH PAH		X									het	
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FAX: (505) 394-2601	Environ	r lain Olness		Eunice N	505-394-	Chesape	Quail State SWD	UL-0, Sect. 11, T	160030	Sebastia		SAMPLE I.D.	SW-11 (2')	SW-12 (2')									S. )	
(505) 394-3481 FAX	Company Name	EPI Project Manager	Mailing Address	City, State, Zip	EPI Phone#/Fax#	Client Company	Facility Name	Location	Project Reference	EPI Sampler Name		LABI.D.	[ { 1  SW.	-12 2 SW-	ę	4	5	9	7	8	6	10	Sampler Relinquishas, Acum Core Helinquished by: Delifered by:	

Page 2 of 2

# Environmental Lab of Texas Variance / Corrective Action Report – Sample Log-In

lient:	EPI	
iate/Time:	7/10/04	
)rder #:	6610009	
nitials:	CK-	

# Sample Receipt Checklist

emperature of container/cooler?	Yes	No	0,5 01
hipping container/cooler in good condition?	CES	No	1
ustody Seals intact on shipping container/cooler?	Yes	No	Not present
sustody Seals intact on sample bottles?	B	No	Not present
hain of custody present?	(es)	No	
ample Instructions complete on Chain of Custody?		No	
hain of Custody signed when relinquished and received?	kes.	No	
Thain of custody agrees with sample label(s)	1 2005	No	
Container labels legible and intact?	<b>\$</b>	No	
Sample Matrix and properties same as on chain of custody?	(ASS	No	
Samples in proper container/bottle?	1 200	No	· · · · · · · · · · · · · · · · · · ·
Samples properly preserved?	1 773	Na	
Sample bottles intact?	Yas	No	
Preservations documented on Chain of Custody?	1 YES	l No	
Containers documented on Chain of Custody?	Jes	No	
Sufficient sample amount for indicated test?	75S	No	
All samples received within sufficient hold time?	Yes	No No	
/OC samples have zero headspace?	Yas	No	Act Acclicables

Other observations:

Centact Person: Regarding:	Variance Documentation: Date/Time:	_ Contacted by:
Corrective Action Taken:		
		· · · · · · · · · · · · · · · · · · ·



# Analytical Report

## **Prepared for:**

Iain Olness Environmental Plus, Incorporated P.O. Box 1558 Eunice, NM 88231

Project: Chesapeake/ Quail State SWD Project Number: 160030 Location: UL-O, Sect. 11, T 19 S, R 34 E

Lab Order Number: 6G17008

Report Date: 07/18/06

Environmental Plus, Incorporated P.O. Box 1558 Eunice NM, 88231 Project:Chesapeake/ Quail State SWDProject Number:160030Project Manager:Iain Olness

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SEE-BH-1 2'	6G17008-01	Soil	07/14/06 08:10	07/17/06 16:15
SEE-BH-2 2'	6G17008-02	Soil	07/14/06 08:45	07/17/06 16:15
SEE-BH-3 2'	6G17008-03	Soil	07/14/06 09:30	07/17/06 16:15
SEE-BH-4 2'	6G17008-04	Soil	07/14/06 14:30	07/17/06 16:15
SEE-SW-1 2'	6G17008-05	Soil	07/14/06 08:50	07/17/06 16:15
SEE-SW-2 2'	6G17008-06	Soil	07/14/06 10:30	07/17/06 16:15
SEE-SW-3 2'	6G17008-07	Soil	07/14/06 13:30	07/17/06 16:15
SEE-SW-4 2'	6G17008-08	Soil	07/14/06 13:45	07/17/06 16:15
SEE-SW-5 2'	6G17008-09	Soil	07/14/06 14:05	07/17/06 16:15
SEE-SW-6 2'	6G17008-10	Soil	07/14/06 14:45	07/17/06 16:15
SEE-SW-7 2'	6G17008-11	Soil	07/14/06 15:00	07/17/06 16:15
#### General Chemistry Parameters by EPA / Standard Methods

#### **Environmental Lab of Texas**

		Reporting				······			
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SEE-BH-1 2' (6G17008-01) Soil									
Chloride	179	5.00	mg/kg	10	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-BH-2 2' (6G17008-02) Soil									
Chloride	221	5.00	mg/kg	10	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-BH-3 2' (6G17008-03) Soil									
Chloride	182	5.00	mg/kg	10	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-BH-4 2' (6G17008-04) Soil									
Chloride	87.6	5.00	mg/kg	10	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-SW-1 2' (6G17008-05) Soil									
Chloride	5380	500	mg/kg	1000	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-SW-2 2' (6G17008-06) Soil									
Chloride	1300	20.0	mg/kg	40	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-SW-3 2' (6G17008-07) Soil									
Chloride	962	10.0	mg/kg	20	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-SW-4 2' (6G17008-08) Soil									
Chloride	2030	25.0	mg/kg	50	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-SW-5 2' (6G17008-09) Soil									
Chloride	2100	25.0	mg/kg	50	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-SW-6 2' (6G17008-10) Soil									
Chloride	1490	20.0	mg/kg	40	EG61812	07/18/06	07/18/06	EPA 300.0	
SEE-SW-7 2' (6G17008-11) Soil									
Chloride	635	10.0	mg/kg	20	EG61812	07/18/06	07/18/06	EPA 300.0	

Environmental Lab of Texas

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EG61812 - Water Extraction										
Blank (EG61812-BLK1)				Prepared &	Analyzed:	07/18/06				
Chloride	ND	0.500	mg/kg							
LCS (EG61812-BS1)				Prepared &	Analyzed:	07/18/06				
Chloride	10.4	0.500	mg/kg	10.0		104	80-120			
Calibration Check (EG61812-CCV1)				Prepared &	Analyzed:	07/18/06				
Chloride	10.1		mg/L	10.0		101	80-120			
Duplicate (EG61812-DUP1)	Sou	ce: 6G17008-	01	Prepared &	Analyzed:	07/18/06				
Chloride	185	5.00	mg/kg		179			3.30	20	
Duplicate (EG61812-DUP2)	Sou	-ce: 6G17008-	-11	Prepared &	Analyzed:	07/18/06				
Chloride	639	10.0	mg/kg		635			0.628	20	

Environmental Lab of Texas

#### Notes and Definitions

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- LCS Laboratory Control Spike
- MS Matrix Spike
- Dup Duplicate

Report Approved By:

Raland K Junes

Date: 7/18/2006

Raland K. Tuttle, Lab Manager Celey D. Keene, Lab Director, Org. Tech Director Peggy Allen, QA Officer Jeanne Mc Murrey, Inorg. Tech Director LaTasha Cornish, Chemist Sandra Sanchez, Lab Tech.

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Environmental Lab of Texas

Page 1 of 2

Environ	<b>Environmental Plus, Inc.</b>															Ċ	air	õ	Un C	sto	d l	Chain of Custody Form	E
2100 Avenue O, (505) 394-3481	2100 Avenue O, Eunice, NM 88231 (505) 394-3481    FAX: (505) 394-2601	Р.О	BO	x 15	58, 1	iuni	ce' I	NW S	P.O. Box 1558, Eunice, NM 88231	*							LAB	••	ELT	Ξ			
Company Name	Environmental Plus, Inc.	s, Inc.								B	BILTO					AN	ANALYSIS REQUEST	SIS	REC	JUE	ST		
EPI Project Manager					_										┢─	⊢	┝─		-				<b>[</b>
Mailing Address	P.O. BOX 1558																						
City, State, Zip	Eunice New Mexico 88231	8823	F							Ň													
EPI Phone#/Fax#	# 505-394-3481 / 505-394-2601	394-2	601						11'	m	م_												
Client Company	Chesapeake Energy																						i-
Facility Name	Quail State SWD																						
Location	UL-O, Sect. 11, T 19	ပ်	R 34 E						Attn	I: lai	0 u	Attn: Iain Olness					_						
<b>Project Reference</b>	ce 160030								<u>م</u>	<u>в</u> .	P.O. Box 1558	558								·· · · · ·			
<b>EPI Sampler Name</b>	ne Sebastian Romero								Euni	ce,	NM	Eunice, NM 88231		ي المراجعة الم									
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Page 2 of 2

## Environmental Lab of Texas Variance / Corrective Action Report – Sample Log-In

Client:	EPI	
Date/Time:	- 1/17/0Ce	4:15
Order #:	6GIND	
Initials:	C.L.	

## Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	0.0 CI
Shipping container/cooler in good condition?	Yes	No	
Custody Seals intact on shipping container/cooler?	Yes	No	Hot present
Custody Seals intact on sample bottles?	X#5	No	Not present
Chain of custody present?	1 Xes	No	}
Sample Instructions complete on Chain of Custody?	Xes	Na	
Chain of Custody signed when relinquished and received?	X=S	No	
Chain of custody agrees with sample label(s)	Yes !	No	
Container labels legible and intact?	Xas_	No	
Sample Matrix and properties same as on chain of custody?	Yes	No	
Samples in proper container/bottle?	1 2635	No	•
Samples properly preserved?	Xes	No	
Sample bottles intact?	Yes	No	
Preservations documented on Chain of Custody?	1 Jos	l No	
Containers documented on Chain of Custody?	1 Xes	Na	
Sufficient sample amount for indicated test?	(jes	No	
All samples received within sufficient hold time?	Yes	No	
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

6617008-02 and 04 have no custody seals

Variance Documentation: Contact Person: -\_\_\_\_\_ Date/Time: \_\_\_\_\_\_ Contacted by: \_\_\_\_\_ Regarding: Corrective Action Taken:

2

# argon laboratories

ENVIRONMENTAL PLUS, INC. 2100 AVENUE O EUNICE, NM 88231

ATTN: IAIN OLNESS CLIENT PROJ. ID: 160030 QUAIL STATE SWD REPORT DATE: 07/20/06 SAMPLE DATE: 07/18/06

AL JOB #: A07041

Project Summary:

On July 19, 2006, this laboratory received 4 soil samples.

Samples were analyzed according to instructions in accompanying chain-of-custody. Results of analysis are summarized on the following pages. Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Sample Control at (505) 397-0295

Hiram Cueto Lab Manager

2126 W. Markund Ave., Hobbs, NM 88240 • Phone (505) 397-0295 • Fax (505) 397-0296 email: info@argonlebs.com

# argon laboratories

Environmental Plus, Inc.Project Number: 160030PO Box 1558Project Name: Quail State SWDEunice, NM 88231Project Manager: Iain Olness

Work Order #: A07041

#### Anions by Ion Chromatography - EPA Method 300.0

			Rep. Lim.				
Analyte		Result	@ D.F.=1	Units	Analyzed	Method	Notes
EER-BH-1 (0.5')	(A07041) Soil	Sampled: 07/18/06	Received:	07/19/06			
Chloride		360	10	mg/Kg	07/20/06	EPA 300.0	
EER-BH-2 (0.5')	(A07042) Soil	Sampled: 07/18/06	Received:	07/19/06			
Chloride		16	10	mg/Kg	07/20/06	EPA 300.0	
EER-BH-3 (0.5')	(A07043) Soil	Sampled: 07/18/06	Received:	07/19/06			
Chloride		250	10	mg/Kg	07/20/06	EPA 300.0	
SW-10A (2') (A	07044) Soil	Sampled: 07/18/06	Received:	)7/19/06			
Chloride		430	10	mg/Kg	07/20/06	EPA 300.0	

Approved By Argon Laboratories

> 2126 W. Marland Ave., Hobbs, NM 88240 • Phone (505) 397-0295 • Fax (505) 397-0296 email: info@argonlebs.com

QC Officer

# argon laboratories

Environmental Plus, Inc.	Project Number: 160030	
P.O. Box 1558	Project Name: Quail State SWD	Work Order #:
Eunice, NM 88231	Project Manager: Ian Olness	A07041

#### EPA 300.0 - Quality Control

				Reporting		
Analyte	MS Rec	MSD Rec	RPD	Limit	Units	Notes
Matrix Spike / Matrix	Spike Duplicate				Spil	ked Sample ID: A07057
Chloride	111%	111%	0%	10	mg/Kg	
				Reporting		<u></u>
Analyte	LCS Rec 1	CSD Rec	RPD	Limit	Units	Notes
Laboratory Control S	pike / Laboratory Control	Spike Dupli	cate			LCS ID: LCS0720A
Chloride	97%	102%	5%	10	mg/Kg	

Note: Daily method blank showed no contamination at or above the reporting limits.

2126 W. Marland Ave., Hobbs, NM 88240 • Phone (505) 397 0295 • Fax (505) 397-0296 email: infe@argonlabs.com



# Argon Laboratories Sample Receipt Checklist

Client Name:	Environmental	Plus,	Inc.	(	Date & Ti	me Received:	07/19/06					12:11
Project Name:	Quail State SW	D	. <u></u>	(	Client Pro	oject Number:	160030					
Received By:	Noemi Franco			Mat	rix:	Water	Soil 🔽					
Sample Carrier:	Client 🗸	Lab	oratory		Fed Ex	UPS	C Other					
Argon Labs Projec	t Number:	A05	041			-						
Shipper Container in	good condition?					Samples received	d in proper containe	ers?	Yes	•	No	
	N/A	Yes	7	No		Samples receive	d intact?		Yes	$\Box$	No	
Samples received un	der refrigeration?	Yes	<b>\</b>	No		Sufficient sample	volume for reques	ted tests?	Yes	J	No	
Chain of custody pre	sent?	Yes	7	No		Samples receive	d within holding tim	e?	Yes	$\Box$	No	
Chain of Custody sig	ned by all parties?	Yes	4	No		Do samples cont	ain proper preserva N/A	ntive?	Yes		No	
Chain of Custody ma	tches all sample la	ibels?				Do VOA vials conta	ain zero headspace?					
		Yes	7	No			(None submitted	<b>!</b> )	Yes		No	
	ANY "N	lo" Ri	ESPONS	E MUST	BE DETA	AILED IN THE CO	MMENTS SECTIO	N BELOW	I			
Date Client Contac	ted:			_	Pe	rson Contacted:						
Contacted By:					Subject:	:						
Comments:					-							_
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Action Taken:	- Martin,											-
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Contacted By:	······					Date:			Time	: <u> </u>		
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# Analytical Report

## **Prepared for:**

Iain Olness Environmental Plus, Incorporated P.O. Box 1558 Eunice, NM 88231

Project: Chesapeake/ Quail State SWD Project Number: 160030 Location: UL-O, Sect. 11, T 19 S, R 34 E

Lab Order Number: 6H02008

Report Date: 08/04/06

Environmental Plus, Incorporated P.O. Box 1558 Eunice NM, 88231 Project:Chesapeake/ Quail State SWDProject Number:160030Project Manager:Iain Olness

Fax: 505-394-2601

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N.E. Wall 2'	6H02008-01	Soil	2006-07-31 09:45	2006-08-02 11:15
W.N. Wall 2'	6H02008-02	Soil	2006-07-31 10:00	2006-08-02 11:15
S.W. Wall 2'	6Н02008-03	Soil	2006-07-31 10:25	2006-08-02 11:15

#### **General Chemistry Parameters by EPA / Standard Methods**

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
N.E. Wall 2' (6H02008-01) Soil									
Chloride	5050	50.0	mg/kg	100	EH60204	08/02/06	08/02/06	EPA 300.0	
W.N. Wall 2' (6H02008-02) Soil									
Chloride	606	10.0	mg/kg	20	EH60204	08/02/06	08/02/06	EPA 300.0	
S.W. Wall 2' (6H02008-03) Soil									
Chloride	947	20.0	mg/kg	40	EH60204	08/02/06	08/02/06	EPA 300.0	

Environmental Lab of Texas

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

#### **Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH60204 - Water Extraction	icesur.			20101		Juneo				
Blank (EH60204-BLK1)				Prepared &	Analyzed	08/02/06				
Chloride	ND	0.500	mg/kg							
LCS (EH60204-BS1)				Prepared &	Analyzed:	08/02/06				
Chloride	9.70	0.500	mg/kg	10.0		97.0	80-120			
Calibration Check (EH60204-CCV1)				Prepared &	Analyzed:	08/02/06				
Chloride	9.83		mg/L	10.0		98.3	80-120			-
Duplicate (EH60204-DUP1)	Sou	rce: 6G31011	-02	Prepared &	Analyzed	08/02/06				
Chloride	47.1	5.00	mg/kg		48.0			1.89	20	
Duplicate (EH60204-DUP2)	Sou	rce: 6G31013-	-02	Prepared &	Analyzed:	08/02/06				
Chloride	173	5.00	mg/kg		176			1.72	20	
Matrix Spike (EH60204-MS1)	Sou	rce: 6G31011	-02	Prepared &	Analyzed:	08/02/06				
Chloride	152	5.00	mg/kg	100	48.0	104	80-120			
Matrix Spike (EH60204-MS2)	Sou	rce: 6G31013	-02	Prepared &	Analyzed:	08/02/06				
Chloride	285	5.00	mg/kg	100	176	109	80-120			

Environmental Lab of Texas

#### **Notes and Definitions**

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- LCS Laboratory Control Spike
- MS Matrix Spike
- Dup Duplicate

Report Approved By:

Raland K Junt

8/4/2006

Raland K. Tuttle, Lab Manager Celey D. Keene, Lab Director, Org. Tech Director Peggy Allen, QA Officer Jeanne Mc Murrey, Inorg. Tech Director LaTasha Cornish, Chemist Sandra Sanchez, Lab Tech.

Date:

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-563-1800.

Environmental Lab of Texas



Chain of Custody Form

ELT

LAB

# **Environmental Plus, Inc.**

2100 Avenue O, Eunice, NM 88231

P.O. Box 1558, Eunice, NM 88231

(505) 394-3481 F	FAX: (505) 394-2601				•																		
l d)	Environmental Plus, Inc.	s, Inc.								8	Bill To					MM	ANALYSIS REQUESI	SIS	RE	<b>JŪE</b>	ST		
EPI Project Manager	jer lain Olness				_									┢──	-	$\vdash$	╞──	-	<u> </u>	-			
Mailing Address	P.O. BOX 1558										904 10202 102020 102020												
City, State, Zip	Eunice New Mexico	8823	E						•	Ń	Ĺ	J					_						
EPI Phone#/Fax#	505-394-3481 / 505-394-20	394-2	601						11.	M	<u>م</u> –	LL.											
<b>Client Company</b>	Chesapeake Energy									9				_		-	_						
Facility Name	Quail State SWD																						
Location	UL-O, Sect. 11, T 19	9 S, R	34 E						Attr	ı: la	in O	Attn: lain Olness			,								
<b>Project Reference</b>									ב	о Ш	Xo	P.O. Box 1558									• •		
EPI Sampler Name	e Sebastian Romero								Eun	ice,	MN	Eunice, NM 88231											an a
		-			٢W	MATRIX			PRE	PRESERV.	Υ.	SAMPLING	ឲ								_	<u> </u>	
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## Environmental Lab of Texas Variance/ Corrective Action Report- Sample Log-In

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ite/ Time:	R/2/06 11:15	
b ID # :	67102008	
tials	CK	

## Sample Receipt Checklist

· .

			Client Initials
Temperature of container/ cooler?	Yes	No	3,0 °C
Shipping container in good condition?	Y@s	No	
Custody Seals intact on shipping container/ cooler?	Yes	No	Not Present,
Custody Seals intact on sample bottles/ container?	Yes	No	Not Present
5 Chain of Custody present?	Yes	No	
Sample instructions complete of Chain of Custody?	Yes	No	
7 Chain of Custody signed when relinquished/ received?	Yes	No	
3 Chain of Custody agrees with sample label(s)?	Xes	No	ID written on Cont./ Lid
Container label(s) legible and intact?	Yes	No	Not Applicable
10 Sample matrix/ properties agree with Chain of Custody?	Xas	No	
11 Containers supplied by ELOT?	(Xes	No	
12 Samples in proper container/ bottle?	Xes	No	See Below
13 Samples properly preserved?	Ye3	No	See Below
14 Sample bottles intact?	YES	No	
15 Preservations documented on Chain of Custody?	Yes	No	
16 Containers documented on Chain of Custody?	Yes	No	
17 Sufficient sample amount for indicated test(s)?	Tes	No	See Below
18 All samples received within sufficient hold time?	Yes	No	See Below
19 VOC samples have zero headspace?	Yes	No	Not Applicable

### Variance Documentation

ontact:		Contacted by:	Date/ Time:
egarding:			
orrective Action Taker	1;		
	•-		
heck all that Apply:		See attached e-mail/ fax Client understands and would like to proceed with analy Cooling process had begun shortly after sampling even	



PHONE (505) 393-2326 + 101 E. MARLAND + HOBBS, NM 88240

ANALYTICAL RESULTS FOR ENVIRONMENTAL PLUS, INC. ATTN: DAVID P. DUNCAN P.O. BOX 1558 EUNICE, NM 88231 FAX TO: (505) 394-2601

Receiving Date: 09/15/06 Reporting Date: 09/18/06 Project Owner: CHESAPEAKE ENERGY (160030) Project Name: QUAIL STATE SWD Project Location: UL-O, SECT. 11, T 19 S, R 34 E Analysis Date: 09/18/06 Sampling Date: 09/14/06 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: HM Analyzed By: HM

LAB NO.	SAMPLE ID	(mg/kg)
H11544-1	SSW-5A (2')	2223
H11544-2	SSW-7A (2')	1264
H11544-3	SSW-8A (2')	2751
H11544-4	SSW-10A (2')	1088
H11544-5	SSW-11A (2')	1280
H11544-6	NSW-1A (2')	1552
H11544-7	NSW-3A (2')	656
H11544-8	NSW-5A (2')	1568
H11544-9	NSW-8A (2')	976
H11544-10	NSW-10A (2')	224
H11544-11	NSW-12A (2')	1136
Quality Cont	rol	990
True Value (	20	1000
% Recovery		100
Relative Per	cent Difference	0.0

METHOD: Standard Methods 4500-CI'B NOTE: Analyses performed on 1:4 w:v aqueous extracts.

Mome Chémist

09-18-06 Date

H11544

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for anxityses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the upplicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

Cl<sup>—</sup> na/kg)

(505) 394-3481       FAX: (505) 394-2601         (505) 394-3481       FAX: (505) 394-2601         City EPI Project Manager       David P. Duncan         Mailing Address       P.O. BOX 1558         City, State, Zip       Eunice New Mexic         EPI Phone#/Fax#       505-394-3481 / 505         City, State, Zip       Eunice New Mexic         EPI Phone#/Fax#       505-394-3481 / 505         City, State SWD       Collent Company         Continue Company       Chesapeake Energy         Cilent Company       Quail State SWD         Location       UL-O, Sect. 11, T         Project Reference       160030         EPI Sampler Name       Jacob Melancon         LAB I.D.       SAMPLE I.D.         SSW-342(2)       385W-342(2)         SSW-342(2)       585W-714 (2)         Anpler Name       Jacob Melancon         LAB I.D.       SSW-342(2)         SSW-342(2)       385W-342(2)         SSW-342(2)       585W-714 (2)         SSW-342(2)       585W-714 (2)         SSW-342(2)       585W-714 (2)         SSW-342(2)       9 NSW-34 (2)         SSW-342(2)       9 NSW-34 (2)         SSW-342(2)       9 NSW-34 (2) <t< th=""></t<>
Color         Saturdia         Color         Color
01 2. Duncan 3. Duncan 3. Duncan 3. Duncan 5. 11, 119, 19, 19, 19, 19, 19, 19, 19, 19
(2) 394-2601 Environmental Plus David P. Duncan P.O. BOX 1558 Eunice New Mexico 505-394-3481 / 505- 505-394-3481 / 505- 505-394-3481 / 505- Chesapeake Energy Quail State SWD UL-O, Sect. 11, T 19 160030 Jacob Melancon Jacob Melancon (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)

Page 1 of 2

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Name     Environmental Plus, Inc.       Name     Environmental Plus, Inc.       1. Manager     David P. Duncan       1. Zipes     Saturback       1. Zipes     David P. Duncan       1. Zipes     Saturback <td>2100 Avenue O, (505) 394-3481</td> <td>Eunice, NM 88231 FAX: (505) 394-2601</td> <td>Ø,</td> <td>0</td> <td>Зох</td> <td>1556</td> <td>, Eu</td> <td>nice</td> <td>NN .</td> <td>882</td> <td>31</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Ľ</td> <td>AB</td> <td>Ŭ</td> <td>Cardí</td> <td>nal</td> <td></td>	2100 Avenue O, (505) 394-3481	Eunice, NM 88231 FAX: (505) 394-2601	Ø,	0	Зох	1556	, Eu	nice	NN .	882	31						Ľ	AB	Ŭ	Cardí	nal	
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Page 2 of 2



PHONE (505) 393-2326 • 101 E MARLAND • HOBBS, NM 88240

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ANALYTICAL RESULTS FOR ENVIRONMENTAL PLUS, INC. ATTN: DAVID P. DUNCAN P.O. BOX 1558 EUNICE, NM 88231 FAX TO: (505) 394-2601

Receiving Date: 12/20/06 Reporting Date: 12/20/06 Project Owner: CHESAPEAKE ENERGY (160030) Project Name: QUAIL STATE SWD Project Location: UL-O, SECT. 11, T 19 S, R 34 E Analysis Date: 12/20/06 Sampling Date: 12/19/06 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: LB Analyzed By: HM

		CI CI
LAB NO.	SAMPLE ID	(mg/Kg)
H11921-1	SSW-5B (1')	416
H11921-2	SSW-11B (1')	416
H11921-3	SSW-13 (1')	928
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	·····	
Quality Contr	ol	480
True Value Q	C	500
% Recovery		96
<b>Relative Perc</b>	ent Difference	4.0

METHOD: Standard Methods4500-CI'BNOTE: Analyses performed on 1:4 w:v aqueous extracts.

Chémist

<u>/.2</u> - Date

21.26

H11921

PLEAGE NOTC: Liability and Damages: Cardinal's liability and clienc's exclusive remedy for any client ansing: whicher based in contract or tort, shall be limited to the amount paid by client for analyses. All claims: including those for negligence and any other croce whatshever shall be ideemed valved unless triade in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequencial damages, including, without limitation, husiness interruptions, loss of use, or loss of profits incurred by client, its subschere's affiliates or successors in cardinal to the performance of services hereunder by Cardinal, regerdless of whether such chilm is based upon any of the above-stated reasons or otherwise

<u>Chain of Custody Form</u> LAB Cardinal													 <<< 83	TCL pH SUL CHL	X	X	X										
					. 11.			Incan	8	231	SAMPLING		 	DATE TIME	19-Dec-06 13:21	19-Dec-06 9:20	19-Dec-06 14:30								E-mail results to: dduncan@envplus.net NOTES:		
3231	BILTO		22 37.000 70.42 97 97	á,	Щ _^_ ПП	) )	cu. Malaria Marana Ma	Attn: David P. Duncan	P.O. Box 1558	Eunice, NM 88231	PRESERV.		 HEB \COOF	ICE	X 19		X 19								E-mail result NOTES:		
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ls, Inc.	ental Plus	David P. Duncan	P.O. BOX 1558	×ico		Chesapeake Energy	Quail State SWD	UL-0, Sect. 11, T 19 S	160030	George Blackburn			 SAMPLE I.D.												040-1-20100	12-20-00	Sample C
mental Plus Eunice, NM 88231 FAX: (505) 394-2601		ager											<i>.</i>			SSW-11B (1')	SSW-13 (1')								m	A.V	
Environmental Plu 2100 Avenue 0, Eunice, NM 88231 (505) 394-3481 FAX: (505) 394-26	Company Name	EPI Project Manager	<b>Mailing Address</b>	City, State, Zip	EPI Phone#/Fax#	Client Company	Facility Name	Location	<b>Project Reference</b>	<b>EPI Sampler Name</b>			LAB I.D.		411931-41	~ 2	- 3	4	5	6	2	8	6	10	Sarriptej Relinquished: // <u> </u>	Jacon Roene	neintered oy:

Page 1 of 1

**APPENDIX II** 

## **PROJECT PHOTOGRAPHS**

					L	.09 (	Test	Borings	(NOTE - Page 1 of 3)
						Ī	roject	Number: 160030	
				TAL P	LUS, IN	C.	roject	Name: Chesapeake Quai	State SWD
	ידי	ENVI	RONME	NTAL SEI	RVICES		ocation:	UL-0, Section 11, Towns	ship 19 South, Range 34 East
			505	-394-348	31	Ī	ring Nu	1ber: BH-2 Su	rface Elevation 3,972
به # ي ق	a a	Recovery (inches)	ê L	_Sc	5 T	÷÷	Start I		me:_1443 hrs
Sanple # and Time	Sample Type		Moisture	PID Readings (ppm)	U.S.C.S. Symbol	Depth (feet)	Complet	ion Date: <u>10/18/05</u>	Time: 1630 hrs
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1526				2.1			Light	Tan Sugar Sand	_
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					L	.og (	Of Test Borings (NOTE - Page 2 of 3)
_ 81_						Ī	Project Number: 160030
				tal Pi ed land	LUS, INC		Project Name: Chesapeake Quail State SWD
		ENVI	ronmei	NTAL SEP		ן שא	Location: UL-O, Section 11, Township 19 South, Range 34 East
<u> </u>			505	EUNICE -394-348	31	F	Boring Number: BH-2 Surface Elevation: 3,972
Sample # and Time	Type	Recovery (inches)	Moisture	PID Readings (ppm)	U.S.C.S. Symbol	Depth (feet)	Start Date:         10/18/05         Time:         1443 hrs           Completion Date:         10/18/05         Time:         1630 hrs
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10/18/05		De	pth	Casing Bepth	Depth		Backfill Method: Bentonite
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					L	.09	Of	Test Barings (NDTE - Page 3 of 3)			
								Project Number: 160030			
		ENVIRONMENTAL PLUS, INC.						oject Name: Chesapeake Quail State SWD			
		STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES				שאו	Loc	ation: UL-D, Section 11, Township 19 South, Range 34 East			
<u>""</u>	<u> </u>		505-	EUNICE -394-348	31		Bori	ing Number: BH-2 Surface Elevation: 3,972			
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a E	Sample Type	Pes Pes	Maisture		U.S.C.S. Symbol	Depth (feet)		Completion Date: 10/18/05 Time: 1630 hrs			
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-		-	-	-	-	—	-	- Fleld Representative: JR			





Photograph #2- Looking westerly at fiberglass tank with top in foreground. Fluid and dark stained soil indicate contamination.



Photograph #3- Produced water saturated soil, looking northerly.



Photograph #4- Injection well and fenced area, looking southerly.





Photograph #6 – Looking northeasterly at excavation and stockpile.



Photograph #7 – Looking northwesterly at excavation and tank battery.



Photograph #8 – Looking south at southern excavation.



Photograph #9 - Looking northwesterly at northern excavation.



Photograph #10 – Looking southwesterly at south excavation.



Photograph #11 – Looking westerly at backfilling of southern excavation.



Photograph #12 – Looking south at finished excavation.

# **APPENDIX III**

## **SOIL BORING LOGS**

Image: State appropriate the second state s		-		-	-	-	_	-	- Field Representative: JR		
Image: State APPROVE TALL PLUS, INC, STATE APPROVE TALL SERVICES S05-394-3481         Project None: Chesapeake Qual State SV0           Incation: UL-0, Section II, Tomship 19 South, Range 34 East East State SV0         Incation: UL-0, Section II, Tomship 19 South, Range 34 East Baring Number: BH-1         Surface Elevation 3,972           Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0         Incation: UL-0, Section II, Tomship 19 South, Range 34 East Baring Number: BH-1         Surface Elevation 3,972           Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0         Incation: UL-0, Section II, Tomship 19 South, Range 34 East Baring Number: BH-1         Surface Elevation 3,972           Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0         Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0           Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0         Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0           Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0         Incation: UL-0, Section II, Tomship 19 South, Range 34 East State SV0           Incation: UL-0, Section II, Tomship 19 South, Range 34 East State St	_	5 -	D	epth	-	Depth		evel -			
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Environmental         PLUS, INC.           STATE APRENCED LAND FAIN AND ENVIRONMENTAL PARENCED S05-394-3481         Project None: Chesapeake Quail State SWD           Location: UL-0, Section II, Tommship 19 South, Range 34 East           Soft Soft Soft Soft Soft Soft Soft Soft											
Environmental         PLUS, INC. SUS-394-34481         Project None: Chesapeake Quail State SVU           International Supervised Land FARM and Environmental Supervised Land Supervised Land Supervised Land Supervised Land Supervised Land Environmental Supervised Land Supervised Land Supervised Land Environmental Supervised Land Supervised Land Supervised Land Supervised Land Supervised Land Supervised Land Supervised Land Supervised Land Land Supervised Land Supervised Lan	1335				2.3				SAND, Caliche		
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ENVIRONMENTAL       PLUS, IAC.         STATE APPROVED LAND FAM. AND ENVIRONMENTAL SCRUCES SUS-394-3481       Project Nome: Chesapeake Qual State SVD         Location: UL-0, Section 11, Tomship 19 South, Range 34 East Boring Number: BH-1       Surface Elevation: 3,972         State St									-		
Enviremental       PLUS, INC.         State       APREDVED         Location:       UL-D, Section II, Township 19 South, Range 34 East         Boring Number:       BH-1         Surface       Elevation: 3,972         Image: State       State	1330				1.5		—2 	₀┼	Caliche, Rack —		
Enviremental       PLUS, INC.         State       APREDVED         Location:       UL-D, Section II, Township 19 South, Range 34 East         Boring Number:       BH-1         Surface       Elevation: 3,972         Image: State       State									-		
Environmental     PLUS, INC. STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES 505-394-3481     Project Name: Chesapeake Quail State SVD       Interview     Location: UL-D, Section II, Township 19 South, Range 34 East       Interview     State Services       EUNICE     State Date:       Interview     Interview       Interview<	1320	_			2.3				Caliche, Rack —		
Envirainmental       PLUS, INC.         STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES       Project Name: Chesapeake Quail State SWD         Location: UL-D, Section II, Township 19 South, Range 34 East         Boring Number: BH-1       Surface Elevation: 3,972         Image: State								5			
Envirainmental       PLUS, INC.         STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES       Project Name: Chesapeake Quail State SWD         Location: UL-D, Section II, Township 19 South, Range 34 East         Boring Number: BH-1       Surface Elevation: 3,972         Image: State	1310				1.3						
Environmental PLUS, Inc.       Project Name: Chesapeake Quail State SWD         Environmental Services       Eunice         505-394-3481       Boring Number: BH-1         State Approved Land Farm and Environmental Services       Boring Number: BH-1         Surface Elevation: 3,972         Tog       Start Date: 10/18/05         Time: 1245 hrs         Start Date: 10/18/05       Time: 1415 hrs         Bescription         1245       4.4         Start Date: 10/18/05       Time: 1415 hrs							<b>1</b>	o+-	Caliche, Rock		
Envireinmental PLUS, Inc.       Project Name: Chesapeake Quail State SWD         Envireinmental Services       Eunice         505-394-3481       Boring Number: BH-1         Surface Elevation: 3,972         ** a       a         a       b         b       a         b       a         b       a         b       a         b       b         c       a         c       a         c       a         c       a         c       a         a       b         a       b         c       a         c       a         a       b         a       b         a       b         a       b         a       a         a       a         a       a         a       a         a       a         b       a         a       a         a       a         a       a         a       a         a       a         a       a <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td>									-		
Environmental       PLUS, Inc.         State approved Land FARM AND Environmental Services EUNICE       Project Name: Chesapeake Quail State SWD         State approved Land FARM AND Environmental Services EUNICE       Project Name: Chesapeake Quail State SWD         State approved Land FARM AND Environmental Services EUNICE       Project Name: Chesapeake Quail State SWD         State approved Land FARM AND Environmental Services EUNICE       State Services Boring Number: BH-1       Surface Elevation: 3,972         State of the services State of the	1259				2.4		!	5+	Caliche, Rock		
Envirence       Envirence       Project Name: Chesapeake Quail State SWD         State APPRDVED LAND FARM AND ENVIRONMENTAL SERVICES       Project Name: Chesapeake Quail State SWD         Location: UL-D, Section II, Township 19 South, Range 34 East         Boring Number: BH-1       Surface Elevation: 3,972         Image: State Stat									-		
ENVIRONMENTAL PLUS, INC. STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES EUNICE 505-394-3481 Project Name: Chesapeake Quail State SWD Location: UL-D, Section 11, Township 19 South, Range 34 East Boring Number: BH-1 Surface Elevation: 3,972	1245				4.4		;	2	Rock, Top Soil, Black Clay —		
ENVIRONMENTAL PLUS, INC. STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES EUNICE 505-394-3481 Project Name: Chesapeake Quail State SWD Location: UL-O, Section 11, Township 19 South, Range 34 East Boring Number: BH-1 Surface Elevation: 3,972	Sample t and Time	Sample Type	Recover (inches)	Maisture	PID Reading: (ppm)	U.S.C.S. Symbol	Jepth (feet)		ompletion Date: <u>10/18/05</u> Time: <u>1415 hrs</u>		
ENVIRONMENTAL PLUS, INC. STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES EUNICE EUNICE	# A1		<u>ج</u>								
ENVIRONMENTAL PLUS, INC. Project Name: Chesaneake Quail State SVD			ENVI	RONMEI	NTAL SEP EUNICE	2331VF		Loc	ation: UL-D, Section 11, Township 19 South, Range 34 East		
			ENVIRONMENTAL PLUS, INC.				C.	Pro	oject Name: Chesapeake Quail State SWD		
Project Number: 160030									Project Number: 160030		

					L	.og I	Of '	Test Borings (NOTE - Page 2 of 2)		
								Project Number: 160030		
		ENVIRONMENTAL PLUS, INC. STATE APPROVED LAND FARM AND				<u>c.</u>	Pro	oject Name: Chesapeake Quail State SWD		
	ן זיין	STATE AL ENVI	RONME	NTAL SEI	FARM A	- עא	Loc	ation: UL-O, Section 11, Township 19 South, Range 34 East		
<b>*</b>	ľ		505	EUNICE -394-341	31	ŀ	Bori	ng Number: BH-1 Surface Elevation: 3,972		
# g	<b>.</b>	2	ę	No.			1	tart Date: 10/18/05 Time: 1245 hrs		
Sanple # and Time	Sample Type	Recovery (inches)	Maisture	Dig C	U.S.C.S. Symbol	Depth (feet)	ľc	Completion Date: 10/18/05 Time: 1415 hrs		
Sar and	3	8.5 8.5	ТО Т	PID Recotings (ppm)	36	ā:		Description		
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Date	Wate Tim	ne Sa	mole	surenent Casing	Cave-k	n Vo	ater	Drilling Method: HSA 3.5" [D		
10/18/0		De	pth	Bepth	Depth		evel -	Backfill Method: Bentonite		
	-		-	-		1	-	Field Representative: JR		
		L			L	_				

## **APPENDIX IV**

# SITE INFORMATION AND METRICS FORM AND INITIAL AND FINAL NMOCD FORM C-141

		Incident Date:	NMOCD N	
	. 9	17 September 2005	18 Septembe	er 2005
Che	sapeake			
	sapran			
Informati	ion and Metrics			
	een SWD No. 001 (Quail	State SWD) Assigned Site	e Reference : 160	0030
	hesapeake Energy	/ I <b>9</b>		
	: 5014 Carlsbad Highw	ay		
	ess: 5014 Carlsbad Highw			
City, State, Zip				
Representative	Bradley Blevins			
Representative	e Telephone: (505) 391-	-1462 ext. 24		
Telephone:				
Fluid volume r	eleased (bbls): 115 barr	els Recov	vered (bbls): 55	barrels
	>25 bbls: Notify NM	OCD verbally within 24 hrs and	d submit form C-1	41 within 15 days.
		pplies to unauthorized releases		
5-251	bbls: Submit form C-141 w	ithin 15 days (Also applies to u	nauthorized releas	es of 50-500 mcf Natural Gas)
		Queen SWD No. 001 (Quail S		
		berglass produced water tank s		σ
	.e., BLM, ST, Fee, Other		unex by inglicelli	·Ø·
	ns: 230 feet by 110 feet			
LSP Area: ~16				
	ference Point (RP):			
	nce and direction from F	RP:		· · · · · · · · · · · · · · · · · · ·
Latitude: N 32				
	103° 31' 43.001"			
	ve mean sea level: 3,972	feet		
	th Section Line: 660			· · ·
	Section Line: 1980			
Location- Unit	or 1/41/4: SW1/4 of the SE	E <sup>1</sup> /4 Unit Lette	er: 0	·····
Location-Secti	ion: 11			
Location- Tow	nship: 19 South			
Location- Rang				
	-			······································
Surface water	body within 1000 ' radiu	is of site: none		
Domestic water	r wells within 1000' radi	ius of site: none		
Agricultural w	ater wells within 1000' r	adius of site: none		
Public water su	upply wells within 1000'	radius of site: none		
	nd surface to groundwat			
	mination (DC): Unknow			
	ndwater (DG – DC = DtC			
	Froundwater	2. Wellhead Protect		3. Distance to Surface Water Bod
	<50 feet: 20 points	If <1000' from water source		<200 horizontal feet: 20 points
If Depth to GW	50 to 99 feet: 10 points	private domestic water source		200-1000 horizontal feet: 10 poir
If Depth to GW	>100 feet: 0 points	If >1000' from water source private domestic water source	· ·	>1000 horizontal feet: 0 points
	+3) =10+20+0=30			
Site Rank (1+2-		ite Ranking Score and Accep	otable Concentra	tions
Site Rank (1+2-	I Utal D			0-9
Site Rank (1+2-	>19	10-19		
		10-19 10 ppm	n	10 ppm
Parameter	>19	10 ppm		10 ppm 50 ppm
Parameter Benzene <sup>1</sup>	>19 10 ppm		1	10 ppm 50 ppm 5,000 ppm

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#### State of New Mexico Energy Minerals and Natural Resources

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 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: Chesapeake Energy	Contact: Bradley Blevins		
Address: 5014 Carlsbad Highway	Telephone No.: (505) 391-146	52 ext. 24	
Facility Name: Quail Queen SWD No. 001 (Quail State SWD)	Facility Type: Tank Battery		

Surface Owner: State of New Mexico-leased<br/>to Snyder RanchesMineral Owner: State of New MexicoLease No.: API #30-025-25536

#### LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/ <del>West</del> Line	County
0	11	19S	34E	660	South	1,980	East	Lea

Latitude: <u>N 32º 40' 10.571"</u> Longitude: <u>W 103° 31' 43.001"</u>

#### NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 115 barrels	Volume Recovered: 55 barrels						
Source of Release: Tank Battery	Date and Hour of Occurrence:	Date and Hour of Discovery:						
	September 17, 2005 P.M.	September 18, 2005 A.M.						
Was Immediate Notice Given?	If YES, To Whom?							
🛛 Yes 🔲 No 🗌 Not Required	NMOCD- Hobbs							
By Whom? Bradley Blevins, Chesapeake	Date and Hour: September 18, 20	05 @ 1130 hours						
Was a Watercourse Reached?	If YES, Volume Impacting the W	atercourse:						
🗋 Yes 🖾 No	Not Applicable							
If a Watercourse was Impacted, Describe Fully.* Not Applicable	<u> </u>							
Describe Cause of Problem and Remedial Action Taken.* Lightening	strike on 500 barrel fiberglass water ta	ank. Wells were shut in upon discovery.						
<b>Describe Area Affected and Cleanup Action Taken.*</b> Approximately 10 delineated and a Remediation/Closure Plan developed and submitted to th		impacted by the release. The site will be						
regulations all operators are required to report and/or file certain release no public health or the environment. The acceptance of a C-141 report by the should their operations have failed to adequately investigate and remediate	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 forders to the environment.							
	OIL CONSERV	ATION DIVISION						
Signature: Stalley Blaven								
	Approved by District Supervisor:							
Title: Field Technician	Approval Date:	Expiration Date:						
E-mail Address: bblevins@chkenergy.com Date: $\mathcal{Y} = \mathcal{Y} = \mathcal{P}$ Phone: (505) 391-1462 ext. 24	Conditions of Approval: Attached							

\* Attach Additional Sheets If Necessary

#### State of New Mexico Energy Minerals and Natural Resources

Form C-141 Revised October 10, 2003

Final Report

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

**Release Notification and Corrective Action** 

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

	OPERATOR	Initial Report
Name of Company: Chesapeake Energy	Contact: Bradley Blevins	
Address: 5014 Carlsbad Highway	Telephone No.: (505) 391-1	462 ext. 24
Facility Name: Quail Queen SWD No. 001 (Quail State SWD)	Facility Type: Tank Battery	/

Surface Owner: State of New Mexico-leased<br/>to Snyder RanchesMineral Owner: State of New MexicoLease No.: API #30-025-25536

## LOCATION OF RELEASE

Unit Letter O	Section 11	Township 19S	Range 34E	Feet from the 660	North/South Line South	Feet from the 1,980	East/ <del>West</del> Line East	County Lea

Latitude: <u>N 32º 40' 10.571"</u> Longitude: <u>W 103° 31' 43.001"</u>

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	September 17, 2005 P.M.	September 18, 2005 A.M.						
Was Immediate Notice Given?	If YES, To Whom?							
Yes 🗌 No 🗍 Not Required	NMOCD- Hobbs							
By Whom? Bradley Blevins, Chesapeake	Date and Hour: September 18, 200	)5 @ 1130 hours						
Was a Watercourse Reached?	If YES, Volume Impacting the Wa	atercourse:						
🗌 Yes 🛛 No	Not Applicable							
If a Watercourse was Impacted, Describe Fully.* Not Applicable								
Describe Cause of Problem and Remedial Action Taken.* Lightening	strike on 500 barrel fiberglass water ta	nk. Wells were shut in upon discovery.						
<b>Describe Area Affected and Cleanup Action Taken.*</b> Approximately 16,500 square feet of surface area was impacted by the release. a) excavated impacted soil above NMOCD remedial goals disposed at Lea Landfill, Inc.; b) laboratory analyses confirmed removal of soil impacted above NMOCD remedial threshold goals in sidewalls and bottom of the excavations; c) back-filled excavated areas with caliche and sandy soil; d) graded release site to allow natural drainage of the area; and e) will seed areas outside the tank battery perimeter with a grass blend preferred by the BLM.								
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 Dealley Blum	<u>OIL CONSERV</u>	ATION DIVISION						
Signature Stalley Slam	ENHRAFICA	$\bigcirc$						
Printed Name: Bradley Blevins	Approved by District Supervisor:	& plucon						
Title: Field Technician	Approval Date: 5.22.07	Expiration Date:						
E-mail Address: bblevins@chkenergy.com	Conditions of Approval:	Attached						
Date:         5-9-07         Phone: (505) 391-1462 ext. 24								

\* Attach Additional Sheets If Necessary

441-0341