AP – 101

2013 RP REPORT

06 / 10 / 2014

El Paso Natural Gas Company, L.L.C.
a Kinder Morgan company

June 10, 2014

Mr. Glenn Von Gonten
New Mexico Oil Conservation Division
1220 St. Francis Dr.
Santa Fe, NM 87505

RE: Remedial Action Plan Report
Jal No. 4 Plant
Lea County, New Mexico
NMOCD Abatement Plan # AP-101 (GW-107R)

Dear Mr. Von Gonten:

El Paso Natural Gas Company, LLC respectfully submits the attached Remedial Action Plan Report Jal No. 4 Plant Lea County, New Mexico (Report) in the anticipation of acceptance and approval. This Report details remediation efforts conducted at the facility associated with soil impacts located at two distinct areas. The two areas are identified by the following Release Notification Tracking Numbers.

- IRP #2026 Filter House Area
- IRP-04-01-2697 RW-2 Area

If you have any questions concerning the Report please call me at (713) 420-3475.

Sincerely,
El Paso Natural Gas Company LLC.

Joseph Wiley, P.G.
Project Manager
Pipeline Remediation

xc: Mr. Jeff Leking, NMOCD, Hobbs – via NMOCD Online FTP Site, w/enclosures; email notification
Mr. Jimmy Doom, Doom Ranch - w/enclosures
Mr. Hank W. McConnell, P.G., ARCADIS - w/enclosures

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El Paso Natural Gas

Remedial Action Plan Report

Jal No. 4 Plant, Jal, Lea County, New Mexico

June 10, 2014

ARCADIS

Aaron Sides
Environmental Scientist

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Project Manager/Principal Geologist

David Vance
Senior Project Advisor

Remedial Action Plan Report

Jal No. 4 Plant, Jal, Lea County, New Mexico

Prepared for:
El Paso Natural Gas

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Our Ref.:
MT001133.0001

Date:
June 10, 2014

ARCADIS

Confidentiality Statement (optional)

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El Paso Natural Gas (EPNG) has retained ARCADIS U.S., Inc. (ARCADIS) to address potential environmental concerns at the above-referenced site.

1. SITE HISTORY AND BACKGROUND

The Jal No. 4 Gas Plant (Plant) was constructed by El Paso Natural Gas Company (EPNG) in 1952 to treat, compress and transport natural gas to EPNG's main transmission lines. EPNG discontinued use of the Plant in 1987, leasing portions of the Plant property to Christie Gas Corporation (Christie) that same year. The Plant was eventually sold to Christie in 1991. In December 2002, Christie sold the Plant to Texas LPG Storage Company (Texas LPG). In March 2008, Texas LPG sold the plant to Western Refining, Inc. (WRI). WRI is the current owner of the Jal No. 4 Plant property. Throughout these transactions, EPNG has retained the environmental liability for groundwater impacts due to their historic operations at the Plant. The location of the Plant property and topographic features are shown on Figure 1. The site is located north of the town of Jal, New Mexico. The depth to groundwater at this site is approximately 100 feet below ground surface (bgs).

Brine and wastewater at the Plant were managed in eight unlined retention ponds from 1952 to 1981. Beginning in 1981, brine at the Plant was managed in three synthetic-lined retention ponds. In 1989, a leak was detected in one of the brine retention ponds and EPNG elected to close two of the ponds. In response to the detected leak, the New Mexico Oil Conservation Division (NMOCD) requested that EPNG perform a hydrologic study. This request led to the drilling of three groundwater monitoring wells and a limited groundwater study at the site in May 1989. The preliminary findings of this study indicated that brine impacted groundwater was present beneath the Plant. Subsequent to this discovery, numerous investigations have been conducted by EPNG at the Plant to characterize and delineate the affected groundwater plume. To date, 18 groundwater monitoring wells and one piezometer have been installed. These wells are located generally along the east side of the Plant property, and on off-site property located east and southeast of the Plant. In addition to these groundwater monitoring wells, two groundwater recovery wells (RW-1 and RW-2) have been installed and three monitoring wells (ENSR-2, ACW-3 and ACW-8) were converted to recover impacted groundwater. The locations of the monitoring and recovery wells are shown on Figure 2. Impacted groundwater recovery was initiated in recovery well RW-1 in October 1999, and in recovery well RW-2 in January 2000. ENSR-2 commenced groundwater recovery in 2000, and ACW-3 and ACW-8 commenced groundwater recovery in 2005. RW-3 was installed in May 2012 as a replacement recovery well for ENSR-2. Groundwater recovered by the remediation system is disposed via an existing injection

well, Shell State Well No. 13, which is currently owned by WRI and located north of the facility.

On October 27, 2008, a filter housing integral to the groundwater remediation and disposal system leaked, resulting in a release of approximately 35 barrels of high chloride water to the ground surface east and southeast of the filter building (Filter House Release) impacting an approximate area of 444 square yards (yd^2) (371 square meters [m^2]). The filter building is located off-site, to the north of the Jal No. 4 property, as shown on **Figure 2** and is identified as the Filter House Excavation. Upon discovery of the release, EPNG recovered approximately 25 barrels of this water utilizing a vac-truck. On November 5, 2008, EPNG submitted a Release Notification and Corrective Action Form C-141 to the NMOCD reporting the release (IRP# 2026) which is included in **Appendix B** and the Remedial Action Plan (RAP) for this release is presented in **Appendix H**.

On October 16, 2010, a pipe broke between the check-valve and cut-off valve located on the discharge line associated with groundwater recovery well RW-2, resulting in the release of an estimated 71 barrels of high chloride water to the ground surface west of recovery well RW-2 (RW-2 Release). The recovered groundwater release encompassed an approximate area of 38 yd^2 (32 m^2). RW-2 is located east of the Plant as shown of **Figure 2** and is identified as the RW-2 Excavation. On October 21, 2010, EPNG submitted a Release Notification and Corrective Action Form C-141 to the New Mexico Oil Conservation Division (NMOCD) reporting the release (1RP-04-01-2697) which is included in **Appendix B** and the RAP for this release is presented as **Appendix I**.

This report presents analytical data generated in previous investigations to delineate the lateral and vertical extent of the brine impacted soils, remedial activities performed at the release sites, and the results of exposure assessments performed using MULTIMED transport modeling.

2. INVESTIGATIONS

The investigations of the Filter House Release were conducted in three events in February, May, and July of 2009 and are discussed separately below. The RW-2 Release was investigated in a single event during the month of January 2011.

2.1 Filter House Release Investigation - February 2009

During the period February 3-4, 2009, to delineate the horizontal and vertical extent of the impacted soil at the Filter House Release, The Benham Companies, LLC (Benham), on behalf of EPNG, installed 10 soil borings to an approximate depth of 3 feet below ground level (bgl) in the potentially impacted area. Soil samples were collected in one foot intervals from the surface to total depth within each borehole. Field electrical conductance (EC) tests were conducted on each sample interval. A total of 30 field EC measurements were conducted during this phase of the investigation. These field EC tests were used as a screening tool to ensure the boring/sampling activities progressed to a depth interval below the lower limit of the impacted soil. Each field EC test was conducted by combining equal volumes of soil and de-ionized water within a clean sealable plastic bag. Following soil and water combination, the plastic bag was sealed and labeled as to source. The soil/water mixture was then mixed thoroughly and allowed to stand for approximately 30 minutes. Following this period, the EC of the soil/water mixture was measured with an electrical conductance meter. An EC value of 4 milliSiemens per centimeter (mS/cm) or less indicated the sample collected was below the lower limit. The field meter units of mS/cm are, in general, equivalent to millimhos per centimeter (mmhos/cm), the units in which laboratory EC data are presented.

A total of 30 soil samples were collected from the 10 borings. Upon collection, an aliquot of each soil sample was placed directly into a clean, sealable, plastic bag, labeled as to source and placed under chain-of-custody control for transport to the analytical laboratory (Environmental Testing, Inc., Oklahoma City, Oklahoma) for analysis of EC. An additional aliquot of each soil sample was placed into a clean, sealable, plastic bag. After approximately 30 minutes at ambient temperature, the headspace within each bag was evaluated with an organic vapor meter (OVM). In each boring, the sampled interval exhibiting the highest OVM headspace reading was selected for submittal to the analytical laboratory (Southern Petroleum Laboratories, Houston, Texas) for benzene, toluene, ethyl benzene, and total xylenes (BTEX) analyses. A total of 10 soil samples were submitted to the laboratory for BTEX analysis.

Upon completion of soil boring/sampling activities, the soil borings were properly plugged from total depth to the surface.

Field EC measurements were obtained from the 0-1' bgl interval, the 1'-2' bgl interval and the 2'-3' bgl interval of each of the 10 borings. Soil samples HA-2 (0-1'), HA-7 (0-1')

and HA-8 (0-1') contained EC field values greater than 4 mS/cm. The field EC of the 1'-2' bgl and 2'-3' bgl sample intervals within each of the 10 borings all measured below 4 mS/cm. These field measurements are summarized in Table 1 of Benham's RAP (2009) which is attached as **Appendix H**.

Of the 30 samples submitted to the analytical laboratory, 24 contained laboratory EC results greater than 4 mmhos/cm. All 10 of the samples from the 0-1' bgl interval exhibited EC values greater than 4 mmhos/cm. Seven of the 10 samples from the 1'-2' bgl interval exhibited EC values greater than 4 mmhos/cm. These samples included: HA-1 (1'-2') (16,000 µmhos/cm) , HA-2 (1'-2') (10,800 µmhos/cm), HA-3 (1'-2') (6,450 µmhos/cm), HA-4 (1'-2') (10,600 µmhos/cm), HA-6 (1'-2') (5,630 µmhos/cm), HA-7 (1'-2') (5,070 µmhos/cm) and HA-8 (1'-2') (6,210 µmhos/cm). Soil samples HA-5 (1'-2'), HA-9 (1'-2') and HA-10 (1'-2') exhibited EC levels below 4,000 µmhos/cm. Seven of the 10 samples from the 2'-3' bgl interval exhibited EC levels greater than 4 mmhos/cm (4,000 µmhos/cm). These samples included: HA-1 (2'-3') (8,810 µmhos/cm), HA-2 (2'-3') (7,510 µmhos/cm), HA-3 (2'-3') (11,800 µmhos/cm), HA-4 (2'-3') (12,400 µmhos/cm), HA-6 (2'-3') (11,000 µmhos/cm), HA-8 (2'-3') (14,300 µmhos/cm) and HA-10 (2'-3') (13,600 µmhos/cm) . Soil samples HA-5 (2'-3'), HA-7 (2'-3') and HA-9 (2'-3') exhibited EC levels below 4,000 µmhos/cm. Benham (2009) summarized these laboratory analytical results in Table 2 of their report (Appendix H).

Soil sample HA-1 (0-1') contained a detectable concentration of toluene, 1.9 micrograms per kilogram (µg/kg), which is well below the NMOCD action level of 5,000 µg/kg. No other concentrations of BTEX were observed in these soil samples. Benham (2009) summarized these laboratory analytical results in Table 3, and complete copies of the laboratory analytical reports were provided in Appendix B. Based upon the laboratory analytical results for these soil samples, BTEX has been eliminated as a potential constituent of concern for this RAP. Based upon the analytical results from this initial phase of investigation it was determined the lateral and vertical extent of the brine impacted soil was not delineated and that additional sampling was warranted.

2.2 Filter House Release Investigation - May 2009

During the period May 5-7, 2009 in order to further delineate the horizontal and vertical extent of the impacted soil at the Filter House Release, Benham installed an additional 25 soil borings ranging in depth from one to eight feet bgl in the potentially impacted area. Soil samples were collected on one foot intervals from the surface to total depth from within each borehole. The field EC measurements taken during the February

2009 phase of investigation did not correlate with the laboratory EC values, therefore, no field EC measurements were conducted during this phase of the investigation.

A total of 128 soil samples were collected from the 25 borings. Upon collection, an aliquot of each soil sample was placed directly into a clean, sealable, plastic bag, labeled as to source and placed under chain-of-custody control for transport to the analytical laboratory. Of the 128 total samples, 35 samples from seven soil borings were held for analysis pending the results of other delineation samples. Upon receipt of the analytical data from the soil samples initially submitted, 20 of the held soil samples were submitted to the analytical laboratory for EC analysis.

Upon completion of soil boring/sampling activities, the soil borings were properly plugged from total depth to the surface.

A total of 113 soil samples were submitted to the analytical laboratory for EC analysis during this phase of investigation.

Soil samples were collected from soil borings HA-33 and HA-34 located in an upgradient, outlying area to demonstrate the background levels of EC in the surrounding soils. All of the soil samples taken from background soil borings HA-33 and HA-34 had soil EC values less than 4 mmhos/cm.

Of the remaining soil samples submitted to the analytical laboratory during this phase of investigation, 53 samples exhibited laboratory levels of EC greater than 4 mhos/cm. The following summary presents the number of samples from each depth interval that contained levels of EC greater than 4 mmhos/cm and the total number of samples submitted for that depth interval.

- (0-1') 8 of 22 samples > 4 mmhos/cm
- (1'-2') 6 of 20 samples > 4 mmhos/cm
- (2'-3') 9 of 20 samples > 4 mmhos/cm
- (3'-4') 8 of 18 samples> 4 mmhos/cm
- (4'-5') 10 of 18 samples> 4 mmhos/cm
- (5'-6') 4 of 5 samples > 4 mmhos/cm
- (6'-7') 4 of 5 samples > 4 mmhos/cm

The 5 samples from the 7'-8' bgl interval were used to determine if the borings advanced into material that was not impacted by the brine release. Four of these 5 samples submitted contained an EC concentration greater than 4 mmhos/cm (4,000 µmhos/cm). These samples were HA-11 (7'-8') (12,300 µmhos/cm), HA-12 (7'-8')

(5,660 µmhos/cm), HA-14 (7'-8') (14,500 µmhos/cm) and HA-15 (7'-8') (12,900 µmhos/cm). Soil sample HA-16 (7'-8') exhibited an EC level of 2,060 µmhos/cm. Benham (2009) summarized these laboratory analytical results in Table 2 of their report located in **Appendix H**.

Isopleth maps of laboratory EC results for the 0-1' , 1'-2' , 2'-3' , 3'-4' , 4'-5' , 5'-6' , 6'-7' and 7'-8' bgl depth intervals were prepared and are presented by Benham (2009) on Figures 3-10, respectively. As can be seen on these figures, the impacted soil at the Site has been substantially delineated.

2.3 Filter House Release Investigation - July 2009

In July 2009, at the request of the NMOCD, eight (8) soil samples previously collected at the Filter House Release site were selected from a range of soil EC levels. These soil samples were analyzed for chloride to determine if there was an observable relationship between the soil EC values and the chloride concentration. Benham (2009) summarized these laboratory analytical results in Table 2 of their report located in **Appendix H**.

2.4 RW-2 Release Investigation - January 2011

On January 20, 2011 in order to delineate the horizontal and vertical extent of the impacted soil, SAIC Energy, Environment & Infrastructure, LLC (SAIC), formerly The Benham Companies, LLC (Benham), on behalf of EPNG, installed nine soil borings to an approximate depth of five feet bgl in the potentially impacted area.

Soil samples were collected on one foot intervals from the surface to total depth within each borehole. Field electrical conductance (EC) tests were conducted on each sample interval. A total of 45 field EC measurements were conducted during this phase of the investigation. These field EC tests were used as a screening tool to ensure that the boring/sampling activities progressed to a depth interval below the lower limit of the impacted soil. Each field EC test was conducted by combining equal volumes of soil and de-ionized water within a clean, sealable, plastic bag. Following soil and water combination, the plastic bag was sealed and labeled as to source. The soil/water mixture was then mixed thoroughly and allowed to stand for approximately 30 minutes. Following this period, the EC of the soil/water mixture was measured with an electrical conductance meter. An EC value of 4 milliSiemens per centimeter (mS/cm) or less indicated that the sample collected was below the lower limit. It should be noted the

field meter EC units of mS/cm are, in general, equivalent to the laboratory EC units of millimhos per centimeter (mmhos/cm).

A total of 45 soil samples were collected from the nine borings. Upon collection, an aliquot of each soil sample was placed directly into a clean, sealable, plastic bag, labeled as to source and placed under chain-of-custody control for transport to the analytical laboratory (Environmental Testing, Inc., Oklahoma City, Oklahoma) for analysis of EC. An additional aliquot of each soil sample was placed into a clean, sealable, plastic bag. After approximately 30 minutes at ambient temperature, the headspace within each bag was evaluated with an organic vapor meter (OVM). In each boring, the sampled interval exhibiting the highest OVM headspace reading was selected for submittal to the analytical laboratory (Southern Petroleum Laboratories, Houston, Texas) for benzene, toluene, ethylbenzene, and total xylenes (BTEX) analyses. A total of nine soil samples were submitted to the laboratory for BTEX analysis.

Upon completion of soil boring/sampling activities, the soil borings were plugged from total depth to the surface.

Field EC measurements were obtained from the 0-1' bgl interval, the 1'-2' bgl interval, the 2'-3' bgl interval, the 3'-4' bgl interval and the 4'-5' bgl interval of each of the nine borings. None of the soil samples collected for field EC measurements contained EC field values greater than 4 mS/cm. These field measurements are summarized in Table 1 of SAIC (2011) report, which is attached as **Appendix I**.

Of the 45 samples submitted to the analytical laboratory, six contained laboratory EC results greater than 4 mmhos/cm. These samples included: HA-1 (3'-4') (4.060 mmhos/cm), HA-2 (0'-1') (7.320 mmhos/cm), HA-2 (1'-2') (5.620 mmhos/cm), HA-2 (2'-3') (4.840 mmhos/cm), HA-4 (2'-3') (4.210 mmhos/cm) and HA-6 (4'-5') (5.360 mmhos/cm). The following summary presents the number of samples from each depth interval that contained levels of EC greater than 4 mmhos/cm and the total number of samples submitted for that depth interval.

- (0-1') 1 of 9 samples > 4 mmhos/cm
- (1'-2') 1 of 9 samples > 4 mmhos/cm
- (2'-3') 2 of 9 samples > 4 mmhos/cm
- (3'-4') 1 of 9 samples > 4 mmhos/cm
- (4'-5') 1 of 9 samples > 4 mmhos/cm

The remaining 39 samples exhibited EC levels below 4 mmhos/cm. SAIC (2011) summarizes these laboratory analytical results in Table 2 of their report (**Appendix I**).

No concentrations of BTEX were observed in the nine soil samples submitted for analysis. SAIC (2011) summarizes these laboratory analytical results in Table 3 of their report (**Appendix I**). Based upon the laboratory analytical results for these soil samples, BTEX was eliminated as a potential constituent of concern (COC) for this RAP.

Isopleth maps of laboratory EC results for the 0-1' bgl, 1'-2' bgl , 2'-3' bgl, 3'-4' bgl and 4'-5' bgl depth intervals were prepared and are presented in SAIC's report (2011) on Figures 3-7, respectively (Appendix I).

3. CORRECTIVE ACTIONS

The area impacted by the Filter House Release was excavated (**Figure 3**) in December 2013 from one to three feet below ground level according to the delineation performed by Brenham (2009). The Filter House is located on state owned lands and the Right of Entry Permit is provided in **Appendix C**. The excavated material (606.96 tons) was transported to Lea Landfill for disposal. Waste manifests are presented in **Appendix D**. A total of 43 soil samples were collected from the excavation floors and walls. A single excavation floor (bottom) sample was collected from every 400 square feet of excavation and a minimum of one sample was collected from each excavation area. Sidewall samples were collected from each excavation. The samples were collected at a maximum spacing of 40 feet between sample locations. The sidewall samples were collected directly into the laboratory glassware. The samples were sent to the laboratory for analysis of chloride and specific conductance. Sample chloride concentrations ranged from 43.7 milligrams per kilogram (mg/kg) to 1,490 mg/kg and are summarized in **Table 1**. **Figure 3** depicts the post excavation chloride concentration from each location. Sample chloride concentrations less than 250 mg/Kg are not shown. The laboratory analytical reports are included in **Appendix G**.

The area impacted by the RW-2 Release was excavated (**Figure 4**) in December 2013 from three to five feet below ground level according to the delineation performed by SAIC (2011). The excavated material (36.36 tons) was transported to Lea Landfill for disposal. Waste manifests can be found in **Appendix E**. A total of 22 soil samples were collected from the excavation floor and walls. A single excavation floor (bottom) sample was collected from every 400 square feet of excavation and a minimum of one sample was collected from each excavation area. Sidewall samples were collected from each excavation. The samples were collected at a maximum spacing of 40 feet between sample locations. The sidewall samples were collected directly into the laboratory glassware. The samples were sent to the laboratory for analysis of chloride

and specific conductance. Sample chloride concentrations ranged from 35.8 mg/kg to 1,840 mg/kg and are summarized in **Table 2**. **Figure 4** depicts the post excavation chloride concentration from each location. Sample chloride concentrations less than 250 mg/Kg are not shown. The laboratory analytical reports are included in **Appendix G**.

4. MULTIMED TRANSPORT MODELING RESULTS

Exposure assessments were run for this site using the United States Environmental Protection Agency Exposure Assessment Multimedia Model (MULTIMED Version 1.5, 2005). Data inputs and model outputs are provided by **Appendix F**. The model outputs indicate that the peak increased concentration of chlorides in groundwater contributed by soils in the vadose zone would be approximately 33.33 miligrams per liter (mg/L) in 370 years at the Filter House Release. Modeling of the RW-2 Release indicates that the peak increased concentration of chloride in groundwater would be approximately 0.000003 mg/L in 366 years. No significant impact was predicted in offsite wells (Oxy Supply Well and Doom Supply Well). Since the estimated increase in chloride concentrations in groundwater would not result in a groundwater background concentration exceedance, vadose zone chloride mass removal estimates are not warranted for these site releases.

Model output after excavation of the Filter House Release predicted a maximum chloride concentration increase of 33.33 mg/L after 370 years 1 meter downgradient of the release. Onsite recovery well RW-3 was predicted to have a maximum chloride increase of 0.0456 mg/L after 836 years. Maximum predicted chloride concentration increases in offsite wells (Oxy Supply Well: 0.0062 mg/L at 1,760 years, Doom Supply Well: 0.00129 mg/L at 3050 years) were insignificant. Modeled chloride concentration increase graphics are given by **Appendix A**.

Modeling of chloride concentration increases 1 meter downgradient of the RW-2 Release site, post excavation, resulted in a maximum increase of 0.000003 mg/L in 366 years. Monitoring well ACW-12 was predicted to have a maximum chloride increase of 0.0219 mg/L after 701 years. Maximum predicted chloride concentration increases in offsite wells (Oxy Supply Well: 0.00793 mg/L at 908 years, Doom Supply Well: 0.00428 mg/L at 2340 years) were insignificant. Modeled chloride concentration increase graphics are given by **Appendix A**.

5. RESULTS

Based on the results of the Multimed modeling no further source removal is required at the Filter House Release or the RW-2 Release Area.

6. RECOMMENDATIONS

Restoration of the excavated area will consist of placement, compaction and contouring of soil backfill material derived from an offsite source. Prior to the placement of any backfill material, a sample of the backfill material will be collected and submitted to an analytical laboratory for analysis to ensure the material is not impacted. The analyses will include chloride, toxicity characteristic leaching procedure (TCLP) metals, BTEX and total petroleum hydrocarbons (TPH).

Upon completion of backfilling operations, the area will be graded to minimize erosion but encourage surface water runoff. Upon completion of grading operations, the areas will be restored to their pre-excavation state (Filter House Release excavation was primarily a caliche road).

7. REFERENCES

Benham, 2009. Remedial Action Plan Brine Impacted Soil Jal No. 4 Gas Plant, Lea County, New Mexico, IRP #2026.

SAIC, 2011. Remedial Action Plan Chloride Impacted Soil Jal No. 4 Gas Plant, Lea County, New Mexico, 1RP-04-01-2697.

Table 1 - Jal #4 Excavation Lab Anlaytical Results
Filter House Excavation

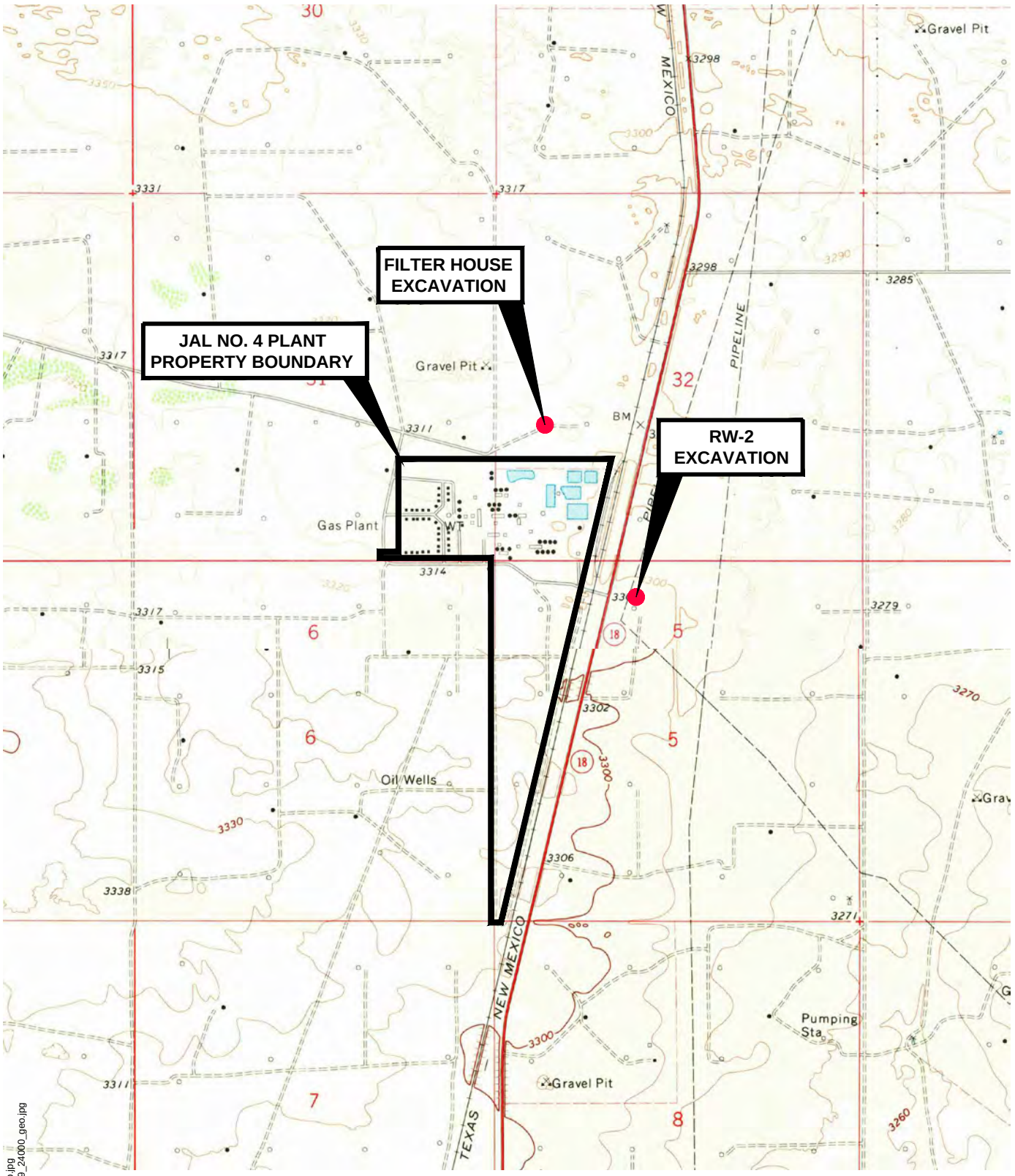
Date	Area	Excavation	Location	Total Chloride (mg/Kg)	Specific Conductance (umhos/cm)
12/20/2013	Bag House	1'	Middle Bottom	162	763
12/20/2013	Bag House	1'	North Middle Bottom	1390	4010
12/20/2013	Bag House	1'	North Bottom	625	1820
12/20/2013	Bag House	1'	North East Bottom	579	1680
12/20/2013	Bag House	1'	East Middle Botom	577	1510
12/20/2013	Bag House	1'	Southeast Middle Bottom	533	1770
12/20/2013	Bag House	1'	West Middle Bottom	600	1900
12/20/2013	Bag House	1'	North Wall East	459	1420
12/20/2013	Bag House	1'	North Wall West	2800	8840
12/20/2013	Bag House	1'	East Wall North	352	970
12/20/2013	Bag House	1'	East Wall South	17.5 J	309
12/20/2013	Bag House	1'	South Wall East Middle	28.2 J	367
12/20/2013	Bag House	1'	South Wall East	44.9 J	439
12/20/2013	Bag House	1'	South Wall West	443	1850
12/20/2013	Bag House	1'	South Wall West Middle	20.5 J	187
12/20/2013	Bag House	1'	West Wall South	163	438
12/20/2013	Bag House	1'	West Wall West	498	1420
12/19/2013	Bag House	2' North	North Bottom	507	1200
12/19/2013	Bag House	2' North	South Bottom	276	453
12/19/2013	Bag House	2' North	North Wall	1490	4070
12/19/2013	Bag House	2' North	East Wall North	288	656
12/19/2013	Bag House	2' North	East Wall South	426	758
12/19/2013	Bag House	2' North	South Wall	159	454
12/19/2013	Bag House	2' North	West Wall North	158	342
12/19/2013	Bag House	2' North	West Wall South	43.7 J	79.7
12/17/2013	Bag House	3' North	North Bottom	1230	1840
12/17/2013	Bag House	3' North	South Bottom	1380	2050
12/17/2013	Bag House	3' North	North Wall	177	461
12/17/2013	Bag House	3' North	East Wall North	227	631
12/17/2013	Bag House	3' North	East Wall South	525	1540
12/17/2013	Bag House	3' North	South Wall	664	1900
12/17/2013	Bag House	3' North	West Wall North	174	521
12/17/2013	Bag House	3' North	West Wall South	132	303
12/20/2013	Bag House	East 3'	Bottom	1130	3540
12/20/2013	Bag House	East 3'	North Wall	329	639
12/20/2013	Bag House	East 3'	East Wall	931	2610
12/20/2013	Bag House	East 3'	South Wall	36.6 J	248
12/20/2013	Bag House	East 3'	West Wall	137	695
12/18/2013	Bag House	3' West	Bottom	557	916
12/18/2013	Bag House	3' West	North Wall	226	771
12/18/2013	Bag House	3' West	East Wall	367	1050
12/18/2013	Bag House	3' West	South Wall	280	634
12/18/2013	Bag House	3' West	West Wall	365	474

concentration > 250 mg/kg

Table 2 - Jal #4 Excavation Lab Analytical Results
RW-2 Excevation

Date	Area	Excavation	Location	Total Chloride (mg/Kg)	Specific Conductance (umhos/cm)
12/2/2013	RW-2	North	Bottom	553	1430
12/2/2013	RW-2	North	North Wall	148	250
12/2/2013	RW-2	North	East Wall	229	1250
12/2/2013	RW-2	North	South Wall	146	800
12/2/2013	RW-2	North	West Wall	112	538
12/2/2013	RW-2	East 4'	East Wall	78.8	534
12/2/2013	RW-2	South	North Bottom	334	1130
12/2/2013	RW-2	South	South Bottom	241	1460
12/2/2013	RW-2	South	North Wall	73.5	290
12/2/2013	RW-2	South	East Wall	1310	2120
12/2/2013	RW-2	South	South Wall	210	902
12/2/2013	RW-2	South	West Wall	581	1350
12/3/2013	RW-2	South Middle	Middle Bottom 5'	869	1280
12/3/2013	RW-2	South Middle	North Wall	471	1320
12/3/2013	RW-2	South Middle	East Wall	551	1420
12/3/2013	RW-2	South Middle	South Wall	621	1200
12/3/2013	RW-2	South Middle	West Wall	929	1780
12/3/2013	RW-2	West	Middle Bottom 4'	1320	2330
12/3/2013	RW-2	West	North Wall	1840	2130
12/3/2013	RW-2	West	East Wall	35.8 J	247
12/3/2013	RW-2	West	South Wall	823	2310
12/3/2013	RW-2	West	West Wall	1230	2590

concentration > 250 mg/kg



SOURCE: U.S.G.S. 7.5 MIN. TOPOGRAPHIC QUADRANGLES: RATTLESNAKE CANYON, NEW MEXICO 1969 AND JAL NW, NEW MEXICO 1969

0 1000 2000
SCALE IN FEET

EL PASO NATURAL GAS COMPANY
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO
REMEDIAL ACTION PLAN REPORT

SITE LOCATION MAP

ARCADIS

FIGURE
1

LEGEND

ACW-5	GROUNDWATER MONITOR WELL
EPNG-1	WATER SUPPLY WELL
RW-2	GROUNDWATER RECOVERY WELL
OXY	WATER SUPPLY WELL
ACW-8	GROUNDWATER MONITOR WELL CONVERTED TO GROUNDWATER RECOVERY WELL
ENSR-2	PLUGGED/ABANDON MAY 2012
	PLANT PROPERTY BOUNDARY

N

0 250 500

SCALE IN FEET

EL PASO NATURAL GAS COMPANY
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

REMEDIAL ACTION PLAN REPORT

SITE LAYOUT

ARCADIS

FIGURE
2

N WALL
1490
N WALL
<250
N BOTTOM
625
W WALL NORTH
<250
E WALL NORTH
288
N BOTTOM
507
N BOTTOM
1230
W WALL NORTH
<250
E WALL NORTH
<250
N MIDDLE BOTTOM
1390
NE WALL
459
S BOTTOM
1380
W WALL SOUTH
<250
W WALL SOUTH
<250
E WALL SOUTH
525
E WALL NORTH
352
NE BOTTOM
579
N WALL
<250
S WALL
664
N WALL WEST
2800
S BOTTOM
276
E WALL SOUTH
426
E MIDDLE BOTTOM
577
W WALL
WEST
498
W WALL
365
BOTTOM
557
E WALL
367
S WALL
<250
N WALL
329
W MIDDLE
BOTTOM
600
S WALL
280
MIDDLE BOTTOM
<250
SW WALL
<250
W WALL
<250
BOTTOM
1130
E WALL
931
SE MIDDLE BOTTOM
533
S WALL
<250
W WALL SOUTH
<250
S WALL EAST MIDDLE
<250
S WALL WEST
443
S WALL WEST MIDDLE
<250
S WALL EAST
<250
SE WALL
<250
Pu
Pu
Pu
Pu
Po
10
3
24

LEGEND

- WALL SAMPLE POINTS
- BOTTOM SAMPLE POINTS
- 10 — 10" GAS LINE, DEPTH 3'10"
- 10 — 10" GAS LINE, DEPTH 4'5"
- 24 — 24" PVC LINES, DEPTH 3'8"
- 3 — 3" POLY, DEPTH 1'9"
- 3 — 24" PVC LINE AT 4.5 FT.
- ABANDONED WELLHEAD
- ELECTRIC POLE
- ELECTRICAL BOX
- INJECTION WELLHEAD
- METER BOX
- Pu — BURIED ELECTRIC
- Po — OVERHEAD ELECTIC
- BURIED PIPELINE
- FENCE LINE
- LINEFINDER HIT
- PAVING EDGE
- SURFACE PIPELINE
- 1 FOOT EXCAVATION
- 2 FOOT EXCAVATION
- 3 FOOT EXCAVATION
- POLY VALVE BOX
- STEEL VALVE BOX
- 471 — CHLORIDE CONCENTRATION, IN MILLIGRAMS PER KILOGRAM

NOTE

AERIAL PHOTO FROM GOOGLE EARTH PRO, IMAGERY DATE NOVEMBER 14, 2011

N

0 7.5 15

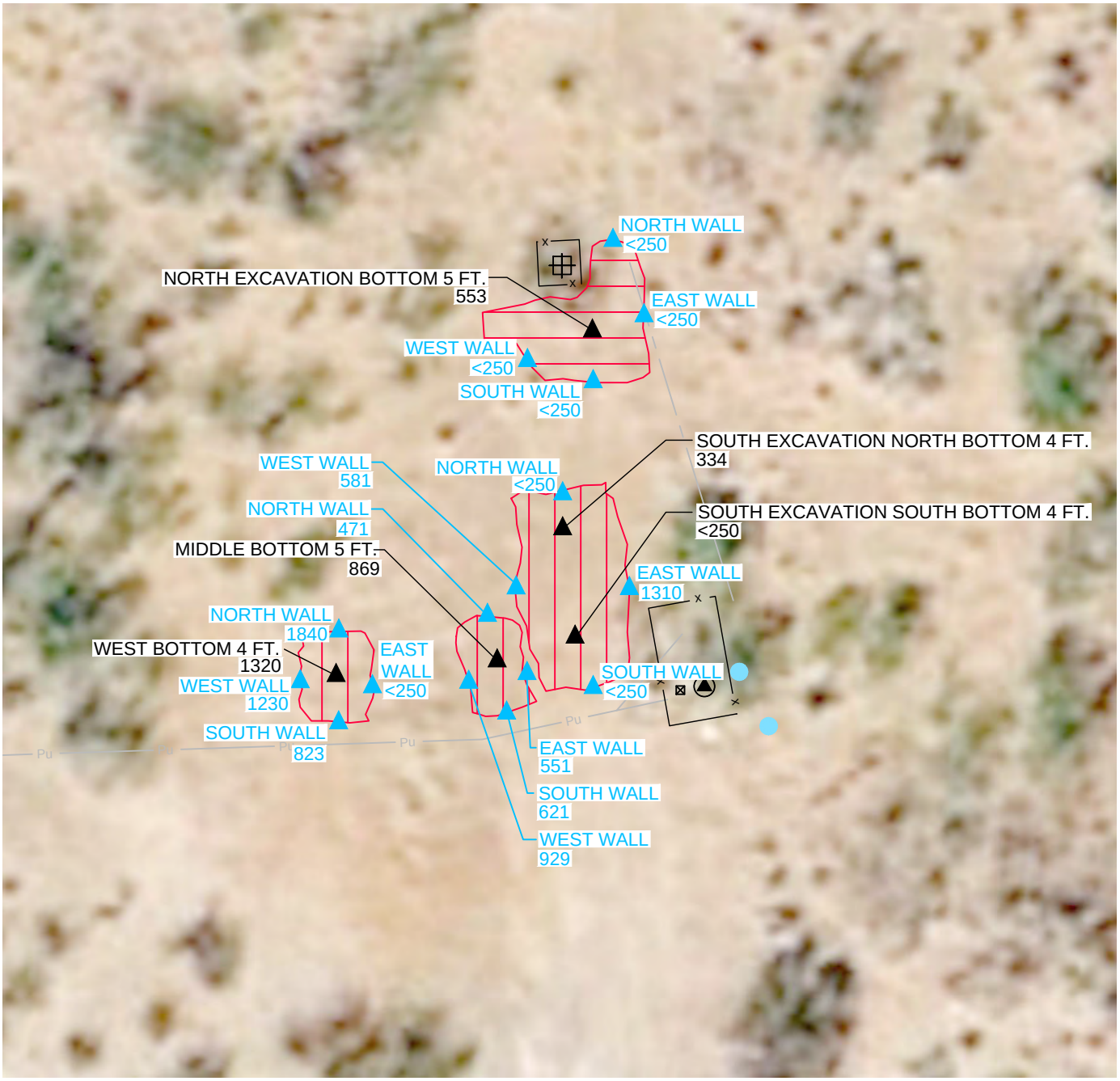
SCALE IN FEET

EL PASO NATURAL GAS COMPANY
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO
REMEDIAL ACTION PLAN REPORT

FILTER HOUSE EXCAVATION

ARCADIS

FIGURE
3



LEGEND

- BOTTOM SAMPLE POINT
- WALL SAMPLE POINT
- MONITOR WELL
- ELECTRICAL BOX
- Pu — BURIED ELECTRIC
- Po — OVERHEAD ELECTIC
- — — BURIED PIPELINE
- x — FENCE LINE
- PAVING EDGE
- 4 FOOT EXCAVATION
- 5 FOOT EXCAVATION
- 621 — CHLORIDE CONCENTRATION, IN MILLIGRAMS PER KILOGRAM

NOTE

AERIAL PHOTO FROM GOOGLE EARTH PRO, IMAGERY DATE NOVEMBER 14, 2011

N

0 7.5 15

SCALE IN FEET

EL PASO NATURAL GAS COMPANY
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

REMEDIAL ACTION PLAN REPORT

RW-2 EXCAVATION

ARCADIS

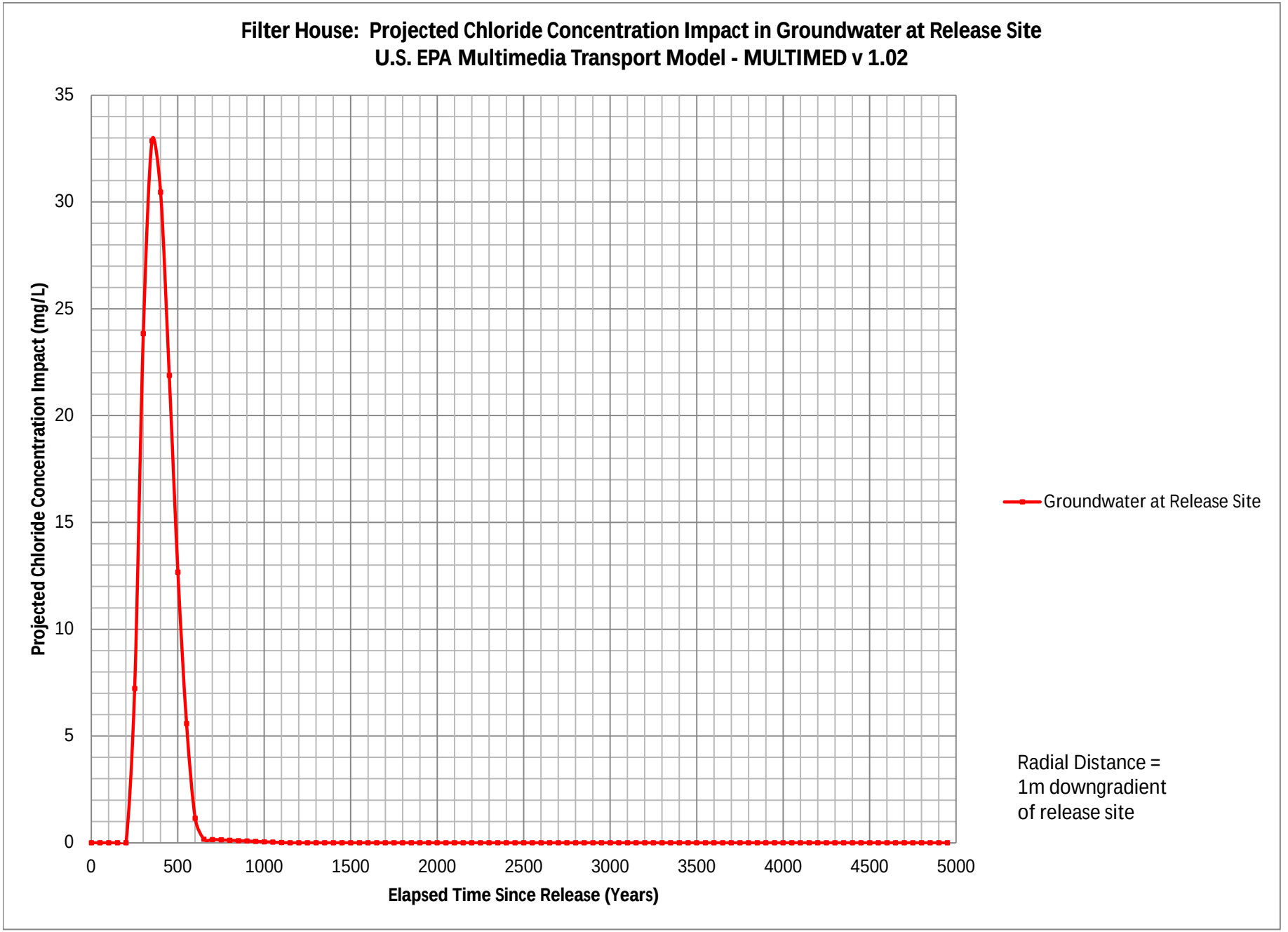
FIGURE
4

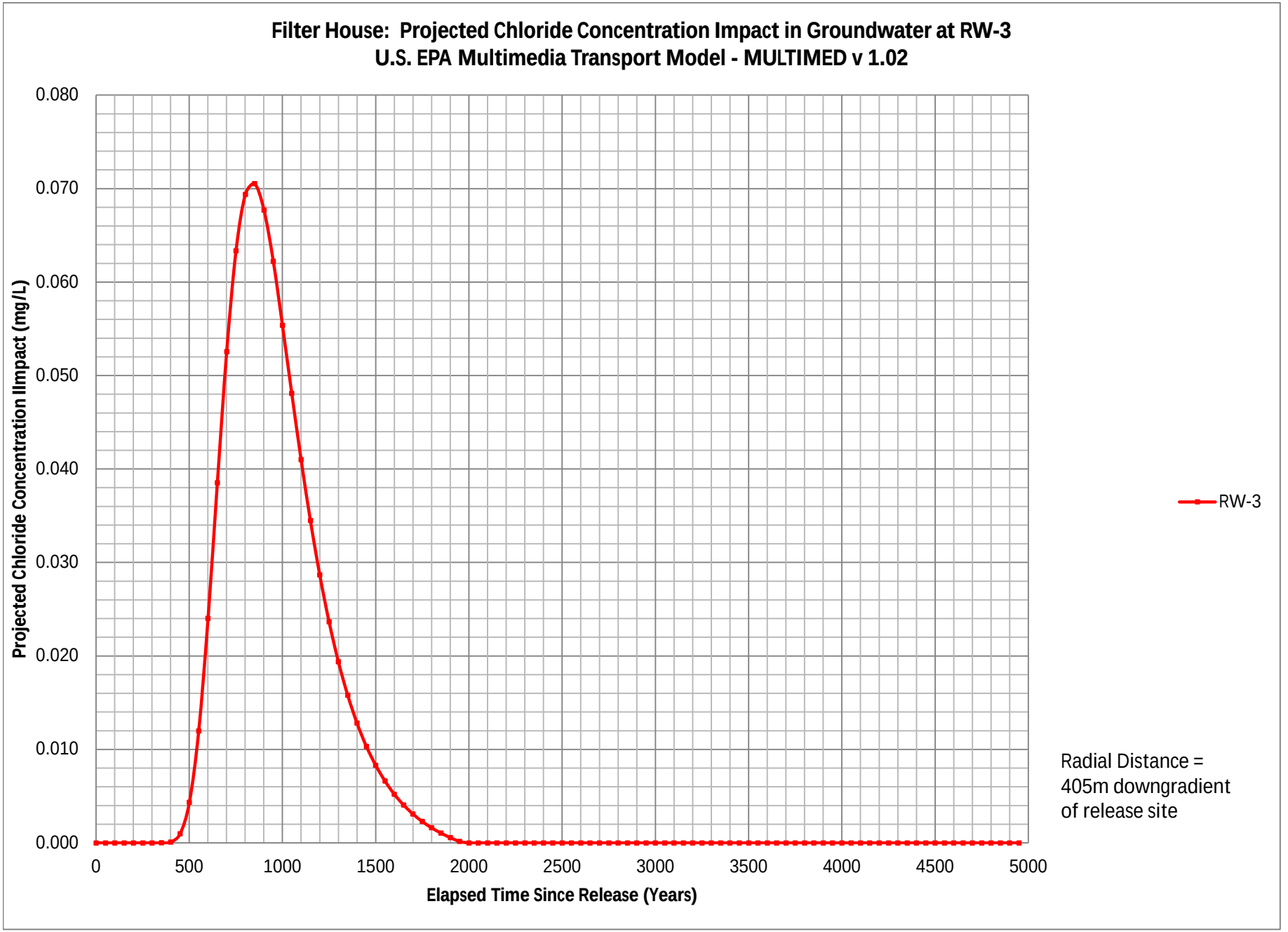
CITY: Milwaukee, WI DIV/GROUP:ENV DB: C. McKeough LD:(Opt) PIC:(Opt) PM:(Reqd) TM: H. McConnell LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Milwaukee\ACTIVITY\00113310001\00001\0414 RAP\4 RW-2.dwg LAYOUT: LAYOUT1 SAVED: 5/7/2014 2:59 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: PDF-PA PLOTSTYLETABLE: BLACKGRAY.CTB PLOTTED: 5/7/2014 2:59 PM BY: MCKEOUGH, CAROL
XREFS: IMAGES: PROJECTNAME: ---
Aerial RW-2.jpg

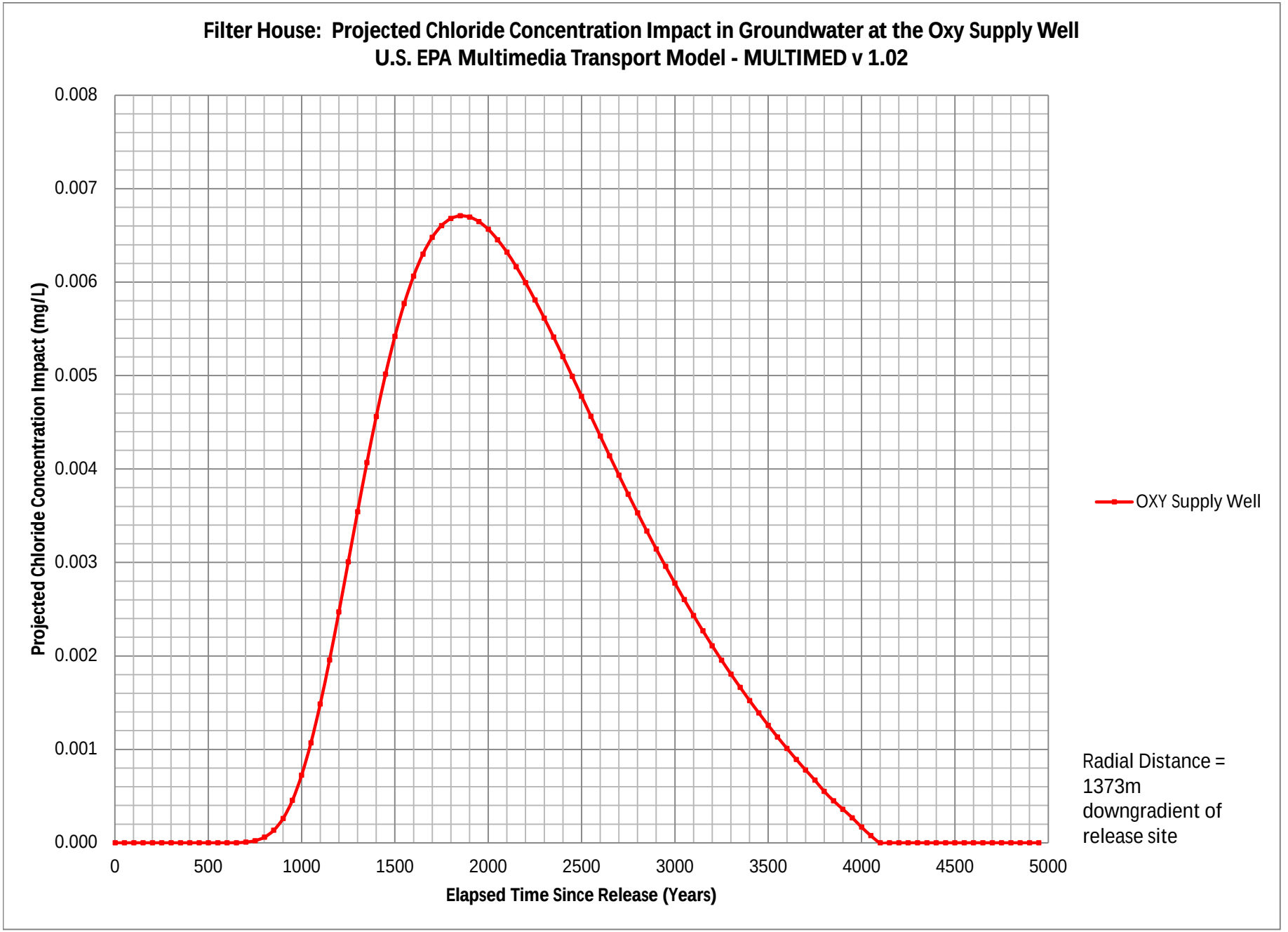
ARCADIS

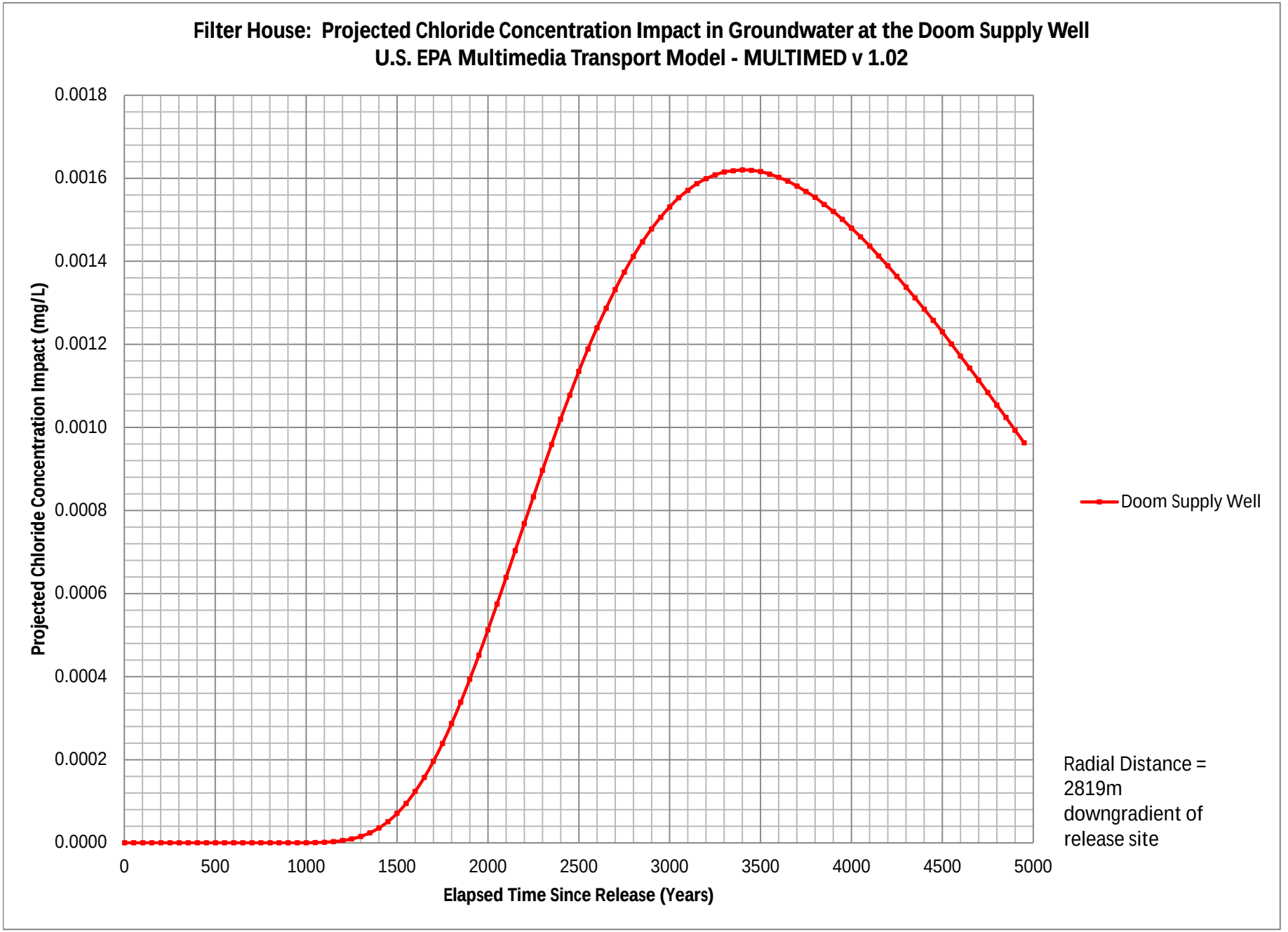
Appendix A

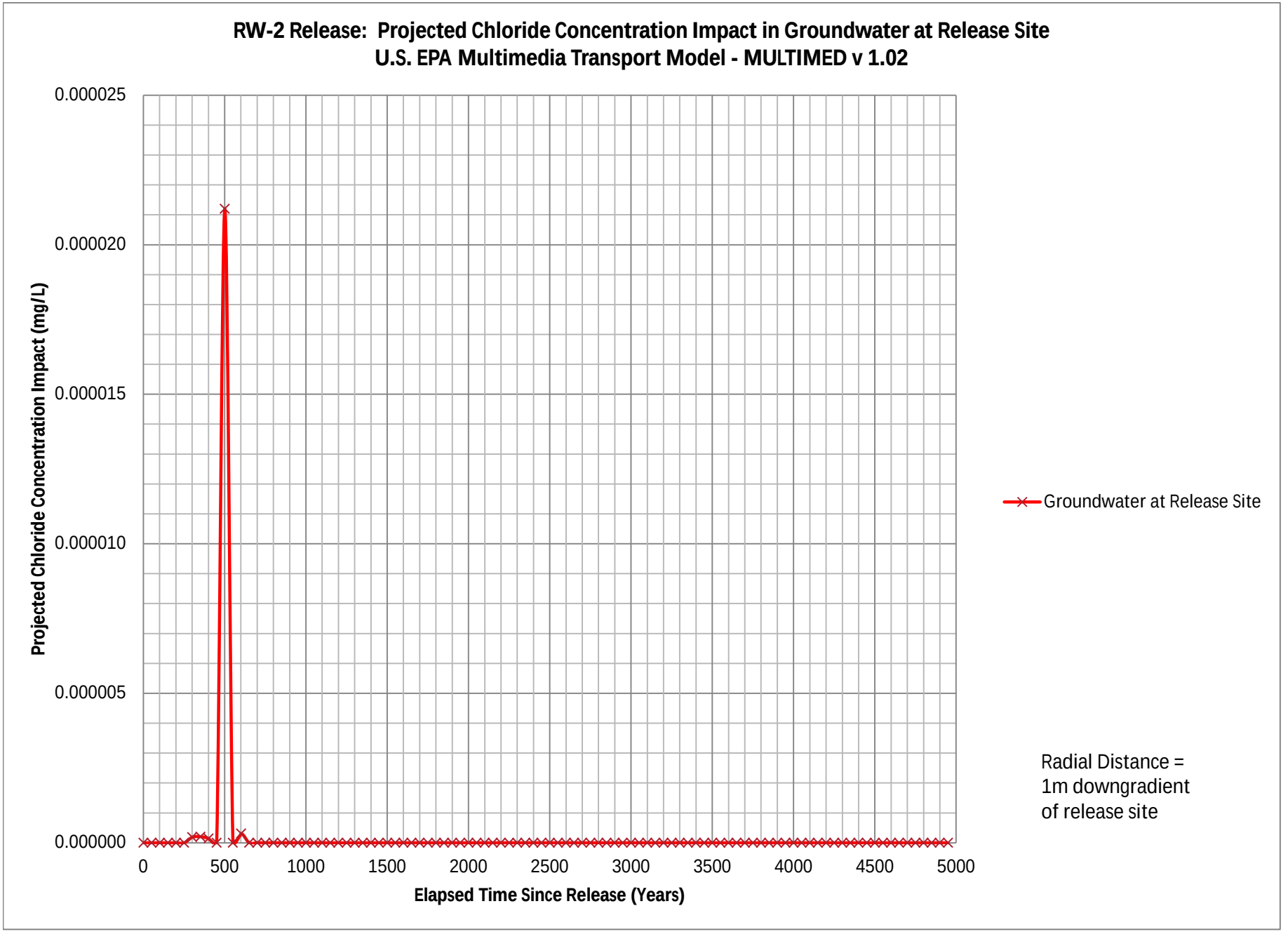
MULTIMED Model Graphics

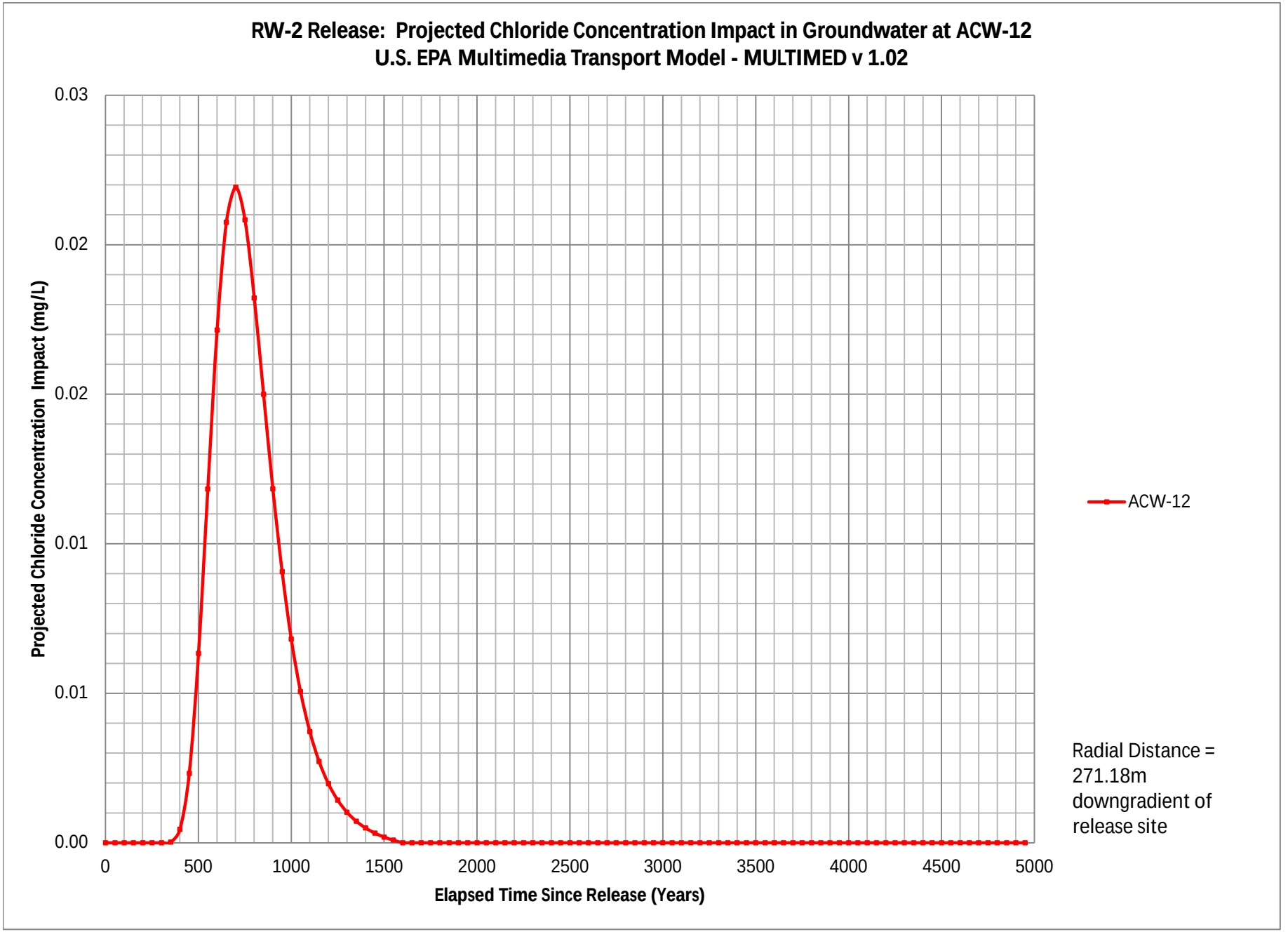

Filter House: Projected Chloride Concentration Impact in Groundwater at Release Site
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration Impact (mg/L)
0
5
10
15
20
25
30
35
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
Groundwater at Release Site
Radial Distance =
1m downgradient
of release site

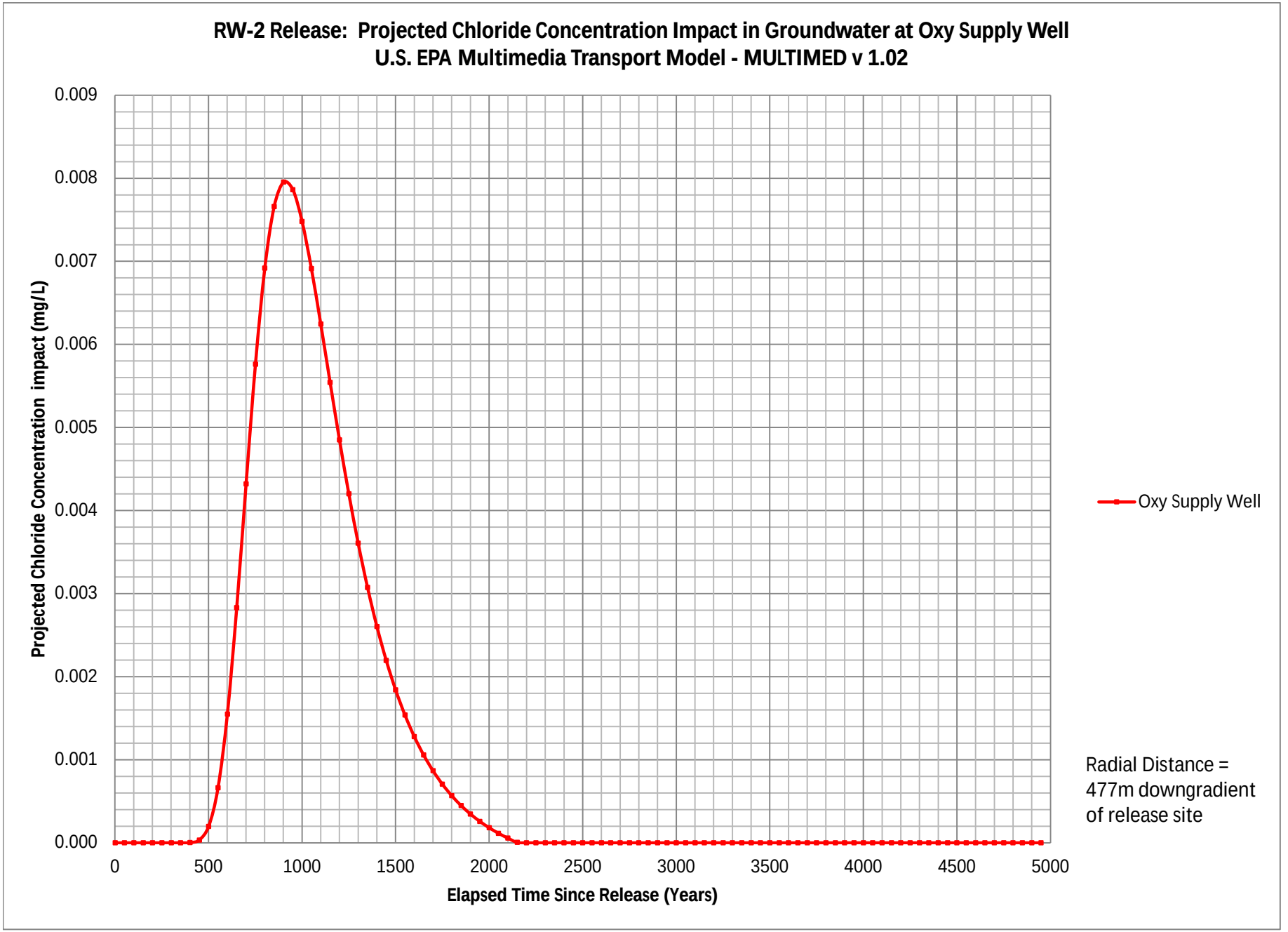

Filter House: Projected Chloride Concentration Impact in Groundwater at RW-3
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration Iimpact (mg/L)
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
RW-3
Radial Distance = 405m downgradient of release site

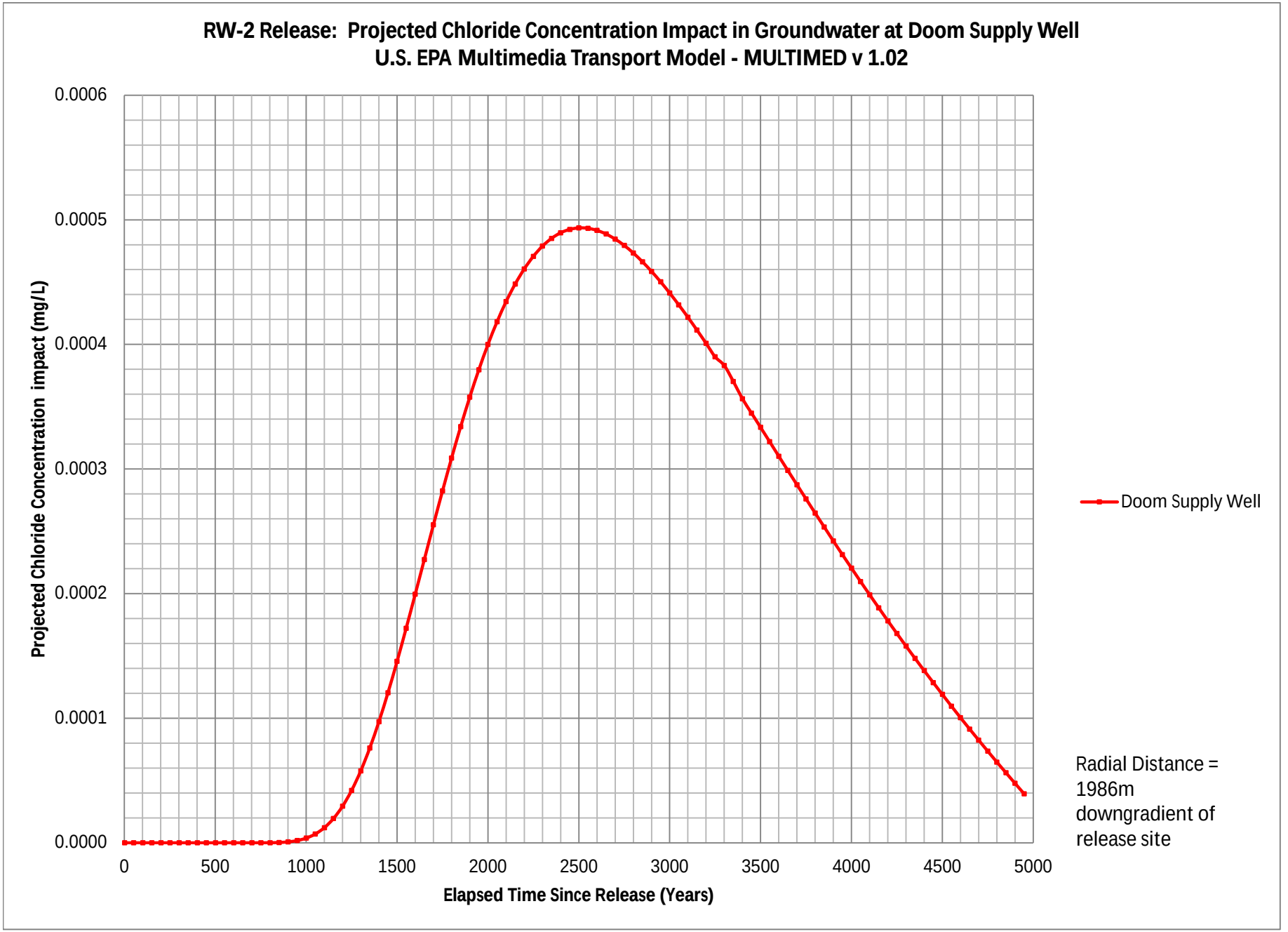

Filter House: Projected Chloride Concentration Impact in Groundwater at the Oxy Supply Well
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration Impact (mg/L)
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
OXY Supply Well
Radial Distance = 1373m downgradient of release site


Filter House: Projected Chloride Concentration Impact in Groundwater at the Doom Supply Well
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration Impact (mg/L)
0.0018
0.0016
0.0014
0.0012
0.0010
0.0008
0.0006
0.0004
0.0002
0.0000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
Doom Supply Well
Radial Distance = 2819m downgradient of release site


RW-2 Release: Projected Chloride Concentration Impact in Groundwater at Release Site
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration Impact (mg/L)
0.000025
0.000020
0.000015
0.000010
0.000005
0.000000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
Groundwater at Release Site
Radial Distance = 1m downgradient of release site


RW-2 Release: Projected Chloride Concentration Impact in Groundwater at ACW-12
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration Impact (mg/L)
0.03
0.02
0.02
0.01
0.01
0.00
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
ACW-12
Radial Distance = 271.18m downgradient of release site


RW-2 Release: Projected Chloride Concentration Impact in Groundwater at Oxy Supply Well
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration impact (mg/L)
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
Oxy Supply Well
Radial Distance = 477m downgradient of release site


RW-2 Release: Projected Chloride Concentration Impact in Groundwater at Doom Supply Well
U.S. EPA Multimedia Transport Model - MULTIMED v 1.02
Projected Chloride Concentration impact (mg/L)
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0.0000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Elapsed Time Since Release (Years)
Doom Supply Well
Radial Distance = 1986m downgradient of release site

Appendix B

Form C-141 Release Notification and Corrective Action

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

RECEIVED
NOV 10 2008
HOBBSOCD

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: El Paso Natural Gas Company	Contact: Doug Stavinoha
Address: 1001 Louisiana Street, Houston, Texas 77002	Telephone No.: (713) 420-5150
Facility Name: Jal #4 Groundwater Remediation Project	Facility Type: Pump and Inject Remediation System

Surface Owner: State of New Mexico	Mineral Owner: N/A	Lease No.: N/A

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
SE/4 NW/4 SW/4 L	32	23S	37E	1,903	South	682	West	Lea

Latitude: 32° 15' 31" N **Longitude:** 103° 11' 28" W

NATURE OF RELEASE

Type of Release: Water high in chlorides.	Volume of Release: Approximately 35 barrels	Volume Recovered: Approximately 25 barrels
Source of Release: Corroded filter housing on groundwater remediation system.	Date and Hour of Occurrence: 10/27/08 @ 1200 hr	Date and Hour of Discovery: 10/27/08 @ 1500 hr
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Larry Johnson	
By Whom? Bruce E. McKenzie, The Benham Companies, LLC	Date and Hour: 10/28/08 @ 1647 hr	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Corroded filter housing on groundwater remediation system leaked, releasing water that was high in chlorides. Remedial actions taken at time of discovery included shutting the groundwater remediation system down, calling a vac-truck to vacuum up approximately 25 barrels of fluid that had collected in a low spot of the access road, and replacing the corroded filter housing.

Describe Area Affected and Cleanup Action Taken.*

Area affected by release was a low spot of a caliche access road, and was approximately 100 feet long and 40 feet wide. Soil samples will be collected from the affected area and analyzed for chlorides. Remedial action will depend upon the results of these soil samples.

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:	OIL CONSERVATION DIVISION
Printed Name: Doug Stavinoha	Approved by District Supervisor: ENVIRONMENTAL ENGINEER
Title: Project Manager	Approval Date: 12-12-08 Expiration Date: 2-12-09
E-mail Address:doug.stavinoha@elpaso.com	Conditions of Approval: Attached ☐
Date: 11/5/08 Phone:(713) 420-5150	SUBMIT FINAL C-141 W/ DOCUMENTATION IRP # 2026

* Attach Additional Sheets If Necessary

INCLUDE THIS TRACKING # ON ALL FUTURE CORRESPONDENCE PERTAINING TO THIS INCIDENT

C:\Documents and Settings\DXS1036\My Documents\Jal 4 Spl Rpt Frm.doc

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: El Paso Natural Gas	Contact: Ian Yanagisawa
Address: 1001 Louisiana Street, Houston, TX 77002	Telephone No.: (713) 420-7361
Facility Name: Jal #4 Groundwater Remediation Project	Facility Type: Pump and Inject Remediation System

Surface Owner: Jimmy Doom	Mineral Owner: N/A	Lease No.: N/A

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	5	24 S	37 E		600 FNL		1980 FWL	Lea

Latitude 32° 15' 31: N Longitude 103° 11' 28" W

NATURE OF RELEASE

Type of Release: Water high in Chlorides.	Volume of Release: Approx 71 Barrels	Volume Recovered: None
Source of Release: Leak from the discharge line from groundwater recovery well RW-2.	Date and Hour of Occurrence: 10/16/10 @ ~2:00pm	Date and Hour of Discovery: 10/18/10 @ ~4:00pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Larry Johnson	
By Whom? Ian Yanagisawa	Date and Hour: 10/20/10 @ 10:11 am	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Pipe broken between the check-valve and cutoff-valve. It is believed that a cow got his head inside the barricade and rubbed up against the piping system around groundwater recovery well RW-2. Fresh cow manure was discovered north of the barricade. Hoof prints were discovered with water sitting in the prints and other hoof prints within the saturated soil.

Describe Area Affected and Cleanup Action Taken.*
Area affect by spill is approximately 20 feet by 20 feet. Remedial action will depend upon the results of soil samples. Soil samples will be collected and analyzed for EC.

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.

OIL CONSERVATION DIVISION

Signature: Ian Yanagisawa	Approved by District Supervisor:	
Printed Name: Ian G. Yanagisawa, P.E., P.G.		
Title: Principle Environmental Engineer	Approval Date:	Expiration Date:
E-mail Address: Ian.Yanagisawa@elpaso.com	Conditions of Approval:	Attached ☐
Date: 10/21/2010 Phone: (713) 420-7361		

* Attach Additional Sheets If Necessary

Appendix C

Right of Entry Permit

Ray Powell, M.S., D.V.M.
COMMISSIONER

State of New Mexico
Commissioner of Public Lands
310 OLD SANTA FE TRAIL
P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

COMMISSIONER'S OFFICE
Phone (505) 827-5760
Fax (505) 827-5766
www.nmstatelands.org

December 11, 2013

El Paso Natural Gas Company
1001 Louisiana Street
Houston, Texas 77002

Attn: Joseph Wiley

Re: Right-of-Entry Application No. ROE-2420

Dear Mr. Wiley

Enclosed is the completed captioned Right-of-Entry permit. If any corrections are necessary, please let us know and we will retype or amend this lease as necessary.

If you have any questions, please feel free to contact this office at the above address or for Donald Martinez, Surface Director @ (505) 827-5731 or myself @ 827-5710.

Sincerely,

Anthony Vigil, Management Analyst
Right of Way Section
Surface Resource Management Division

NEW MEXICO
STATE LAND OFFICE
When we Take Care of the Land, the Land Takes Care of Us

NEW MEXICO STATE LAND OFFICE
Commissioner of Public Lands
Ray Powell, M.S., D.V.M.
New Mexico State Land Office Building
P.O. Box 1148, Santa Fe, NM 87504-1148

RIGHT OF ENTRY PERMIT
CONTRACT NO. ROE-2420
(Remediation)

1. RIGHT OF ENTRY PERMIT

This permit is issued under the authority of NMSA 1978, Section 19-1-2. Therefore, and in consideration of and subject to the terms, covenants, conditions, agreements, obligations and reservations contained in the permit and all other existing rights, the Commissioner of Public Lands, New Mexico State Land Office, State Of New Mexico, hereinafter called "COMMISSIONER," grants to **El Paso Natural Gas Company.** State of Incorporation (if applicable) , whose address is **1001 Louisiana Street, Houston, Texas 77002**, **hereinafter** called "PERMITTEE," authorized use of a specific tract(s) of State Trust Land only for the term, and only for the permitted use, described in this permit.

2. TERM AND LAND DESCRIPTION

Right of entry is granted for a term of **180 days**, commencing, **November 25, 2013,** and ending **May 24, 2014** to the following State Trust Lands.

Section 32, Township 23 South, Range 37 East. NW ¼ SW ¼ Lea County

2013 DEC 9 AM 9 22

3. APPLICATION and PROCESSING FEE

$530.00

4. PERMITTED USE, PERSONNEL, EQUIPMENT AND MATERIALS

Permitted use is for the purpose of: **Excavation and replacement of brine impacted**

soil.

Personnel present on State Trust Land: **ARCADIS-US and Rice Operating**
Equipment & Materials present on State Trust Land: **Excavator, Loader, Haul Trucks and Replacement soil**

Prior to execution of project company must identify and contact the Grazing Lessee.

The granting of this permit does not allow access across private lands.

5. IMPROVEMENTS

No improvements shall be placed on the premises without the prior written consent of the Commissioner.

6. RESERVATIONS

Commissioner reserves the right to execute leases, rights of way, easements, permits, exchange agreements, sale agreements, permits and other lawful rights on or across the land covered by this permit, including but not limited to any such rights for mining purposes and for the extraction of oil, gas, salt, geothermal resources, and other mineral deposits there from and the right to go upon, explore for, mine, remove and sell same.

7. COMPLIANCE WITH LAWS

Permittee shall at its own expense comply fully with and be subject to all applicable regulations, rules, ordinances, and requirements of law or of the Commissioner, including but not limited to the regulations of the State Land Office; Chapter 19 NMSA governing State Trust Lands; federal and state environmental laws and regulations; and the New Mexico Cultural Properties Act, NMSA 1978 Sections 18-6-1 through 18-6-23. It is illegal for any person or his agent to appropriate, excavate, injure, or destroy any historic, or prehistoric ruin or monument, or any object of historical, archaeological, architectural, or scientific value situated on lands owned or controlled by the State Land Office without a valid permit issued by the Cultural Properties Review Committee and approved by the Commissioner of Public Lands.

8. HOLD HARMLESS AND IMDEMNIFICATION

Permittee shall save, hold harmless, indemnify and defend Commissioner, the State Land Office, the State of New Mexico, and any of their officers, employees or agents, in their official and individual capacities, of and from any and all liability, claims, losses, damages, costs, and fees arising out of or alleged to arise out of, or directly or indirectly connected with, the operations of Permittee under this permit on or off State Trust Lands or arising out of the presence on State Trust Lands of any equipment, material, agent, invitee, contractor or subcontractor of Permittee. This Hold Harmless and Indemnification clause covers any claim, including any brought in any court or before

any administrative agency, of any loss or alleged loss, and any damages or alleged damages asserted with respect to any violation or alleged violation of any state, federal or local law or regulation, including but not limited to any environmental law or regulation, any cultural properties law (including the New Mexico Cultural Properties Act, cited above) or regulation, and any alleged damage to the property, rights or interests of any State Land Office lessee, right-of-way holder, or other permittee.

9. AMENDMENT

This permit shall not be altered, changed, or amended except by an instrument in writing executed by Commissioner and Permittee.

10. WITHDRAWAL

Commissioner reserves the right to withdraw any or all of the land authorized for use under this permit. If applicable, Permittee shall vacate the acreage specified within 30 days after receipt of written notification of withdrawal from the Commissioner.

11. CANCELLATION

The violation by Permittee of any of the terms, conditions, or covenants of this permit or the nonpayment by Permittee of the fees due under this permit shall at the option of the Commissioner be considered a default and shall cause the cancellation of this permit 30 days after Permittee has been sent written notice of such.

12. PRESERVE AND PROTECT

The Permittee agrees to preserve and protect the natural environmental conditions of the land encompassed in this permit, and to take those reclamation or corrective actions that are accepted soil and water conservation practices and that are deemed necessary by the Commissioner to protect the land from pollution, erosion, or other environmental degradation. The Permittee further agrees not to injure the property of, or interfere with the operations or rights of, any State Land Office lessee, right-of-way holder, easement holder or other permittee who has rights to use the State Trust Land subject to this permit.

13. RECLAMATION, REMOVAL OF EQUIPMENT, MATERIALS, AND WASTE

The Permittee agrees to reclaim those areas that may be damaged by activities conducted thereon.

The Permittee agrees to remove from the State Trust Lands, no later than the end of the term of this permit, all equipment, and materials it has placed or brought upon the land and to clean up and remove from the land any trash, waste, effluent, or other products used or brought upon the land in connection with this permit.

14. SPECIAL INSTRUCTIONS AND/OR RESTRICTIONS

1. No off road traffic allowed.

2. No wood collection or tree cutting allowed.

3. Disturbing, dislodging, damaging, defacing, destroying or removing historical archaeological, paleontological or cultural sites or artifacts is prohibited.

4. Disturbing, dislodging, damaging, defacing, destroying any improvement, fixture, item, object or thing placed or located in, under or upon the land is prohibited.

5. This permit does not grant a right to enter State Trust Lands to which there is no public access.

6. Any uses or activities not within the scope of this permit are not allowed unless prior written approval from the Commissioner of Public Lands is granted.

7. OTHER

WITNESS the hands and seals of PERMITTEE and COMMISSIONER on the day(s) and year entered below.

Telephone: 713-420-4061

PERMITTEE

ACKNOWLEDGMENT

STATE OF Texas)

COUNTY OF Harris)

The foregoing instrument was acknowledged before me this 3rd day of December, 20 13.

My Commission Expires: 3-26-2017

NOTARY PUBLIC

SHANETRA VERNEE' RANDLE
Notary Public, State of Texas
My Commission Expires
March 26, 2017

COMMISSIONER OF PUBLIC LANDS

DATE: 12-11-13

ROE- 2420 (Remediation)

2013 DEC 9 AM 9 23

Appendix D

Filter House Waste Manifests

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

TCT

NON-HAZARDOUS WASTE MANIFEST NO 094207 | 1. PAGE __ OF __ | 2. TRAILER NO. # 984

GENERATOR

3. COMPANY NAME / PHONE NO.	4. ADDRESS / CITY / STATE / ZIP	5. PICK-UP DATE / 6. TNRCC I.D. NO.
El Paso Natural Gas	23 miles S on Hwy 62/180 / Carlsbad / NM / 88220	12/16/2013

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 2e, L2D					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: Kin Slaughter | PHONE NO: 575-887-4048 | 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: LAWRENCE VALDEZ	PRINTED/TYPED NAME:
SIGNATURE: Lawrence Valdez DATE: 12/16/2013	SIGNATURE: DATE:

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048

PERMIT NO. WM-01-035 - New Mexico

20. COMMENTS

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/16/2013	2:30

GENERATOR: COPIES 1 & 6 | DISPOSAL SITE: COPIES 2 & 3 | TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257 T. C. T.

NON-HAZARDOUS WASTE MANIFEST NO 094208 | 1. PAGE __ OF __ | 2. TRAILER NO. # 1680

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas PHONE NO.	23 miles S on Hwy 62/180 CITY: Carlsbad STATE: NM ZIP: 88220	12/16/2013 6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 21,280					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: Kim Slaughter PHONE NO. 575-887-4048 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME Herman Klos	PRINTED/TYPED NAME
SIGNATURE X Herman Klos DATE 12/16/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzales	—	12/16/2013	2:30

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

T.C.T

NON-HAZARDOUS WASTE MANIFEST NO 094215 | 1. PAGE __ OF __ | 2. TRAILER NO. 984

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/17/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 25,400					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: AM Slaughter PHONE NO. 575-887-4048 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: X LAWRENCE VALDEZ	PRINTED/TYPED NAME:
SIGNATURE: X Lawrence Valdez DATE: 12/17/2013	SIGNATURE: DATE:

DISPOSAL FACILITY

	ADDRESS:	PHONE:
Lea Land, LLC	Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	505-887-4048

PERMIT NO. WM-01-035 - New Mexico

20. COMMENTS

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/17/2013	9:05

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Fourboys #2

NON-HAZARDOUS WASTE MANIFEST NO 094216 | 1. PAGE __ OF __ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/17/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 47,840					

12. COMMENTS OR SPECIAL INSTRUCTIONS: ~~BAG HOUSE~~ BAG House

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME Slaughter PHONE 575-887-4048 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. **TRANSPORTER (1)** TCT MAINTENANCE	17. **TRANSPORTER (2)**
NAME:	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Bobby Brooks	PRINTED/TYPED NAME
SIGNATURE X Bobby Brooks DATE 12/17/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE Santos Gonzalez	CELL NO.	DATE 12/17/2013	TIME 9:30

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Big ID #16

NON-HAZARDOUS WASTE MANIFEST NO 094217 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/17/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 32,780					

12. COMMENTS OR SPECIAL INSTRUCTIONS: ~~BAG HOUSE~~ BAG House

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME Kim Slaughter PHONE 575-887-4048 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. **TRANSPORTER (1)** TCT MAINTENANCE	17. **TRANSPORTER (2)**
NAME:	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN (575) 942-8542	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE:	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME James Armstrong	PRINTED/TYPED NAME
SIGNATURE DATE 12/17/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE Santos Gonzalez	CELL NO.	DATE 12/17/2013	TIME 9:40

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

T.C.T #680

NON-HAZARDOUS WASTE MANIFEST NO 094218 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME: El Paso Natural Gas
PHONE NO.: (432) 940-1808
4. ADDRESS: 23 miles S on Hwy 62/180
CITY: Carlsbad STATE: NM ZIP: 88220
5. PICK-UP DATE: 12/17/2013
6. TNRCC I.D. NO.:

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 20,160					

12. COMMENTS OR SPECIAL INSTRUCTIONS: ~~BAG HOUSE~~ BAG House

13. WASTE PROFILE NO.:

14. IN CASE OF EMERGENCY OR SPILL, CONTACT
NAME: ~~Kim~~ Slaughter PHONE: ~~575~~ 505-887-4048 24-HOUR EMERGENCY NO.:

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. **TRANSPORTER (1)** TCT MAINTENANCE
NAME:
TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN
EMERGENCY PHONE: (575) 942-8542

17. **TRANSPORTER (2)**
NAME:
TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE:

18. **TRANSPORTER (1):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: Herman Klass
SIGNATURE: Herman Klass DATE: 12/17/2013

19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: _____
SIGNATURE _____ DATE _____

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048

PERMIT NO.: WM-01-035 - New Mexico

20. COMMENTS:

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE: Santos Gonzalez | CELL NO.: ——— | DATE: 12/17/2013 | TIME: 10:15

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257 Four boys

NON-HAZARDOUS WASTE MANIFEST NO 094235 | 1. PAGE __ OF __ | 2. TRAILER NO. #2

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/18/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. @ 48,360 @ 47,840					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
BAG HOUSE Total 96,200	

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. **TRANSPORTER (1)**	17. **TRANSPORTER (2)**
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME Bobby Brooks	PRINTED/TYPED NAME
SIGNATURE Bobby Brooks DATE 12/18/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/18/2013	9:35

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Big 10 # 6

NON-HAZARDOUS WASTE MANIFEST NO 094236 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas PHONE NO. (432) 940-1806	23 miles S on Hwy 62/180 CITY: Carlsbad STATE: NM ZIP: 88220	12/18/2013 6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. ① 31,720 ② 32,560					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE TOTAL 64,280

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: Kin Slaughter PHONE NO: 575-887-4048 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: James Armstrong	PRINTED/TYPED NAME:
SIGNATURE: DATE: 12/18/2013	SIGNATURE: DATE:

DISPOSAL FACILITY

	ADDRESS:	PHONE:
Lea Land, LLC	Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	505-887-4048

PERMIT NO. WM-01-035 - New Mexico | 20. COMMENTS

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/18/2013	10:00

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

TCT

NON-HAZARDOUS WASTE MANIFEST NO 094237 | 1. PAGE ___ OF ___ | 2. TRAILER NO #1686

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas PHONE NO. (432) 940-1808	23 miles S on Hwy 62/180 CITY Carlsbad STATE NM ZIP 88220	12/18/2013 6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. @ 21,580 @ 18,880					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
BAG HOUSE TOTAL 40,460	

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME Kin Slaughter | PHONE NO 575-887-4048 | 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. **TRANSPORTER (1)**	17. **TRANSPORTER (2)**
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME Herman Klaus	PRINTED/TYPED NAME
SIGNATURE X Herman Klaus DATE 12/18/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/18/2013	1130

GENERATOR: COPIES 1 & 6 | DISPOSAL SITE: COPIES 2 & 3 | TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257 Four boys

NON-HAZARDOUS WASTE MANIFEST NO 094258 | 1. PAGE __ OF __ | 2. TRAILER NO. 2

GENERATOR

3. COMPANY NAME	4. ADDRESS			5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180			12/19/2013
PHONE NO. (432) 940-1805	CITY Carlsbad	STATE NM	ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 47,000 ② 47,040 ③ 41,040					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE TOTAL 135,080

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME Kim Slaughter PHONE NO. 575-887-4048 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. **TRANSPORTER (1)**	17. **TRANSPORTER (2)**
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME Bobby Brooks	PRINTED/TYPED NAME
SIGNATURE Bobby Brooks DATE 12/19/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/19/2013	9:05

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Big 10 #4

NON-HAZARDOUS WASTE MANIFEST NO 094259 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS			5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180			12/19/2013
PHONE NO.	CITY	STATE	ZIP	6. TNRCC I.D. NO.
(432) 940-1808	Carlsbad	NM	88220	

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. ① 39,720 ② 42,040 ③ 40,540					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE — TOTAL 122,300

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: Kin Slaughter | PHONE NO: 575-887-4048 | 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: James Amsley	PRINTED/TYPED NAME:
SIGNATURE: [signature] DATE: 12/19/2013	SIGNATURE: DATE:

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048

PERMIT NO. WM-01-035 - New Mexico | 20. COMMENTS

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/19/2013	9:30

GENERATOR: COPIES 1 & 6 | DISPOSAL SITE: COPIES 2 & 3 | TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257 Heredia

NON-HAZARDOUS WASTE MANIFEST NO 094260 | 1. PAGE ___ OF ___ | 2. TRAILER NO. #005

GENERATOR

3. COMPANY NAME	4. ADDRESS			5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180			12/19/2013
PHONE NO. (432) 940-1808	CITY Carlsbad	STATE NM	ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. ① 42,480 ② 47,460					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE TOTAL @ 89.940

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME Kin Slaughter | PHONE NO. 575-887-4048 | 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. **TRANSPORTER (1)**	17. **TRANSPORTER (2)**
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Juan Herrera	PRINTED/TYPED NAME
SIGNATURE X [signature] DATE 12/19/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/19/2013	9:35

GENERATOR: COPIES 1 & 6 | DISPOSAL SITE: COPIES 2 & 3 | TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

BACA #5

NON-HAZARDOUS WASTE MANIFEST NO 094273 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/19/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 21,680 @ 23,520					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE TOTAL 45,200

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: Kim Slaughter PHONE NO. 575-887-4048 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. **TRANSPORTER (1)** TCT MAINTENANCE	17. **TRANSPORTER (2)**
NAME:	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN (575) 942-8542	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE:	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Trinidad Baca	PRINTED/TYPED NAME
SIGNATURE X T Baca DATE 12/19/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE Santos Gonzalez	CELL NO.	DATE 12/19/2013	TIME 11:00

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257 Diamond back #316

NON-HAZARDOUS WASTE MANIFEST NO 094276 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME: El Paso Natural Gas
PHONE NO.: (432) 940-1808
4. ADDRESS: 23 miles S on Hwy 62/180
CITY: Carlsbad STATE: NM ZIP: 88220
5. PICK-UP DATE: 12/19/2013
6. TNRCC I.D. NO.:

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 28,LeLeD					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE

13. WASTE PROFILE NO.:

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: Kin Slaughter PHONE NO: 575-887-4048 24-HOUR EMERGENCY NO.:

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. **TRANSPORTER (1)**
NAME: TCT MAINTENANCE
TEXAS I.D. NO.:
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN
EMERGENCY PHONE: (575) 942-8542

17. **TRANSPORTER (2)**
NAME:
TEXAS I.D. NO.:
IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE:

18. **TRANSPORTER (1):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: X JAY Criswell
SIGNATURE: X Jay Criswell DATE: 12/19/2013

19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME:
SIGNATURE: DATE:

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048

PERMIT NO.: WM-01-035 - New Mexico

20. COMMENTS:

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/19/2013	1:00

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Tk & I # 01

NON-HAZARDOUS WASTE MANIFEST NO 094277 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/19/2013
PHONE NO. (432) 940-1806	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
~~Non-Regulated, Non-Hazardous Waste~~ a.	1	CM			
b.					
c.					
d. 21,560					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
BAG HOUSE	

14. IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. GENERATOR'S CERTIFICATION: I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Linda Bailey	PRINTED/TYPED NAME
SIGNATURE X Linda Bailey DATE 12/19/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. DISPOSAL FACILITY'S CERTIFICATION: I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/19/2013	1:55

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Heredia #005

NON-HAZARDOUS WASTE MANIFEST NO 094280 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/19/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED: Non-Regulated, Non Hazardous Waste	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a.					
b.					
c.					
d. 45,280					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE	13. WASTE PROFILE NO.

TRANSPORTER

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. **TRANSPORTER (1)**	17. **TRANSPORTER (2)**
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Juan Herrera	PRINTED/TYPED NAME
SIGNATURE X [signature] DATE 12/19/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/19/2013	3:20

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257 Baca

NON-HAZARDOUS WASTE MANIFEST NO 094284 | 1. PAGE ___ OF ___ | 2. TRAILER NO. #5

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/20/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. (1) 20,180 (2) 21,680					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE Total 41,860

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kip Slaughter	575-887-4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Trinidad Baca	PRINTED/TYPED NAME
SIGNATURE X T Baca DATE 12/20/2013	SIGNATURE DATE

DISPOSAL FACILITY

	ADDRESS:	PHONE:
Lea Land, LLC	Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	505-887-4048

PERMIT NO.	20. COMMENTS
WM-01-035 - New Mexico	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/20/2013	8:45

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Fourbovs

NON-HAZARDOUS WASTE MANIFEST NO 094285 | 1. PAGE ___ OF ___ | 2. TRAILER NO. #2

GENERATOR

3. COMPANY NAME	4. ADDRESS			5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180			12/20/2013
PHONE NO.	CITY	STATE	ZIP	6. TNRCC I.D. NO.
(432) 840-1808	Carlsbad	NM	88220	

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. ① 49,780 ② 49760 ③ 32760					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
BAG HOUSE TOTAL @ 132,300	

GENERATOR

14. IN CASE OF EMERGENCY OR SPILL, CONTACT		
NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME Bobby Brooks	PRINTED/TYPED NAME
SIGNATURE Bobby Brooks DATE 12/20/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/20/2013	8:50

GENERATOR: COPIES 1 & 6 | DISPOSAL SITE: COPIES 2 & 3 | TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Big 10 #6

NON-HAZARDOUS WASTE MANIFEST NO 094287 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS			5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180			12/20/2013
PHONE NO.	CITY	STATE	ZIP	6. TNRCC I.D. NO.
(432) 940-1806	Carlsbad	NM	88220	

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 35,780 @ 44,140					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
BAG HOUSE Total 79,920	

GENERATOR

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575 887 4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME:	NAME:
TEXAS I.D. NO. TCT MAINTENANCE	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME James A. Mosley	PRINTED/TYPED NAME
SIGNATURE DATE 12/20/2013	SIGNATURE DATE

DISPOSAL FACILITY

	ADDRESS:	PHONE:
Lea Land, LLC	Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	505-887-4048

PERMIT NO.	20. COMMENTS
WM-01-035 - New Mexico	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/20/2013	9:00

GENERATOR: COPIES 1 & 6 | DISPOSAL SITE: COPIES 2 & 3 | TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

TK & I

NON-HAZARDOUS WASTE MANIFEST NO 094288 | 1. PAGE __ OF __ | 2. TRAILER NO. #01

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/20/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 18,720 @ 25,000					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE TOTAL 43,720

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: Linda Bailey	PRINTED/TYPED NAME
SIGNATURE: Linda Bailey DATE: 12/20/2013	SIGNATURE DATE

DISPOSAL FACILITY

	ADDRESS:	PHONE:
Lea Land, LLC	Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	505-887-4048

PERMIT NO.	20. COMMENTS
WM-01-035 - New Mexico	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzales	—	12/20/2013	9:05

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257 Baker

NON-HAZARDOUS WASTE MANIFEST NO 094289 | 1. PAGE __ OF __ | 2. TRAILER NO. #4

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/20/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 25,340					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
BAG HOUSE	

TRANSPORTER

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Randy	PRINTED/TYPED NAME
SIGNATURE X Randy Rend DATE 12/20/2013	SIGNATURE DATE

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzales	—	12/20/2013	9:40

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Diamondback # 516

NON-HAZARDOUS WASTE MANIFEST NO 094302 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/20/2013
PHONE NO. (432) 940-1808	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 27,680					

12. COMMENTS OR SPECIAL INSTRUCTIONS: BAG HOUSE

13. WASTE PROFILE NO.

14. **IN CASE OF EMERGENCY OR SPILL, CONTACT**

NAME: Kin Slaughter | PHONE NO: 575-887-4048 | 24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME | SIGNATURE | DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: X Jay Criswell	PRINTED/TYPED NAME:
SIGNATURE: X Jay Criswell DATE: 12/20/2013	SIGNATURE: DATE:

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048
PERMIT NO. WM-01-035 - New Mexico	20. COMMENTS	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez		12/20/2013	11:30

GENERATOR: COPIES 1 & 6 | DISPOSAL SITE: COPIES 2 & 3 | TRANSPORTERS: COPIES 4 & 5

COPY 1

Appendix E

RW-2 Waste Manifests

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

TCT #984

NON-HAZARDOUS WASTE MANIFEST NO 094197 | 1. PAGE ___ OF ___ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas PHONE NO.	23 miles S on Hwy 62/180 CITY STATE ZIP Carlsbad NM 88220	12/16/2013 6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste		1 CM			
b.					
c.					
d. 25,220					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
RW#2	

14. IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. GENERATOR'S CERTIFICATION: I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: LAWRENCE VALDEZ	PRINTED/TYPED NAME:
SIGNATURE: Lawrence Valdez DATE: 12/16/2013	SIGNATURE: DATE:

DISPOSAL FACILITY

	ADDRESS:	PHONE:
Lea Land, LLC	Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	505-887-4048

PERMIT NO.	20. COMMENTS
WM-01-035 - New Mexico	

21. DISPOSAL FACILITY'S CERTIFICATION: I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzalez	—	12/16/2013	11:20

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

TCT

NON-HAZARDOUS WASTE MANIFEST NO 094199 | 1. PAGE __ OF __ | 2. TRAILER NO. # 6860

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas PHONE NO.	23 miles S on Hwy 62/180 CITY STATE ZIP Carlsbad NM 88220	12/16/2013 6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	8. CONTAINERS Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste		1	CM		
b.					
c.					
d. 24,620					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
RW#2	

14. IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME: Herman Holm	PRINTED/TYPED NAME:
SIGNATURE: Herman Holm DATE: 12/16/2013	SIGNATURE: DATE:

DISPOSAL FACILITY

Lea Land, LLC	ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	PHONE: 505-887-4048

PERMIT NO.	20. COMMENTS
WM-01-035 - New Mexico	

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzales		12/16/2013	11:25

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (505) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Baca #5

NON-HAZARDOUS WASTE MANIFEST NO 094305 | 1. PAGE __ OF __ | 2. TRAILER NO.

GENERATOR

3. COMPANY NAME	4. ADDRESS	5. PICK-UP DATE
El Paso Natural Gas	23 miles S on Hwy 62/180	12/20/2013
PHONE NO. (432) 940-1806	CITY Carlsbad STATE NM ZIP 88220	6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:	8. CONTAINERS No.	Type	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
a. Non-Regulated, Non Hazardous Waste	1	CM			
b.					
c.					
d. 22880					

12. COMMENTS OR SPECIAL INSTRUCTIONS:	13. WASTE PROFILE NO.
RW 2	

14. IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME	PHONE NO	24-HOUR EMERGENCY NO.
Kin Slaughter	575-887-4048	

15. GENERATOR'S CERTIFICATION: I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME	SIGNATURE	DATE

TRANSPORTERS

16. TRANSPORTER (1)	17. TRANSPORTER (2)
NAME: TCT MAINTENANCE	NAME:
TEXAS I.D. NO.	TEXAS I.D. NO.
IN CASE OF EMERGENCY CONTACT: KYLE NORMAN	IN CASE OF EMERGENCY CONTACT:
EMERGENCY PHONE: (575) 942-8542	EMERGENCY PHONE:
18. **TRANSPORTER (1):** Acknowledgment of receipt of material	19. **TRANSPORTER (2):** Acknowledgment of receipt of material
PRINTED/TYPED NAME X Trinidad Baca	PRINTED/TYPED NAME
SIGNATURE X T Baca DATE 12/20/2013	SIGNATURE DATE

DISPOSAL FACILITY

	ADDRESS:	PHONE:
Lea Land, LLC	Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM	505-887-4048

PERMIT NO.	20. COMMENTS
WM-01-035 - New Mexico	

21. DISPOSAL FACILITY'S CERTIFICATION: I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE	CELL NO.	DATE	TIME
Santos Gonzales	—	12/20/2013	2:30

GENERATOR: COPIES 1 & 6 DISPOSAL SITE: COPIES 2 & 3 TRANSPORTERS: COPIES 4 & 5

COPY 1

ARCADIS

Appendix F

MULTIMED Model Inputs and Output

GENERAL DATA GROUP

*** CHEMICAL NAME
Chloride

```
***    ISOURC                              ROUTE      NT       IYCHK   PALPH      APPTYP
***OPTION   OPTAIR  RUN              MONTE    ISTEAD     IOPEN     IZCHK     LANDF   COMPLETE
    2    0    0     DETERMINISTIC    500    1    0  100    0    0    0 90.0    0    1    1
```

*** TIMES FOR CONCENTRATION CALCULATION AT WELL

1.0	51.0	101.0	151.0	201.0	251.0	301.0	351.0	401.0	451.0
501.0	551.0	601.0	651.0	701.0	751.0	801.0	851.0	901.0	951.0
1001.0	1051.0	1101.0	1151.0	1201.0	1251.0	1301.0	1351.0	1401.0	1451.0
1501.0	1551.0	1601.0	1651.0	1701.0	1751.0	1801.0	1851.0	1901.0	1951.0
2001.0	2051.0	2101.0	2151.0	2201.0	2251.0	2301.0	2351.0	2401.0	2451.0
2501.0	2551.0	2601.0	2651.0	2701.0	2751.0	2801.0	2851.0	2901.0	2951.0
3001.0	3051.0	3101.0	3151.0	3201.0	3251.0	3301.0	3351.0	3401.0	3451.0
3501.0	3551.0	3601.0	3651.0	3701.0	3751.0	3801.0	3851.0	3901.0	3951.0
4001.0	4051.0	4101.0	4151.0	4201.0	4251.0	4301.0	4351.0	4401.0	4451.0
4501.0	4551.0	4601.0	4651.0	4701.0	4751.0	4801.0	4851.0	4901.0	4951.0

END GENERAL

CHEMICAL DATA GROUP
ARRAY VALUES
***   CHEMICAL SPECIFIC VARIABLES

***	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
***				MEAN	STD DEV	MIN	MAX
1	Solid phase decay coefficient	1/yr	0	0.000E+00	-9.99E+02	-9.99E+02	-9.99E+02
2	Dissolved phase decay coefficient	1/yr	0	0.000E+00	-9.99E+02	-9.99E+02	-9.99E+02

```
 3 Overall chemical decay coefficient        1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Acid catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Neutral catalyzed hydrolysis rate         1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Base catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 7 Reference temperature                     C                     0      2.500E+01 -9.99E+02 -9.99E+02 -9.99E+02
 8 Normalized distribution coefficient       ml/g                  0      1.219E-01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Distribution coefficient                  ml/g                 -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Biodegradation coefficient (sat. zone)    1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
11 Air diffusion coefficient                 cm^2/s                0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Reference temperature for air diffusion   C                     0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Molecular weight                          g/M                   0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
14 Mole fraction of solute                   --                    0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
15 Vapor pressure of solute                  mm Hg                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
16 Henry's Law constant                  atm-m^3/M                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END CHEMICAL GROUP


SOURCE DATA GROUP
ARRAY VALUES
***        SOURCE SPECIFIC VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Infiltration rate                        m/yr                  0      1.270E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Area of waste disposal unit              m^2                   0      3.716E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Duration of pulse                        yr                   -1      5.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Spread of contaminant source             m                    -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 5 Recharge rate                            m/yr                  0      1.270E-02 -9.99E+02 -9.99E+02 -9.99E+02
 6 Source decay constant                    1/yr                  0      5.000E-02 0.000E+00 0.000E+00 0.000E+00
 7 Initial concentration at landfill        mg/l                  0      3.924E+02 -9.99E+02 -9.99E+02 -9.99E+02
 8 Length scale of facility                 m                    -1      2.740E+01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Width scale of facility                  m                    -1      2.290E+01 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END SOURCE GROUP
```

```
VFL   UNSATURATED FLOW MODEL PARAMETERS


CONTROL PARAMETERS
***    DUMMY     NMAT      KPROP     DUMMY    NVFLAY
         7         1         1         1         1


END CONTROL PARAMETERS
SATURATED MATERIAL PROPERTY PARAMETERS
ARRAY VALUES
***   SATURATED MATERIAL VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Sat hydraulic conductivity              cm/hr                    0      3.600E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Unsaturated zone porosity               --                       0      2.500E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Air entry pressure head                 m                        0      7.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Depth of the unsaturated zone           m                        0      3.197E+01 0.000E+00 0.000E+00 0.000E+00
END ARRAY

END MATERIAL   1
END SATURATED MATERIAL PROPERTIES
SOIL MOISTURE PARAMETERS
***   FUNCTIONAL COEFFICIENTS
ARRAY VALUES
***   FUNCTIONAL COEFFICIENT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Residual water content                  --                       0      6.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Brooks and Corey exponent, EN           --                       0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Alpha van Genuchten parameter           1/cm                     0      7.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 4 Beta van Genuchten parameter            --                       0      1.890E+00 -9.99E+02 -9.99E+02 -9.99E+02
```

```
END ARRAY

END MATERIAL  1
END FUNCTIONAL COEFFICIENTS
END UNSATURATED ZONE FLOW MODEL PARAMETERS



VTP    UNSATURATED ZONE TRANSPORT MODEL PARAMETERS
CONTROL PARAMETERS
***   NLAY     DUMMY      IADU      ISOL         N      NTEL     NGPTS       NIT     DUMMY     DUMMY
        1        20         1         2        18         3       104         2         1         1
***  WTFUN
     1.200


END CONTROL PARAMETERS
TRANSPORT PARAMETERS
ARRAY VALUES
***   UNSATURATED ZONE TRANSPORT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Thickness of layer                      m                      0      3.197E+01 -9.99E+02 -9.99E+02 -9.99E+02
 2 Longitudinal dispersivity of layer      m                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Percent organic matter                  --                     0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Bulk Density of soil layer              g/cc                   0      1.830E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Biological decay coefficient            1/yr                   0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END LAYER  1
END UNSATURATED ZONE TRANSPORT PARAMETERS
END UNSATURATED ZONE TRANSPORT MODEL


AQUIFER DATA GROUP
ARRAY VALUES
```

```
***       AQUIFER SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Particle diameter                         cm                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Aquifer porosity                          --                        0      3.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Bulk density                              g/cc                      0      1.700E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Aquifer thickness                         m                         0      1.862E+01 -9.99E+02 -9.99E+02 -9.99E+02
 5 Source thickness (mixing zone depth)      m                        -1      3.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Hydraulic conductivity                    m/yr                      0      3.150E+02 -9.99E+02 -9.99E+02 -9.99E+02
 7 Hydraulc gradient                         --                        0      6.080E-04 -9.99E+02 -9.99E+02 -9.99E+02
 8 Groundwater seepage velocity              m/yr                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 9 Retardation coefficient                   --                       -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Longitudinal dispersivity                 m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
11 Transverse dispersivity                   m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Vertical dispersivity                     m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Temperature of aquifer                    C                         0      2.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
14 pH                                        --                        0      7.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
15 Organic carbon content                    --                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
16 Well radial distance from site            m                         0      1.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
17 Angle off plume centerline            degree                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
18 Well vertical distance                    m                         0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END AQUIFER GROUP

END ALL DATA
```

MULTIMED V1.01 DATE OF CALCULATIONS: 15-APR-2014 TIME: 14:52: 5

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

E X P O S U R E A S S E S S M E N T

M U L T I M E D I A M O D E L

MULTIMED (Version 1.50, 2005)

Switched to Stehfest algorithm to avoid numerical problems
with Convolution algorithm. Problems were caused by
high source decay rate. Everything ok now, execution continuing...

1

Run options

--- -------

Chemical simulated is Chloride

Option Chosen	Saturated and unsaturated zone models
Run was	DETERMIN

Infiltration Specified By User: 1.270E-02 m/yr

Run was transient

Well Times: Entered Explicitly

Reject runs if Y coordinate outside plume

Reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1

1

UNSATURATED ZONE FLOW MODEL PARAMETERS

(input parameter description and value)

NP - Total number of nodal points 240

```
 NMAT    - Number of different porous materials          1
 KPROP   - Van Genuchten or Brooks and Corey             1
 IMSHGN  - Spatial discretization option                 1
 NVFLAYR - Number of layers in flow model                1


 OPTIONS CHOSEN
 ------- ------
 Van Genuchten functional coefficients
 User defined coordinate system
1


 Layer information
 -----------------
 LAYER NO.    LAYER THICKNESS     MATERIAL PROPERTY
 ---------    ---------------     -----------------
     1                 31.97             1
```

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	32.0	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.650E-01	-999.	-999.	-999.
Brook and Corey exponent,EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.750E-01	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.89	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used		1
NTSTPS	- Number of time values concentration calc		40
DUMMY	- Not presently used		1
ISOL	- Type of scheme used in unsaturated zone		1
N	- Stehfest terms or number of increments		18
NTEL	- Points in Lagrangian interpolation		3
NGPTS	- Number of Gauss points		104
NIT	- Convolution integral segments		2
IBOUND	- Type of boundary condition		3
ITSGEN	- Time values generated or input		1
TMAX	- Max simulation time	--	0.0
WTFUN	- Weighting factor	--	1.2

OPTIONS CHOSEN

------- ------

Stehfest numerical inversion algorithm

Exponentially decaying continuous source

Computer generated times for computing concentrations

1

DATA FOR LAYER 1

---- --- -----

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	32.0	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.83	-999.	-999.	-999.
Biological decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.122	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry`s law constant	atm-m^3/M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.127E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	372.	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	50.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.127E-01	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.500E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	392.	-999.	-999.	-999.
Length scale of facility	m	DERIVED	27.4	-999.	-999.	-999.
Width scale of facility	m	DERIVED	22.9	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.70	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	18.6	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.608E-03	-999.	-999.	-999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	-999.	-999.
Retardation coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.

Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Temperature of aquifer	C	CONSTANT	20.0	-999.	-999.	-999.
pH	--	CONSTANT	7.00	-999.	-999.	-999.
Organic carbon content (fraction)		CONSTANT	0.000	-999.	-999.	-999.
Well distance from site	m	CONSTANT	1.00	-999.	-999.	-999.
Angle off center	degree	CONSTANT	0.000	-999.	-999.	-999.
Well vertical distance	m	CONSTANT	0.000	-999.	-999.	-999.

1

TIME	CONCENTRATION
0.100E+01	0.00000E+00
0.510E+02	0.00000E+00
0.101E+03	0.00000E+00
0.151E+03	0.00000E+00
0.201E+03	0.00000E+00
0.251E+03	0.72280E+01
0.301E+03	0.23837E+02
0.351E+03	0.32857E+02
0.401E+03	0.30456E+02
0.451E+03	0.21876E+02
0.501E+03	0.12667E+02
0.551E+03	0.55855E+01
0.601E+03	0.11479E+01
0.651E+03	0.17334E+00
0.701E+03	0.15554E+00
0.751E+03	0.13773E+00
0.801E+03	0.11993E+00
0.851E+03	0.10212E+00
0.901E+03	0.84318E-01
0.951E+03	0.66513E-01
0.100E+04	0.48709E-01
0.105E+04	0.30904E-01
0.110E+04	0.13099E-01
0.115E+04	0.00000E+00
0.120E+04	0.00000E+00
0.125E+04	0.00000E+00

```
0.130E+04 0.00000E+00
0.135E+04 0.00000E+00
0.140E+04 0.00000E+00
0.145E+04 0.00000E+00
0.150E+04 0.00000E+00
0.155E+04 0.00000E+00
0.160E+04 0.00000E+00
0.165E+04 0.00000E+00
0.170E+04 0.00000E+00
0.175E+04 0.00000E+00
0.180E+04 0.00000E+00
0.185E+04 0.00000E+00
0.190E+04 0.00000E+00
0.195E+04 0.00000E+00
0.200E+04 0.00000E+00
0.205E+04 0.00000E+00
0.210E+04 0.00000E+00
0.215E+04 0.00000E+00
0.220E+04 0.00000E+00
0.225E+04 0.00000E+00
0.230E+04 0.00000E+00
0.235E+04 0.00000E+00
0.240E+04 0.00000E+00
0.245E+04 0.00000E+00
0.250E+04 0.00000E+00
0.255E+04 0.00000E+00
0.260E+04 0.00000E+00
0.265E+04 0.00000E+00
0.270E+04 0.00000E+00
0.275E+04 0.00000E+00
0.280E+04 0.00000E+00
0.285E+04 0.00000E+00
0.290E+04 0.00000E+00
0.295E+04 0.00000E+00
0.300E+04 0.00000E+00
0.305E+04 0.00000E+00
0.310E+04 0.00000E+00
0.315E+04 0.00000E+00
```

```
0.320E+04 0.00000E+00
0.325E+04 0.00000E+00
0.330E+04 0.00000E+00
0.335E+04 0.00000E+00
0.340E+04 0.00000E+00
0.345E+04 0.00000E+00
0.350E+04 0.00000E+00
0.355E+04 0.00000E+00
0.360E+04 0.00000E+00
0.365E+04 0.00000E+00
0.370E+04 0.00000E+00
0.375E+04 0.00000E+00
0.380E+04 0.00000E+00
0.385E+04 0.00000E+00
0.390E+04 0.00000E+00
0.395E+04 0.00000E+00
0.400E+04 0.00000E+00
0.405E+04 0.00000E+00
0.410E+04 0.00000E+00
0.415E+04 0.00000E+00
0.420E+04 0.00000E+00
0.425E+04 0.00000E+00
0.430E+04 0.00000E+00
0.435E+04 0.00000E+00
0.440E+04 0.00000E+00
0.445E+04 0.00000E+00
0.450E+04 0.00000E+00
0.455E+04 0.00000E+00
0.460E+04 0.00000E+00
0.465E+04 0.00000E+00
0.470E+04 0.00000E+00
0.475E+04 0.00000E+00
0.480E+04 0.00000E+00
0.485E+04 0.00000E+00
0.490E+04 0.00000E+00
0.495E+04 0.00000E+00
```

GENERAL DATA GROUP

*** CHEMICAL NAME
Chloride

***   ISOURC   ROUTE   NT   IYCHK   PALPH   APPTYP
***OPTION   OPTAIR RUN   MONTE   ISTEAD   IOPEN   IZCHK   LANDF   COMPLETE
    2   0   0   DETERMINISTIC   500   1   0 100   0   0   0 90.0   0   1   1

*** TIMES FOR CONCENTRATION CALCULATION AT WELL
     1.0   51.0   101.0   151.0   201.0   251.0   301.0   351.0   401.0   451.0
   501.0   551.0   601.0   651.0   701.0   751.0   801.0   851.0   901.0   951.0
  1001.0   1051.0   1101.0   1151.0   1201.0   1251.0   1301.0   1351.0   1401.0   1451.0
  1501.0   1551.0   1601.0   1651.0   1701.0   1751.0   1801.0   1851.0   1901.0   1951.0
  2001.0   2051.0   2101.0   2151.0   2201.0   2251.0   2301.0   2351.0   2401.0   2451.0
  2501.0   2551.0   2601.0   2651.0   2701.0   2751.0   2801.0   2851.0   2901.0   2951.0
  3001.0   3051.0   3101.0   3151.0   3201.0   3251.0   3301.0   3351.0   3401.0   3451.0
  3501.0   3551.0   3601.0   3651.0   3701.0   3751.0   3801.0   3851.0   3901.0   3951.0
  4001.0   4051.0   4101.0   4151.0   4201.0   4251.0   4301.0   4351.0   4401.0   4451.0
  4501.0   4551.0   4601.0   4651.0   4701.0   4751.0   4801.0   4851.0   4901.0   4951.0

END GENERAL

CHEMICAL DATA GROUP
ARRAY VALUES
***   CHEMICAL SPECIFIC VARIABLES

***   VARIABLE NAME   UNITS   DISTRIBUTION   PARAMETERS   LIMITS
***   MEAN   STD DEV   MIN   MAX
 ****
 1 Solid phase decay coefficient   1/yr   0   0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Dissolved phase decay coefficient   1/yr   0   0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02

```
 3 Overall chemical decay coefficient        1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Acid catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Neutral catalyzed hydrolysis rate         1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Base catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 7 Reference temperature                     C                     0      2.500E+01 -9.99E+02 -9.99E+02 -9.99E+02
 8 Normalized distribution coefficient       ml/g                  0      1.219E-01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Distribution coefficient                  ml/g                 -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Biodegradation coefficient (sat. zone)    1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
11 Air diffusion coefficient                 cm^2/s                0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Reference temperature for air diffusion   C                     0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Molecular weight                          g/M                   0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
14 Mole fraction of solute                   --                    0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
15 Vapor pressure of solute                  mm Hg                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
16 Henry's Law constant                  atm-m^3/M                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END CHEMICAL GROUP


SOURCE DATA GROUP
ARRAY VALUES
***        SOURCE SPECIFIC VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Infiltration rate                        m/yr                  0      1.270E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Area of waste disposal unit              m^2                   0      3.716E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Duration of pulse                        yr                   -1      5.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Spread of contaminant source             m                    -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 5 Recharge rate                            m/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Source decay constant                    1/yr                  0      5.000E-02 0.000E+00 0.000E+00 0.000E+00
 7 Initial concentration at landfill        mg/l                  0      3.924E+02 -9.99E+02 -9.99E+02 -9.99E+02
 8 Length scale of facility                 m                    -1      2.740E+01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Width scale of facility                  m                    -1      2.290E+01 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END SOURCE GROUP
```

```
VFL   UNSATURATED FLOW MODEL PARAMETERS


CONTROL PARAMETERS
***    DUMMY     NMAT      KPROP     DUMMY    NVFLAY
         7         1         1         1         1


END CONTROL PARAMETERS
SATURATED MATERIAL PROPERTY PARAMETERS
ARRAY VALUES
***   SATURATED MATERIAL VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Sat hydraulic conductivity              cm/hr                    0      3.600E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Unsaturated zone porosity               --                       0      2.500E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Air entry pressure head                 m                        0      7.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Depth of the unsaturated zone           m                        0      3.197E+01 0.000E+00 0.000E+00 0.000E+00
END ARRAY

END MATERIAL   1
END SATURATED MATERIAL PROPERTIES
SOIL MOISTURE PARAMETERS
***   FUNCTIONAL COEFFICIENTS
ARRAY VALUES
***   FUNCTIONAL COEFFICIENT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Residual water content                  --                       0      6.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Brooks and Corey exponent, EN           --                       0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Alpha van Genuchten parameter           1/cm                     0      7.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 4 Beta van Genuchten parameter            --                       0      1.890E+00 -9.99E+02 -9.99E+02 -9.99E+02
```

```
END ARRAY

END MATERIAL  1
END FUNCTIONAL COEFFICIENTS
END UNSATURATED ZONE FLOW MODEL PARAMETERS



VTP    UNSATURATED ZONE TRANSPORT MODEL PARAMETERS
CONTROL PARAMETERS
***   NLAY     DUMMY      IADU      ISOL         N      NTEL     NGPTS       NIT     DUMMY     DUMMY
        1        20         1         2        18         3       104         2         1         1
***  WTFUN
     1.200


END CONTROL PARAMETERS
TRANSPORT PARAMETERS
ARRAY VALUES
***   UNSATURATED ZONE TRANSPORT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Thickness of layer                      m                      0      3.197E+01 -9.99E+02 -9.99E+02 -9.99E+02
 2 Longitudinal dispersivity of layer      m                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Percent organic matter                  --                     0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Bulk Density of soil layer              g/cc                   0      1.830E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Biological decay coefficient            1/yr                   0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END LAYER  1
END UNSATURATED ZONE TRANSPORT PARAMETERS
END UNSATURATED ZONE TRANSPORT MODEL


AQUIFER DATA GROUP
ARRAY VALUES
```

```
***       AQUIFER SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Particle diameter                         cm                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Aquifer porosity                          --                        0      3.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Bulk density                              g/cc                      0      1.700E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Aquifer thickness                         m                         0      1.862E+01 -9.99E+02 -9.99E+02 -9.99E+02
 5 Source thickness (mixing zone depth)      m                        -1      3.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Hydraulic conductivity                    m/yr                      0      3.150E+02 -9.99E+02 -9.99E+02 -9.99E+02
 7 Hydraulc gradient                         --                        0      6.080E-04 -9.99E+02 -9.99E+02 -9.99E+02
 8 Groundwater seepage velocity              m/yr                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 9 Retardation coefficient                   --                       -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Longitudinal dispersivity                 m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
11 Transverse dispersivity                   m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Vertical dispersivity                     m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Temperature of aquifer                    C                         0      2.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
14 pH                                        --                        0      7.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
15 Organic carbon content                    --                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
16 Well radial distance from site            m                         0      1.373E+03 -9.99E+02 -9.99E+02 -9.99E+02
17 Angle off plume centerline            degree                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
18 Well vertical distance                    m                         0      1.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END AQUIFER GROUP

END ALL DATA
```

MULTIMED V1.01 DATE OF CALCULATIONS: 15-APR-2014 TIME: 16:10: 5

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

E X P O S U R E A S S E S S M E N T

M U L T I M E D I A M O D E L

MULTIMED (Version 1.50, 2005)

Switched to Stehfest algorithm to avoid numerical problems
with Convolution algorithm. Problems were caused by
high source decay rate. Everything ok now, execution continuing...

1

Run options

--- -------

Chemical simulated is Chloride

Option Chosen	Saturated and unsaturated zone models
Run was	DETERMIN

Infiltration Specified By User: 1.270E-02 m/yr
Run was transient
Well Times: Entered Explicitly
Reject runs if Y coordinate outside plume
Reject runs if Z coordinate outside plume
Gaussian source used in saturated zone model

1

1

UNSATURATED ZONE FLOW MODEL PARAMETERS
(input parameter description and value)

NP	- Total number of nodal points	240

```
 NMAT    - Number of different porous materials          1
 KPROP   - Van Genuchten or Brooks and Corey             1
 IMSHGN  - Spatial discretization option                 1
 NVFLAYR - Number of layers in flow model                1


 OPTIONS CHOSEN
 ------- ------
 Van Genuchten functional coefficients
 User defined coordinate system
1


 Layer information
 -----------------
 LAYER NO.    LAYER THICKNESS     MATERIAL PROPERTY
 ---------    ---------------     -----------------
     1                 31.97             1
```

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	32.0	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.650E-01	-999.	-999.	-999.
Brook and Corey exponent,EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.750E-01	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.89	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used		1
NTSTPS	- Number of time values concentration calc		40
DUMMY	- Not presently used		1
ISOL	- Type of scheme used in unsaturated zone		1
N	- Stehfest terms or number of increments		18
NTEL	- Points in Lagrangian interpolation		3
NGPTS	- Number of Gauss points		104
NIT	- Convolution integral segments		2
IBOUND	- Type of boundary condition		3
ITSGEN	- Time values generated or input		1
TMAX	- Max simulation time	--	0.0
WTFUN	- Weighting factor	--	1.2

OPTIONS CHOSEN

------- ------

Stehfest numerical inversion algorithm

Exponentially decaying continuous source

Computer generated times for computing concentrations

1

DATA FOR LAYER 1

---- --- -----

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	32.0	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.83	-999.	-999.	-999.
Biological decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.122	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry`s law constant	atm-m^3/M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.127E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	372.	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	50.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.500E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	392.	-999.	-999.	-999.
Length scale of facility	m	DERIVED	27.4	-999.	-999.	-999.
Width scale of facility	m	DERIVED	22.9	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.70	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	18.6	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.608E-03	-999.	-999.	-999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	-999.	-999.
Retardation coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.

Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Temperature of aquifer	C	CONSTANT	20.0	-999.	-999.	-999.
pH	--	CONSTANT	7.00	-999.	-999.	-999.
Organic carbon content (fraction)		CONSTANT	0.000	-999.	-999.	-999.
Well distance from site	m	CONSTANT	0.137E+04	-999.	-999.	-999.
Angle off center	degree	CONSTANT	0.000	-999.	-999.	-999.
Well vertical distance	m	CONSTANT	1.00	-999.	-999.	-999.

1

TIME	CONCENTRATION
0.100E+01	0.00000E+00
0.510E+02	0.00000E+00
0.101E+03	0.00000E+00
0.151E+03	0.00000E+00
0.201E+03	0.00000E+00
0.251E+03	0.57485E-14
0.301E+03	0.57485E-14
0.351E+03	0.57485E-14
0.401E+03	0.44999E-14
0.451E+03	0.68962E-11
0.501E+03	0.79497E-09
0.551E+03	0.21521E-07
0.601E+03	0.24513E-06
0.651E+03	0.15926E-05
0.701E+03	0.69817E-05
0.751E+03	0.22932E-04
0.801E+03	0.60499E-04
0.851E+03	0.13456E-03
0.901E+03	0.26132E-03
0.951E+03	0.45480E-03
0.100E+04	0.72361E-03
0.105E+04	0.10690E-02
0.110E+04	0.14846E-02
0.115E+04	0.19577E-02
0.120E+04	0.24713E-02
0.125E+04	0.30064E-02

```
0.130E+04 0.35442E-02
0.135E+04 0.40676E-02
0.140E+04 0.45619E-02
0.145E+04 0.50155E-02
0.150E+04 0.54201E-02
0.155E+04 0.57704E-02
0.160E+04 0.60638E-02
0.165E+04 0.62997E-02
0.170E+04 0.64792E-02
0.175E+04 0.66046E-02
0.180E+04 0.66797E-02
0.185E+04 0.67088E-02
0.190E+04 0.66961E-02
0.195E+04 0.66465E-02
0.200E+04 0.65646E-02
0.205E+04 0.64543E-02
0.210E+04 0.63198E-02
0.215E+04 0.61650E-02
0.220E+04 0.59937E-02
0.225E+04 0.58091E-02
0.230E+04 0.56141E-02
0.235E+04 0.54116E-02
0.240E+04 0.52035E-02
0.245E+04 0.49920E-02
0.250E+04 0.47788E-02
0.255E+04 0.45653E-02
0.260E+04 0.43527E-02
0.265E+04 0.41421E-02
0.270E+04 0.39344E-02
0.275E+04 0.37302E-02
0.280E+04 0.35301E-02
0.285E+04 0.33345E-02
0.290E+04 0.31437E-02
0.295E+04 0.29581E-02
0.300E+04 0.27776E-02
0.305E+04 0.26025E-02
0.310E+04 0.24328E-02
0.315E+04 0.22684E-02
```

```
0.320E+04 0.21092E-02
0.325E+04 0.19553E-02
0.330E+04 0.18064E-02
0.335E+04 0.16625E-02
0.340E+04 0.15234E-02
0.345E+04 0.13889E-02
0.350E+04 0.12584E-02
0.355E+04 0.11322E-02
0.360E+04 0.10106E-02
0.365E+04 0.89328E-03
0.370E+04 0.77991E-03
0.375E+04 0.67013E-03
0.380E+04 0.55059E-03
0.385E+04 0.44993E-03
0.390E+04 0.35916E-03
0.395E+04 0.26859E-03
0.400E+04 0.16838E-03
0.405E+04 0.76557E-04
0.410E+04 0.00000E+00
0.415E+04 0.00000E+00
0.420E+04 0.00000E+00
0.425E+04 0.00000E+00
0.430E+04 0.00000E+00
0.435E+04 0.00000E+00
0.440E+04 0.00000E+00
0.445E+04 0.00000E+00
0.450E+04 0.00000E+00
0.455E+04 0.00000E+00
0.460E+04 0.00000E+00
0.465E+04 0.00000E+00
0.470E+04 0.00000E+00
0.475E+04 0.00000E+00
0.480E+04 0.00000E+00
0.485E+04 0.00000E+00
0.490E+04 0.00000E+00
0.495E+04 0.00000E+00
```

GENERAL DATA GROUP

*** CHEMICAL NAME
Chloride

***   ISOURC   ROUTE   NT   IYCHK   PALPH   APPTYP
***OPTION   OPTAIR RUN   MONTE   ISTEAD   IOPEN   IZCHK   LANDF   COMPLETE
    2   0   0   DETERMINISTIC   500   1   0 100   0   0   0 90.0   0   1   1

*** TIMES FOR CONCENTRATION CALCULATION AT WELL

1.0	51.0	101.0	151.0	201.0	251.0	301.0	351.0	401.0	451.0
501.0	551.0	601.0	651.0	701.0	751.0	801.0	851.0	901.0	951.0
1001.0	1051.0	1101.0	1151.0	1201.0	1251.0	1301.0	1351.0	1401.0	1451.0
1501.0	1551.0	1601.0	1651.0	1701.0	1751.0	1801.0	1851.0	1901.0	1951.0
2001.0	2051.0	2101.0	2151.0	2201.0	2251.0	2301.0	2351.0	2401.0	2451.0
2501.0	2551.0	2601.0	2651.0	2701.0	2751.0	2801.0	2851.0	2901.0	2951.0
3001.0	3051.0	3101.0	3151.0	3201.0	3251.0	3301.0	3351.0	3401.0	3451.0
3501.0	3551.0	3601.0	3651.0	3701.0	3751.0	3801.0	3851.0	3901.0	3951.0
4001.0	4051.0	4101.0	4151.0	4201.0	4251.0	4301.0	4351.0	4401.0	4451.0
4501.0	4551.0	4601.0	4651.0	4701.0	4751.0	4801.0	4851.0	4901.0	4951.0

END GENERAL

CHEMICAL DATA GROUP
ARRAY VALUES
***   CHEMICAL SPECIFIC VARIABLES

***	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
***				MEAN	STD DEV	MIN	MAX
1	Solid phase decay coefficient	1/yr	0	0.000E+00	-9.99E+02	-9.99E+02	-9.99E+02
2	Dissolved phase decay coefficient	1/yr	0	0.000E+00	-9.99E+02	-9.99E+02	-9.99E+02

```
 3 Overall chemical decay coefficient        1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Acid catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Neutral catalyzed hydrolysis rate         1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Base catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 7 Reference temperature                     C                     0      2.500E+01 -9.99E+02 -9.99E+02 -9.99E+02
 8 Normalized distribution coefficient       ml/g                  0      1.219E-01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Distribution coefficient                  ml/g                 -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Biodegradation coefficient (sat. zone)    1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
11 Air diffusion coefficient                 cm^2/s                0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Reference temperature for air diffusion   C                     0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Molecular weight                          g/M                   0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
14 Mole fraction of solute                   --                    0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
15 Vapor pressure of solute                  mm Hg                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
16 Henry's Law constant                  atm-m^3/M                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END CHEMICAL GROUP


SOURCE DATA GROUP
ARRAY VALUES
***        SOURCE SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Infiltration rate                         m/yr                  0      1.270E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Area of waste disposal unit               m^2                   0      3.716E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Duration of pulse                         yr                   -1      5.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Spread of contaminant source              m                    -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 5 Recharge rate                             m/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Source decay constant                     1/yr                  0      5.000E-02 0.000E+00 0.000E+00 0.000E+00
 7 Initial concentration at landfill         mg/l                  0      3.924E+02 -9.99E+02 -9.99E+02 -9.99E+02
 8 Length scale of facility                  m                    -1      2.740E+01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Width scale of facility                   m                    -1      2.290E+01 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END SOURCE GROUP
```

```
VFL   UNSATURATED FLOW MODEL PARAMETERS


CONTROL PARAMETERS
***    DUMMY     NMAT      KPROP     DUMMY    NVFLAY
         7         1         1         1         1


END CONTROL PARAMETERS
SATURATED MATERIAL PROPERTY PARAMETERS
ARRAY VALUES
***   SATURATED MATERIAL VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Sat hydraulic conductivity              cm/hr                    0      3.600E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Unsaturated zone porosity               --                       0      2.500E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Air entry pressure head                 m                        0      7.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Depth of the unsaturated zone           m                        0      3.197E+01 0.000E+00 0.000E+00 0.000E+00
END ARRAY

END MATERIAL   1
END SATURATED MATERIAL PROPERTIES
SOIL MOISTURE PARAMETERS
***   FUNCTIONAL COEFFICIENTS
ARRAY VALUES
***   FUNCTIONAL COEFFICIENT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Residual water content                  --                       0      6.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Brooks and Corey exponent, EN           --                       0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Alpha van Genuchten parameter           1/cm                     0      7.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 4 Beta van Genuchten parameter            --                       0      1.890E+00 -9.99E+02 -9.99E+02 -9.99E+02
```

```
END ARRAY

END MATERIAL  1
END FUNCTIONAL COEFFICIENTS
END UNSATURATED ZONE FLOW MODEL PARAMETERS



VTP    UNSATURATED ZONE TRANSPORT MODEL PARAMETERS
CONTROL PARAMETERS
***   NLAY     DUMMY      IADU      ISOL         N      NTEL     NGPTS       NIT     DUMMY     DUMMY
        1        20         1         2        18         3       104         2         1         1
***  WTFUN
     1.200


END CONTROL PARAMETERS
TRANSPORT PARAMETERS
ARRAY VALUES
***   UNSATURATED ZONE TRANSPORT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Thickness of layer                      m                      0      3.197E+01 -9.99E+02 -9.99E+02 -9.99E+02
 2 Longitudinal dispersivity of layer      m                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Percent organic matter                  --                     0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Bulk Density of soil layer              g/cc                   0      1.830E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Biological decay coefficient            1/yr                   0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END LAYER  1
END UNSATURATED ZONE TRANSPORT PARAMETERS
END UNSATURATED ZONE TRANSPORT MODEL


AQUIFER DATA GROUP
ARRAY VALUES
```

```
***       AQUIFER SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Particle diameter                         cm                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Aquifer porosity                          --                        0      3.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Bulk density                              g/cc                      0      1.700E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Aquifer thickness                         m                         0      1.862E+01 -9.99E+02 -9.99E+02 -9.99E+02
 5 Source thickness (mixing zone depth)      m                        -1      3.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Hydraulic conductivity                    m/yr                      0      3.150E+02 -9.99E+02 -9.99E+02 -9.99E+02
 7 Hydraulc gradient                         --                        0      6.080E-04 -9.99E+02 -9.99E+02 -9.99E+02
 8 Groundwater seepage velocity              m/yr                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 9 Retardation coefficient                   --                       -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Longitudinal dispersivity                 m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
11 Transverse dispersivity                   m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Vertical dispersivity                     m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Temperature of aquifer                    C                         0      2.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
14 pH                                        --                        0      7.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
15 Organic carbon content                    --                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
16 Well radial distance from site            m                         0      2.819E+03 -9.99E+02 -9.99E+02 -9.99E+02
17 Angle off plume centerline            degree                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
18 Well vertical distance                    m                         0      1.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END AQUIFER GROUP

END ALL DATA
```

MULTIMED V1.01 DATE OF CALCULATIONS: 15-APR-2014 TIME: 16:11:56

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

E X P O S U R E A S S E S S M E N T

M U L T I M E D I A M O D E L

MULTIMED (Version 1.50, 2005)

Switched to Stehfest algorithm to avoid numerical problems
with Convolution algorithm. Problems were caused by
high source decay rate. Everything ok now, execution continuing...

1

Run options

--- -------

Chemical simulated is Chloride

Option Chosen	Saturated and unsaturated zone models
Run was	DETERMIN

Infiltration Specified By User: 1.270E-02 m/yr

Run was transient

Well Times: Entered Explicitly

Reject runs if Y coordinate outside plume

Reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1

1

UNSATURATED ZONE FLOW MODEL PARAMETERS

(input parameter description and value)

NP - Total number of nodal points 240

```
 NMAT    - Number of different porous materials          1
 KPROP   - Van Genuchten or Brooks and Corey             1
 IMSHGN  - Spatial discretization option                 1
 NVFLAYR - Number of layers in flow model                1


 OPTIONS CHOSEN
 ------- ------
 Van Genuchten functional coefficients
 User defined coordinate system
1


 Layer information
 -----------------
 LAYER NO.    LAYER THICKNESS     MATERIAL PROPERTY
 ---------    ---------------     -----------------
     1                 31.97             1
```

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	32.0	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.650E-01	-999.	-999.	-999.
Brook and Corey exponent,EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.750E-01	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.89	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used		1
NTSTPS	- Number of time values concentration calc		40
DUMMY	- Not presently used		1
ISOL	- Type of scheme used in unsaturated zone		1
N	- Stehfest terms or number of increments		18
NTEL	- Points in Lagrangian interpolation		3
NGPTS	- Number of Gauss points		104
NIT	- Convolution integral segments		2
IBOUND	- Type of boundary condition		3
ITSGEN	- Time values generated or input		1
TMAX	- Max simulation time	--	0.0
WTFUN	- Weighting factor	--	1.2

OPTIONS CHOSEN

------- ------

Stehfest numerical inversion algorithm

Exponentially decaying continuous source

Computer generated times for computing concentrations

1

DATA FOR LAYER 1

---- --- -----

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	32.0	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.83	-999.	-999.	-999.
Biological decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.122	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry`s law constant	atm-m^3/M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.127E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	372.	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	50.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.500E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	392.	-999.	-999.	-999.
Length scale of facility	m	DERIVED	27.4	-999.	-999.	-999.
Width scale of facility	m	DERIVED	22.9	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.70	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	18.6	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.608E-03	-999.	-999.	-999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	-999.	-999.
Retardation coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.

Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Temperature of aquifer	C	CONSTANT	20.0	-999.	-999.	-999.
pH	--	CONSTANT	7.00	-999.	-999.	-999.
Organic carbon content (fraction)		CONSTANT	0.000	-999.	-999.	-999.
Well distance from site	m	CONSTANT	0.282E+04	-999.	-999.	-999.
Angle off center	degree	CONSTANT	0.000	-999.	-999.	-999.
Well vertical distance	m	CONSTANT	1.00	-999.	-999.	-999.

1

TIME	CONCENTRATION
0.100E+01	0.00000E+00
0.510E+02	0.00000E+00
0.101E+03	0.00000E+00
0.151E+03	0.00000E+00
0.201E+03	0.00000E+00
0.251E+03	0.57485E-14
0.301E+03	0.57485E-14
0.351E+03	0.57485E-14
0.401E+03	0.57485E-14
0.451E+03	0.57485E-14
0.501E+03	0.57485E-14
0.551E+03	0.57485E-14
0.601E+03	0.17235E-13
0.651E+03	0.61413E-12
0.701E+03	0.10133E-10
0.751E+03	0.96774E-10
0.801E+03	0.99137E-09
0.851E+03	0.61767E-08
0.901E+03	0.25728E-07
0.951E+03	0.86627E-07
0.100E+04	0.24804E-06
0.105E+04	0.62127E-06
0.110E+04	0.13906E-05
0.115E+04	0.28300E-05
0.120E+04	0.53097E-05
0.125E+04	0.92897E-05

```
0.130E+04 0.15300E-04
0.135E+04 0.23910E-04
0.140E+04 0.35689E-04
0.145E+04 0.51169E-04
0.150E+04 0.70808E-04
0.155E+04 0.94961E-04
0.160E+04 0.12386E-03
0.165E+04 0.15761E-03
0.170E+04 0.19617E-03
0.175E+04 0.23938E-03
0.180E+04 0.28697E-03
0.185E+04 0.33857E-03
0.190E+04 0.39372E-03
0.195E+04 0.45189E-03
0.200E+04 0.51255E-03
0.205E+04 0.57510E-03
0.210E+04 0.63898E-03
0.215E+04 0.70361E-03
0.220E+04 0.76843E-03
0.225E+04 0.83292E-03
0.230E+04 0.89659E-03
0.235E+04 0.95898E-03
0.240E+04 0.10197E-02
0.245E+04 0.10784E-02
0.250E+04 0.11348E-02
0.255E+04 0.11886E-02
0.260E+04 0.12395E-02
0.265E+04 0.12874E-02
0.270E+04 0.13321E-02
0.275E+04 0.13736E-02
0.280E+04 0.14118E-02
0.285E+04 0.14467E-02
0.290E+04 0.14782E-02
0.295E+04 0.15063E-02
0.300E+04 0.15313E-02
0.305E+04 0.15529E-02
0.310E+04 0.15713E-02
0.315E+04 0.15865E-02
```

```
0.320E+04 0.15989E-02
0.325E+04 0.16082E-02
0.330E+04 0.16146E-02
0.335E+04 0.16184E-02
0.340E+04 0.16199E-02
0.345E+04 0.16189E-02
0.350E+04 0.16155E-02
0.355E+04 0.16100E-02
0.360E+04 0.16023E-02
0.365E+04 0.15927E-02
0.370E+04 0.15812E-02
0.375E+04 0.15682E-02
0.380E+04 0.15536E-02
0.385E+04 0.15373E-02
0.390E+04 0.15196E-02
0.395E+04 0.15005E-02
0.400E+04 0.14803E-02
0.405E+04 0.14589E-02
0.410E+04 0.14365E-02
0.415E+04 0.14132E-02
0.420E+04 0.13890E-02
0.425E+04 0.13641E-02
0.430E+04 0.13384E-02
0.435E+04 0.13120E-02
0.440E+04 0.12851E-02
0.445E+04 0.12576E-02
0.450E+04 0.12296E-02
0.455E+04 0.12012E-02
0.460E+04 0.11723E-02
0.465E+04 0.11432E-02
0.470E+04 0.11137E-02
0.475E+04 0.10840E-02
0.480E+04 0.10540E-02
0.485E+04 0.10239E-02
0.490E+04 0.99354E-03
0.495E+04 0.96307E-03
```

GENERAL DATA GROUP

*** CHEMICAL NAME
Chloride

```
***    ISOURC                              ROUTE      NT       IYCHK   PALPH      APPTYP
***OPTION   OPTAIR  RUN              MONTE    ISTEAD     IOPEN     IZCHK     LANDF   COMPLETE
    2    0    0     DETERMINISTIC    500    1    0  100    0    0    0 90.0    0    1    1
```

*** TIMES FOR CONCENTRATION CALCULATION AT WELL

1.0	51.0	101.0	151.0	201.0	251.0	301.0	351.0	401.0	451.0
501.0	551.0	601.0	651.0	701.0	751.0	801.0	851.0	901.0	951.0
1001.0	1051.0	1101.0	1151.0	1201.0	1251.0	1301.0	1351.0	1401.0	1451.0
1501.0	1551.0	1601.0	1651.0	1701.0	1751.0	1801.0	1851.0	1901.0	1951.0
2001.0	2051.0	2101.0	2151.0	2201.0	2251.0	2301.0	2351.0	2401.0	2451.0
2501.0	2551.0	2601.0	2651.0	2701.0	2751.0	2801.0	2851.0	2901.0	2951.0
3001.0	3051.0	3101.0	3151.0	3201.0	3251.0	3301.0	3351.0	3401.0	3451.0
3501.0	3551.0	3601.0	3651.0	3701.0	3751.0	3801.0	3851.0	3901.0	3951.0
4001.0	4051.0	4101.0	4151.0	4201.0	4251.0	4301.0	4351.0	4401.0	4451.0
4501.0	4551.0	4601.0	4651.0	4701.0	4751.0	4801.0	4851.0	4901.0	4951.0

END GENERAL

CHEMICAL DATA GROUP
ARRAY VALUES
***   CHEMICAL SPECIFIC VARIABLES

***	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
***				MEAN	STD DEV	MIN	MAX
1	Solid phase decay coefficient	1/yr	0	0.000E+00	-9.99E+02	-9.99E+02	-9.99E+02
2	Dissolved phase decay coefficient	1/yr	0	0.000E+00	-9.99E+02	-9.99E+02	-9.99E+02

```
 3 Overall chemical decay coefficient        1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Acid catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Neutral catalyzed hydrolysis rate         1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Base catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 7 Reference temperature                     C                     0      2.500E+01 -9.99E+02 -9.99E+02 -9.99E+02
 8 Normalized distribution coefficient       ml/g                  0      1.219E-01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Distribution coefficient                  ml/g                 -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Biodegradation coefficient (sat. zone)    1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
11 Air diffusion coefficient                 cm^2/s                0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Reference temperature for air diffusion   C                     0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Molecular weight                          g/M                   0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
14 Mole fraction of solute                   --                    0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
15 Vapor pressure of solute                  mm Hg                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
16 Henry's Law constant                   atm-m^3/M                0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END CHEMICAL GROUP


SOURCE DATA GROUP
ARRAY VALUES
***        SOURCE SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Infiltration rate                         m/yr                  0      1.270E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Area of waste disposal unit               m^2                   0      3.697E+01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Duration of pulse                         yr                   -1      5.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Spread of contaminant source              m                    -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 5 Recharge rate                             m/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Source decay constant                     1/yr                  0      5.000E-02 0.000E+00 0.000E+00 0.000E+00
 7 Initial concentration at landfill         mg/l                  0      6.013E+02 -9.99E+02 -9.99E+02 -9.99E+02
 8 Length scale of facility                  m                    -1      2.740E+01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Width scale of facility                   m                    -1      2.290E+01 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END SOURCE GROUP
```

```
VFL   UNSATURATED FLOW MODEL PARAMETERS


CONTROL PARAMETERS
***     DUMMY      NMAT       KPROP      DUMMY     NVFLAY
          7          1          1          1          1


END CONTROL PARAMETERS
SATURATED MATERIAL PROPERTY PARAMETERS
ARRAY VALUES
***   SATURATED MATERIAL VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Sat hydraulic conductivity              cm/hr                     0      3.600E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Unsaturated zone porosity               --                        0      2.500E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Air entry pressure head                 m                         0      7.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Depth of the unsaturated zone           m                         0      3.197E+01 0.000E+00 0.000E+00 0.000E+00
END ARRAY

END MATERIAL   1
END SATURATED MATERIAL PROPERTIES
SOIL MOISTURE PARAMETERS
***   FUNCTIONAL COEFFICIENTS
ARRAY VALUES
***   FUNCTIONAL COEFFICIENT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Residual water content                  --                        0      6.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Brooks and Corey exponent, EN           --                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Alpha van Genuchten parameter           1/cm                      0      7.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 4 Beta van Genuchten parameter            --                        0      1.890E+00 -9.99E+02 -9.99E+02 -9.99E+02
```

```
END ARRAY

END MATERIAL  1
END FUNCTIONAL COEFFICIENTS
END UNSATURATED ZONE FLOW MODEL PARAMETERS



VTP    UNSATURATED ZONE TRANSPORT MODEL PARAMETERS
CONTROL PARAMETERS
***   NLAY     DUMMY      IADU      ISOL         N      NTEL     NGPTS       NIT     DUMMY     DUMMY
        1        20         1         2        18         3       104         2         1         1
***  WTFUN
     1.200


END CONTROL PARAMETERS
TRANSPORT PARAMETERS
ARRAY VALUES
***   UNSATURATED ZONE TRANSPORT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Thickness of layer                      m                      0      3.197E+01 -9.99E+02 -9.99E+02 -9.99E+02
 2 Longitudinal dispersivity of layer      m                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Percent organic matter                  --                     0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Bulk Density of soil layer              g/cc                   0      1.830E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Biological decay coefficient            1/yr                   0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END LAYER  1
END UNSATURATED ZONE TRANSPORT PARAMETERS
END UNSATURATED ZONE TRANSPORT MODEL


AQUIFER DATA GROUP
ARRAY VALUES
```

```
***       AQUIFER SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Particle diameter                         cm                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Aquifer porosity                          --                        0      3.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Bulk density                              g/cc                      0      1.700E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Aquifer thickness                         m                         0      1.862E+01 -9.99E+02 -9.99E+02 -9.99E+02
 5 Source thickness (mixing zone depth)      m                        -1      3.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Hydraulic conductivity                    m/yr                      0      3.150E+02 -9.99E+02 -9.99E+02 -9.99E+02
 7 Hydraulc gradient                         --                        0      6.080E-04 -9.99E+02 -9.99E+02 -9.99E+02
 8 Groundwater seepage velocity              m/yr                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 9 Retardation coefficient                   --                       -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Longitudinal dispersivity                 m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
11 Transverse dispersivity                   m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Vertical dispersivity                     m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Temperature of aquifer                    C                         0      2.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
14 pH                                        --                        0      7.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
15 Organic carbon content                    --                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
16 Well radial distance from site            m                         0      1.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
17 Angle off plume centerline            degree                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
18 Well vertical distance                    m                         0      1.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END AQUIFER GROUP

END ALL DATA
```

MULTIMED V1.01 DATE OF CALCULATIONS: 15-APR-2014 TIME: 17:11:43

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

E X P O S U R E A S S E S S M E N T

M U L T I M E D I A M O D E L

MULTIMED (Version 1.50, 2005)

Switched to Stehfest algorithm to avoid numerical problems
with Convolution algorithm. Problems were caused by
high source decay rate. Everything ok now, execution continuing...

1

Run options

--- -------

Chemical simulated is Chloride

Option Chosen	Saturated and unsaturated zone models
Run was	DETERMIN

Infiltration Specified By User: 1.270E-02 m/yr

Run was transient

Well Times: Entered Explicitly

Reject runs if Y coordinate outside plume

Reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1

1

UNSATURATED ZONE FLOW MODEL PARAMETERS

(input parameter description and value)

NP - Total number of nodal points 240

```
 NMAT    - Number of different porous materials          1
 KPROP   - Van Genuchten or Brooks and Corey             1
 IMSHGN  - Spatial discretization option                 1
 NVFLAYR - Number of layers in flow model                1


 OPTIONS CHOSEN
 ------- ------
 Van Genuchten functional coefficients
 User defined coordinate system
1


 Layer information
 -----------------
 LAYER NO.    LAYER THICKNESS     MATERIAL PROPERTY
 ---------    ---------------     -----------------
     1                 31.97             1
```

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	32.0	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.650E-01	-999.	-999.	-999.
Brook and Corey exponent,EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.750E-01	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.89	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used		1
NTSTPS	- Number of time values concentration calc		40
DUMMY	- Not presently used		1
ISOL	- Type of scheme used in unsaturated zone		1
N	- Stehfest terms or number of increments		18
NTEL	- Points in Lagrangian interpolation		3
NGPTS	- Number of Gauss points		104
NIT	- Convolution integral segments		2
IBOUND	- Type of boundary condition		3
ITSGEN	- Time values generated or input		1
TMAX	- Max simulation time	--	0.0
WTFUN	- Weighting factor	--	1.2

OPTIONS CHOSEN

------- ------

Stehfest numerical inversion algorithm

Exponentially decaying continuous source

Computer generated times for computing concentrations

1

DATA FOR LAYER 1

---- --- -----

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	32.0	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.83	-999.	-999.	-999.
Biological decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.122	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry`s law constant	atm-m^3/M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.127E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	37.0	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	50.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.500E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	601.	-999.	-999.	-999.
Length scale of facility	m	DERIVED	27.4	-999.	-999.	-999.
Width scale of facility	m	DERIVED	22.9	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.70	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	18.6	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.608E-03	-999.	-999.	-999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	-999.	-999.
Retardation coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.

Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Temperature of aquifer	C	CONSTANT	20.0	-999.	-999.	-999.
pH	--	CONSTANT	7.00	-999.	-999.	-999.
Organic carbon content (fraction)		CONSTANT	0.000	-999.	-999.	-999.
Well distance from site	m	CONSTANT	1.00	-999.	-999.	-999.
Angle off center	degree	CONSTANT	0.000	-999.	-999.	-999.
Well vertical distance	m	CONSTANT	1.00	-999.	-999.	-999.

1

TIME	CONCENTRATION
0.100E+01	0.00000E+00
0.510E+02	0.00000E+00
0.101E+03	0.00000E+00
0.151E+03	0.00000E+00
0.201E+03	0.00000E+00
0.251E+03	0.00000E+00
0.301E+03	0.18742E-06
0.351E+03	0.20627E-06
0.401E+03	0.14656E-06
0.451E+03	0.00000E+00
0.501E+03	0.21199E-04
0.551E+03	0.00000E+00
0.601E+03	0.30857E-06
0.651E+03	0.78701E-09
0.701E+03	0.81511E-09
0.751E+03	0.72180E-09
0.801E+03	0.62849E-09
0.851E+03	0.53519E-09
0.901E+03	0.44188E-09
0.951E+03	0.34857E-09
0.100E+04	0.25526E-09
0.105E+04	0.16196E-09
0.110E+04	0.68649E-10
0.115E+04	0.00000E+00
0.120E+04	0.00000E+00
0.125E+04	0.00000E+00

0.130E+04 0.00000E+00
0.135E+04 0.00000E+00
0.140E+04 0.00000E+00
0.145E+04 0.00000E+00
0.150E+04 0.00000E+00
0.155E+04 0.00000E+00
0.160E+04 0.00000E+00
0.165E+04 0.00000E+00
0.170E+04 0.00000E+00
0.175E+04 0.00000E+00
0.180E+04 0.00000E+00
0.185E+04 0.00000E+00
0.190E+04 0.00000E+00
0.195E+04 0.00000E+00
0.200E+04 0.00000E+00
0.205E+04 0.00000E+00
0.210E+04 0.00000E+00
0.215E+04 0.00000E+00
0.220E+04 0.00000E+00
0.225E+04 0.00000E+00
0.230E+04 0.00000E+00
0.235E+04 0.00000E+00
0.240E+04 0.00000E+00
0.245E+04 0.00000E+00
0.250E+04 0.00000E+00
0.255E+04 0.00000E+00
0.260E+04 0.00000E+00
0.265E+04 0.00000E+00
0.270E+04 0.00000E+00
0.275E+04 0.00000E+00
0.280E+04 0.00000E+00
0.285E+04 0.00000E+00
0.290E+04 0.00000E+00
0.295E+04 0.00000E+00
0.300E+04 0.00000E+00
0.305E+04 0.00000E+00
0.310E+04 0.00000E+00
0.315E+04 0.00000E+00

```
0.320E+04 0.00000E+00
0.325E+04 0.00000E+00
0.330E+04 0.00000E+00
0.335E+04 0.00000E+00
0.340E+04 0.00000E+00
0.345E+04 0.00000E+00
0.350E+04 0.00000E+00
0.355E+04 0.00000E+00
0.360E+04 0.00000E+00
0.365E+04 0.00000E+00
0.370E+04 0.00000E+00
0.375E+04 0.00000E+00
0.380E+04 0.00000E+00
0.385E+04 0.00000E+00
0.390E+04 0.00000E+00
0.395E+04 0.00000E+00
0.400E+04 0.00000E+00
0.405E+04 0.00000E+00
0.410E+04 0.00000E+00
0.415E+04 0.00000E+00
0.420E+04 0.00000E+00
0.425E+04 0.00000E+00
0.430E+04 0.00000E+00
0.435E+04 0.00000E+00
0.440E+04 0.00000E+00
0.445E+04 0.00000E+00
0.450E+04 0.00000E+00
0.455E+04 0.00000E+00
0.460E+04 0.00000E+00
0.465E+04 0.00000E+00
0.470E+04 0.00000E+00
0.475E+04 0.00000E+00
0.480E+04 0.00000E+00
0.485E+04 0.00000E+00
0.490E+04 0.00000E+00
0.495E+04 0.00000E+00
```

GENERAL DATA GROUP

*** CHEMICAL NAME
Chloride

***   ISOURC   ROUTE   NT   IYCHK   PALPH   APPTYP
***OPTION   OPTAIR RUN   MONTE   ISTEAD   IOPEN   IZCHK   LANDF   COMPLETE
    2   0   0   DETERMINISTIC   500   1   0 100   0   0   0 90.0   0   1   1

*** TIMES FOR CONCENTRATION CALCULATION AT WELL
     1.0   51.0   101.0   151.0   201.0   251.0   301.0   351.0   401.0   451.0
   501.0   551.0   601.0   651.0   701.0   751.0   801.0   851.0   901.0   951.0
  1001.0   1051.0   1101.0   1151.0   1201.0   1251.0   1301.0   1351.0   1401.0   1451.0
  1501.0   1551.0   1601.0   1651.0   1701.0   1751.0   1801.0   1851.0   1901.0   1951.0
  2001.0   2051.0   2101.0   2151.0   2201.0   2251.0   2301.0   2351.0   2401.0   2451.0
  2501.0   2551.0   2601.0   2651.0   2701.0   2751.0   2801.0   2851.0   2901.0   2951.0
  3001.0   3051.0   3101.0   3151.0   3201.0   3251.0   3301.0   3351.0   3401.0   3451.0
  3501.0   3551.0   3601.0   3651.0   3701.0   3751.0   3801.0   3851.0   3901.0   3951.0
  4001.0   4051.0   4101.0   4151.0   4201.0   4251.0   4301.0   4351.0   4401.0   4451.0
  4501.0   4551.0   4601.0   4651.0   4701.0   4751.0   4801.0   4851.0   4901.0   4951.0

END GENERAL

CHEMICAL DATA GROUP
ARRAY VALUES
***   CHEMICAL SPECIFIC VARIABLES

***   VARIABLE NAME   UNITS   DISTRIBUTION   PARAMETERS   LIMITS
***   MEAN   STD DEV   MIN   MAX
 ****
 1 Solid phase decay coefficient   1/yr   0   0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Dissolved phase decay coefficient   1/yr   0   0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02

```
 3 Overall chemical decay coefficient        1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Acid catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Neutral catalyzed hydrolysis rate         1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Base catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 7 Reference temperature                     C                     0      2.500E+01 -9.99E+02 -9.99E+02 -9.99E+02
 8 Normalized distribution coefficient       ml/g                  0      1.219E-01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Distribution coefficient                  ml/g                 -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Biodegradation coefficient (sat. zone)    1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
11 Air diffusion coefficient                 cm^2/s                0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Reference temperature for air diffusion   C                     0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Molecular weight                          g/M                   0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
14 Mole fraction of solute                   --                    0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
15 Vapor pressure of solute                  mm Hg                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
16 Henry's Law constant                  atm-m^3/M                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END CHEMICAL GROUP


SOURCE DATA GROUP
ARRAY VALUES
***        SOURCE SPECIFIC VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Infiltration rate                        m/yr                  0      1.270E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Area of waste disposal unit              m^2                   0      3.697E+01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Duration of pulse                        yr                   -1      5.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Spread of contaminant source             m                    -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 5 Recharge rate                            m/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Source decay constant                    1/yr                  0      5.000E-02 0.000E+00 0.000E+00 0.000E+00
 7 Initial concentration at landfill        mg/l                  0      6.013E+02 -9.99E+02 -9.99E+02 -9.99E+02
 8 Length scale of facility                 m                    -1      2.740E+01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Width scale of facility                  m                    -1      2.290E+01 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END SOURCE GROUP
```

```
VFL   UNSATURATED FLOW MODEL PARAMETERS


CONTROL PARAMETERS
***     DUMMY      NMAT       KPROP      DUMMY     NVFLAY
          7          1          1          1          1


END CONTROL PARAMETERS
SATURATED MATERIAL PROPERTY PARAMETERS
ARRAY VALUES
***   SATURATED MATERIAL VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Sat hydraulic conductivity              cm/hr                     0      3.600E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Unsaturated zone porosity               --                        0      2.500E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Air entry pressure head                 m                         0      7.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Depth of the unsaturated zone           m                         0      3.197E+01 0.000E+00 0.000E+00 0.000E+00
END ARRAY

END MATERIAL   1
END SATURATED MATERIAL PROPERTIES
SOIL MOISTURE PARAMETERS
***   FUNCTIONAL COEFFICIENTS
ARRAY VALUES
***   FUNCTIONAL COEFFICIENT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Residual water content                  --                        0      6.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Brooks and Corey exponent, EN           --                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Alpha van Genuchten parameter           1/cm                      0      7.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 4 Beta van Genuchten parameter            --                        0      1.890E+00 -9.99E+02 -9.99E+02 -9.99E+02
```

```
END ARRAY

END MATERIAL  1
END FUNCTIONAL COEFFICIENTS
END UNSATURATED ZONE FLOW MODEL PARAMETERS



VTP    UNSATURATED ZONE TRANSPORT MODEL PARAMETERS
CONTROL PARAMETERS
***   NLAY     DUMMY      IADU      ISOL         N      NTEL     NGPTS       NIT     DUMMY     DUMMY
        1        20         1         2        18         3       104         2         1         1
***  WTFUN
     1.200


END CONTROL PARAMETERS
TRANSPORT PARAMETERS
ARRAY VALUES
***   UNSATURATED ZONE TRANSPORT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Thickness of layer                      m                      0      3.197E+01 -9.99E+02 -9.99E+02 -9.99E+02
 2 Longitudinal dispersivity of layer      m                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Percent organic matter                  --                     0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Bulk Density of soil layer              g/cc                   0      1.830E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Biological decay coefficient            1/yr                   0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END LAYER  1
END UNSATURATED ZONE TRANSPORT PARAMETERS
END UNSATURATED ZONE TRANSPORT MODEL


AQUIFER DATA GROUP
ARRAY VALUES
```

```
***       AQUIFER SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Particle diameter                         cm                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Aquifer porosity                          --                        0      3.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Bulk density                              g/cc                      0      1.700E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Aquifer thickness                         m                         0      1.862E+01 -9.99E+02 -9.99E+02 -9.99E+02
 5 Source thickness (mixing zone depth)      m                        -1      3.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Hydraulic conductivity                    m/yr                      0      3.150E+02 -9.99E+02 -9.99E+02 -9.99E+02
 7 Hydraulc gradient                         --                        0      6.080E-04 -9.99E+02 -9.99E+02 -9.99E+02
 8 Groundwater seepage velocity              m/yr                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 9 Retardation coefficient                   --                       -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Longitudinal dispersivity                 m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
11 Transverse dispersivity                   m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Vertical dispersivity                     m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Temperature of aquifer                    C                         0      2.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
14 pH                                        --                        0      7.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
15 Organic carbon content                    --                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
16 Well radial distance from site            m                         0      4.768E+02 -9.99E+02 -9.99E+02 -9.99E+02
17 Angle off plume centerline            degree                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
18 Well vertical distance                    m                         0      1.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END AQUIFER GROUP

END ALL DATA
```

MULTIMED V1.01 DATE OF CALCULATIONS: 15-APR-2014 TIME: 16:49:13

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

E X P O S U R E A S S E S S M E N T

M U L T I M E D I A M O D E L

MULTIMED (Version 1.50, 2005)

Switched to Stehfest algorithm to avoid numerical problems
with Convolution algorithm. Problems were caused by
high source decay rate. Everything ok now, execution continuing...

1

Run options

--- -------

Chemical simulated is Chloride

Option Chosen	Saturated and unsaturated zone models
Run was	DETERMIN

Infiltration Specified By User: 1.270E-02 m/yr
Run was transient
Well Times: Entered Explicitly
Reject runs if Y coordinate outside plume
Reject runs if Z coordinate outside plume
Gaussian source used in saturated zone model

1

1

UNSATURATED ZONE FLOW MODEL PARAMETERS
(input parameter description and value)

NP	- Total number of nodal points	240

```
 NMAT    - Number of different porous materials          1
 KPROP   - Van Genuchten or Brooks and Corey             1
 IMSHGN  - Spatial discretization option                 1
 NVFLAYR - Number of layers in flow model                1


 OPTIONS CHOSEN
 ------- ------
 Van Genuchten functional coefficients
 User defined coordinate system
1


 Layer information
 -----------------
 LAYER NO.    LAYER THICKNESS     MATERIAL PROPERTY
 ---------    ---------------     -----------------
     1                 31.97             1
```

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	32.0	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.650E-01	-999.	-999.	-999.
Brook and Corey exponent,EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.750E-01	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.89	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used		1
NTSTPS	- Number of time values concentration calc		40
DUMMY	- Not presently used		1
ISOL	- Type of scheme used in unsaturated zone		1
N	- Stehfest terms or number of increments		18
NTEL	- Points in Lagrangian interpolation		3
NGPTS	- Number of Gauss points		104
NIT	- Convolution integral segments		2
IBOUND	- Type of boundary condition		3
ITSGEN	- Time values generated or input		1
TMAX	- Max simulation time	--	0.0
WTFUN	- Weighting factor	--	1.2

OPTIONS CHOSEN

------- ------

Stehfest numerical inversion algorithm

Exponentially decaying continuous source

Computer generated times for computing concentrations

1

DATA FOR LAYER 1

---- --- -----

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	32.0	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.83	-999.	-999.	-999.
Biological decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.122	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry`s law constant	atm-m^3/M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.127E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	37.0	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	50.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.500E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	601.	-999.	-999.	-999.
Length scale of facility	m	DERIVED	27.4	-999.	-999.	-999.
Width scale of facility	m	DERIVED	22.9	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.70	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	18.6	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.608E-03	-999.	-999.	-999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	-999.	-999.
Retardation coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.

Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Temperature of aquifer	C	CONSTANT	20.0	-999.	-999.	-999.
pH	--	CONSTANT	7.00	-999.	-999.	-999.
Organic carbon content (fraction)		CONSTANT	0.000	-999.	-999.	-999.
Well distance from site	m	CONSTANT	477.	-999.	-999.	-999.
Angle off center	degree	CONSTANT	0.000	-999.	-999.	-999.
Well vertical distance	m	CONSTANT	1.00	-999.	-999.	-999.

1

TIME	CONCENTRATION
0.100E+01	0.00000E+00
0.510E+02	0.00000E+00
0.101E+03	0.00000E+00
0.151E+03	0.00000E+00
0.201E+03	0.00000E+00
0.251E+03	0.87311E-14
0.301E+03	0.14475E-12
0.351E+03	0.18393E-07
0.401E+03	0.22534E-05
0.451E+03	0.34318E-04
0.501E+03	0.19898E-03
0.551E+03	0.66378E-03
0.601E+03	0.15510E-02
0.651E+03	0.28321E-02
0.701E+03	0.43217E-02
0.751E+03	0.57607E-02
0.801E+03	0.69184E-02
0.851E+03	0.76590E-02
0.901E+03	0.79543E-02
0.951E+03	0.78628E-02
0.100E+04	0.74818E-02
0.105E+04	0.69134E-02
0.110E+04	0.62449E-02
0.115E+04	0.55427E-02
0.120E+04	0.48521E-02
0.125E+04	0.42016E-02

```
0.130E+04 0.36069E-02
0.135E+04 0.30745E-02
0.140E+04 0.26051E-02
0.145E+04 0.21959E-02
0.150E+04 0.18424E-02
0.155E+04 0.15389E-02
0.160E+04 0.12791E-02
0.165E+04 0.10572E-02
0.170E+04 0.86772E-03
0.175E+04 0.70594E-03
0.180E+04 0.56758E-03
0.185E+04 0.44898E-03
0.190E+04 0.34697E-03
0.195E+04 0.25859E-03
0.200E+04 0.18183E-03
0.205E+04 0.11500E-03
0.210E+04 0.56492E-04
0.215E+04 0.48897E-05
0.220E+04 0.00000E+00
0.225E+04 0.00000E+00
0.230E+04 0.00000E+00
0.235E+04 0.00000E+00
0.240E+04 0.00000E+00
0.245E+04 0.00000E+00
0.250E+04 0.00000E+00
0.255E+04 0.00000E+00
0.260E+04 0.00000E+00
0.265E+04 0.00000E+00
0.270E+04 0.00000E+00
0.275E+04 0.00000E+00
0.280E+04 0.00000E+00
0.285E+04 0.00000E+00
0.290E+04 0.00000E+00
0.295E+04 0.00000E+00
0.300E+04 0.00000E+00
0.305E+04 0.00000E+00
0.310E+04 0.00000E+00
0.315E+04 0.00000E+00
```

```
0.320E+04 0.00000E+00
0.325E+04 0.00000E+00
0.330E+04 0.00000E+00
0.335E+04 0.00000E+00
0.340E+04 0.00000E+00
0.345E+04 0.00000E+00
0.350E+04 0.00000E+00
0.355E+04 0.00000E+00
0.360E+04 0.00000E+00
0.365E+04 0.00000E+00
0.370E+04 0.00000E+00
0.375E+04 0.00000E+00
0.380E+04 0.00000E+00
0.385E+04 0.00000E+00
0.390E+04 0.00000E+00
0.395E+04 0.00000E+00
0.400E+04 0.00000E+00
0.405E+04 0.00000E+00
0.410E+04 0.00000E+00
0.415E+04 0.00000E+00
0.420E+04 0.00000E+00
0.425E+04 0.00000E+00
0.430E+04 0.00000E+00
0.435E+04 0.00000E+00
0.440E+04 0.00000E+00
0.445E+04 0.00000E+00
0.450E+04 0.00000E+00
0.455E+04 0.00000E+00
0.460E+04 0.00000E+00
0.465E+04 0.00000E+00
0.470E+04 0.00000E+00
0.475E+04 0.00000E+00
0.480E+04 0.00000E+00
0.485E+04 0.00000E+00
0.490E+04 0.00000E+00
0.495E+04 0.00000E+00
```

```
GENERAL DATA GROUP

***  CHEMICAL NAME
Chloride

***    ISOURC                              ROUTE      NT       IYCHK   PALPH      APPTYP
***OPTION   OPTAIR  RUN              MONTE    ISTEAD     IOPEN     IZCHK     LANDF   COMPLETE
    2    0    0     DETERMINISTIC    500    1    0  100    0    0    0 90.0    0    1    1

***  TIMES FOR CONCENTRATION CALCULATION AT WELL
     1.0      51.0     101.0     151.0     201.0     251.0     301.0     351.0     401.0     451.0
   501.0     551.0     601.0     651.0     701.0     751.0     801.0     851.0     901.0     951.0
  1001.0    1051.0    1101.0    1151.0    1201.0    1251.0    1301.0    1351.0    1401.0    1451.0
  1501.0    1551.0    1601.0    1651.0    1701.0    1751.0    1801.0    1851.0    1901.0    1951.0
  2001.0    2051.0    2101.0    2151.0    2201.0    2251.0    2301.0    2351.0    2401.0    2451.0
  2501.0    2551.0    2601.0    2651.0    2701.0    2751.0    2801.0    2851.0    2901.0    2951.0
  3001.0    3051.0    3101.0    3151.0    3201.0    3251.0    3301.0    3351.0    3401.0    3451.0
  3501.0    3551.0    3601.0    3651.0    3701.0    3751.0    3801.0    3851.0    3901.0    3951.0
  4001.0    4051.0    4101.0    4151.0    4201.0    4251.0    4301.0    4351.0    4401.0    4451.0
  4501.0    4551.0    4601.0    4651.0    4701.0    4751.0    4801.0    4851.0    4901.0    4951.0


END GENERAL


CHEMICAL DATA GROUP
ARRAY VALUES
***      CHEMICAL SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Solid phase decay coefficient             1/yr                    0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Dissolved phase decay coefficient         1/yr                    0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
```

```
 3 Overall chemical decay coefficient        1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Acid catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Neutral catalyzed hydrolysis rate         1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Base catalyzed hydrolysis rate            1/M-yr                0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 7 Reference temperature                     C                     0      2.500E+01 -9.99E+02 -9.99E+02 -9.99E+02
 8 Normalized distribution coefficient       ml/g                  0      1.219E-01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Distribution coefficient                  ml/g                 -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Biodegradation coefficient (sat. zone)    1/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
11 Air diffusion coefficient                 cm^2/s                0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Reference temperature for air diffusion   C                     0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Molecular weight                          g/M                   0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
14 Mole fraction of solute                   --                    0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
15 Vapor pressure of solute                  mm Hg                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
16 Henry's Law constant                  atm-m^3/M                 0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END CHEMICAL GROUP


SOURCE DATA GROUP
ARRAY VALUES
***        SOURCE SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Infiltration rate                         m/yr                  0      1.270E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Area of waste disposal unit               m^2                   0      3.697E+01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Duration of pulse                         yr                   -1      5.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Spread of contaminant source              m                    -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 5 Recharge rate                             m/yr                  0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Source decay constant                     1/yr                  0      5.000E-02 0.000E+00 0.000E+00 0.000E+00
 7 Initial concentration at landfill         mg/l                  0      6.013E+02 -9.99E+02 -9.99E+02 -9.99E+02
 8 Length scale of facility                  m                    -1      2.740E+01 -9.99E+02 -9.99E+02 -9.99E+02
 9 Width scale of facility                   m                    -1      2.290E+01 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END SOURCE GROUP
```

```
VFL   UNSATURATED FLOW MODEL PARAMETERS


CONTROL PARAMETERS
***    DUMMY     NMAT      KPROP     DUMMY    NVFLAY
         7         1         1         1         1


END CONTROL PARAMETERS
SATURATED MATERIAL PROPERTY PARAMETERS
ARRAY VALUES
***   SATURATED MATERIAL VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Sat hydraulic conductivity              cm/hr                    0      3.600E+00 -9.99E+02 -9.99E+02 -9.99E+02
 2 Unsaturated zone porosity               --                       0      2.500E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Air entry pressure head                 m                        0      7.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 4 Depth of the unsaturated zone           m                        0      3.197E+01 0.000E+00 0.000E+00 0.000E+00
END ARRAY

END MATERIAL   1
END SATURATED MATERIAL PROPERTIES
SOIL MOISTURE PARAMETERS
***   FUNCTIONAL COEFFICIENTS
ARRAY VALUES
***   FUNCTIONAL COEFFICIENT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************************
 1 Residual water content                  --                       0      6.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Brooks and Corey exponent, EN           --                       0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Alpha van Genuchten parameter           1/cm                     0      7.500E-02 -9.99E+02 -9.99E+02 -9.99E+02
 4 Beta van Genuchten parameter            --                       0      1.890E+00 -9.99E+02 -9.99E+02 -9.99E+02
```

```
END ARRAY

END MATERIAL  1
END FUNCTIONAL COEFFICIENTS
END UNSATURATED ZONE FLOW MODEL PARAMETERS



VTP    UNSATURATED ZONE TRANSPORT MODEL PARAMETERS
CONTROL PARAMETERS
***   NLAY     DUMMY      IADU      ISOL         N      NTEL     NGPTS       NIT     DUMMY     DUMMY
        1        20         1         2        18         3       104         2         1         1
***  WTFUN
     1.200


END CONTROL PARAMETERS
TRANSPORT PARAMETERS
ARRAY VALUES
***   UNSATURATED ZONE TRANSPORT VARIABLES

***            VARIABLE NAME               UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                             MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Thickness of layer                      m                      0      3.197E+01 -9.99E+02 -9.99E+02 -9.99E+02
 2 Longitudinal dispersivity of layer      m                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 3 Percent organic matter                  --                     0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Bulk Density of soil layer              g/cc                   0      1.830E+00 -9.99E+02 -9.99E+02 -9.99E+02
 5 Biological decay coefficient            1/yr                   0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END LAYER  1
END UNSATURATED ZONE TRANSPORT PARAMETERS
END UNSATURATED ZONE TRANSPORT MODEL


AQUIFER DATA GROUP
ARRAY VALUES
```

```
***       AQUIFER SPECIFIC VARIABLES

***            VARIABLE NAME                UNITS               DISTRIBUTION   PARAMETERS             LIMITS
***                                                                              MEAN      STD DEV    MIN      MAX
 ********************************************************************************************************************
 1 Particle diameter                         cm                        0      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 2 Aquifer porosity                          --                        0      3.000E-01 -9.99E+02 -9.99E+02 -9.99E+02
 3 Bulk density                              g/cc                      0      1.700E+00 -9.99E+02 -9.99E+02 -9.99E+02
 4 Aquifer thickness                         m                         0      1.862E+01 -9.99E+02 -9.99E+02 -9.99E+02
 5 Source thickness (mixing zone depth)      m                        -1      3.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
 6 Hydraulic conductivity                    m/yr                      0      3.150E+02 -9.99E+02 -9.99E+02 -9.99E+02
 7 Hydraulc gradient                         --                        0      6.080E-04 -9.99E+02 -9.99E+02 -9.99E+02
 8 Groundwater seepage velocity              m/yr                     -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
 9 Retardation coefficient                   --                       -1      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
10 Longitudinal dispersivity                 m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
11 Transverse dispersivity                   m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
12 Vertical dispersivity                     m                        10      -9.99E+02 -9.99E+02 -9.99E+02 -9.99E+02
13 Temperature of aquifer                    C                         0      2.000E+01 -9.99E+02 -9.99E+02 -9.99E+02
14 pH                                        --                        0      7.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
15 Organic carbon content                    --                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
16 Well radial distance from site            m                         0      1.986E+03 -9.99E+02 -9.99E+02 -9.99E+02
17 Angle off plume centerline            degree                        0      0.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
18 Well vertical distance                    m                         0      1.000E+00 -9.99E+02 -9.99E+02 -9.99E+02
END ARRAY

END AQUIFER GROUP

END ALL DATA
```

MULTIMED V1.01 DATE OF CALCULATIONS: 15-APR-2014 TIME: 16:51:26

U. S. E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y

E X P O S U R E A S S E S S M E N T

M U L T I M E D I A M O D E L

MULTIMED (Version 1.50, 2005)

Switched to Stehfest algorithm to avoid numerical problems
with Convolution algorithm. Problems were caused by
high source decay rate. Everything ok now, execution continuing...

1

Run options

--- -------

Chemical simulated is Chloride

Option Chosen	Saturated and unsaturated zone models
Run was	DETERMIN

Infiltration Specified By User: 1.270E-02 m/yr

Run was transient

Well Times: Entered Explicitly

Reject runs if Y coordinate outside plume

Reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1

1

UNSATURATED ZONE FLOW MODEL PARAMETERS

(input parameter description and value)

NP - Total number of nodal points 240

```
 NMAT    - Number of different porous materials          1
 KPROP   - Van Genuchten or Brooks and Corey             1
 IMSHGN  - Spatial discretization option                 1
 NVFLAYR - Number of layers in flow model                1


 OPTIONS CHOSEN
 ------- ------
 Van Genuchten functional coefficients
 User defined coordinate system
1


 Layer information
 -----------------
 LAYER NO.    LAYER THICKNESS     MATERIAL PROPERTY
 ---------    ---------------     -----------------
     1                 31.97             1
```

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	-999.	-999.
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	-999.	-999.
Air entry pressure head	m	CONSTANT	0.700	-999.	-999.	-999.
Depth of the unsaturated zone	m	CONSTANT	32.0	0.000	0.000	0.000

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.650E-01	-999.	-999.	-999.
Brook and Corey exponent,EN	--	CONSTANT	-999.	-999.	-999.	-999.
ALFA coefficient	1/cm	CONSTANT	0.750E-01	-999.	-999.	-999.
Van Genuchten exponent, ENN	--	CONSTANT	1.89	-999.	-999.	-999.

1

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used		1
NTSTPS	- Number of time values concentration calc		40
DUMMY	- Not presently used		1
ISOL	- Type of scheme used in unsaturated zone		1
N	- Stehfest terms or number of increments		18
NTEL	- Points in Lagrangian interpolation		3
NGPTS	- Number of Gauss points		104
NIT	- Convolution integral segments		2
IBOUND	- Type of boundary condition		3
ITSGEN	- Time values generated or input		1
TMAX	- Max simulation time	--	0.0
WTFUN	- Weighting factor	--	1.2

OPTIONS CHOSEN

------- ------

Stehfest numerical inversion algorithm

Exponentially decaying continuous source

Computer generated times for computing concentrations

1

DATA FOR LAYER 1

---- --- -----

VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	32.0	-999.	-999.	-999.
Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.	-999.	-999.
Percent organic matter	--	CONSTANT	0.000	-999.	-999.	-999.
Bulk density of soil for layer	g/cc	CONSTANT	1.83	-999.	-999.	-999.
Biological decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.

1

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Dissolved phase decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Overall chemical decay coefficient	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Acid catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Base catalyzed hydrolysis rate	l/M-yr	CONSTANT	0.000	-999.	-999.	-999.
Reference temperature	C	CONSTANT	25.0	-999.	-999.	-999.
Normalized distribution coefficient	ml/g	CONSTANT	0.122	-999.	-999.	-999.
Distribution coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.	-999.	-999.
Air diffusion coefficient	cm2/s	CONSTANT	-999.	-999.	-999.	-999.
Reference temperature for air diffusion	C	CONSTANT	-999.	-999.	-999.	-999.
Molecular weight	g/M	CONSTANT	-999.	-999.	-999.	-999.
Mole fraction of solute	--	CONSTANT	-999.	-999.	-999.	-999.
Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.	-999.	-999.
Henry`s law constant	atm-m^3/M	CONSTANT	-999.	-999.	-999.	-999.
Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000	0.000	1.00
Not currently used		CONSTANT	0.000	0.000	0.000	0.000

Not currently used		CONSTANT	0.000	0.000	0.000	0.000

1

SOURCE SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Infiltration rate	m/yr	CONSTANT	0.127E-01	-999.	-999.	-999.
Area of waste disposal unit	m^2	CONSTANT	37.0	-999.	-999.	-999.
Duration of pulse	yr	DERIVED	50.0	-999.	-999.	-999.
Spread of contaminant source	m	DERIVED	-999.	-999.	-999.	-999.
Recharge rate	m/yr	CONSTANT	0.000	-999.	-999.	-999.
Source decay constant	1/yr	CONSTANT	0.500E-01	0.000	0.000	0.000
Initial concentration at landfill	mg/l	CONSTANT	601.	-999.	-999.	-999.
Length scale of facility	m	DERIVED	27.4	-999.	-999.	-999.
Width scale of facility	m	DERIVED	22.9	-999.	-999.	-999.
Near field dilution		DERIVED	1.00	0.000	0.000	1.00

1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	-999.	-999.	-999.	-999.
Aquifer porosity	--	CONSTANT	0.300	-999.	-999.	-999.
Bulk density	g/cc	CONSTANT	1.70	-999.	-999.	-999.
Aquifer thickness	m	CONSTANT	18.6	-999.	-999.	-999.
Source thickness (mixing zone depth)	m	DERIVED	3.00	-999.	-999.	-999.
Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.	-999.	-999.
Gradient (hydraulic)		CONSTANT	0.608E-03	-999.	-999.	-999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	-999.	-999.
Retardation coefficient	--	DERIVED	-999.	-999.	-999.	-999.
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.

Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	-999.
Temperature of aquifer	C	CONSTANT	20.0	-999.	-999.	-999.
pH	--	CONSTANT	7.00	-999.	-999.	-999.
Organic carbon content (fraction)		CONSTANT	0.000	-999.	-999.	-999.
Well distance from site	m	CONSTANT	0.199E+04	-999.	-999.	-999.
Angle off center	degree	CONSTANT	0.000	-999.	-999.	-999.
Well vertical distance	m	CONSTANT	1.00	-999.	-999.	-999.

1

TIME	CONCENTRATION
0.100E+01	0.00000E+00
0.510E+02	0.00000E+00
0.101E+03	0.00000E+00
0.151E+03	0.00000E+00
0.201E+03	0.00000E+00
0.251E+03	0.87311E-14
0.301E+03	0.87311E-14
0.351E+03	0.87311E-14
0.401E+03	0.87311E-14
0.451E+03	0.87311E-14
0.501E+03	0.96956E-14
0.551E+03	0.91297E-12
0.601E+03	0.24707E-10
0.651E+03	0.30082E-09
0.701E+03	0.33674E-08
0.751E+03	0.21804E-07
0.801E+03	0.89276E-07
0.851E+03	0.28971E-06
0.901E+03	0.78324E-06
0.951E+03	0.18273E-05
0.100E+04	0.37780E-05
0.105E+04	0.70667E-05
0.110E+04	0.12155E-04
0.115E+04	0.19476E-04
0.120E+04	0.29382E-04
0.125E+04	0.42101E-04

```
0.130E+04 0.57711E-04
0.135E+04 0.76137E-04
0.140E+04 0.97166E-04
0.145E+04 0.12046E-03
0.150E+04 0.14562E-03
0.155E+04 0.17215E-03
0.160E+04 0.19957E-03
0.165E+04 0.22740E-03
0.170E+04 0.25515E-03
0.175E+04 0.28241E-03
0.180E+04 0.30880E-03
0.185E+04 0.33399E-03
0.190E+04 0.35771E-03
0.195E+04 0.37974E-03
0.200E+04 0.39992E-03
0.205E+04 0.41814E-03
0.210E+04 0.43435E-03
0.215E+04 0.44851E-03
0.220E+04 0.46064E-03
0.225E+04 0.47074E-03
0.230E+04 0.47889E-03
0.235E+04 0.48514E-03
0.240E+04 0.48957E-03
0.245E+04 0.49232E-03
0.250E+04 0.49350E-03
0.255E+04 0.49320E-03
0.260E+04 0.49152E-03
0.265E+04 0.48857E-03
0.270E+04 0.48447E-03
0.275E+04 0.47935E-03
0.280E+04 0.47327E-03
0.285E+04 0.46633E-03
0.290E+04 0.45860E-03
0.295E+04 0.45021E-03
0.300E+04 0.44122E-03
0.305E+04 0.43173E-03
0.310E+04 0.42181E-03
0.315E+04 0.41151E-03
```

```
0.320E+04 0.40090E-03
0.325E+04 0.39003E-03
0.330E+04 0.38314E-03
0.335E+04 0.37029E-03
0.340E+04 0.35635E-03
0.345E+04 0.34489E-03
0.350E+04 0.33339E-03
0.355E+04 0.32186E-03
0.360E+04 0.31034E-03
0.365E+04 0.29884E-03
0.370E+04 0.28738E-03
0.375E+04 0.27599E-03
0.380E+04 0.26468E-03
0.385E+04 0.25346E-03
0.390E+04 0.24234E-03
0.395E+04 0.23134E-03
0.400E+04 0.22045E-03
0.405E+04 0.20969E-03
0.410E+04 0.19907E-03
0.415E+04 0.18857E-03
0.420E+04 0.17822E-03
0.425E+04 0.16801E-03
0.430E+04 0.15793E-03
0.435E+04 0.14800E-03
0.440E+04 0.13821E-03
0.445E+04 0.12856E-03
0.450E+04 0.11905E-03
0.455E+04 0.10968E-03
0.460E+04 0.10044E-03
0.465E+04 0.91342E-04
0.470E+04 0.82372E-04
0.475E+04 0.73530E-04
0.480E+04 0.64814E-04
0.485E+04 0.56227E-04
0.490E+04 0.47732E-04
0.495E+04 0.39312E-04
```

Appendix G

Laboratory Analytical Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Corpus Christi
1733 N. Padre Island Drive
Corpus Christi, TX 78408
Tel: (361)289-2673

TestAmerica Job ID: 560-44229-1
TestAmerica Sample Delivery Group: December 2013
Client Project/Site: Jal #4 Gas Plant Soil Analysis

For:
ARCADIS U.S., Inc.
1004 North Big Spring
Suite 300
Midland, Texas 79701

Attn: Hank McConnell

Authorized for release by:
12/24/2013 12:13:46 PM

Timothy Kellogg, Lab Director
(361)289-2673
tim.kellogg@testamericainc.com

Qualifiers

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F	MS/MSD Recovery and/or RPD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 560-44229-1

Laboratory: TestAmerica Corpus Christi

Narrative

Receipt

The samples were received on 12/11/2013 2:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9º C.

General Chemistry

Method(s) 9251: It was noted that the matrix spike duplicate (MSD) recovery for 560-44229-21 in batch #56096247 was slightly outside of the control limits. The laboratory control sample (LCS) and matrix spike (MS) recoveries were within acceptance limits therefore the values were qualified and reported. No other analytical or quality issues were noted.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Jal #4 Gas Plant Soil Analysis

TestAmerica Job ID: 560-44229-1
SDG: December 2013

Client Sample ID: RW-2 North Exc 5' Bottom — Lab Sample ID: 560-44229-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	553		54.7	5.47	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1430		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 North Exc North Wall — Lab Sample ID: 560-44229-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	148		52.4	5.24	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	250		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 North Exc South Wall — Lab Sample ID: 560-44229-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	146		51.0	5.10	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	800		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 North Exc East Wall — Lab Sample ID: 560-44229-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	229		51.9	5.19	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1250		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 North Exc West Wall — Lab Sample ID: 560-44229-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	112		50.9	5.09	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	538		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Exc South Bottom — Lab Sample ID: 560-44229-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	241		53.4	5.34	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1460		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Exc North Bottom — Lab Sample ID: 560-44229-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	334		53.7	5.37	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1130		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Exc North Wall — Lab Sample ID: 560-44229-8

This Detection Summary does not include radiochemical test results.

Client Sample ID: RW-2 South Exc North Wall (Continued) — Lab Sample ID: 560-44229-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	73.5		50.8	5.08	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	290		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Exc South Wall — Lab Sample ID: 560-44229-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	210		51.0	5.10	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	902		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Exc East Wall — Lab Sample ID: 560-44229-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	1310		54.5	5.45	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2120		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Exc West Wall — Lab Sample ID: 560-44229-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	581		53.6	5.36	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1350		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 West Exc Middle Bottom 5' — Lab Sample ID: 560-44229-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	1320		52.8	5.28	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2230		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 West Exc North Wall — Lab Sample ID: 560-44229-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	1840		53.3	5.33	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2130		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 West Exc South Wall — Lab Sample ID: 560-44229-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	823		52.9	5.29	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2310		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Middle Exc Midle Bottom 4' — Lab Sample ID: 560-44229-15

This Detection Summary does not include radiochemical test results.

Client Sample ID: RW-2 South Middle Exc Midle Bottom 4' (Continued)

Lab Sample ID: 560-44229-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	869		53.6	5.36	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1280		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Middle Exc North Wall

Lab Sample ID: 560-44229-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	471		107	10.7	mg/Kg	2	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1320		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 West Exc West Wall

Lab Sample ID: 560-44229-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	1230		215	21.5	mg/Kg	4	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2590		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 West Exc East Wall

Lab Sample ID: 560-44229-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	35.8	J	51.7	5.17	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	247		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Middle Exc South Wall

Lab Sample ID: 560-44229-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	621		54.2	5.42	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1200		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Middle Exc East Wall

Lab Sample ID: 560-44229-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	551		52.8	5.28	mg/Kg	1	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1420		1.00	1.00	umhos/cm	1		9050A	Soluble

Client Sample ID: RW-2 South Middle Exc West Wall

Lab Sample ID: 560-44229-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	929		215	21.5	mg/Kg	4	☼	9251	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1780		1.00	1.00	umhos/cm	1		9050A	Soluble

This Detection Summary does not include radiochemical test results.

Client Sample ID: RW-2 North Exc 5' Bottom

Lab Sample ID: 560-44229-1
Date Collected: 12/02/13 13:15
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 91.4

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	553		54.7	5.47	mg/Kg	☼		12/16/13 12:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1430		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 North Exc North Wall

Lab Sample ID: 560-44229-2
Date Collected: 12/02/13 13:20
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 95.3

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	148		52.4	5.24	mg/Kg	☼		12/16/13 12:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	250		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 North Exc South Wall

Lab Sample ID: 560-44229-3
Date Collected: 12/02/13 13:25
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 98.1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	146		51.0	5.10	mg/Kg	☼		12/16/13 12:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	800		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 North Exc East Wall

Lab Sample ID: 560-44229-4
Date Collected: 12/02/13 13:30
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 96.3

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	229		51.9	5.19	mg/Kg	☼		12/16/13 12:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1250		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 North Exc West Wall

Lab Sample ID: 560-44229-5
Date Collected: 12/02/13 13:35
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 98.3

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	112		50.9	5.09	mg/Kg	☼		12/16/13 12:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	538		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Exc South Bottom

Lab Sample ID: 560-44229-6
Date Collected: 12/02/13 15:35
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.7

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	241		53.4	5.34	mg/Kg	☼		12/16/13 12:21	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1460		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Exc North Bottom

Lab Sample ID: 560-44229-7
Date Collected: 12/02/13 15:40
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	334		53.7	5.37	mg/Kg	☼		12/16/13 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1130		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Exc North Wall

Lab Sample ID: 560-44229-8
Date Collected: 12/02/13 15:45
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 98.4

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	73.5		50.8	5.08	mg/Kg	☼		12/16/13 12:23	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	290		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Exc South Wall

Lab Sample ID: 560-44229-9
Date Collected: 12/02/13 15:50
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 98.0

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		51.0	5.10	mg/Kg	☼		12/16/13 12:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	902		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Exc East Wall

Lab Sample ID: 560-44229-10
Date Collected: 12/02/13 15:55
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 91.8

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1310		54.5	5.45	mg/Kg	☼		12/16/13 12:25	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2120		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Exc West Wall

Lab Sample ID: 560-44229-11
Date Collected: 12/02/13 16:00
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.3

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	581		53.6	5.36	mg/Kg	☼		12/16/13 12:27	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1350		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 West Exc Middle Bottom 5'

Lab Sample ID: 560-44229-12
Date Collected: 12/03/13 10:45
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 94.7

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1320		52.8	5.28	mg/Kg	☼		12/16/13 12:28	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2230		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 West Exc North Wall

Lab Sample ID: 560-44229-13
Date Collected: 12/03/13 10:50
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.7

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1840		53.3	5.33	mg/Kg	☼		12/16/13 12:28	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2130		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 West Exc South Wall

Lab Sample ID: 560-44229-14
Date Collected: 12/03/13 10:55
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 94.6

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	823		52.9	5.29	mg/Kg	☼		12/16/13 12:29	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2310		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Middle Exc Midle Bottom 4'

Lab Sample ID: 560-44229-15
Date Collected: 12/03/13 10:55
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.3

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	869		53.6	5.36	mg/Kg	☼		12/16/13 12:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1280		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Middle Exc North Wall

Lab Sample ID: 560-44229-16
Date Collected: 12/03/13 11:00
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.4

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	471		107	10.7	mg/Kg	☼		12/16/13 16:18	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1320		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 West Exc West Wall

Lab Sample ID: 560-44229-17
Date Collected: 12/03/13 11:00
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.2

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1230		215	21.5	mg/Kg	☼		12/16/13 16:18	4

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2590		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 West Exc East Wall

Lab Sample ID: 560-44229-18
Date Collected: 12/03/13 11:05
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 96.7

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	35.8	J	51.7	5.17	mg/Kg	☼		12/16/13 12:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	247		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Middle Exc South Wall

Lab Sample ID: 560-44229-19
Date Collected: 12/03/13 11:05
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 92.2

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	621		54.2	5.42	mg/Kg	☼		12/16/13 12:33	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1200		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client Sample ID: RW-2 South Middle Exc East Wall

Lab Sample ID: 560-44229-20
Date Collected: 12/03/13 11:10
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 94.7

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	551		52.8	5.28	mg/Kg	☼		12/16/13 12:33	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1420		1.00	1.00	umhos/cm			12/23/13 09:00	1

Client: ARCADIS U.S., Inc.
Project/Site: Jal #4 Gas Plant Soil Analysis

TestAmerica Job ID: 560-44229-1
SDG: December 2013

Client Sample ID: RW-2 South Middle Exc West Wall
Lab Sample ID: 560-44229-21
Date Collected: 12/03/13 11:15
Matrix: Solid
Date Received: 12/11/13 14:40
Percent Solids: 93.1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	929		215	21.5	mg/Kg	☼		12/16/13 16:37	4

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1780		1.00	1.00	umhos/cm			12/23/13 09:00	1

Method: 9050A - Specific Conductance

Lab Sample ID: MB 560-96502/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96503

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	<1.00		1.00	1.00	umhos/cm			12/23/13 09:00	1

Lab Sample ID: 560-44229-10 DU — **Client Sample ID: RW-2 South Exc East Wall**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96503

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	2120			2140		umhos/cm				0.9	

Lab Sample ID: 560-44229-19 DU — **Client Sample ID: RW-2 South Middle Exc South Wall**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96503

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	1200			1199		umhos/cm				0.3	

Method: 9251 - Chloride

Lab Sample ID: MB 560-96267/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96247

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.204	J	5.00	0.500	mg/Kg			12/16/13 12:14	1

Lab Sample ID: MB 560-96267/23-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96247

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.283	J	5.00	0.500	mg/Kg			12/16/13 16:36	1

Lab Sample ID: LCS 560-96267/24-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96247

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			150	151.2		mg/Kg		101	85 - 115		

Lab Sample ID: LCS 560-96267/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96247

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			150	144.1		mg/Kg		96	85 - 115		

Method: 9251 - Chloride (Continued)

Lab Sample ID: 560-44229-5 MS
Matrix: Solid
Analysis Batch: 96247

Client Sample ID: RW-2 North Exc West Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	112		2040	2197		mg/Kg	☼	102	85 - 115

Lab Sample ID: 560-44229-5 MSD
Matrix: Solid
Analysis Batch: 96247

Client Sample ID: RW-2 North Exc West Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	112		2040	2232		mg/Kg	☼	104	85 - 115	2	30

Lab Sample ID: 560-44229-18 MS
Matrix: Solid
Analysis Batch: 96247

Client Sample ID: RW-2 West Exc East Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	35.8	J	2070	2258		mg/Kg	☼	107	85 - 115

Lab Sample ID: 560-44229-18 MSD
Matrix: Solid
Analysis Batch: 96247

Client Sample ID: RW-2 West Exc East Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	35.8	J	2070	2207		mg/Kg	☼	105	85 - 115	2	30

Lab Sample ID: 560-44229-A-21-A MS
Matrix: Solid
Analysis Batch: 96247

Client Sample ID: 560-44229-A-21-A MS
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	248		8600	10230	F	mg/Kg	☼	116	85 - 115

Lab Sample ID: 560-44229-A-21-A MSD
Matrix: Solid
Analysis Batch: 96247

Client Sample ID: 560-44229-A-21-A MSD
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	248		8600	10030		mg/Kg	☼	114	85 - 115	2	30

Client Sample ID: RW-2 North Exc 5' Bottom

Lab Sample ID: 560-44229-1

Date Collected: 12/02/13 13:15

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:16	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 North Exc North Wall

Lab Sample ID: 560-44229-2

Date Collected: 12/02/13 13:20

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:17	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 North Exc South Wall

Lab Sample ID: 560-44229-3

Date Collected: 12/02/13 13:25

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:18	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 North Exc East Wall

Lab Sample ID: 560-44229-4

Date Collected: 12/02/13 13:30

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:18	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 North Exc West Wall — Lab Sample ID: 560-44229-5

Date Collected: 12/02/13 13:35 — **Matrix: Solid**
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:19	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Exc South Bottom — Lab Sample ID: 560-44229-6

Date Collected: 12/02/13 15:35 — **Matrix: Solid**
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:21	LPO	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Exc North Bottom — Lab Sample ID: 560-44229-7

Date Collected: 12/02/13 15:40 — **Matrix: Solid**
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:22	LPO	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Exc North Wall — Lab Sample ID: 560-44229-8

Date Collected: 12/02/13 15:45 — **Matrix: Solid**
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:23	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Exc South Wall

Lab Sample ID: 560-44229-9

Date Collected: 12/02/13 15:50
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:24	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Exc East Wall

Lab Sample ID: 560-44229-10

Date Collected: 12/02/13 15:55
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:25	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Exc West Wall

Lab Sample ID: 560-44229-11

Date Collected: 12/02/13 16:00
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:27	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 West Exc Middle Bottom 5'

Lab Sample ID: 560-44229-12

Date Collected: 12/03/13 10:45
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:28	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 West Exc North Wall

Lab Sample ID: 560-44229-13

Date Collected: 12/03/13 10:50

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:28	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 West Exc South Wall

Lab Sample ID: 560-44229-14

Date Collected: 12/03/13 10:55

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:29	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Middle Exc Midle Bottom 4'

Lab Sample ID: 560-44229-15

Date Collected: 12/03/13 10:55

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:30	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Middle Exc North Wall

Lab Sample ID: 560-44229-16

Date Collected: 12/03/13 11:00

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		2	96247	12/16/13 16:18	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 West Exc West Wall

Lab Sample ID: 560-44229-17

Date Collected: 12/03/13 11:00
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		4	96247	12/16/13 16:18	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 West Exc East Wall

Lab Sample ID: 560-44229-18

Date Collected: 12/03/13 11:05
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:31	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Middle Exc South Wall

Lab Sample ID: 560-44229-19

Date Collected: 12/03/13 11:05
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:33	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Client Sample ID: RW-2 South Middle Exc East Wall

Lab Sample ID: 560-44229-20

Date Collected: 12/03/13 11:10
Matrix: Solid
Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		1	96247	12/16/13 12:33	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Jal #4 Gas Plant Soil Analysis

TestAmerica Job ID: 560-44229-1
SDG: December 2013

Client Sample ID: RW-2 South Middle Exc West Wall

Lab Sample ID: 560-44229-21

Date Collected: 12/03/13 11:15

Matrix: Solid

Date Received: 12/11/13 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96127	12/12/13 12:28	DRB	TAL CC
Soluble	Leach	DI Leach			96267	12/16/13 09:00	LPO	TAL CC
Soluble	Analysis	9251		4	96247	12/16/13 16:37	LPO	TAL CC
Soluble	Leach	DI Leach			96502	12/23/13 09:00	OV56	TAL CC
Soluble	Analysis	9050A		1	96503	12/23/13 09:00	OV56	TAL CC

Laboratory References:

TAL CC = TestAmerica Corpus Christi, 1733 N. Padre Island Drive, Corpus Christi, TX 78408, TEL (361)289-2673

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Jal #4 Gas Plant Soil Analysis

TestAmerica Job ID: 560-44229-1
SDG: December 2013

Laboratory: TestAmerica Corpus Christi

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Kansas	NELAP	7	E-10362	10-31-14
Oklahoma	State Program	6	9968	08-31-14
Texas	NELAP	6	T104704210-12-8	03-31-14
USDA	Federal		P330-11-00060	02-03-14

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Jal #4 Gas Plant Soil Analysis

TestAmerica Job ID: 560-44229-1
SDG: December 2013

Method	Method Description	Protocol	Laboratory
9050A	Specific Conductance	SW846	TAL CC
9251	Chloride	SW846	TAL CC
Moisture	Percent Moisture	EPA	TAL CC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CC = TestAmerica Corpus Christi, 1733 N. Padre Island Drive, Corpus Christi, TX 78408, TEL (361)289-2673

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Jal #4 Gas Plant Soil Analysis

TestAmerica Job ID: 560-44229-1
SDG: December 2013

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
560-44229-1	RW-2 North Exc 5' Bottom	Solid	12/02/13 13:15	12/11/13 14:40
560-44229-2	RW-2 North Exc North Wall	Solid	12/02/13 13:20	12/11/13 14:40
560-44229-3	RW-2 North Exc South Wall	Solid	12/02/13 13:25	12/11/13 14:40
560-44229-4	RW-2 North Exc East Wall	Solid	12/02/13 13:30	12/11/13 14:40
560-44229-5	RW-2 North Exc West Wall	Solid	12/02/13 13:35	12/11/13 14:40
560-44229-6	RW-2 South Exc South Bottom	Solid	12/02/13 15:35	12/11/13 14:40
560-44229-7	RW-2 South Exc North Bottom	Solid	12/02/13 15:40	12/11/13 14:40
560-44229-8	RW-2 South Exc North Wall	Solid	12/02/13 15:45	12/11/13 14:40
560-44229-9	RW-2 South Exc South Wall	Solid	12/02/13 15:50	12/11/13 14:40
560-44229-10	RW-2 South Exc East Wall	Solid	12/02/13 15:55	12/11/13 14:40
560-44229-11	RW-2 South Exc West Wall	Solid	12/02/13 16:00	12/11/13 14:40
560-44229-12	RW-2 West Exc Middle Bottom 5'	Solid	12/03/13 10:45	12/11/13 14:40
560-44229-13	RW-2 West Exc North Wall	Solid	12/03/13 10:50	12/11/13 14:40
560-44229-14	RW-2 West Exc South Wall	Solid	12/03/13 10:55	12/11/13 14:40
560-44229-15	RW-2 South Middle Exc Midle Bottom 4'	Solid	12/03/13 10:55	12/11/13 14:40
560-44229-16	RW-2 South Middle Exc North Wall	Solid	12/03/13 11:00	12/11/13 14:40
560-44229-17	RW-2 West Exc West Wall	Solid	12/03/13 11:00	12/11/13 14:40
560-44229-18	RW-2 West Exc East Wall	Solid	12/03/13 11:05	12/11/13 14:40
560-44229-19	RW-2 South Middle Exc South Wall	Solid	12/03/13 11:05	12/11/13 14:40
560-44229-20	RW-2 South Middle Exc East Wall	Solid	12/03/13 11:10	12/11/13 14:40
560-44229-21	RW-2 South Middle Exc West Wall	Solid	12/03/13 11:15	12/11/13 14:40

Chain of Custody Record

Obs 0.7 Corr 0.9c
Temperature on Receipt 1 Deg
Drinking Water? Yes ☐ No ☒ Seal

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007) ARCADIS

Client: 1004 N. Big Spring St Ste 300	Project Manager: Hank McConnell	Date: 12/09/13	Chain of Custody Number: 175636
Address: Midland	Telephone Number (Area Code)/Fax Number: 432-687-5400 / 432-687-5401	Loc: 560 44229	Page 1 of 2
City: Jal Gas Plant #4 / State: TX / Zip Code: 79701	Site Contact: Hank McConnell	Lab Contact: Tim Kellogg	Analysis more sp
Project Name and Location (State): MT001133.0001 - Jal, NM	Carrier/Waybill Number: 8045 1570066		
Contract/Purchase Order/Quote No.: Bill to Kinder Morgan			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Electrical Conductivity	Chlorides
RW-2 North Exc 5' Bottom	120213	1315				X	X						X	X
RW-2 North Exc North Wall	120213	1320				X	X						X	X
RW-2 North Exc South Wall	120213	1325				X	X						X	X
RW-2 North Exc East Wall	120213	1330				X	X						X	X
RW-2 North Exc West Wall	120213	1335				X	X						X	X
RW-2 South Exc South Bottom	120213	1535				X	X						X	X
RW-2 South Exc North Bottom	120213	1540				X	X						X	X
RW-2 South Exc North Wall	120213	1545				X	X						X	X
RW-2 South Exc South Wall	120213	1550				X	X						X	X
RW-2 South Exc East Wall	120213	1555				X	X						X	X
RW-2 South Exc West Wall	120213	1600				X	X						X	X
RW-2 West Exc Middle Bottom 5'	120313	1045				X	X						X	X

Special Instructions/ Conditions of Receipt

560-44229 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Max Key	120913	1500	1. Received By:	12-11-13	1440
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007) ARCADIS

Client	Project Manager	Date	Chain of Custody Number
1004 N Big Spring St Ste 300	Hank McConnell	12/09/13	061257
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 2 of 2**
Midland	432-687-5400 / 432-687-5401		
City	**State**	**Zip Code**	**Site Contact**	**Lab Contact**
Jal Gas Plant #4	TX	79701	Hank McConnell	Tim Kellogg
Project Name and Location (State)	**Carrier/Waybill Number**	
MT001133.0001 - Jal, NM		
Contract/Purchase Order/Quote No.	
Bill to Kinder Morgan	

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: Electrical Conductivity	Chlorides	Special Instructions/ Conditions of Receipt
RW-2 West Exc North Wall	120313	1050				X	X						X	X	
RW-2 West Exc South Wall	120313	1055				X	X						X	X	
RW-2 South Middle Exc Middle Bottom 4'	120313	1055				X	X						X	X	
RW-2 South Middle Exc North Wall	120313	1100				X	X						X	X	
RW-2 West Exc West Wall	120313	1100				X	X						X	X	
RW-2 West Exc East Wall	120313	1105				X	X						X	X	
RW-2 South Middle Exc South Wall	120313	1105				X	X						X	X	
RW-2 South Middle Exc East Wall	120313	1110				X	X						X	X	
RW-2 South Middle Exc West Wall	120313	1115				X	X						X	X	
Temp Blank															
				UK											

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify)

1. Relinquished By: Max Key	Date: 12/09/13	Time: 1500	1. Received By: V Cleaved	Date: 12/11/13	Time: 1448
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

12/24/2013

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 560-44229-1
SDG Number: December 2013

Login Number: 44229
List Number: 1
Creator: Rood, Vivian R

List Source: TestAmerica Corpus Christi

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Corpus Christi
1733 N. Padre Island Drive
Corpus Christi, TX 78408
Tel: (361)289-2673

TestAmerica Job ID: 560-44467-1
Client Project/Site: MT001133.0001-Jal, NM

For:
ARCADIS U.S., Inc.
1004 North Big Spring
Suite 300
Midland, Texas 79701

Attn: Hank McConnell

Authorized for release by:
1/6/2014 5:03:40 PM

Timothy Kellogg, Lab Director
(361)289-2673
tim.kellogg@testamericainc.com

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the MQL but greater than or equal to the SDL and the concentration is an estimated value.

Metals

Qualifier	Qualifier Description
J	Result is less than the MQL but greater than or equal to the SDL and the concentration is an estimated value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the MQL but greater than or equal to the SDL and the concentration is an estimated value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Job ID: 560-44467-1

Laboratory: TestAmerica Corpus Christi

Narrative

Receipt

The samples were received on 12/21/2013 4:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.2º C. No analytical or quality issues were noted.

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 3' North Exc North Wall

Lab Sample ID: 560-44467-1
Date Collected: 12/17/13 14:00
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	177		50.0	5.00	mg/Kg			12/30/13 08:40	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	461		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' North Exc South Wall

Lab Sample ID: 560-44467-2
Date Collected: 12/17/13 14:05
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	664		50.0	5.00	mg/Kg			12/30/13 08:43	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1900		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' North Exc East Wall North

Lab Sample ID: 560-44467-3
Date Collected: 12/17/13 14:10
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	227		50.0	5.00	mg/Kg			12/30/13 08:44	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	631		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' North Exc East Wall South

Lab Sample ID: 560-44467-4
Date Collected: 12/17/13 14:15
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	525		50.0	5.00	mg/Kg			12/30/13 08:44	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1540		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' North Exc West Wall North

Lab Sample ID: 560-44467-5
Date Collected: 12/17/13 14:20
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	174		50.0	5.00	mg/Kg			12/30/13 08:45	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	521		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' North Exc West Wall South

Lab Sample ID: 560-44467-6
Matrix: Solid
Date Collected: 12/17/13 14:25
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	132		50.0	5.00	mg/Kg			12/30/13 08:46	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	303		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' North Exc North Bottom

Lab Sample ID: 560-44467-7
Matrix: Solid
Date Collected: 12/17/13 14:30
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	1230		100	10.0	mg/Kg			12/30/13 08:47	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1840		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' North Exc South Bottom

Lab Sample ID: 560-44467-8
Matrix: Solid
Date Collected: 12/17/13 14:35
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	1380		200	20.0	mg/Kg			12/30/13 08:47	4

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2050		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' West Exc North Wall

Lab Sample ID: 560-44467-9
Matrix: Solid
Date Collected: 12/18/13 14:30
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	226		50.0	5.00	mg/Kg			12/30/13 08:48	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	771		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' West Exc South Wall

Lab Sample ID: 560-44467-10
Matrix: Solid
Date Collected: 12/18/13 14:35
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	280		50.0	5.00	mg/Kg			12/30/13 08:48	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	634		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 3' West Exc East Wall — Lab Sample ID: 560-44467-11

Date Collected: 12/18/13 14:40
Date Received: 12/21/13 16:30
Matrix: Solid

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	367		50.0	5.00	mg/Kg			12/30/13 08:50	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1050		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' West Exc West Wall — Lab Sample ID: 560-44467-12

Date Collected: 12/18/13 14:45
Date Received: 12/21/13 16:30
Matrix: Solid

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	365		50.0	5.00	mg/Kg			12/30/13 08:51	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	474		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 3' West Exc Bottom — Lab Sample ID: 560-44467-13

Date Collected: 12/18/13 14:50
Date Received: 12/21/13 16:30
Matrix: Solid

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	557		50.0	5.00	mg/Kg			12/30/13 10:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	916		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 2' North Exc North Wall — Lab Sample ID: 560-44467-14

Date Collected: 12/19/13 14:00
Date Received: 12/21/13 16:30
Matrix: Solid

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	1490		50.0	5.00	mg/Kg			12/30/13 08:52	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	4070		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 2' North Exc South Wall — Lab Sample ID: 560-44467-15

Date Collected: 12/19/13 14:05
Date Received: 12/21/13 16:30
Matrix: Solid

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	159		50.0	5.00	mg/Kg			12/30/13 08:53	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	454		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 2' North Exc East Wall North — **Lab Sample ID: 560-44467-16**
Date Collected: 12/19/13 14:10 — **Matrix: Solid**
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	288		50.0	5.00	mg/Kg			12/30/13 08:53	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	656		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 2' North Exc East Wall South — **Lab Sample ID: 560-44467-17**
Date Collected: 12/19/13 14:15 — **Matrix: Solid**
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	426		50.0	5.00	mg/Kg			12/30/13 08:54	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	758		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 2' North Exc West Wall North — **Lab Sample ID: 560-44467-18**
Date Collected: 12/19/13 14:20 — **Matrix: Solid**
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	158		50.0	5.00	mg/Kg			12/30/13 08:54	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	342		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 2' North Exc West Wall South — **Lab Sample ID: 560-44467-19**
Date Collected: 12/19/13 14:25 — **Matrix: Solid**
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	43.7	J	50.0	5.00	mg/Kg			12/30/13 08:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	79.7		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 2' North Exc West Wall North Bottom — **Lab Sample ID: 560-44467-20**
Date Collected: 12/19/13 14:30 — **Matrix: Solid**
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	507		50.0	5.00	mg/Kg			12/30/13 08:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1200		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 2' North Exc South Bottom

Lab Sample ID: 560-44467-21
Date Collected: 12/19/13 14:35
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	**276**		50.0	5.00	mg/Kg			12/30/13 09:10	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	**453**		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Zigler's Pit Top Soil

Lab Sample ID: 560-44467-22
Date Collected: 12/19/13 13:45
Matrix: Solid
Date Received: 12/21/13 16:30
Percent Solids: 94.9

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.000240		0.00523	0.000240	mg/Kg	☼		12/30/13 15:35	1
Ethylbenzene	<0.000470		0.00523	0.000470	mg/Kg	☼		12/30/13 15:35	1
Toluene	<0.000941		0.00523	0.000941	mg/Kg	☼		12/30/13 15:35	1
Xylenes, Total	<0.000523		0.0157	0.000523	mg/Kg	☼		12/30/13 15:35	1
o-Xylene	<0.000230		0.00523	0.000230	mg/Kg	☼		12/30/13 15:35	1
m-Xylene & p-Xylene	<0.000523		0.0105	0.000523	mg/Kg	☼		12/30/13 15:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*65 - 139*		*12/30/13 15:35*	*1*
4-Bromofluorobenzene (Surr)	*90*		*61 - 136*		*12/30/13 15:35*	*1*
Dibromofluoromethane (Surr)	*98*		*50 - 136*		*12/30/13 15:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*65 - 152*		*12/30/13 15:35*	*1*

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	<10.5		52.7	10.5	mg/Kg	☼	12/24/13 10:07	12/24/13 14:55	1
Over C12-C28	<10.5		52.7	10.5	mg/Kg	☼	12/24/13 10:07	12/24/13 14:55	1
Over C28-C35	<10.5		52.7	10.5	mg/Kg	☼	12/24/13 10:07	12/24/13 14:55	1
Total Petroleum Hydrocarbons (C6-C35)	<10.5		52.7	10.5	mg/Kg	☼	12/24/13 10:07	12/24/13 14:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*84*		*70 - 130*	*12/24/13 10:07*	*12/24/13 14:55*	*1*
1-Chlorooctane (Surr)	*87*		*70 - 130*	*12/24/13 10:07*	*12/24/13 14:55*	*1*

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.108		0.492	0.108	mg/Kg	☼	12/26/13 10:30	12/27/13 14:47	1
Arsenic	**2.08**		1.97	0.143	mg/Kg	☼	12/26/13 10:30	12/27/13 14:47	1
Barium	**115**		0.985	0.186	mg/Kg	☼	12/26/13 10:30	12/27/13 14:47	1
Cadmium	**0.185**	**J**	0.492	0.0354	mg/Kg	☼	12/26/13 10:30	12/27/13 14:47	1
Chromium	**4.09**		0.985	0.132	mg/Kg	☼	12/26/13 10:30	12/31/13 15:41	1
Lead	**2.39**		0.492	0.150	mg/Kg	☼	12/26/13 10:30	12/27/13 14:47	1
Selenium	**0.963**	**J**	0.985	0.195	mg/Kg	☼	12/26/13 10:30	12/27/13 14:47	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0108		0.120	0.0108	mg/Kg	☼	12/31/13 10:30	12/31/13 15:23	1

Client Sample ID: Zigler's Pit Top Soil

Lab Sample ID: 560-44467-22

Date Collected: 12/19/13 13:45

Matrix: Solid

Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	9.25	J	50.0	5.00	mg/Kg			12/30/13 09:13	1

Client Sample ID: Zigler's Pit Caliche

Lab Sample ID: 560-44467-23

Date Collected: 12/19/13 13:50

Matrix: Solid

Date Received: 12/21/13 16:30

Percent Solids: 98.5

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.000223		0.00485	0.000223	mg/Kg	☼		12/30/13 16:01	1
Ethylbenzene	<0.000437		0.00485	0.000437	mg/Kg	☼		12/30/13 16:01	1
Toluene	0.00237	J	0.00485	0.000874	mg/Kg	☼		12/30/13 16:01	1
Xylenes, Total	0.000824	J	0.0146	0.000485	mg/Kg	☼		12/30/13 16:01	1
o-Xylene	<0.000214		0.00485	0.000214	mg/Kg	☼		12/30/13 16:01	1
m-Xylene & p-Xylene	0.000653	J	0.00971	0.000485	mg/Kg	☼		12/30/13 16:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*94*		*65 - 139*		*12/30/13 16:01*	*1*
4-Bromofluorobenzene (Surr)	*90*		*61 - 136*		*12/30/13 16:01*	*1*
Dibromofluoromethane (Surr)	*96*		*50 - 136*		*12/30/13 16:01*	*1*
1,2-Dichloroethane-d4 (Surr)	*91*		*65 - 152*		*12/30/13 16:01*	*1*

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	<10.1		50.5	10.1	mg/Kg	☼	12/24/13 10:07	12/24/13 15:02	1
Over C12-C28	<10.1		50.5	10.1	mg/Kg	☼	12/24/13 10:07	12/24/13 15:02	1
Over C28-C35	<10.1		50.5	10.1	mg/Kg	☼	12/24/13 10:07	12/24/13 15:02	1
Total Petroleum Hydrocarbons (C6-C35)	<10.1		50.5	10.1	mg/Kg	☼	12/24/13 10:07	12/24/13 15:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*70 - 130*	*12/24/13 10:07*	*12/24/13 15:02*	*1*
1-Chlorooctane (Surr)	*89*		*70 - 130*	*12/24/13 10:07*	*12/24/13 15:02*	*1*

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.0859		0.391	0.0859	mg/Kg	☼	12/26/13 10:30	12/27/13 14:52	1
Arsenic	2.51		1.56	0.113	mg/Kg	☼	12/26/13 10:30	12/27/13 14:52	1
Barium	33.8		0.781	0.148	mg/Kg	☼	12/26/13 10:30	12/27/13 14:52	1
Cadmium	0.216	J	0.391	0.0281	mg/Kg	☼	12/26/13 10:30	12/27/13 14:52	1
Chromium	6.48		0.781	0.105	mg/Kg	☼	12/26/13 10:30	12/31/13 15:45	1
Lead	5.24		0.391	0.119	mg/Kg	☼	12/26/13 10:30	12/27/13 14:52	1
Selenium	<0.155		0.781	0.155	mg/Kg	☼	12/26/13 10:30	12/27/13 14:52	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0101		0.112	0.0101	mg/Kg	☼	12/31/13 10:30	12/31/13 15:25	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	14.7	J	50.0	5.00	mg/Kg			12/30/13 09:13	1

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 1' Exc North Wall West

Lab Sample ID: 560-44467-24
Date Collected: 12/20/13 12:30
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	2800		100	10.0	mg/Kg			12/30/13 10:22	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	8840		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc South Wall West

Lab Sample ID: 560-44467-25
Date Collected: 12/20/13 12:35
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	443		50.0	5.00	mg/Kg			12/30/13 09:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1850		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc South Wall West Middle

Lab Sample ID: 560-44467-26
Date Collected: 12/20/13 12:40
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	20.5	J	50.0	5.00	mg/Kg			12/30/13 09:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	187		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc South Wall East Middle

Lab Sample ID: 560-44467-27
Date Collected: 12/20/13 12:45
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	28.2	J	50.0	5.00	mg/Kg			12/30/13 09:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	367		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc South Wall East

Lab Sample ID: 560-44467-28
Date Collected: 12/20/13 12:50
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	44.9	J	50.0	5.00	mg/Kg			12/30/13 09:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	439		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 1' Exc East Wall South

Lab Sample ID: 560-44467-29
Matrix: Solid
Date Collected: 12/20/13 12:55
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	17.5	J	50.0	5.00	mg/Kg			12/30/13 09:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	309		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc East Wall North

Lab Sample ID: 560-44467-30
Matrix: Solid
Date Collected: 12/20/13 13:00
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	352		50.0	5.00	mg/Kg			12/30/13 09:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	970		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc West Wall West

Lab Sample ID: 560-44467-31
Matrix: Solid
Date Collected: 12/20/13 13:05
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	498		50.0	5.00	mg/Kg			12/30/13 09:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1420		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc West Wall South

Lab Sample ID: 560-44467-32
Matrix: Solid
Date Collected: 12/20/13 13:10
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	163		50.0	5.00	mg/Kg			12/30/13 09:21	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	438		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc North Bottom

Lab Sample ID: 560-44467-33
Matrix: Solid
Date Collected: 12/20/13 13:15
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	625		50.0	5.00	mg/Kg			12/30/13 09:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1820		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 1' Exc North Middle Bottom

Lab Sample ID: 560-44467-34
Matrix: Solid
Date Collected: 12/20/13 13:20
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	1390		50.0	5.00	mg/Kg			12/30/13 09:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	4010		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc North East Bottom

Lab Sample ID: 560-44467-35
Matrix: Solid
Date Collected: 12/20/13 13:25
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	579		50.0	5.00	mg/Kg			12/30/13 09:23	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1680		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc East Middle Bottom

Lab Sample ID: 560-44467-36
Matrix: Solid
Date Collected: 12/20/13 13:30
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	577		50.0	5.00	mg/Kg			12/30/13 09:23	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1510		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc Southeast MIddle Bottom

Lab Sample ID: 560-44467-37
Matrix: Solid
Date Collected: 12/20/13 15:35
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	533		50.0	5.00	mg/Kg			12/30/13 09:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1770		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc Middle Bottom

Lab Sample ID: 560-44467-38
Matrix: Solid
Date Collected: 12/20/13 13:35
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	162		50.0	5.00	mg/Kg			12/30/13 09:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	763		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 1' Exc North Wall East

Lab Sample ID: 560-44467-39

Date Collected: 12/20/13 13:40
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	459		50.0	5.00	mg/Kg			12/30/13 09:25	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1420		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House 1' Exc West Middle Bottom

Lab Sample ID: 560-44467-40

Date Collected: 12/20/13 13:45
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	600		50.0	5.00	mg/Kg			12/30/13 09:25	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1900		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House East 3' Exc North Wall

Lab Sample ID: 560-44467-41

Date Collected: 12/20/13 14:00
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	329		50.0	5.00	mg/Kg			12/30/13 10:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	639		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House East 3' Exc South Wall

Lab Sample ID: 560-44467-42

Date Collected: 12/20/13 14:05
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	36.6	J	50.0	5.00	mg/Kg			12/30/13 10:19	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	248		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House East 3' Exc East Wall

Lab Sample ID: 560-44467-43

Date Collected: 12/20/13 14:10
Matrix: Solid
Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	931		50.0	5.00	mg/Kg			12/30/13 10:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2610		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House East 3' Exc West Wall

Lab Sample ID: 560-44467-44

Date Collected: 12/20/13 14:15

Matrix: Solid

Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	137		50.0	5.00	mg/Kg			12/30/13 10:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	695		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: Bag House East 3' Exc Bottom

Lab Sample ID: 560-44467-45

Date Collected: 12/20/13 14:20

Matrix: Solid

Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	1130		50.0	5.00	mg/Kg			12/30/13 10:21	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	3540		1.00	1.00	umhos/cm			12/27/13 15:30	1

Client Sample ID: RW-2 East 4' Exc East Wall

Lab Sample ID: 560-44467-46

Date Collected: 12/20/13 15:00

Matrix: Solid

Date Received: 12/21/13 16:30

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	78.8		50.0	5.00	mg/Kg			12/30/13 10:21	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	534		1.00	1.00	umhos/cm			12/27/13 15:30	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 560-96682/9
Matrix: Solid
Analysis Batch: 96682

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.000429		0.00933	0.000429	mg/Kg			12/30/13 13:29	1
Ethylbenzene	<0.000840		0.00933	0.000840	mg/Kg			12/30/13 13:29	1
Toluene	<0.00168		0.00933	0.00168	mg/Kg			12/30/13 13:29	1
Xylenes, Total	<0.000933		0.0280	0.000933	mg/Kg			12/30/13 13:29	1
o-Xylene	<0.000410		0.00933	0.000410	mg/Kg			12/30/13 13:29	1
m-Xylene & p-Xylene	<0.000933		0.0187	0.000933	mg/Kg			12/30/13 13:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*65 - 139*		*12/30/13 13:29*	*1*
4-Bromofluorobenzene (Surr)	*92*		*61 - 136*		*12/30/13 13:29*	*1*
Dibromofluoromethane (Surr)	*94*		*50 - 136*		*12/30/13 13:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*65 - 152*		*12/30/13 13:29*	*1*

Lab Sample ID: LCS 560-96682/3
Matrix: Solid
Analysis Batch: 96682

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.0400	0.04233		mg/Kg		106	70 - 130
Ethylbenzene	0.0400	0.04211		mg/Kg		105	70 - 130
Toluene	0.0400	0.04176		mg/Kg		104	70 - 130
Xylenes, Total	0.0800	0.08299		mg/Kg		104	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*65 - 139*
4-Bromofluorobenzene (Surr)	*101*		*61 - 136*
Dibromofluoromethane (Surr)	*96*		*50 - 136*
1,2-Dichloroethane-d4 (Surr)	*89*		*65 - 152*

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Lab Sample ID: MB 560-96555/1-A
Matrix: Solid
Analysis Batch: 96549

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 96555

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	<10.0		50.1	10.0	mg/Kg		12/24/13 10:07	12/24/13 12:37	1
Over C12-C28	<10.0		50.1	10.0	mg/Kg		12/24/13 10:07	12/24/13 12:37	1
Over C28-C35	<10.0		50.1	10.0	mg/Kg		12/24/13 10:07	12/24/13 12:37	1
Total Petroleum Hydrocarbons (C6-C35)	<10.0		50.1	10.0	mg/Kg		12/24/13 10:07	12/24/13 12:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*88*		*70 - 130*	*12/24/13 10:07*	*12/24/13 12:37*	*1*
1-Chlorooctane (Surr)	*87*		*70 - 130*	*12/24/13 10:07*	*12/24/13 12:37*	*1*

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC) (Continued)

Lab Sample ID: LCS 560-96555/2-A
Matrix: Solid
Analysis Batch: 96549

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 96555

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Petroleum Hydrocarbons (C6-C35)			249	218.3		mg/Kg		88	75 - 125		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*87*		*70 - 130*
1-Chlorooctane (Surr)	*90*		*70 - 130*

Lab Sample ID: LCSD 560-96555/3-A
Matrix: Solid
Analysis Batch: 96549

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 96555

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Petroleum Hydrocarbons (C6-C35)			251	213.2		mg/Kg		85	75 - 125	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*87*		*70 - 130*
1-Chlorooctane (Surr)	*90*		*70 - 130*

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 560-96609/1-A
Matrix: Solid
Analysis Batch: 96676

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 96609

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.110		0.500	0.110	mg/Kg		12/26/13 10:30	12/27/13 13:50	1
Arsenic	<0.145		2.00	0.145	mg/Kg		12/26/13 10:30	12/27/13 13:50	1
Barium	<0.189		1.00	0.189	mg/Kg		12/26/13 10:30	12/27/13 13:50	1
Cadmium	<0.0360		0.500	0.0360	mg/Kg		12/26/13 10:30	12/27/13 13:50	1
Lead	<0.152		0.500	0.152	mg/Kg		12/26/13 10:30	12/27/13 13:50	1
Selenium	0.3010	J	1.00	0.198	mg/Kg		12/26/13 10:30	12/27/13 13:50	1

Lab Sample ID: MB 560-96609/1-A
Matrix: Solid
Analysis Batch: 96751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 96609

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.110		0.500	0.110	mg/Kg		12/26/13 10:30	12/31/13 14:15	1
Arsenic	<0.145		2.00	0.145	mg/Kg		12/26/13 10:30	12/31/13 14:15	1
Barium	<0.189		1.00	0.189	mg/Kg		12/26/13 10:30	12/31/13 14:15	1
Cadmium	<0.0360		0.500	0.0360	mg/Kg		12/26/13 10:30	12/31/13 14:15	1
Chromium	<0.134		1.00	0.134	mg/Kg		12/26/13 10:30	12/31/13 14:15	1
Lead	<0.152		0.500	0.152	mg/Kg		12/26/13 10:30	12/31/13 14:15	1
Selenium	0.3375	J	1.00	0.198	mg/Kg		12/26/13 10:30	12/31/13 14:15	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCS 560-96609/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 96676 — **Prep Batch: 96609**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	25.0	24.28		mg/Kg		97	80 - 120
Arsenic	25.0	24.14		mg/Kg		97	80 - 120
Barium	25.0	24.82		mg/Kg		99	80 - 120
Cadmium	25.0	24.12		mg/Kg		96	80 - 120
Lead	25.0	24.77		mg/Kg		99	80 - 120
Selenium	25.0	23.55		mg/Kg		94	80 - 120

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 560-96750/4-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 96746 — **Prep Batch: 96750**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0108		0.120	0.0108	mg/Kg		12/31/13 10:30	12/31/13 14:59	1

Lab Sample ID: LCS 560-96750/5-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 96746 — **Prep Batch: 96750**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.250	0.2600		mg/Kg		104	80 - 120

Method: 9050A - Specific Conductance

Lab Sample ID: MB 560-96668/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96669

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	<1.00		1.00	1.00	umhos/cm			12/27/13 15:30	1

Lab Sample ID: MB 560-96668/25-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96669

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	<1.00		1.00	1.00	umhos/cm			12/27/13 15:30	1

Lab Sample ID: 560-44467-10 DU — **Client Sample ID: Bag House 3' West Exc South Wall**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 96669

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	634		627.0		umhos/cm		1	

Method: 9050A - Specific Conductance (Continued)

Lab Sample ID: 560-44467-20 DU
Matrix: Solid
Analysis Batch: 96669

Client Sample ID: Bag House 2' North Exc West Wall North Bottom
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1200		1170		umhos/cm		3	

Lab Sample ID: 560-44467-33 DU
Matrix: Solid
Analysis Batch: 96669

Client Sample ID: Bag House 1' Exc North Bottom
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1820		1811		umhos/cm		0.7	

Lab Sample ID: 560-44467-46 DU
Matrix: Solid
Analysis Batch: 96669

Client Sample ID: RW-2 East 4' Exc East Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	534		531.0		umhos/cm		0.6	

Method: 9251 - Chloride

Lab Sample ID: MB 560-96699/1-A
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	<0.500		5.00	0.500	mg/Kg			12/30/13 08:39	1

Lab Sample ID: MB 560-96699/23-A
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	<0.500		5.00	0.500	mg/Kg			12/30/13 09:09	1

Lab Sample ID: MB 560-96699/45-A
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Chloride	0.6590	J	5.00	0.500	mg/Kg			12/30/13 10:17	1

Lab Sample ID: LCS 560-96699/24-A
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	150	143.9		mg/Kg		96	85 - 115

Method: 9251 - Chloride (Continued)

Lab Sample ID: LCS 560-96699/2-A
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	150	139.9		mg/Kg		93	85 - 115

Lab Sample ID: LCS 560-96699/46-A
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	150	141.1		mg/Kg		94	85 - 115

Lab Sample ID: 560-44467-1 MS
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 3' North Exc North Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	177		2000	2189		mg/Kg		101	85 - 115

Lab Sample ID: 560-44467-1 MSD
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 3' North Exc North Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Chloride	177		2000	2138		mg/Kg		98	85 - 115	2	30

Lab Sample ID: 560-44467-11 MS
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 3' West Exc East Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	367		2000	2418		mg/Kg		102	85 - 115

Lab Sample ID: 560-44467-11 MSD
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 3' West Exc East Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Chloride	367		2000	2405		mg/Kg		102	85 - 115	1	30

Lab Sample ID: 560-44467-21 MS
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 2' North Exc South Bottom
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	276		2000	2243		mg/Kg		98	85 - 115

Lab Sample ID: 560-44467-21 MSD
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 2' North Exc South Bottom
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Chloride	276		2000	2327		mg/Kg		103	85 - 115	4	30

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Lab Sample ID: 560-44467-31 MS
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 1' Exc West Wall West
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	498		2000	2465		mg/Kg		98	85 - 115

Lab Sample ID: 560-44467-31 MSD
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House 1' Exc West Wall West
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Chloride	498		2000	2504		mg/Kg		100	85 - 115	2	30

Lab Sample ID: 560-44467-41 MS
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House East 3' Exc North Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Chloride	329		2000	2407		mg/Kg		104	85 - 115

Lab Sample ID: 560-44467-41 MSD
Matrix: Solid
Analysis Batch: 96691

Client Sample ID: Bag House East 3' Exc North Wall
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Chloride	329		2000	2409		mg/Kg		104	85 - 115	0	30

GC/MS VOA

Analysis Batch: 96682

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	8260B	
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	8260B	
LCS 560-96682/3	Lab Control Sample	Total/NA	Solid	8260B	
MB 560-96682/9	Method Blank	Total/NA	Solid	8260B	

GC Semi VOA

Analysis Batch: 96549

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	TX 1005	96555
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	TX 1005	96555
LCS 560-96555/2-A	Lab Control Sample	Total/NA	Solid	TX 1005	96555
LCSD 560-96555/3-A	Lab Control Sample Dup	Total/NA	Solid	TX 1005	96555
MB 560-96555/1-A	Method Blank	Total/NA	Solid	TX 1005	96555

Prep Batch: 96555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	TX_1005_S_Prep	
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	TX_1005_S_Prep	
LCS 560-96555/2-A	Lab Control Sample	Total/NA	Solid	TX_1005_S_Prep	
LCSD 560-96555/3-A	Lab Control Sample Dup	Total/NA	Solid	TX_1005_S_Prep	
MB 560-96555/1-A	Method Blank	Total/NA	Solid	TX_1005_S_Prep	

Metals

Prep Batch: 96609

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	3050B	
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	3050B	
LCS 560-96609/2-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 560-96609/1-A	Method Blank	Total/NA	Solid	3050B	

Analysis Batch: 96676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	6010B	96609
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	6010B	96609
LCS 560-96609/2-A	Lab Control Sample	Total/NA	Solid	6010B	96609
MB 560-96609/1-A	Method Blank	Total/NA	Solid	6010B	96609

Analysis Batch: 96746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	7471A	96750
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	7471A	96750
LCS 560-96750/5-A	Lab Control Sample	Total/NA	Solid	7471A	96750
MB 560-96750/4-A	Method Blank	Total/NA	Solid	7471A	96750

Metals (Continued)

Prep Batch: 96750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	7471A	
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	7471A	
LCS 560-96750/5-A	Lab Control Sample	Total/NA	Solid	7471A	
MB 560-96750/4-A	Method Blank	Total/NA	Solid	7471A	

Analysis Batch: 96751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	6010B	96609
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	6010B	96609
MB 560-96609/1-A	Method Blank	Total/NA	Solid	6010B	96609

General Chemistry

Analysis Batch: 96536

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-34	Bag House 1' Exc North Middle Bottom	Total/NA	Solid	Moisture	
560-44467-35	Bag House 1' Exc North East Bottom	Total/NA	Solid	Moisture	
560-44467-36	Bag House 1' Exc East Middle Bottom	Total/NA	Solid	Moisture	
560-44467-37	Bag House 1' Exc Southeast MIddle Bottom	Total/NA	Solid	Moisture	
560-44467-38	Bag House 1' Exc Middle Bottom	Total/NA	Solid	Moisture	
560-44467-39	Bag House 1' Exc North Wall East	Total/NA	Solid	Moisture	

Analysis Batch: 96566

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-1	Bag House 3' North Exc North Wall	Total/NA	Solid	Moisture	
560-44467-2	Bag House 3' North Exc South Wall	Total/NA	Solid	Moisture	
560-44467-3	Bag House 3' North Exc East Wall North	Total/NA	Solid	Moisture	
560-44467-4	Bag House 3' North Exc East Wall South	Total/NA	Solid	Moisture	
560-44467-5	Bag House 3' North Exc West Wall North	Total/NA	Solid	Moisture	
560-44467-6	Bag House 3' North Exc West Wall South	Total/NA	Solid	Moisture	
560-44467-7	Bag House 3' North Exc North Bottom	Total/NA	Solid	Moisture	
560-44467-8	Bag House 3' North Exc South Bottom	Total/NA	Solid	Moisture	
560-44467-9	Bag House 3' West Exc North Wall	Total/NA	Solid	Moisture	
560-44467-10	Bag House 3' West Exc South Wall	Total/NA	Solid	Moisture	
560-44467-11	Bag House 3' West Exc East Wall	Total/NA	Solid	Moisture	
560-44467-12	Bag House 3' West Exc West Wall	Total/NA	Solid	Moisture	
560-44467-12 DU	Bag House 3' West Exc West Wall	Total/NA	Solid	Moisture	
560-44467-13	Bag House 3' West Exc Bottom	Total/NA	Solid	Moisture	
560-44467-14	Bag House 2' North Exc North Wall	Total/NA	Solid	Moisture	
560-44467-15	Bag House 2' North Exc South Wall	Total/NA	Solid	Moisture	
560-44467-16	Bag House 2' North Exc East Wall North	Total/NA	Solid	Moisture	
560-44467-17	Bag House 2' North Exc East Wall South	Total/NA	Solid	Moisture	
560-44467-18	Bag House 2' North Exc West Wall North	Total/NA	Solid	Moisture	
560-44467-19	Bag House 2' North Exc West Wall South	Total/NA	Solid	Moisture	
560-44467-20	Bag House 2' North Exc West Wall North Bottom	Total/NA	Solid	Moisture	

Analysis Batch: 96567

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-21	Bag House 2' North Exc South Bottom	Total/NA	Solid	Moisture	
560-44467-22	Zigler's Pit Top Soil	Total/NA	Solid	Moisture	

General Chemistry (Continued)

Analysis Batch: 96567 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-23	Zigler's Pit Caliche	Total/NA	Solid	Moisture	
560-44467-24	Bag House 1' Exc North Wall West	Total/NA	Solid	Moisture	
560-44467-25	Bag House 1' Exc South Wall West	Total/NA	Solid	Moisture	
560-44467-26	Bag House 1' Exc South Wall West Middle	Total/NA	Solid	Moisture	
560-44467-27	Bag House 1' Exc South Wall East Middle	Total/NA	Solid	Moisture	
560-44467-28	Bag House 1' Exc South Wall East	Total/NA	Solid	Moisture	
560-44467-29	Bag House 1' Exc East Wall South	Total/NA	Solid	Moisture	
560-44467-30	Bag House 1' Exc East Wall North	Total/NA	Solid	Moisture	
560-44467-31	Bag House 1' Exc West Wall West	Total/NA	Solid	Moisture	
560-44467-32	Bag House 1' Exc West Wall South	Total/NA	Solid	Moisture	
560-44467-32 DU	Bag House 1' Exc West Wall South	Total/NA	Solid	Moisture	
560-44467-33	Bag House 1' Exc North Bottom	Total/NA	Solid	Moisture	
560-44467-40	Bag House 1' Exc West Middle Bottom	Total/NA	Solid	Moisture	
560-44467-41	Bag House East 3' Exc North Wall	Total/NA	Solid	Moisture	
560-44467-42	Bag House East 3' Exc South Wall	Total/NA	Solid	Moisture	
560-44467-43	Bag House East 3' Exc East Wall	Total/NA	Solid	Moisture	
560-44467-44	Bag House East 3' Exc West Wall	Total/NA	Solid	Moisture	
560-44467-45	Bag House East 3' Exc Bottom	Total/NA	Solid	Moisture	
560-44467-46	RW-2 East 4' Exc East Wall	Total/NA	Solid	Moisture	

Leach Batch: 96668

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-1	Bag House 3' North Exc North Wall	Soluble	Solid	DI Leach	
560-44467-2	Bag House 3' North Exc South Wall	Soluble	Solid	DI Leach	
560-44467-3	Bag House 3' North Exc East Wall North	Soluble	Solid	DI Leach	
560-44467-4	Bag House 3' North Exc East Wall South	Soluble	Solid	DI Leach	
560-44467-5	Bag House 3' North Exc West Wall North	Soluble	Solid	DI Leach	
560-44467-6	Bag House 3' North Exc West Wall South	Soluble	Solid	DI Leach	
560-44467-7	Bag House 3' North Exc North Bottom	Soluble	Solid	DI Leach	
560-44467-8	Bag House 3' North Exc South Bottom	Soluble	Solid	DI Leach	
560-44467-9	Bag House 3' West Exc North Wall	Soluble	Solid	DI Leach	
560-44467-10	Bag House 3' West Exc South Wall	Soluble	Solid	DI Leach	
560-44467-10 DU	Bag House 3' West Exc South Wall	Soluble	Solid	DI Leach	
560-44467-11	Bag House 3' West Exc East Wall	Soluble	Solid	DI Leach	
560-44467-12	Bag House 3' West Exc West Wall	Soluble	Solid	DI Leach	
560-44467-13	Bag House 3' West Exc Bottom	Soluble	Solid	DI Leach	
560-44467-14	Bag House 2' North Exc North Wall	Soluble	Solid	DI Leach	
560-44467-15	Bag House 2' North Exc South Wall	Soluble	Solid	DI Leach	
560-44467-16	Bag House 2' North Exc East Wall North	Soluble	Solid	DI Leach	
560-44467-17	Bag House 2' North Exc East Wall South	Soluble	Solid	DI Leach	
560-44467-18	Bag House 2' North Exc West Wall North	Soluble	Solid	DI Leach	
560-44467-19	Bag House 2' North Exc West Wall South	Soluble	Solid	DI Leach	
560-44467-20	Bag House 2' North Exc West Wall North Bottom	Soluble	Solid	DI Leach	
560-44467-20 DU	Bag House 2' North Exc West Wall North Bottom	Soluble	Solid	DI Leach	
560-44467-21	Bag House 2' North Exc South Bottom	Soluble	Solid	DI Leach	
560-44467-24	Bag House 1' Exc North Wall West	Soluble	Solid	DI Leach	
560-44467-25	Bag House 1' Exc South Wall West	Soluble	Solid	DI Leach	
560-44467-26	Bag House 1' Exc South Wall West Middle	Soluble	Solid	DI Leach	
560-44467-27	Bag House 1' Exc South Wall East Middle	Soluble	Solid	DI Leach	
560-44467-28	Bag House 1' Exc South Wall East	Soluble	Solid	DI Leach	
560-44467-29	Bag House 1' Exc East Wall South	Soluble	Solid	DI Leach	

General Chemistry (Continued)

Leach Batch: 96668 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-30	Bag House 1' Exc East Wall North	Soluble	Solid	DI Leach	
560-44467-31	Bag House 1' Exc West Wall West	Soluble	Solid	DI Leach	
560-44467-32	Bag House 1' Exc West Wall South	Soluble	Solid	DI Leach	
560-44467-33	Bag House 1' Exc North Bottom	Soluble	Solid	DI Leach	
560-44467-33 DU	Bag House 1' Exc North Bottom	Soluble	Solid	DI Leach	
560-44467-34	Bag House 1' Exc North Middle Bottom	Soluble	Solid	DI Leach	
560-44467-35	Bag House 1' Exc North East Bottom	Soluble	Solid	DI Leach	
560-44467-36	Bag House 1' Exc East Middle Bottom	Soluble	Solid	DI Leach	
560-44467-37	Bag House 1' Exc Southeast MIddle Bottom	Soluble	Solid	DI Leach	
560-44467-38	Bag House 1' Exc Middle Bottom	Soluble	Solid	DI Leach	
560-44467-39	Bag House 1' Exc North Wall East	Soluble	Solid	DI Leach	
560-44467-40	Bag House 1' Exc West Middle Bottom	Soluble	Solid	DI Leach	
560-44467-41	Bag House East 3' Exc North Wall	Soluble	Solid	DI Leach	
560-44467-42	Bag House East 3' Exc South Wall	Soluble	Solid	DI Leach	
560-44467-43	Bag House East 3' Exc East Wall	Soluble	Solid	DI Leach	
560-44467-44	Bag House East 3' Exc West Wall	Soluble	Solid	DI Leach	
560-44467-45	Bag House East 3' Exc Bottom	Soluble	Solid	DI Leach	
560-44467-46	RW-2 East 4' Exc East Wall	Soluble	Solid	DI Leach	
560-44467-46 DU	RW-2 East 4' Exc East Wall	Soluble	Solid	DI Leach	
LCS 560-96668/26-A	Lab Control Sample	Soluble	Solid	DI Leach	
LCS 560-96668/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
MB 560-96668/1-A	Method Blank	Soluble	Solid	DI Leach	
MB 560-96668/25-A	Method Blank	Soluble	Solid	DI Leach	

Analysis Batch: 96669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-1	Bag House 3' North Exc North Wall	Soluble	Solid	9050A	96668
560-44467-2	Bag House 3' North Exc South Wall	Soluble	Solid	9050A	96668
560-44467-3	Bag House 3' North Exc East Wall North	Soluble	Solid	9050A	96668
560-44467-4	Bag House 3' North Exc East Wall South	Soluble	Solid	9050A	96668
560-44467-5	Bag House 3' North Exc West Wall North	Soluble	Solid	9050A	96668
560-44467-6	Bag House 3' North Exc West Wall South	Soluble	Solid	9050A	96668
560-44467-7	Bag House 3' North Exc North Bottom	Soluble	Solid	9050A	96668
560-44467-8	Bag House 3' North Exc South Bottom	Soluble	Solid	9050A	96668
560-44467-9	Bag House 3' West Exc North Wall	Soluble	Solid	9050A	96668
560-44467-10	Bag House 3' West Exc South Wall	Soluble	Solid	9050A	96668
560-44467-10 DU	Bag House 3' West Exc South Wall	Soluble	Solid	9050A	96668
560-44467-11	Bag House 3' West Exc East Wall	Soluble	Solid	9050A	96668
560-44467-12	Bag House 3' West Exc West Wall	Soluble	Solid	9050A	96668
560-44467-13	Bag House 3' West Exc Bottom	Soluble	Solid	9050A	96668
560-44467-14	Bag House 2' North Exc North Wall	Soluble	Solid	9050A	96668
560-44467-15	Bag House 2' North Exc South Wall	Soluble	Solid	9050A	96668
560-44467-16	Bag House 2' North Exc East Wall North	Soluble	Solid	9050A	96668
560-44467-17	Bag House 2' North Exc East Wall South	Soluble	Solid	9050A	96668
560-44467-18	Bag House 2' North Exc West Wall North	Soluble	Solid	9050A	96668
560-44467-19	Bag House 2' North Exc West Wall South	Soluble	Solid	9050A	96668
560-44467-20	Bag House 2' North Exc West Wall North Bottom	Soluble	Solid	9050A	96668
560-44467-20 DU	Bag House 2' North Exc West Wall North Bottom	Soluble	Solid	9050A	96668
560-44467-21	Bag House 2' North Exc South Bottom	Soluble	Solid	9050A	96668
560-44467-24	Bag House 1' Exc North Wall West	Soluble	Solid	9050A	96668
560-44467-25	Bag House 1' Exc South Wall West	Soluble	Solid	9050A	96668

General Chemistry (Continued)

Analysis Batch: 96669 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-26	Bag House 1' Exc South Wall West Middle	Soluble	Solid	9050A	96668
560-44467-27	Bag House 1' Exc South Wall East Middle	Soluble	Solid	9050A	96668
560-44467-28	Bag House 1' Exc South Wall East	Soluble	Solid	9050A	96668
560-44467-29	Bag House 1' Exc East Wall South	Soluble	Solid	9050A	96668
560-44467-30	Bag House 1' Exc East Wall North	Soluble	Solid	9050A	96668
560-44467-31	Bag House 1' Exc West Wall West	Soluble	Solid	9050A	96668
560-44467-32	Bag House 1' Exc West Wall South	Soluble	Solid	9050A	96668
560-44467-33	Bag House 1' Exc North Bottom	Soluble	Solid	9050A	96668
560-44467-33 DU	Bag House 1' Exc North Bottom	Soluble	Solid	9050A	96668
560-44467-34	Bag House 1' Exc North Middle Bottom	Soluble	Solid	9050A	96668
560-44467-35	Bag House 1' Exc North East Bottom	Soluble	Solid	9050A	96668
560-44467-36	Bag House 1' Exc East Middle Bottom	Soluble	Solid	9050A	96668
560-44467-37	Bag House 1' Exc Southeast MIddle Bottom	Soluble	Solid	9050A	96668
560-44467-38	Bag House 1' Exc Middle Bottom	Soluble	Solid	9050A	96668
560-44467-39	Bag House 1' Exc North Wall East	Soluble	Solid	9050A	96668
560-44467-40	Bag House 1' Exc West Middle Bottom	Soluble	Solid	9050A	96668
560-44467-41	Bag House East 3' Exc North Wall	Soluble	Solid	9050A	96668
560-44467-42	Bag House East 3' Exc South Wall	Soluble	Solid	9050A	96668
560-44467-43	Bag House East 3' Exc East Wall	Soluble	Solid	9050A	96668
560-44467-44	Bag House East 3' Exc West Wall	Soluble	Solid	9050A	96668
560-44467-45	Bag House East 3' Exc Bottom	Soluble	Solid	9050A	96668
560-44467-46	RW-2 East 4' Exc East Wall	Soluble	Solid	9050A	96668
560-44467-46 DU	RW-2 East 4' Exc East Wall	Soluble	Solid	9050A	96668
LCS 560-96668/26-A	Lab Control Sample	Soluble	Solid	9050A	96668
LCS 560-96668/2-A	Lab Control Sample	Soluble	Solid	9050A	96668
MB 560-96668/1-A	Method Blank	Soluble	Solid	9050A	96668
MB 560-96668/25-A	Method Blank	Soluble	Solid	9050A	96668

Analysis Batch: 96691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-1	Bag House 3' North Exc North Wall	Soluble	Solid	9251	96699
560-44467-1 MS	Bag House 3' North Exc North Wall	Soluble	Solid	9251	96699
560-44467-1 MSD	Bag House 3' North Exc North Wall	Soluble	Solid	9251	96699
560-44467-2	Bag House 3' North Exc South Wall	Soluble	Solid	9251	96699
560-44467-3	Bag House 3' North Exc East Wall North	Soluble	Solid	9251	96699
560-44467-4	Bag House 3' North Exc East Wall South	Soluble	Solid	9251	96699
560-44467-5	Bag House 3' North Exc West Wall North	Soluble	Solid	9251	96699
560-44467-6	Bag House 3' North Exc West Wall South	Soluble	Solid	9251	96699
560-44467-7	Bag House 3' North Exc North Bottom	Soluble	Solid	9251	96699
560-44467-8	Bag House 3' North Exc South Bottom	Soluble	Solid	9251	96699
560-44467-9	Bag House 3' West Exc North Wall	Soluble	Solid	9251	96699
560-44467-10	Bag House 3' West Exc South Wall	Soluble	Solid	9251	96699
560-44467-11	Bag House 3' West Exc East Wall	Soluble	Solid	9251	96699
560-44467-11 MS	Bag House 3' West Exc East Wall	Soluble	Solid	9251	96699
560-44467-11 MSD	Bag House 3' West Exc East Wall	Soluble	Solid	9251	96699
560-44467-12	Bag House 3' West Exc West Wall	Soluble	Solid	9251	96699
560-44467-13	Bag House 3' West Exc Bottom	Soluble	Solid	9251	96699
560-44467-14	Bag House 2' North Exc North Wall	Soluble	Solid	9251	96699
560-44467-15	Bag House 2' North Exc South Wall	Soluble	Solid	9251	96699
560-44467-16	Bag House 2' North Exc East Wall North	Soluble	Solid	9251	96699
560-44467-17	Bag House 2' North Exc East Wall South	Soluble	Solid	9251	96699

General Chemistry (Continued)

Analysis Batch: 96691 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-18	Bag House 2' North Exc West Wall North	Soluble	Solid	9251	96699
560-44467-19	Bag House 2' North Exc West Wall South	Soluble	Solid	9251	96699
560-44467-20	Bag House 2' North Exc West Wall North Bottom	Soluble	Solid	9251	96699
560-44467-21	Bag House 2' North Exc South Bottom	Soluble	Solid	9251	96699
560-44467-21 MS	Bag House 2' North Exc South Bottom	Soluble	Solid	9251	96699
560-44467-21 MSD	Bag House 2' North Exc South Bottom	Soluble	Solid	9251	96699
560-44467-22	Zigler's Pit Top Soil	Soluble	Solid	9251	96699
560-44467-23	Zigler's Pit Caliche	Soluble	Solid	9251	96699
560-44467-24	Bag House 1' Exc North Wall West	Soluble	Solid	9251	96699
560-44467-25	Bag House 1' Exc South Wall West	Soluble	Solid	9251	96699
560-44467-26	Bag House 1' Exc South Wall West Middle	Soluble	Solid	9251	96699
560-44467-27	Bag House 1' Exc South Wall East Middle	Soluble	Solid	9251	96699
560-44467-28	Bag House 1' Exc South Wall East	Soluble	Solid	9251	96699
560-44467-29	Bag House 1' Exc East Wall South	Soluble	Solid	9251	96699
560-44467-30	Bag House 1' Exc East Wall North	Soluble	Solid	9251	96699
560-44467-31	Bag House 1' Exc West Wall West	Soluble	Solid	9251	96699
560-44467-31 MS	Bag House 1' Exc West Wall West	Soluble	Solid	9251	96699
560-44467-31 MSD	Bag House 1' Exc West Wall West	Soluble	Solid	9251	96699
560-44467-32	Bag House 1' Exc West Wall South	Soluble	Solid	9251	96699
560-44467-33	Bag House 1' Exc North Bottom	Soluble	Solid	9251	96699
560-44467-34	Bag House 1' Exc North Middle Bottom	Soluble	Solid	9251	96699
560-44467-35	Bag House 1' Exc North East Bottom	Soluble	Solid	9251	96699
560-44467-36	Bag House 1' Exc East Middle Bottom	Soluble	Solid	9251	96699
560-44467-37	Bag House 1' Exc Southeast MIddle Bottom	Soluble	Solid	9251	96699
560-44467-38	Bag House 1' Exc Middle Bottom	Soluble	Solid	9251	96699
560-44467-39	Bag House 1' Exc North Wall East	Soluble	Solid	9251	96699
560-44467-40	Bag House 1' Exc West Middle Bottom	Soluble	Solid	9251	96699
560-44467-41	Bag House East 3' Exc North Wall	Soluble	Solid	9251	96699
560-44467-41 MS	Bag House East 3' Exc North Wall	Soluble	Solid	9251	96699
560-44467-41 MSD	Bag House East 3' Exc North Wall	Soluble	Solid	9251	96699
560-44467-42	Bag House East 3' Exc South Wall	Soluble	Solid	9251	96699
560-44467-43	Bag House East 3' Exc East Wall	Soluble	Solid	9251	96699
560-44467-44	Bag House East 3' Exc West Wall	Soluble	Solid	9251	96699
560-44467-45	Bag House East 3' Exc Bottom	Soluble	Solid	9251	96699
560-44467-46	RW-2 East 4' Exc East Wall	Soluble	Solid	9251	96699
LCS 560-96699/24-A	Lab Control Sample	Soluble	Solid	9251	96699
LCS 560-96699/2-A	Lab Control Sample	Soluble	Solid	9251	96699
LCS 560-96699/46-A	Lab Control Sample	Soluble	Solid	9251	96699
MB 560-96699/1-A	Method Blank	Soluble	Solid	9251	96699
MB 560-96699/23-A	Method Blank	Soluble	Solid	9251	96699
MB 560-96699/45-A	Method Blank	Soluble	Solid	9251	96699

Leach Batch: 96699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-1	Bag House 3' North Exc North Wall	Soluble	Solid	DI Leach	
560-44467-1 MS	Bag House 3' North Exc North Wall	Soluble	Solid	DI Leach	
560-44467-1 MSD	Bag House 3' North Exc North Wall	Soluble	Solid	DI Leach	
560-44467-2	Bag House 3' North Exc South Wall	Soluble	Solid	DI Leach	
560-44467-3	Bag House 3' North Exc East Wall North	Soluble	Solid	DI Leach	
560-44467-4	Bag House 3' North Exc East Wall South	Soluble	Solid	DI Leach	
560-44467-5	Bag House 3' North Exc West Wall North	Soluble	Solid	DI Leach	

General Chemistry (Continued)

Leach Batch: 96699 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
560-44467-6	Bag House 3' North Exc West Wall South	Soluble	Solid	DI Leach	
560-44467-7	Bag House 3' North Exc North Bottom	Soluble	Solid	DI Leach	
560-44467-8	Bag House 3' North Exc South Bottom	Soluble	Solid	DI Leach	
560-44467-9	Bag House 3' West Exc North Wall	Soluble	Solid	DI Leach	
560-44467-10	Bag House 3' West Exc South Wall	Soluble	Solid	DI Leach	
560-44467-11	Bag House 3' West Exc East Wall	Soluble	Solid	DI Leach	
560-44467-11 MS	Bag House 3' West Exc East Wall	Soluble	Solid	DI Leach	
560-44467-11 MSD	Bag House 3' West Exc East Wall	Soluble	Solid	DI Leach	
560-44467-12	Bag House 3' West Exc West Wall	Soluble	Solid	DI Leach	
560-44467-13	Bag House 3' West Exc Bottom	Soluble	Solid	DI Leach	
560-44467-14	Bag House 2' North Exc North Wall	Soluble	Solid	DI Leach	
560-44467-15	Bag House 2' North Exc South Wall	Soluble	Solid	DI Leach	
560-44467-16	Bag House 2' North Exc East Wall North	Soluble	Solid	DI Leach	
560-44467-17	Bag House 2' North Exc East Wall South	Soluble	Solid	DI Leach	
560-44467-18	Bag House 2' North Exc West Wall North	Soluble	Solid	DI Leach	
560-44467-19	Bag House 2' North Exc West Wall South	Soluble	Solid	DI Leach	
560-44467-20	Bag House 2' North Exc West Wall North Bottom	Soluble	Solid	DI Leach	
560-44467-21	Bag House 2' North Exc South Bottom	Soluble	Solid	DI Leach	
560-44467-21 MS	Bag House 2' North Exc South Bottom	Soluble	Solid	DI Leach	
560-44467-21 MSD	Bag House 2' North Exc South Bottom	Soluble	Solid	DI Leach	
560-44467-22	Zigler's Pit Top Soil	Soluble	Solid	DI Leach	
560-44467-23	Zigler's Pit Caliche	Soluble	Solid	DI Leach	
560-44467-24	Bag House 1' Exc North Wall West	Soluble	Solid	DI Leach	
560-44467-25	Bag House 1' Exc South Wall West	Soluble	Solid	DI Leach	
560-44467-26	Bag House 1' Exc South Wall West Middle	Soluble	Solid	DI Leach	
560-44467-27	Bag House 1' Exc South Wall East Middle	Soluble	Solid	DI Leach	
560-44467-28	Bag House 1' Exc South Wall East	Soluble	Solid	DI Leach	
560-44467-29	Bag House 1' Exc East Wall South	Soluble	Solid	DI Leach	
560-44467-30	Bag House 1' Exc East Wall North	Soluble	Solid	DI Leach	
560-44467-31	Bag House 1' Exc West Wall West	Soluble	Solid	DI Leach	
560-44467-31 MS	Bag House 1' Exc West Wall West	Soluble	Solid	DI Leach	
560-44467-31 MSD	Bag House 1' Exc West Wall West	Soluble	Solid	DI Leach	
560-44467-32	Bag House 1' Exc West Wall South	Soluble	Solid	DI Leach	
560-44467-33	Bag House 1' Exc North Bottom	Soluble	Solid	DI Leach	
560-44467-34	Bag House 1' Exc North Middle Bottom	Soluble	Solid	DI Leach	
560-44467-35	Bag House 1' Exc North East Bottom	Soluble	Solid	DI Leach	
560-44467-36	Bag House 1' Exc East Middle Bottom	Soluble	Solid	DI Leach	
560-44467-37	Bag House 1' Exc Southeast MIddle Bottom	Soluble	Solid	DI Leach	
560-44467-38	Bag House 1' Exc Middle Bottom	Soluble	Solid	DI Leach	
560-44467-39	Bag House 1' Exc North Wall East	Soluble	Solid	DI Leach	
560-44467-40	Bag House 1' Exc West Middle Bottom	Soluble	Solid	DI Leach	
560-44467-41	Bag House East 3' Exc North Wall	Soluble	Solid	DI Leach	
560-44467-41 MS	Bag House East 3' Exc North Wall	Soluble	Solid	DI Leach	
560-44467-41 MSD	Bag House East 3' Exc North Wall	Soluble	Solid	DI Leach	
560-44467-42	Bag House East 3' Exc South Wall	Soluble	Solid	DI Leach	
560-44467-43	Bag House East 3' Exc East Wall	Soluble	Solid	DI Leach	
560-44467-44	Bag House East 3' Exc West Wall	Soluble	Solid	DI Leach	
560-44467-45	Bag House East 3' Exc Bottom	Soluble	Solid	DI Leach	
560-44467-46	RW-2 East 4' Exc East Wall	Soluble	Solid	DI Leach	
LCS 560-96699/24-A	Lab Control Sample	Soluble	Solid	DI Leach	
LCS 560-96699/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

General Chemistry (Continued)

Leach Batch: 96699 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 560-96699/46-A	Lab Control Sample	Soluble	Solid	DI Leach	
MB 560-96699/1-A	Method Blank	Soluble	Solid	DI Leach	
MB 560-96699/23-A	Method Blank	Soluble	Solid	DI Leach	
MB 560-96699/45-A	Method Blank	Soluble	Solid	DI Leach	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 3' North Exc North Wall — Lab Sample ID: 560-44467-1

Date Collected: 12/17/13 14:00 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:40	LPO	TAL CC

Client Sample ID: Bag House 3' North Exc South Wall — Lab Sample ID: 560-44467-2

Date Collected: 12/17/13 14:05 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:43	LPO	TAL CC

Client Sample ID: Bag House 3' North Exc East Wall North — Lab Sample ID: 560-44467-3

Date Collected: 12/17/13 14:10 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:44	LPO	TAL CC

Client Sample ID: Bag House 3' North Exc East Wall South — Lab Sample ID: 560-44467-4

Date Collected: 12/17/13 14:15 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:44	LPO	TAL CC

Client Sample ID: Bag House 3' North Exc West Wall North — Lab Sample ID: 560-44467-5

Date Collected: 12/17/13 14:20 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:45	LPO	TAL CC

Client Sample ID: Bag House 3' North Exc West Wall South — Lab Sample ID: 560-44467-6

Date Collected: 12/17/13 14:25 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:46	LPO	TAL CC

Client Sample ID: Bag House 3' North Exc North Bottom — Lab Sample ID: 560-44467-7

Date Collected: 12/17/13 14:30 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		2	96691	12/30/13 08:47	LPO	TAL CC

Client Sample ID: Bag House 3' North Exc South Bottom — Lab Sample ID: 560-44467-8

Date Collected: 12/17/13 14:35 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		4	96691	12/30/13 08:47	LPO	TAL CC

Client Sample ID: Bag House 3' West Exc North Wall

Lab Sample ID: 560-44467-9

Date Collected: 12/18/13 14:30

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:48	LPO	TAL CC

Client Sample ID: Bag House 3' West Exc South Wall

Lab Sample ID: 560-44467-10

Date Collected: 12/18/13 14:35

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:48	LPO	TAL CC

Client Sample ID: Bag House 3' West Exc East Wall

Lab Sample ID: 560-44467-11

Date Collected: 12/18/13 14:40

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:50	LPO	TAL CC

Client Sample ID: Bag House 3' West Exc West Wall

Lab Sample ID: 560-44467-12

Date Collected: 12/18/13 14:45

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:51	LPO	TAL CC

Client Sample ID: Bag House 3' West Exc Bottom — Lab Sample ID: 560-44467-13

Date Collected: 12/18/13 14:50 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 10:22	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc North Wall — Lab Sample ID: 560-44467-14

Date Collected: 12/19/13 14:00 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:52	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc South Wall — Lab Sample ID: 560-44467-15

Date Collected: 12/19/13 14:05 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:53	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc East Wall North — Lab Sample ID: 560-44467-16

Date Collected: 12/19/13 14:10 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:53	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc East Wall South — Lab Sample ID: 560-44467-17

Date Collected: 12/19/13 14:15 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:54	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc West Wall North — Lab Sample ID: 560-44467-18

Date Collected: 12/19/13 14:20 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:54	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc West Wall South — Lab Sample ID: 560-44467-19

Date Collected: 12/19/13 14:25 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:55	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc West Wall North Bottom — Lab Sample ID: 560-44467-20

Date Collected: 12/19/13 14:30 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96566	12/24/13 11:39	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 08:55	LPO	TAL CC

Client Sample ID: Bag House 2' North Exc South Bottom

Lab Sample ID: 560-44467-21

Date Collected: 12/19/13 14:35

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:10	LPO	TAL CC

Client Sample ID: Zigler's Pit Top Soil

Lab Sample ID: 560-44467-22

Date Collected: 12/19/13 13:45

Matrix: Solid

Date Received: 12/21/13 16:30

Percent Solids: 94.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	96682	12/30/13 15:35	RJT	TAL CC
Total/NA	Prep	TX_1005_S_Prep			96555	12/24/13 10:07	DRB	TAL CC
Total/NA	Analysis	TX 1005		1	96549	12/24/13 14:55	GEF	TAL CC
Total/NA	Analysis	6010B		1	96676	12/27/13 14:47	EDR	TAL CC
Total/NA	Prep	7471A			96750	12/31/13 10:30	JEM	TAL CC
Total/NA	Analysis	7471A		1	96746	12/31/13 15:23	JEM	TAL CC
Total/NA	Prep	3050B			96609	12/26/13 10:30	MIG	TAL CC
Total/NA	Analysis	6010B		1	96751	12/31/13 15:41	MIG	TAL CC
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:13	LPO	TAL CC

Client Sample ID: Zigler's Pit Caliche

Lab Sample ID: 560-44467-23

Date Collected: 12/19/13 13:50

Matrix: Solid

Date Received: 12/21/13 16:30

Percent Solids: 98.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	96682	12/30/13 16:01	RJT	TAL CC
Total/NA	Prep	TX_1005_S_Prep			96555	12/24/13 10:07	DRB	TAL CC
Total/NA	Analysis	TX 1005		1	96549	12/24/13 15:02	GEF	TAL CC
Total/NA	Analysis	6010B		1	96676	12/27/13 14:52	EDR	TAL CC
Total/NA	Prep	7471A			96750	12/31/13 10:30	JEM	TAL CC
Total/NA	Analysis	7471A		1	96746	12/31/13 15:25	JEM	TAL CC
Total/NA	Prep	3050B			96609	12/26/13 10:30	MIG	TAL CC
Total/NA	Analysis	6010B		1	96751	12/31/13 15:45	MIG	TAL CC
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:13	LPO	TAL CC

Client Sample ID: Bag House 1' Exc North Wall West — Lab Sample ID: 560-44467-24

Date Collected: 12/20/13 12:30 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		2	96691	12/30/13 10:22	LPO	TAL CC

Client Sample ID: Bag House 1' Exc South Wall West — Lab Sample ID: 560-44467-25

Date Collected: 12/20/13 12:35 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:15	LPO	TAL CC

Client Sample ID: Bag House 1' Exc South Wall West Middle — Lab Sample ID: 560-44467-26

Date Collected: 12/20/13 12:40 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:16	LPO	TAL CC

Client Sample ID: Bag House 1' Exc South Wall East Middle — Lab Sample ID: 560-44467-27

Date Collected: 12/20/13 12:45 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:17	LPO	TAL CC

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House 1' Exc South Wall East — Lab Sample ID: 560-44467-28

Date Collected: 12/20/13 12:50 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:17	LPO	TAL CC

Client Sample ID: Bag House 1' Exc East Wall South — Lab Sample ID: 560-44467-29

Date Collected: 12/20/13 12:55 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:18	LPO	TAL CC

Client Sample ID: Bag House 1' Exc East Wall North — Lab Sample ID: 560-44467-30

Date Collected: 12/20/13 13:00 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:18	LPO	TAL CC

Client Sample ID: Bag House 1' Exc West Wall West — Lab Sample ID: 560-44467-31

Date Collected: 12/20/13 13:05 — **Matrix: Solid**
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:20	LPO	TAL CC

Client Sample ID: Bag House 1' Exc West Wall South

Lab Sample ID: 560-44467-32

Date Collected: 12/20/13 13:10

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:21	LPO	TAL CC

Client Sample ID: Bag House 1' Exc North Bottom

Lab Sample ID: 560-44467-33

Date Collected: 12/20/13 13:15

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:22	LPO	TAL CC

Client Sample ID: Bag House 1' Exc North Middle Bottom

Lab Sample ID: 560-44467-34

Date Collected: 12/20/13 13:20

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96536	12/23/13 16:53	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:22	LPO	TAL CC

Client Sample ID: Bag House 1' Exc North East Bottom

Lab Sample ID: 560-44467-35

Date Collected: 12/20/13 13:25

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96536	12/23/13 16:53	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:23	LPO	TAL CC

Client Sample ID: Bag House 1' Exc East Middle Bottom

Lab Sample ID: 560-44467-36

Date Collected: 12/20/13 13:30

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96536	12/23/13 16:53	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:23	LPO	TAL CC

Client Sample ID: Bag House 1' Exc Southeast MIddle Bottom

Lab Sample ID: 560-44467-37

Date Collected: 12/20/13 15:35

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96536	12/23/13 16:53	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:24	LPO	TAL CC

Client Sample ID: Bag House 1' Exc Middle Bottom

Lab Sample ID: 560-44467-38

Date Collected: 12/20/13 13:35

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96536	12/23/13 16:53	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:24	LPO	TAL CC

Client Sample ID: Bag House 1' Exc North Wall East

Lab Sample ID: 560-44467-39

Date Collected: 12/20/13 13:40

Matrix: Solid

Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96536	12/23/13 16:53	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:25	LPO	TAL CC

Client Sample ID: Bag House 1' Exc West Middle Bottom

Lab Sample ID: 560-44467-40

Date Collected: 12/20/13 13:45
Matrix: Solid
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 09:25	LPO	TAL CC

Client Sample ID: Bag House East 3' Exc North Wall

Lab Sample ID: 560-44467-41

Date Collected: 12/20/13 14:00
Matrix: Solid
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 10:18	LPO	TAL CC

Client Sample ID: Bag House East 3' Exc South Wall

Lab Sample ID: 560-44467-42

Date Collected: 12/20/13 14:05
Matrix: Solid
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 10:19	LPO	TAL CC

Client Sample ID: Bag House East 3' Exc East Wall

Lab Sample ID: 560-44467-43

Date Collected: 12/20/13 14:10
Matrix: Solid
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 10:20	LPO	TAL CC

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Client Sample ID: Bag House East 3' Exc West Wall

Lab Sample ID: 560-44467-44

Date Collected: 12/20/13 14:15
Matrix: Solid
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 10:20	LPO	TAL CC

Client Sample ID: Bag House East 3' Exc Bottom

Lab Sample ID: 560-44467-45

Date Collected: 12/20/13 14:20
Matrix: Solid
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 15:30	OV56	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 10:21	LPO	TAL CC

Client Sample ID: RW-2 East 4' Exc East Wall

Lab Sample ID: 560-44467-46

Date Collected: 12/20/13 15:00
Matrix: Solid
Date Received: 12/21/13 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	96567	12/24/13 11:44	DRB	TAL CC
Soluble	Analysis	9050A		1	96669	12/27/13 15:30	OV56	TAL CC
Soluble	Leach	DI Leach			96668	12/27/13 16:21	OV56	TAL CC
Soluble	Leach	DI Leach			96699	12/27/13 14:00	LPO	TAL CC
Soluble	Analysis	9251		1	96691	12/30/13 10:21	LPO	TAL CC

Laboratory References:

TAL CC = TestAmerica Corpus Christi, 1733 N. Padre Island Drive, Corpus Christi, TX 78408, TEL (361)289-2673

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Laboratory: TestAmerica Corpus Christi

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Kansas	NELAP	7	E-10362	10-31-14
Oklahoma	State Program	6	9968	08-31-14
Texas	NELAP	6	T104704210	03-31-14
USDA	Federal		P330-11-00060	02-03-14

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CC
TX 1005	Texas - Total Petroleum Hydrocarbon (GC)	TCEQ	TAL CC
6010B	Metals (ICP)	SW846	TAL CC
7471A	Mercury (CVAA)	SW846	TAL CC
9050A	Specific Conductance	SW846	TAL CC
9251	Chloride	SW846	TAL CC
Moisture	Percent Moisture	EPA	TAL CC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TCEQ = Texas Commission of Environmental Quality

Laboratory References:

TAL CC = TestAmerica Corpus Christi, 1733 N. Padre Island Drive, Corpus Christi, TX 78408, TEL (361)289-2673

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: MT001133.0001-Jal, NM

TestAmerica Job ID: 560-44467-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
560-44467-1	Bag House 3' North Exc North Wall	Solid	12/17/13 14:00	12/21/13 16:30
560-44467-2	Bag House 3' North Exc South Wall	Solid	12/17/13 14:05	12/21/13 16:30
560-44467-3	Bag House 3' North Exc East Wall North	Solid	12/17/13 14:10	12/21/13 16:30
560-44467-4	Bag House 3' North Exc East Wall South	Solid	12/17/13 14:15	12/21/13 16:30
560-44467-5	Bag House 3' North Exc West Wall North	Solid	12/17/13 14:20	12/21/13 16:30
560-44467-6	Bag House 3' North Exc West Wall South	Solid	12/17/13 14:25	12/21/13 16:30
560-44467-7	Bag House 3' North Exc North Bottom	Solid	12/17/13 14:30	12/21/13 16:30
560-44467-8	Bag House 3' North Exc South Bottom	Solid	12/17/13 14:35	12/21/13 16:30
560-44467-9	Bag House 3' West Exc North Wall	Solid	12/18/13 14:30	12/21/13 16:30
560-44467-10	Bag House 3' West Exc South Wall	Solid	12/18/13 14:35	12/21/13 16:30
560-44467-11	Bag House 3' West Exc East Wall	Solid	12/18/13 14:40	12/21/13 16:30
560-44467-12	Bag House 3' West Exc West Wall	Solid	12/18/13 14:45	12/21/13 16:30
560-44467-13	Bag House 3' West Exc Bottom	Solid	12/18/13 14:50	12/21/13 16:30
560-44467-14	Bag House 2' North Exc North Wall	Solid	12/19/13 14:00	12/21/13 16:30
560-44467-15	Bag House 2' North Exc South Wall	Solid	12/19/13 14:05	12/21/13 16:30
560-44467-16	Bag House 2' North Exc East Wall North	Solid	12/19/13 14:10	12/21/13 16:30
560-44467-17	Bag House 2' North Exc East Wall South	Solid	12/19/13 14:15	12/21/13 16:30
560-44467-18	Bag House 2' North Exc West Wall North	Solid	12/19/13 14:20	12/21/13 16:30
560-44467-19	Bag House 2' North Exc West Wall South	Solid	12/19/13 14:25	12/21/13 16:30
560-44467-20	Bag House 2' North Exc West Wall North Bottom	Solid	12/19/13 14:30	12/21/13 16:30
560-44467-21	Bag House 2' North Exc South Bottom	Solid	12/19/13 14:35	12/21/13 16:30
560-44467-22	Zigler's Pit Top Soil	Solid	12/19/13 13:45	12/21/13 16:30
560-44467-23	Zigler's Pit Caliche	Solid	12/19/13 13:50	12/21/13 16:30
560-44467-24	Bag House 1' Exc North Wall West	Solid	12/20/13 12:30	12/21/13 16:30
560-44467-25	Bag House 1' Exc South Wall West	Solid	12/20/13 12:35	12/21/13 16:30
560-44467-26	Bag House 1' Exc South Wall West Middle	Solid	12/20/13 12:40	12/21/13 16:30
560-44467-27	Bag House 1' Exc South Wall East Middle	Solid	12/20/13 12:45	12/21/13 16:30
560-44467-28	Bag House 1' Exc South Wall East	Solid	12/20/13 12:50	12/21/13 16:30
560-44467-29	Bag House 1' Exc East Wall South	Solid	12/20/13 12:55	12/21/13 16:30
560-44467-30	Bag House 1' Exc East Wall North	Solid	12/20/13 13:00	12/21/13 16:30
560-44467-31	Bag House 1' Exc West Wall West	Solid	12/20/13 13:05	12/21/13 16:30
560-44467-32	Bag House 1' Exc West Wall South	Solid	12/20/13 13:10	12/21/13 16:30
560-44467-33	Bag House 1' Exc North Bottom	Solid	12/20/13 13:15	12/21/13 16:30
560-44467-34	Bag House 1' Exc North Middle Bottom	Solid	12/20/13 13:20	12/21/13 16:30
560-44467-35	Bag House 1' Exc North East Bottom	Solid	12/20/13 13:25	12/21/13 16:30
560-44467-36	Bag House 1' Exc East Middle Bottom	Solid	12/20/13 13:30	12/21/13 16:30
560-44467-37	Bag House 1' Exc Southeast MIddle Bottom	Solid	12/20/13 15:35	12/21/13 16:30
560-44467-38	Bag House 1' Exc Middle Bottom	Solid	12/20/13 13:35	12/21/13 16:30
560-44467-39	Bag House 1' Exc North Wall East	Solid	12/20/13 13:40	12/21/13 16:30
560-44467-40	Bag House 1' Exc West Middle Bottom	Solid	12/20/13 13:45	12/21/13 16:30
560-44467-41	Bag House East 3' Exc North Wall	Solid	12/20/13 14:00	12/21/13 16:30
560-44467-42	Bag House East 3' Exc South Wall	Solid	12/20/13 14:05	12/21/13 16:30
560-44467-43	Bag House East 3' Exc East Wall	Solid	12/20/13 14:10	12/21/13 16:30
560-44467-44	Bag House East 3' Exc West Wall	Solid	12/20/13 14:15	12/21/13 16:30
560-44467-45	Bag House East 3' Exc Bottom	Solid	12/20/13 14:20	12/21/13 16:30
560-44467-46	RW-2 East 4' Exc East Wall	Solid	12/20/13 15:00	12/21/13 16:30

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: ARCADIS	Project Manager: Hank McConnell	Date: 12/20/13	Chain of Custody Number: 061259
Address: 1004 N Big Spring St Ste 300	Telephone Number (Area Code)/Fax Number: 432-687-5400 / 432-687-5401	Lab: Loc: 560 44467	Page 1 of 4
City: Midland State: TX Zip Code: 79701	Site Contact: Hank McConnell Lab Contact: Tim Kellogg	Analysis (more sp...)	
Project Name and Location (State): MT001133.0001 - Jal, NM	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.: - Bill to Kinder Morgan			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Electrical Conductivity	Chlorides	
Bag House 3' North Exc North Wall	12/7/13	1400				X	X						X	X	
Bag House 3' North Exc South Wall	12/7/13	1405				X	X						X	X	
Bag House 3' North Exc East Wall North	12/7/13	1410				X	X						X	X	
Bag House 3' North Exc East Wall South	12/7/13	1415				X	X						X	X	
Bag House 3' North Exc West Wall North	12/7/13	1420				X	X						X	X	
Bag House 3' North Exc West Wall South	12/7/13	1425				X	X						X	X	
Bag House 3' North Exc North Bottom	12/7/13	1430				X	X						X	X	
Bag House 3' North Exc South Bottom	12/7/13	1435				X	X						X	X	
Bag House 3' West Exc North Wall	12/8/13	1430				X	X						X	X	
Bag House 3' West Exc South Wall	12/8/13	1435				X	X						X	X	
Bag House 3' West Exc East Wall	12/8/13	1440				X	X						X	X	
Bag House 3' West Exc West Wall	12/8/13	1445				X	X						X	X	

Special Instructions/ Conditions of Receipt

560-44467 Chain of Custody

4.3 | 4.2
IR4 Sal

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other Standard

QC Requirements (Specify)

1. Relinquished By: Max Key	Date: 12/20/13	Time: 1805	1. Received By:	Date: 12-21-13	Time: 4:30
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Page 44 of 48

1/6/2014

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
ARCADIS	Hank McConnell	12/20/13	061260
Address 1004 N Big Spring St Ste 300	**Telephone Number (Area Code)/Fax Number** 4321687400 / 4321687401	**Lab Number**	**Page** 2 of 4
City Midland **State** TX **Zip Code** 79701	**Site Contact** Hank McConnell **Lab Contact** Tim Kellogg	**Analysis (Attach list if more space is needed)**	
Project Name and Location (State) MT001133.0001 - Jal, NM	**Carrier/Waybill Number**		
Contract/Purchase Order/Quote No. - Bill to Kinder Morgan			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Electrical Conductivity	Chlorides	TPH	BTEX	RCRA 8 Metals	Special Instructions/ Conditions of Receipt
Bag House 3' West Exc Bottom	12/8/13	1450				X	X						X	X				
Bag House 2' North Exc North Wall	12/9/13	1400				X	X						X	X				
Bag House 2' North Exc South Wall	12/9/13	1405				X	X						X	X				
Bag House 2' North Exc East Wall North	12/9/13	1410				X	X						X	X				
Bag House 2' North Exc East Wall South	12/9/13	1415				X	X						X	X				
Bag House 2' North Exc West Wall North	12/9/13	1420				X	X						X	X				4.3/4.2
Bag House 2' North Exc West Wall South	12/9/13	1425				X	X						X	X				IR Seal
Bag House 2' North Exc North Bottom	12/9/13	1430				X	X						X	X				
Bag House 2' North Exc South Bottom	12/9/13	1435				X	X						X	X				
Zigler's Pit Top Soil	12/9/13	1345				X	X							X	X	X	X	
Zigler's Pit Caliche	12/9/13	1350				X	X							X	X	X	X	
Bag House 1' Exc North Wall West	12/20/13	1230				X	X						X	X				

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Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other Standard

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Max Hey	12/20/13		1. Received By: RWM	12-21-13	4:30
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1/6/2014

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: ARCADIS	Project Manager: Hank McConnell	Date: 12/20/13	Chain of Custody Number: 061264
Address: 1004 N Big Spring St Ste 300	Telephone Number (Area Code)/Fax Number: 4326315400/4326875401	Lab Number:	Page 3 of 4
City: Midland / State: TX / Zip Code: 79701	Site Contact: Hank McConnell	Lab Contact: Tim Kellogg	
Project Name and Location (State): MTB01133.0001 - Jal, NM	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.: - Bill to Kinder Morgan			

Analysis (Attach list if more space is needed): Electrical Conductivity; Chlorides

Special Instructions/ Conditions of Receipt: 4.3/4.2 IR Seal

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH
BagHouse1'Exc SouthWallWest	122013	1235				X	X					
BagHouse1'Exc SouthWallWestMiddle	122013	1240				X	X					
BagHouse1'Exc SouthWallEastMiddle	122013	1245				X	X					
BagHouse1'Exc SouthWallEast	122013	1250				X	X					
BagHouse1'Exc EastWallSouth	122013	1255				X	X					
BagHouse1'Exc EastWallNorth	122013	1300				X	X					
BagHouse1'Exc WestWallWest	122013	1305				X	X					
BagHouse1'Exc WestWallSouth	122013	1310				X	X					
BagHouse1'Exc NorthBottom	122013	1315				X	X					
BagHouse1'Exc NorthMiddleBottom	122013	1320				X	X					
BagHouse1'Exc NorthEastBottom	122013	1325				X	X					
BagHouse1'Exc EastMiddleBottom	122013	1330				X	X					

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other Standard

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By: Max Key	12/20/13	1805	1. Received By: RWM	12-21-13	4:30
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1/6/2014

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: ARCADIS	Project Manager: Hank McConnell	Date: 12/20/13	Chain of Custody Number: 061263
Address: 1004 N Big Spring St Ste 300	Telephone Number (Area Code)/Fax Number: 4326875400/4326875401	Lab Number:	Page 4 of 4
City: Midland / State: TX / Zip Code: 79701	Site Contact: Hank McConnell	Lab Contact: Tim Kellogg	Analysis (Attach list if more space is needed)
Project Name and Location (State): MT001133.0001 - Jal, NM	Carrier/Waybill Number:		Special Instructions/ Conditions of Receipt
Contract/Purchase Order/Quote No.: Bill to Kinder Morgan			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Electrical Conductivity	Chlorides	Special Instructions/ Conditions of Receipt
BagHouse 1' Exc Southeast Middle Bottom	122013	1335				X	X						X	X	
BagHouse 1' Exc Middle Bottom	122013	1335				X	X						X	X	
BagHouse 1' Exc North Wall East	122013	1340				X	X						X	X	
BagHouse 1' Exc West Middle Bottom	122013	1345				X	X						X	X	
BagHouse East 3' Exc North Wall	122013	1400				X	X						X	X	4.3/4.7
BagHouse East 3' Exc South Wall	122013	1405				X	X						X	X	IRI Seal
BagHouse East 3' Exc East Wall	122013	1410				X	X						X	X	
BagHouse East 3' Exc West Wall	122013	1415				X	X						X	X	
BagHouse East 3' Exc Bottom	122013	1420				X	X						X	X	
RW-2 East 4' Exc East Wall	122013	1500				X	X						X	X	
Temp Blank															

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other Standard

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Max Key	12/20/13	1805	1. Received By:	12-21-13	9:30
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1/6/2014

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 560-44467-1

Login Number: 44467

List Source: TestAmerica Corpus Christi

List Number: 1

Creator: Rood, Vivian R

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix H

Benham, 2009. Remedial Action Plan

The Benham Companies, LLC
One West 3rd Street, Suite 100
Tulsa, OK 74103

Telephone 918.492.1600
Fax 918.496.0132

info@benham.com
www.benham.com
www.saic.com

November 6, 2009

Mr. Doug Stavinoha
Project Manager
El Paso Natural Gas Company
1001 Louisiana Street
Houston, Texas 77002

Re: Remedial Action Plan
Brine Impacted Soil
Jal No. 4 Gas Plant
Lea County, New Mexico
IRP #2026

Dear Mr. Stavinoha:

Please find enclosed one copy of the Remedial Action Plan (RAP) for Brine Impacted Soil at the Jal No.4 Gas Plant (Site) located in Lea County, New Mexico.

As we discussed, Benham's investigation was restricted to collection and analyses of a limited number of environmental samples and visual observations obtained during the physical site visit, and from records made available by EPNG or third parties during the investigation. Because the investigation consisted of collecting and evaluating a limited supply of information, Benham may not have identified all potential items of concern and, therefore, Benham warrants only that the project activities under this contract have been performed within the parameters and scope communicated by EPNG and reflected in the contract. This report is intended to be used in its entirety. Taking or using in any way excerpts from this report are not permitted and any party doing so does so at its own risk. In preparing this report, Benham has relied on verbal and written information provided by secondary sources and interviews, including information provided by EPNG. Because the assessment consisted of evaluating a limited supply of information, Benham may not have identified all potential items of concern and/or discrepancies and, therefore, Benham warrants only that the project activities under this contract have been performed within the parameters and scope communicated by EPNG and reflected in the contract. Benham has made no independent investigations concerning the accuracy or completeness of the information relied upon. EPNG acknowledges that Benham has not contributed to the presence of hazardous

substances, hazardous wastes, petroleum products, asbestos, chemicals, pollutants, contaminants, or any other hazardous or toxic materials (hereinafter Hazardous Materials) that may exist or be discovered in the future at the site and that Benham does not assume any liability for the known or unknown presence of Hazardous Materials.

If you have any questions regarding this Report, please do not hesitate to contact me at (918) 599-4383.

Sincerely,
The Benham Companies, LLC

Bruce E. McKenzie, P.G.
Project Manager

Enclosure: Remedial Action Plan

The Benham Companies, LLC
One West 3rd Street, Suite 100
Tulsa, OK 74103

Telephone 918.492.1600
Fax 918.496.0132

info@benham.com
www.benham.com
www.saic.com

November 6, 2009

Mr. Larry Johnson
Environmental Engineer
New Mexico Oil Conservation Division
District 1 Office
1625 North French Drive
Hobbs, New Mexico 88240

Re: Remedial Action Plan
Brine Impacted Soil
Jal No. 4 Gas Plant
Lea County, New Mexico
IRP #2026

Dear Mr. Johnson:

The Benham Companies, LLC (Benham), on behalf of El Paso Natural Gas Company (EPNG), hereby submits the enclosed Remedial Action Plan (RAP) for Brine Impacted Soil at the Jal No.4 Gas Plant (Site) located in Lea County, New Mexico for your approval. The above referenced document is in response to the chloride impacted water released from a corroded filter housing integral to the groundwater remediation system operating at the Site. The enclosed RAP details the proposed remediation of the soil impacted by the spill.

EPNG requests written approval of the RAP so that preparations for the field remedial activities can be initiated as soon as possible. If you have any questions regarding the RAP, please do not hesitate to contact me at (918) 599-4383 or Mr. Doug Stavinoha at (713) 420-5150.

Sincerely,
The Benham Companies, LLC

Bruce E. McKenzie, P.G.
Project Manager

REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL
JAL NO. 4 GAS PLANT
LEA COUNTY, NEW MEXICO
IRP #2026

Prepared for:

El Paso Natural Gas Company
1001 Louisiana Street
Houston, Texas 77002
(713) 420-5150

Prepared by:

The Benham Companies, LLC
One West Third Street, Suite 100
Tulsa, Oklahoma 74103
(918) 492-1600

November 6, 2009

BENHAM

an SAIC company

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EL PASO NATURAL GAS COMPANY
JAL NO. 4 GAS PLANT, LEA COUNTY, NEW MEXICO
REMEDIAL ACTION PLAN FOR BRINE IMPACTED SOIL
November 6, 2009

1.0 INTRODUCTION

The Jal No. 4 Gas Plant (Plant) was constructed by El Paso Natural Gas Company (EPNG) in 1952 to treat, compress and transport natural gas to EPNG's main transmission lines. EPNG discontinued use of the Plant in 1987, leasing portions of the Plant property to Christie Gas Corporation (Christie) that same year. The Plant was eventually sold to Christie in 1991. In December 2002, Christie sold the Plant to Texas LPG Storage Company (Texas LPG). In March 2008, Texas LPG sold the plant to Western Refining, Inc. (WFI). WFI is the current owner of the Jal No. 4 Plant property. Throughout these transactions, EPNG has retained the environmental liability for groundwater impacts due to historic operations at the Plant. The location of the Plant property and topographic features are shown on **Figure 1**.

Brine and wastewater at the Plant were managed in 8 unlined retention ponds from 1952 to 1981. Beginning in 1981, brine at the Plant was managed in 3 synthetic-lined retention ponds. In 1989, a leak was detected in one of the brine retention ponds and EPNG elected to close 2 of the ponds. In response to the detected leak, the New Mexico Oil Conservation Division (NMOCD) requested that EPNG perform a hydrologic study. This request led to the drilling of 3 groundwater monitoring wells and a limited groundwater study at the site in May 1989. The preliminary findings of this study indicated that brine-impacted groundwater was present beneath the Plant. Subsequent to this discovery, numerous investigations have been conducted by EPNG at the Plant to characterize and delineate the affected groundwater plume.

To date, 18 groundwater monitoring wells and 1 piezometer have been installed. These wells are located generally along the east side of the Plant property, and on off-site properties located east and southeast of the Plant. In addition to these groundwater monitoring wells, 2 groundwater recovery wells (RW-1 and RW-2) have been installed and 3 monitoring wells (ENSR-2, ACW-3 and ACW-8) have been converted to recover impacted groundwater and to prevent downgradient migration. The locations of the monitoring and recovery wells are shown on **Figure 2**. Impacted groundwater recovery was initiated in recovery well RW-1 in October 1999, and in recovery well RW-2 in January 2000. ENSR-2 commenced groundwater recovery in 2000, and ACW-3 and ACW-8 commenced groundwater recovery in 2005. Recovered groundwater recovered by the remediation system is disposed via an existing on-site injection well that is currently owned by WFI.

On October 27, 2008, a filter housing integral to the groundwater remediation/disposal system leaked, resulting in a release of approximately 35 barrels of high chloride water to the ground surface east and southeast of the filter building. The filter building is located off-site, to the north of the Jal No. 4 property, as shown on **Figure 2**. Upon discovery of the release, EPNG recovered approximately 25 barrels of this water utilizing a vac-truck. This Remedial Action Plan (RAP) presents analytical data generated to delineate the lateral and vertical extent of the brine impacted soils, the mechanism utilized by the NMOCD to rank and develop remediation goals for the site, and the methodologies to be employed to remediate the affected soils.

1.1 SITE DESCRIPTION

The Plant property is comprised of approximately 181 acres of land located west of State Highway 18, approximately 9 miles north of the town of Jal, New Mexico. As shown on **Figure 1**, the Plant property occupies portions of Sections 31 and 32 of Township 23 South, Range 37 East, and Sections 5 and 6 of Township 24 South, Range 37 East in Lea County, New Mexico.

Off-site groundwater monitoring and recovery wells installed to delineate and remediate the brine impacted groundwater are located east of State Highway 18. These off-site monitoring wells are located in Sections 5 and 6 of Township 24 South, Range 37 East. The area affected by the impacted groundwater release is located in Section 32 of Township 23 South, Range 37 East and is shown on **Figure 2**.

1.2 INVESTIGATION

As previously stated, on October 27, 2008 a filter housing integral to the groundwater remediation/disposal system failed resulting in a release of approximately 30 barrels of high-chloride water to the ground surface east and southeast of the filter building. Upon discovery of the release, EPNG recovered approximately 25 barrels of this water utilizing a vac-truck. On November 5, 2008, EPNG submitted *Release Notification and Corrective Action Form C-141* to the NMOCD reporting the release. The activities performed to implement the impacted soil investigation are described below. A copy of the Form C-141 filed by EPNG has been provided in **Appendix A**.

1.2.1 February 2009 Investigation

During the period February 3-4, 2009, to delineate the horizontal and vertical extent of the impacted soil, The Benham Companies, LLC (Benham), on behalf of EPNG, installed 10 soil borings to an approximate depth of 3 feet below ground level (bgl) in the potentially impacted area. Soil samples were collected on one foot intervals from the surface to total depth within each borehole. Field electrical conductance (EC) tests were conducted on each sample interval. A total of 30 field EC measurements were conducted during this phase of the investigation. These field EC tests were used as a

screening tool to ensure that the boring/sampling activities progressed to a depth interval below the lower limit of the impacted soil. Each field EC test was conducted by combining equal volumes of soil and de-ionized water within a clean sealable plastic bag. Following soil and water combination, the plastic bag was sealed and labeled as to source. The soil/water mixture was then mixed thoroughly and allowed to stand for approximately 30 minutes. Following this period, the EC of the soil/water mixture was measured with an electrical conductance meter. An EC value of 4 milliSiemens per centimeter (mS/cm) or less indicated that the sample collected was below the lower limit. The field meter units of mS/cm are, in general, equivalent to millimhos per centimeter (mmhos/cm), the units in which laboratory EC data are presented.

A total of 30 soil samples were collected from the 10 borings. Upon collection, an aliquot of each soil sample was placed directly into a clean, sealable, plastic bag, labeled as to source and placed under chain-of-custody control for transport to the analytical laboratory (Environmental Testing, Inc., Oklahoma City, Oklahoma) for analysis of EC. An additional aliquot of each soil sample was placed into a clean, sealable, plastic bag. After approximately 30 minutes at ambient temperature, the headspace within each bag was evaluated with an organic vapor meter (OVM). In each boring, the sampled interval exhibiting the highest OVM headspace reading was selected for submittal to the analytical laboratory (Southern Petroleum Laboratories, Houston, Texas) for benzene, toluene, ethylbenzene, and total xylenes (BTEX) analyses. A total of 10 soil samples were submitted to the laboratory for BTEX analysis.

Upon completion of soil boring/sampling activities, the soil borings were properly plugged from total depth to the surface.

1.2.2 February 2009 Investigation Results

Field EC measurements were obtained from the 0-1' bgl interval, the 1'-2' bgl interval and the 2'-3' bgl interval of each of the 10 borings. Soil samples HA-2 (0-1'), HA-7 (0-1') and HA-8 (0-1') contained EC field values greater than 4 mS/cm, a common screening level for brine impacts to soil further discussed in Section 1.6. The field EC of the 1'-2' bgl and 2'-3' bgl sample intervals within each of the 10 borings all measured below 4 mS/cm. These field measurements are summarized in **Table 1**.

Of the 30 samples submitted to the analytical laboratory, 24 contained laboratory EC results greater than 4 mmhos/cm. All 10 the samples from the 0-1' bgl interval exhibited EC values greater than 4 mmhos/cm. Seven of the 10 samples from the 1'-2' bgl interval exhibited EC values greater than 4 mmhos/cm. These samples included: HA-1 (1'-2') (16,000 µmhos/cm), HA-2 (1'-2') (10,800 µmhos/cm), HA-3 (1'-2') (6,450 µmhos/cm),

HA-4 (1'-2') (10,600 µmhos/cm), HA-6 (1'-2') (5,630 µmhos/cm), HA-7 (1'-2') (5,070 µmhos/cm) and HA-8 (1'-2') (6,210 µmhos/cm). Soil samples HA-5 (1'-2'), HA-9 (1'-2') and HA-10 (1'-2') exhibited EC levels below 4,000 µmhos/cm. Seven of the 10 samples from the 2'-3' bgl interval exhibited EC levels greater than 4 mmhos/cm (4,000 µmhos/cm). These samples included: HA-1 (2'-3') (8,810 µmhos/cm), HA-2 (2'-3') (7,510 µmhos/cm), HA-3 (2'-3') (11,800 µmhos/cm), HA-4 (2'-3') (12,400 µmhos/cm), HA-6 (2'-3') (11,000 µmhos/cm), HA-8 (2'-3') (14,300 µmhos/cm) and HA-10 (2'-3') (13,600 µmhos/cm). Soil samples HA-5 (2'-3'), HA-7 (2'-3') and HA-9 (2'-3') exhibited EC levels below 4,000 µmhos/cm. These laboratory analytical results are summarized in **Table 2**, and complete copies of the laboratory analytical reports are provided in **Appendix B**.

Soil sample HA-1 (0-1") contained a detectable concentration of toluene, 1.9 micorgrams per kilogram (µg/kg), that is well below the NWOCD action level of 5,000 µg/kg. No other concentrations of BTEX were observed in these soil samples. These laboratory analytical results are summarized in **Table 3**, and complete copies of the laboratory analytical reports are provided in **Appendix B**. Based upon the laboratory analytical results for these soil samples, BTEX has been eliminated as a potential constituent of concern for this RAP. Based upon the analytical results from this initial phase of investigation it was determined that the lateral and vertical extent of the brine impacted soil was not delineated and that additional sampling was warranted.

1.2.3 May 2009 Investigation

During the period May 5-7, 2009, to further delineate the horizontal and vertical extent of the impacted soil, Benham installed an additional 25 soil borings ranging in depth from 1 to 8 feet bgl in the potentially impacted area. Soil samples were collected on 1 foot intervals from the surface to total depth from within each borehole. The field EC measurements taken during the February 2009 phase of investigation did not correlate with the laboratory EC values, therefore, no field EC measurements were conducted during this phase of the investigation.

A total of 128 soil samples were collected from the 25 borings. Upon collection, an aliquot of each soil sample was placed directly into a clean, sealable, plastic bag, labeled as to source and placed under chain-of-custody control for transport to the analytical laboratory. Of the 128 total samples, 35 samples from 7 soil borings were held for analysis pending the results of other delineation samples. Upon receipt of the analytical data from the soil samples initially submitted, 20 of the held soil samples were submitted to the analytical laboratory for EC analysis.

Upon completion of soil boring/sampling activities, the soil borings were properly plugged from total depth to the surface.

1.2.4 May 2009 Investigation Results

A total of 113 soil samples were submitted to the analytical laboratory for EC analysis during this phase of investigation.

Soil samples were collected from soil borings HA-33 and HA-34 located in an upgradient, outlying area to demonstrate the background levels of EC in the surrounding soils. All of the soil samples taken from background soil borings HA-33 and HA-34 had soil EC values less than 4 mmhos/cm.

Of the remaining soil samples submitted to the analytical laboratory during this phase of investigation, 53 samples exhibited laboratory levels of EC greater than 4 mmhos/cm. The following summary presents the number of samples from each depth interval that contained levels of EC greater than 4 mmhos/cm and the total number of samples submitted for that depth interval.

- (0-1') 8 of 22 samples > 4 mmhos/cm
- (1'-2') 6 of 20 samples > 4 mmhos/cm
- (2'-3') 9 of 20 samples > 4 mmhos/cm
- (3'-4') 8 of 18 samples > 4 mmhos/cm
- (4'-5') 10 of 18 samples > 4 mmhos/cm
- (5'-6') 4 of 5 samples > 4 mmhos/cm
- (6'-7') 4 of 5 samples > 4 mmhos/cm

The 5 samples from the 7'-8' bgl interval were used to determine if the borings advanced into material that was not impacted by the brine release. Four of these 5 samples submitted contained an EC concentration greater than 4 mmhos/cm (4,000 µmhos/cm). These samples were HA-11 (7'-8') (12,300 µmhos/cm), HA-12 (7'-8') (5,660 µmhos/cm), HA-14 (7'-8') (14,500 µmhos/cm) and HA-15 (7'-8') (12,900 µmhos/cm). Soil sample HA-16 (7'-8') exhibited an EC level of 2,060 µmhos/cm. The laboratory analytical results are summarized in **Table 2**, and complete copies of the laboratory analytical reports are provided in **Appendix B**.

Isopleth maps of laboratory EC results for the 0-1' bgl, 1'-2' bgl, 2'-3' bgl, 3'-4' bgl, 4'-5' bgl, 5'-6' bgl, 6'-7' bgl and 7'-8' bgl depth intervals have been prepared and are presented on **Figures 3, 4, 5, 6, 7, 8, 9** and **10**, respectively. As can be seen on these figures, the impacted soil at the Site has been substantially delineated.

1.2.5 July 2009 Chloride Results

In July 2009, at the request of the NMOCD, eight (8) soil samples previously collected at the Site were selected from a range of soil EC levels. These soil samples were analyzed for chloride to determine if there was an observable relationship between the soil EC values and the chloride concentration. The laboratory analytical results for these soil samples are summarized in **Table 2**, and complete copies of the laboratory analytical reports are provided in **Appendix B**. These data are also summarized in the following table.

Sample ID	Conductivity (µmhos/cm)	Chloride (mg/kg)
HA-14 (0-1')	12,000	941
HA-15 (0-1')	43,400	11,300
HA-16 (5'-6')	2,750	5,020
HA-18 (0-1')	969	2,060
HA-21 (2'-3')	5,250	2,170
HA-27 (3'-4')	420	36
HA-32 (0-1')	8,760	3,450
HA-34 (2'-3')	161	50.5

As evidenced by the data presented above, no apparent correlation between the soil EC levels and chloride concentration was observed in these soil samples.

1.3 SITE HYDROGEOLOGICAL CONDITIONS

Site hydrogeological conditions are described in *Expanded Hydrogeology Study for the El Paso Natural Gas Company Jal 4 Facility*, dated August 1990, prepared by K. W. Brown & Associates, Inc.

1.4 REMEDIATION GUIDELINES

The remediation goals outlined in *Guidelines for Remediation of Leaks, Spills and Releases* (Guidelines) dated August 13, 1993 and published by NMOCD do not apply to the constituent of concern (chloride) addressed by this RAP. However, this RAP will consider the criteria presented in these Guidelines to evaluate the potential risk to surface water and groundwater.

The Guidelines provide guidance for evaluating hydrocarbon impacts to determine remediation goals for benzene, BTEX and total petroleum hydrocarbon (TPH). These Guidelines evaluate the potential threat to water sources such as depth to groundwater, wellhead protection area and distance to surface water bodies.

Each factor is provided with a ranking score based upon the distance from the source to the potentially threatened water. With these ranking scores, a remediation standard was established. The ranking scores and established remediation standards resulting from these factors are located in **Table 3**. While these Guidelines are not applicable to this constituent of concern, an evaluation of the criteria will demonstrate the potential level of threat to these water sources.

1.4.1 Depth to Groundwater

As previously stated, EPNG has been conducting groundwater monitoring and remediation at the Jal #4 Plant for many years. During these activities, EPNG routinely measures the depths to groundwater within 17 monitoring wells, 1 piezometer and 3 water supply wells located in and around the Jal #4 Plant. In general, the depths to groundwater observed in these wells are 100 feet or greater.

Monitoring well ACW-01, the monitoring well located closest to the release area, has routinely been monitored for depth to groundwater since 1997. Historical depth to groundwater measurements taken by EPNG within this well show that the depth to groundwater has ranged from 106.65 feet top of casing (TOC) in February 1997 to 106.64 feet TOC in November 2008 with an average depth to groundwater of 106.20 feet TOC. The TOC stick-up for monitoring well ACW-01 is 2.73 feet above ground level. A summary of the depth to groundwater measurements for ACW-01 is shown on **Table 4**.

In accordance with the Guidelines, Section IV.A.2.a, the depth to groundwater component receives a ranking score of zero because the depth to groundwater is greater than 100 feet.

1.4.2 Wellhead Protection Area

Wellhead protection area is defined in the Guidelines as "...the horizontal distance from all water sources including private and domestic water sources. Water sources are defined as wells, springs, or other sources of fresh water extraction." The closest water source is water production well EPNG-1, located in the western portion of the plant property. This production well is located approximately 1,553 feet west-southwest (upgradient) of the affected area as shown on **Figure 2**.

In accordance with the Guidelines, Section IV.A.2.a, the wellhead protection area component receives a ranking score of zero because the distance to the nearest well is greater than 1,000 feet to the nearest water source or greater than 200 feet from the nearest private domestic water source.

1.4.3 Distance to Nearest Surface Water Body

Surface water bodies are defined in the Guidelines as "...perennial rivers, streams, creeks, irrigation canals and ditches, lakes, ponds and playas." There are no surface water bodies within 1,000 feet of the affected area.

In accordance with the Guidelines, Section IV.A.2.a, the distance to nearest surface water body component receives a ranking score of zero because the nearest surface water body is greater than 1,000 feet downgradient.

1.5 REMEDIAL OBJECTIVE

In developing the Remedial Objective for the Site EPNG considered the following information:

- A release of approximately 35 barrels of high chloride water occurred at the Site and approximately 25 barrels of this water were recovered utilizing a vac-truck.
- The release of high chloride water was wholly contained within the caliche roadway and no vegetated areas were affected.
- The highest soil EC levels (i.e., EC>15 mmhos/cm) in the release area are relegated to the upper two (2) feet of caliche/soil.
- The depth to groundwater at the Site is approximately 104 feet below ground level.
- There are no surface water bodies within 1,000 feet of the release area.
- The evaporation rate (45 inches/year) at the Site is over three times the average precipitation rate (13.8 inches/year).

The Site is located in the Chihuahuan Desert Ecoregion of New Mexico and the predominant plant species surrounding the release area consist of Creosotebush, Fourwing Saltbush and Mesquite. The Creosotebush and the Fourwing Saltbush are highly salt tolerant, and the Mesquite is moderately salt tolerant.

Based upon the information presented above, EPNG believes that it is unlikely that the chloride impacts present in the shallow Site soils will migrate down through approximately 100 feet of vadose zone and markedly impact the underlying groundwater. However, to minimize the potential for lateral migration of these impacts into the vegetated areas of the Site during heavy rainfall events, EPNG proposes to excavate and dispose of the soils exhibiting EC values of 10 mmhos/cm or greater to a depth of 3 feet below ground level (1 foot below the highly affected soil material) in the release area. This remedial objective is based upon information published by the United States Department of Agriculture in Agriculture Handbook No. 60, Diagnosis and Improvement of Saline and Alkali Soils, (USDA Handbook 60) issued in February 1954. USDA Handbook 60 is a common reference utilized by numerous states when evaluating brine impacts to soil and describes soil having an EC of 8-16 mmhos/cm as an EC range where "only tolerant

crops yield satisfactorily." The pertinent section of the USDA Handbook 60 is provided in **Appendix C**. Because the Site is not suitable for cultivation and because the native plant species present are salt tolerant, a soil EC level of 10 mmhos/cm was selected as the cleanup level for this remedial action. Remediation of the soil material exhibiting EC values of 10 mmhos/cm or greater to a depth of 3 feet below ground level will protect the native plant species surrounding the release area as well as minimize any future impact to the underlying groundwater. The excavated soil will be disposed of at an approved disposal site. The excavated area will be backfilled with clean material and graded to minimize erosion but encourage surface water runoff.

2.0 SCOPE OF WORK

The following section outlines the scope of work that is planned for this remedial action. All field activities will be conducted under the supervision of a Benham hydrogeologist or engineer and in accordance with the Site-specific Health and Safety Plan (HASP) previously prepared for the Plant. A copy of the HASP will be kept on-site by the Benham Site Safety Officer at all times. Field activities will be documented in a dedicated field log book.

2.1 ESTABLISHING THE LIMITS OF EXCAVATION

To accurately locate the limits of excavation, the affected area will be over laid with a grid system. The grid system will consist of 10-foot by 10-foot grid pattern with grid crossing points having unique letter/number identifications as shown on **Figure 11**.

After establishing the grid, the limits of excavation will be marked. These limits of excavation will be marked with different colored marking flags or wooden stakes to indicate the various proposed depths of excavation. It is estimated that approximately 470 cubic yards of material will be excavated.

2.2 EXCAVATION AND DISPOSAL OF BRINE IMPACTED SOIL

Prior to the start of excavation activities, the limits of the excavation will be surveyed using a transit to determine the existing elevations at the corners, approximate center of the excavation and at other control points as necessary. Upon completion of the excavation activities, the elevations of the excavated surface at the previously surveyed points will be established to verify that the proposed excavation depth has been achieved.

One permanent structure exists within the area to be excavated. This structure is the filter building from where the release originated. To prevent the potential for comprising the structural integrity the filter building, potentially impacted soils immediately surrounding this structure will not be excavated. Excavation equipment will not excavate within two (2) feet of the building foundation.

The brine impacted soil material will be excavated with a rubber-tired backhoe or hydraulic excavator to the proposed excavation depths indicated on **Figure 11**. After the proposed excavation depth in each area is obtained, confirmatory soil samples will be collected from the perimeter of the excavation for submittal to the analytical laboratory. The locations of the proposed confirmation soil samples are shown on **Figure 12**. The confirmation soil samples will be collected from the 0 to 1 foot bgl depth interval and will be placed into clean, sealable bags, properly labeled and shipped under chain-of-custody control to the analytical laboratory (Environmental Testing, Inc., Oklahoma City, Oklahoma) and analyzed for EC. If a soil EC level

greater than 10 mmhos/cm is observed in a perimeter soil sample, the soil from the area immediately surrounding the initial sample location will be over-excavated 5 feet laterally. The over-excavation vertical depth will be approximately 1.0 foot. Following these additional excavation activities, an additional soil sample for EC analysis will be collected from the newly excavated perimeter wall and submitted to the laboratory for EC analysis.

The impacted soil materials will be excavated, loaded directly onto dump-trucks, manifested and transported to a permitted disposal facility.

2.3 BACKFILL AND RESTORATION

Once the impacted soil has been removed, the excavated area will be restored. Restoration will consist of the placement, compaction and contouring of soil backfill material derived from an off-site source. Prior to the placement of any backfill material, a sample of the backfill material will be collected and submitted to the analytical laboratory for analysis to ensure the backfill material is not impacted. The analyses will include EC, TCLP metals, BTEX and total petroleum hydrocarbons (TPH) (Diesel Range Organics and Gasoline Range Organics). The standards for the testing of the backfill are as follows:

- EC: less than 4 mmhos/cm,
- TCLP metals: less than 40 CFR 261.24, Table 1-Maximum Concentration of Contaminants for Toxicity Characteristic,
- BTEX: less than laboratory practical quantification limit, and
- TPH: less than laboratory quantification limit.

Upon completion of backfilling operations, the area will be graded to minimize erosion but encourage surface water runoff. Upon completion of grading operations, the area will be restored to its pre-excavation state, which is primarily a caliche road.

3.0 PROJECT SCHEDULE

It is anticipated that the excavation, backfilling and restoration of the area will be completed in two phases. The first phase will include the excavation, removal and disposal of the impacted soil material, as well as, collection of laboratory confirmation samples to demonstrate that the excavation perimeter is below the remedial objective of 10 mmhos/cm. The second phase will include backfilling and restoration of the excavation area.

The first phase is expected to take approximately three days. The first day will be used to establish the limits of excavation and gather the survey information. The second and third days will be used to excavate, remove and dispose of the brine impacted material and to collect laboratory confirmation samples. The second phase, backfilling and site restoration, will take approximately two days. There will be a delay of approximately three days between the two phases while the laboratory analyzes the soil confirmation samples and provides preliminary results.

4.0 REPORTING

Upon completion of the remedial action, a Closure Report will be prepared and submitted to NMOCD for review and approval. The Closure Report will describe the activities conducted during implementation of this RAP. The report will also include figures showing the final limits of excavation, locations of laboratory confirmatory samples and laboratory analytical results.

Upon receipt of approval of the Closure Report, a final report Form C-141 will be submitted to the NMOCD.

TABLES

Table 1 : Summary of Field Electrical Conductance Readings for Soil Samples
Jal #4 Remedial Action Plan
El Paso Natural Gas Company

Sample ID:	Depth	Sample Date:	Conductance µS/cm
HA-1	0-1'	03-Feb-09	1,430
HA-1	1'-2'	03-Feb-09	932
HA-1	2'-3'	03-Feb-09	800
HA-2	0-1'	03-Feb-09	5,600
HA-2	1'-2'	03-Feb-09	761
HA-2	2'-3'	03-Feb-09	1,388
HA-3	0-1'	03-Feb-09	1,940
HA-3	1'-2'	03-Feb-09	1,740
HA-3	2'-3'	03-Feb-09	2,310
HA-4	0-1'	03-Feb-09	1,540
HA-4	1'-2'	03-Feb-09	1,270
HA-4	2'-3'	03-Feb-09	1,210
HA-5	0-1'	03-Feb-09	1,080
HA-5	1'-2'	03-Feb-09	1,310
HA-5	2'-3'	03-Feb-09	1,280
HA-6	0-1'	03-Feb-09	3,710
HA-6	1'-2'	03-Feb-09	1,430
HA-6	2'-3'	03-Feb-09	3,190
HA-7	0-1'	03-Feb-09	4,570
HA-7	1'-2'	03-Feb-09	1,830
HA-7	2'-3'	03-Feb-09	1,010
HA-8	0-1'	04-Feb-09	5,190
HA-8	1'-2'	04-Feb-09	2,940
HA-8	2'-3'	04-Feb-09	2,910
HA-9	0-1'	04-Feb-09	1,760
HA-9	1'-2'	04-Feb-09	2,020
HA-9	2'-3'	04-Feb-09	1,930
HA-10	0-1'	04-Feb-09	3,570
HA-10	1'-2'	04-Feb-09	1,970
HA-10	2'-3'	04-Feb-09	1,960

Notes:
1. Analysis preformed by combing equal parts soil and de-ionized water into a clean, sealable bag, mixing the contents and allowing them to sit for 30 minutes. The field EC measurement was then taken by placing an EC probe into the mixture and recorded.

Table 2 : Summary of Laboratory Analysis for Soil Samples
Jal #4 Remedial Action Plan
El Paso Natural Gas Company

Sample ID	Depth, feet	Sample Date	Conductivity µmhos/cm	Chloride mg/Kg
HA-1	0-1'	03-Feb-09	28,600	---
HA-1	1'-2'	03-Feb-09	16,000	---
HA-1	2'-3'	03-Feb-09	8,110	---
HA-2	0-1'	03-Feb-09	25,500	---
HA-2	1'-2'	03-Feb-09	10,800	---
HA-2	2'-3'	03-Feb-09	7,510	---
HA-3	0-1'	03-Feb-09	12,900	---
HA-3	1'-2'	03-Feb-09	6,150	---
HA-3	2'-3'	03-Feb-09	11,800	---
HA-4	0-1'	03-Feb-09	21,600	---
HA-4	1'-2'	03-Feb-09	10,600	---
HA-4	2'-3'	03-Feb-09	12,400	---
HA-5	0-1'	03-Feb-09	4,400	---
HA-5	1'-2'	03-Feb-09	2,080	---
HA-5	2'-3'	03-Feb-09	3,420	---
HA-6	0-1'	03-Feb-09	9,770	---
HA-6	1'-2'	03-Feb-09	5,630	---
HA-6	2'-3'	03-Feb-09	11,000	---
HA-7	0-1'	03-Feb-09	27,000	---
HA-7	1'-2'	03-Feb-09	5,070	---
HA-7	2'-3'	03-Feb-09	3,960	---
HA-8	0-1'	04-Feb-09	25,500	---
HA-8	1'-2'	04-Feb-09	6,210	---
HA-8	2'-3'	04-Feb-09	14,300	---
HA-9	0-1'	04-Feb-09	5,720	---
HA-9	1'-2'	04-Feb-09	1,210	---
HA-9	2'-3'	04-Feb-09	3,010	---
HA-10	0-1'	04-Feb-09	8,330	---
HA-10	1'-2'	04-Feb-09	3,300	---
HA-10	2'-3'	04-Feb-09	13,600	---
HA-11	0-1'	05-May-09	7,940	---
HA-11	1'-2'	05-May-09	3,760	---
HA-11	2'-3'	05-May-09	6,340	---
HA-11	3'-4'	05-May-09	5,030	---
HA-11	4'-5'	05-May-09	5,350	---
HA-11	5'-6'	05-May-09	9,280	---
HA-11	6'-7'	05-May-09	12,500	---
HA-11	7'-8'	05-May-09	12,300	---
HA-12	0-1'	05-May-09	19,700	---
HA-12	1'-2'	05-May-09	5,220	---
HA-12	2'-3'	05-May-09	5,140	---
HA-12	3'-4'	05-May-09	4,650	---
HA-12	4'-5'	05-May-09	4,080	---
HA-12	5'-6'	05-May-09	5,910	---
HA-12	6'-7'	05-May-09	7,220	---
HA-12	7'-8'	05-May-09	5,660	---
HA-13	0-1'	05-May-09	1,700	---
HA-13	1'-2'	05-May-09	1,370	---
HA-13	2'-3'	05-May-09	1,530	---
HA-13	3'-4'	05-May-09	1,890	---
HA-13	4'-5'	05-May-09	1,830	---

Table 2 : Summary of Laboratory Analysis for Soil Samples
Jal #4 Remedial Action Plan
El Paso Natural Gas Company

Sample ID	Depth, feet	Sample Date	Conductivity µmhos/cm	Chloride mg/Kg
HA-14	0-1'	05-May-09	12,000	941
HA-14	1'-2'	05-May-09	5,800	---
HA-14	2'-3'	05-May-09	9,300	---
HA-14	3'-4'	05-May-09	9,530	---
HA-14	4'-5'	05-May-09	10,300	---
HA-14	5'-6'	05-May-09	11,800	---
HA-14	6'-7'	05-May-09	10,700	---
HA-14	7'-8'	05-May-09	14,500	---
HA-15	0-1'	05-May-09	43,400	11,300
HA-15	1'-2'	05-May-09	6,730	---
HA-15	2'-3'	05-May-09	7,570	---
HA-15	3'-4'	05-May-09	6,140	---
HA-15	4'-5'	05-May-09	6,400	---
HA-15	5'-6'	05-May-09	6,750	---
HA-15	6'-7'	05-May-09	7,150	---
HA-15	7'-8'	05-May-09	12,900	---
HA-16	0-1'	05-May-09	10,300	---
HA-16	1'-2'	05-May-09	3,840	---
HA-16	2'-3'	05-May-09	5,910	---
HA-16	3'-4'	05-May-09	5,730	---
HA-16	4'-5'	05-May-09	4,940	---
HA-16	5'-6'	05-May-09	2,750	5,020
HA-16	6'-7'	05-May-09	1,890	---
HA-16	7'-8'	05-May-09	2,060	---
HA-17	0-1'	05-May-09	1,660	---
HA-17	1'-2'	05-May-09	1,350	---
HA-17	2'-3'	05-May-09	2,330	---
HA-17	3'-4'	05-May-09	3,220	---
HA-17	4'-5'	05-May-09	6,780	---
HA-18	0-1'	06-May-09	969	2,060
HA-18	1'-2'	06-May-09	1,690	---
HA-18	2'-3'	06-May-09	3,120	---
HA-18	3'-4'	06-May-09	2,850	---
HA-18	4'-5'	06-May-09	5,670	---
HA-19	0-1'	05-May-09	2,780	---
HA-19	1'-2'	05-May-09	2,090	---
HA-19	2'-3'	05-May-09	4,320	---
HA-19	3'-4'	05-May-09	4,340	---
HA-19	4'-5'	05-May-09	3,750	---
HA-20	0-1'	05-May-09	3,290	---
HA-21	0-1'	05-May-09	16,200	---
HA-21	1'-2'	05-May-09	10,700	---
HA-21	2'-3'	05-May-09	5,250	2,170
HA-21	3'-4'	05-May-09	3,610	---
HA-21	4'-5'	05-May-09	5,040	---
HA-22	0-1'	06-May-09	938	---
HA-22	1'-2'	06-May-09	563	---
HA-22	2'-3'	06-May-09	556	---
HA-22	3'-4'	06-May-09	385	---
HA-22	4'-5'	06-May-09	430	---

Table 2 : Summary of Laboratory Analysis for Soil Samples
Jal #4 Remedial Action Plan
El Paso Natural Gas Company

Sample ID	Depth, feet	Sample Date	Conductivity µmhos/cm	Chloride mg/Kg
HA-24	0-1'	06-May-09	408	---
HA-24	1'-2'	06-May-09	369	---
HA-24	2'-3'	06-May-09	441	---
HA-24	3'-4'	06-May-09	344	---
HA-24	4'-5'	06-May-09	356	---
HA-25	0-1'	05-May-09	546	---
HA-25	1'-2'	05-May-09	321	---
HA-25	2'-3'	05-May-09	279	---
HA-25	3'-4'	05-May-09	197	---
HA-25	4'-5'	05-May-09	275	---
HA-27	0-1'	06-May-09	507	---
HA-27	1'-2'	06-May-09	465	---
HA-27	2'-3'	06-May-09	341	---
HA-27	3'-4'	06-May-09	420	36
HA-27	4'-5'	06-May-09	263	---
HA-28	0-1'	05-May-09	2,190	---
HA-30	0-1'	07-May-09	833	---
HA-30	1'-2'	07-May-09	1,020	---
HA-30	2'-3'	07-May-09	1,260	---
HA-30	3'-4'	07-May-09	1,010	---
HA-30	4'-5'	07-May-09	1,080	---
HA-31	0-1'	07-May-09	14,500	---
HA-31	1'-2'	07-May-09	5,610	---
HA-31	2'-3'	07-May-09	4,090	---
HA-31	3'-4'	07-May-09	7,650	---
HA-31	4'-5'	07-May-09	4,020	---
HA-32	0-1'	07-May-09	8,760	3,450
HA-32	1'-2'	07-May-09	10,200	---
HA-32	2'-3'	07-May-09	14,200	---
HA-32	3'-4'	07-May-09	11,600	---
HA-32	4'-5'	07-May-09	10,900	---
HA-33	0-1'	07-May-09	273	---
HA-33	1'-2'	07-May-09	289	---
HA-33	2'-3'	07-May-09	229	---
HA-34	0-1'	07-May-09	265	---
HA-34	1'-2'	07-May-09	189	---
HA-34	2'-3'	07-May-09	161	50.5
HA-35	0-1'	07-May-09	461	---
HA-35	1'-2'	07-May-09	372	---
HA-35	2'-3'	07-May-09	672	---
HA-35	3'-4'	07-May-09	906	---
HA-35	4'-5'	07-May-09	1,520	---

Notes:
1. Analysis based on saturated paste.
2. Select samples were analyzed for Chloride concentration in July 2009.

Table 2 : Summary of Laboratory Analysis for Soil Samples
Jal #4 Remedial Action Plan
El Paso Natural Gas Company

Parameter	Sample ID:	HA-1	HA-2	HA-3	HA-4	HA-5	HA-6	HA-7	HA-8	HA-9	HA-10
	Depth	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
	Sample Date:	03-Feb-09	03-Feb-09	03-Feb-09	03-Feb-09	03-Feb-09	03-Feb-09	03-Feb-09	4-Feb-09	4-Feb-09	4-Feb-09
BTEX											
Benzene	µg/kg	<1.4	<1.1	<1.2	<1	<1	<0.98	<1	<1.1	<1	<1
Toluene	µg/kg	1.9	<1.1	<1.2	<1	<1	<0.98	<1	<1.1	<1	<1
Ethylbenzene	µg/kg	<1.4	<1.1	<1.2	<1	<1	<0.98	<1	<1.1	<1	<1
m,p-Xylene	µg/kg	<1.4	<1.1	<1.2	<1	<1	<0.98	<1	<1.1	<1	<1
o-Xylene	µg/kg	<1.4	<1.1	<1.2	<1	<1	<0.98	<1	<1.1	<1	<1
Xylene, total	µg/kg	<1.4	<1.1	<1.2	<1	<1	<0.98	<1	<1.1	<1	<1
Percent Moisture											
Percent Moisture	%	1.08	1.73	0.914	2.65	2.34	3.85	4.48	1.75	2.96	7.42

Notes:
1. Results are reported on a dry weight basis.
2. < : Denotes a sample value of less than the laboratory reporting limit.
3. µg/kg : Micrograms per kilogram.

Table 3 : New Mexico Oil Conservation Division Remediation Standard Ranking Criteria, Jal #4 Remedial Action Plan El Paso Natural Gas Company

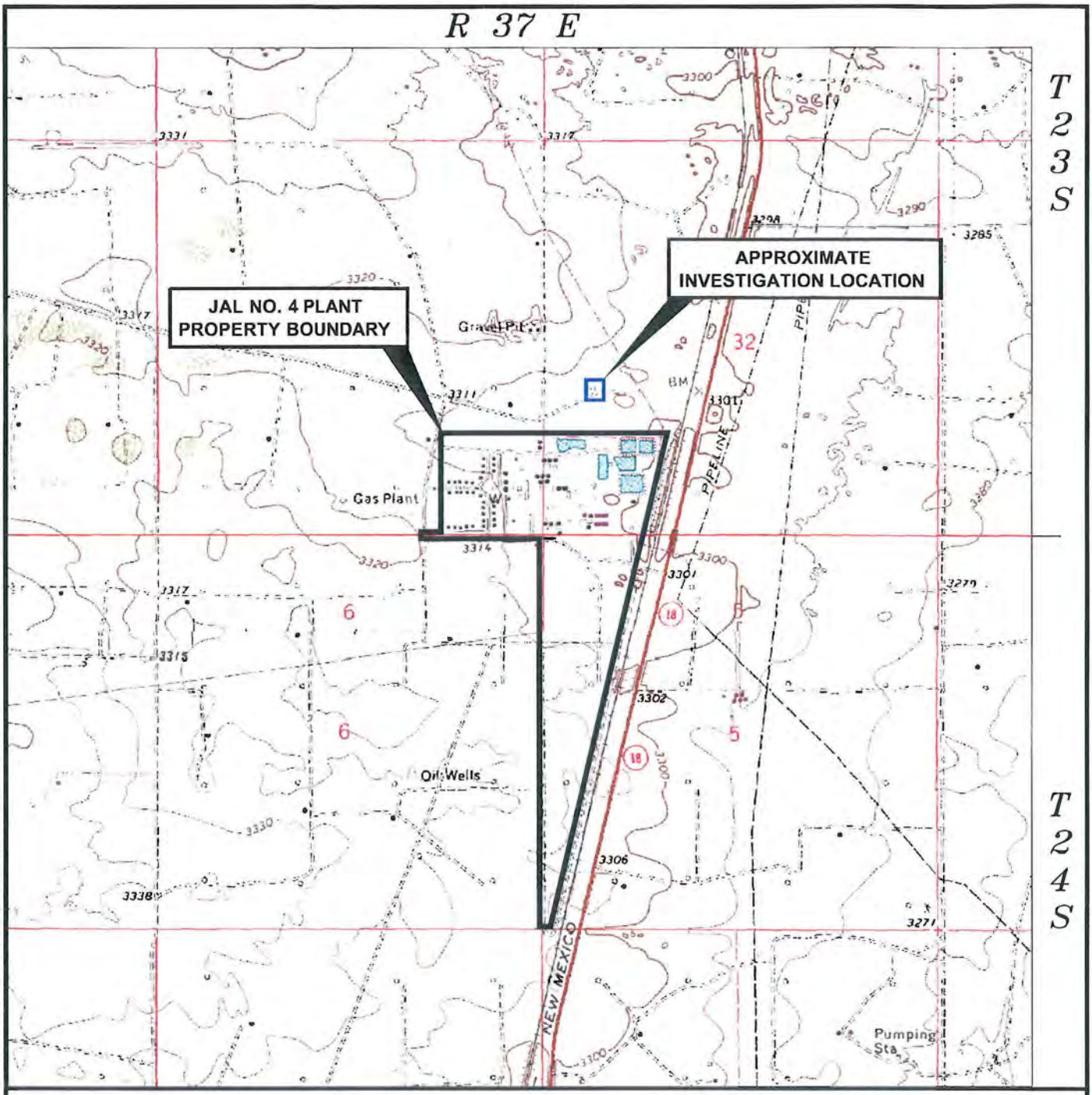
Ranking Criteria per the Guidelines Depth to Groundwater	
Criteria	**Ranking**
<50 feet	20
50 - 99 feet	10
>100 feet	0
Wellhead Protection Area	
Criteria	**Ranking**
<1000 feet from a source or <200 feet from a private domestic source	
Yes	20
No	0
Distance to Surface Water Body	
Criteria	**Ranking**
<200 horizontal feet	20
200 - 1,000 horizontal feet	10
>1,000 horizontal feet	0

Recommended Remediation Levels			
	>19	**19-Oct**	**0 - 9**
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
TPH (ppm)	100	1,000	5,000

Table 4 : Summary of Monitor Well ACW-01 Historical Depth to Groundwater Measurements
Jal #4 Remedial Action Plan
El Paso Natural Gas Company

Monitor Well	Screened Interval (Feet-BGL)	Top of Casing Elevation (Feet-AMSL)	Depth to Groundwater Measurement Date	Depth to Groundwater (Feet-TOC)	Groundwater Elevation (Feet-AMSL)
ACW-01	110 to 130	3300.87	02/19/97	106.65	3194.22
			05/07/97	105.59	3195.28
			08/19/97	105.61	3195.26
			10/21/97	105.71	3195.16
			02/24/98	105.62	3195.25
			05/12/98	105.59	3195.28
			08/11/98	105.61	3195.26
			10/20/98	105.67	3195.20
			02/23/99	105.72	3195.15
			05/11/99	105.66	3195.21
			08/11/99	105.68	3195.19
			10/18/99	105.73	3195.14
			02/22/00	105.81	3195.06
			05/09/00	105.90	3194.97
			08/07/00	105.99	3194.88
			10/26/00	106.10	3194.77
			02/20/01	106.19	3194.68
			05/01/01	105.90	3194.97
			08/01/01	105.89	3194.98
			10/22/01	106.05	3194.82
			02/20/02	106.30	3194.57
			04/29/02	106.30	3194.57
			09/24/02	106.04	3194.83
			11/03/02	106.30	3194.57
			03/31/03	106.22	3194.65
			05/20/03	106.41	3194.46
			08/18/03	106.39	3194.48
			11/04/03	106.19	3194.68
			02/25/04	106.19	3194.68
			05/13/04	106.15	3194.72
			08/25/04	106.46	3194.41
			11/09/04	106.57	3194.30
			05/25/05	106.38	3194.49
			08/23/05	106.52	3194.35
			12/12/05	106.56	3194.31
			02/14/06	106.72	3194.15
			05/09/06	106.87	3194.00
			08/23/06	106.89	3193.98
			12/14/06	106.45	3194.42
			03/05/07	106.61	3194.26
			05/16/07	106.58	3194.29
			08/23/07	106.50	3194.37
			11/12/07	106.77	3194.10
			02/20/08	106.50	3194.37
			06/10/08	106.65	3194.22
			08/08/08	106.69	3194.18
			11/17/08	106.64	3194.23

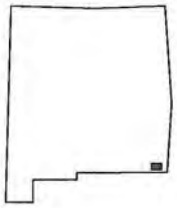
FIGURES



SOURCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLES - RATTLESNAKE CANYON, N.M. 1979 AND JAL NW, N.M., 1979

SCALE
0 1/2 1 MILE

NEW MEXICO



-N-

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FIGURE TITLE
SITE LOCATION AND TOPOGRAPHIC FEATURES

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	AS SHOWN
DESIGNED BY	BEM\PCR
APPROVED BY	GHR
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	1

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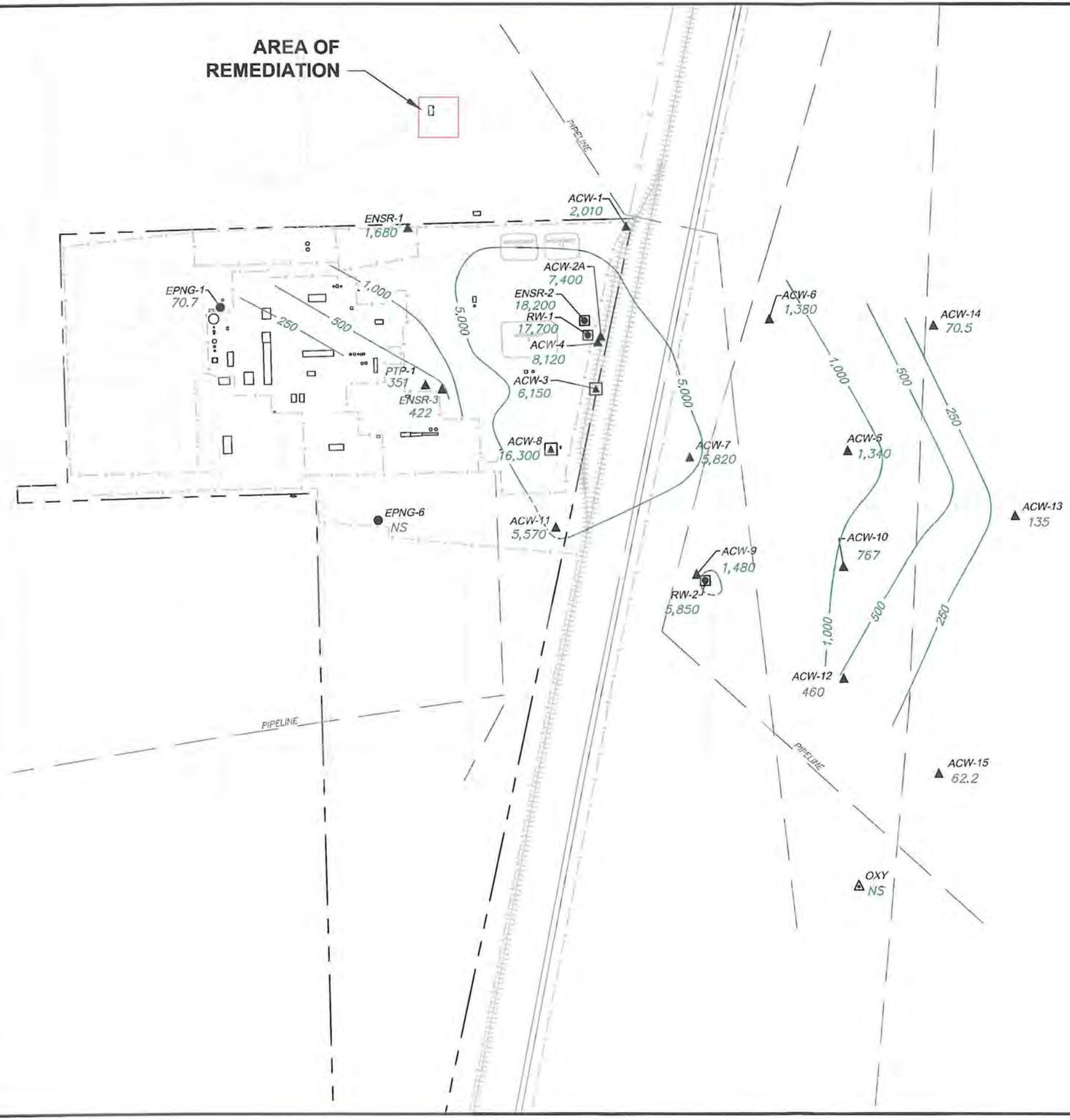

LEGEND

- ACW-5 1,340 — GROUNDWATER MONITOR WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER, mg/L
- EPNG-1 70.7 — WATER SUPPLY WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER, mg/L
- RW-2 5,850 — GROUNDWATER RECOVERY WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER, mg/L
- OXY NS — WATER SUPPLY WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER, mg/L
- ACW-8 16,300 — GROUNDWATER MONITOR WELL CONVERTED TO GROUNDWATER RECOVERY WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER, mg/L
- NS — NOT SAMPLED
- 250 — CONTOUR LINE SHOWING EQUAL CONCENTRATIONS OF CHLORIDE IN GROUNDWATER, mg/L (DASHED WHERE INFERRED)
- PLANT PROPERTY BOUNDARY
- FENCE
- PRIMARY ROAD OR HIGHWAY
- SECONDARY ROAD
- RAILROAD TRACK
- PIPELINE
- IMPOUNDMENT

NOTES:

1) CHLORIDE CONCENTRATIONS SHOWN ARE THE HIGHEST LEVELS DETECTED IN GROUNDWATER IN EACH WELL DURING THE 2008 MONITORING PROGRAM. THESE DATA WERE PRESENTED IN THE 2008 ANNUAL GROUNDWATER REMEDIATION REPORT SUBMITTED TO THE NMOCD ON FEBRUARY 6, 2009
2) EPA's SECONDARY DRINKING WATER STANDARD (SMCL) FOR CHLORIDE IN PUBLIC WATER SUPPLY SYSTEMS IS 250 mg/L.
3) NEW MEXICO ENVIRONMENTAL DIVISION HAS ESTABLISHED AN OTHER STANDARDS FOR DOMESTIC WATER SUPPLY OF 250 mg/L FOR CHLORIDE IN GROUNDWATER CONTAINING TDS LEVELS OF 10,000 mg/L OR LESS.
4) JAL #4 PLANT PROPERTY IS LOCATED WITHIN SECTIONS 31 AND 32 OF TOWNSHIP 23 SOUTH, RANGE 37 EAST, AND SECTIONS 5 AND 6 OF TOWNSHIP 24 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO.
5) SITE BASE AREA DIGITIZED FROM 11/04/76 AERIAL PHOTOGRAPH WITH PLANT PROPERTY BOUNDARY AND WELLS INSERTED FROM VARIOUS OTHER SOURCES.

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FIGURE TITLE	SITE BASE MAP
DOCUMENT TITLE	REMEDIAL ACTION PLAN BRINE IMPACTED SOIL - IRP #2026
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 GAS PLANT LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=600'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG

PROJECT NUMBER
4100417112
FIGURE NUMBER
2

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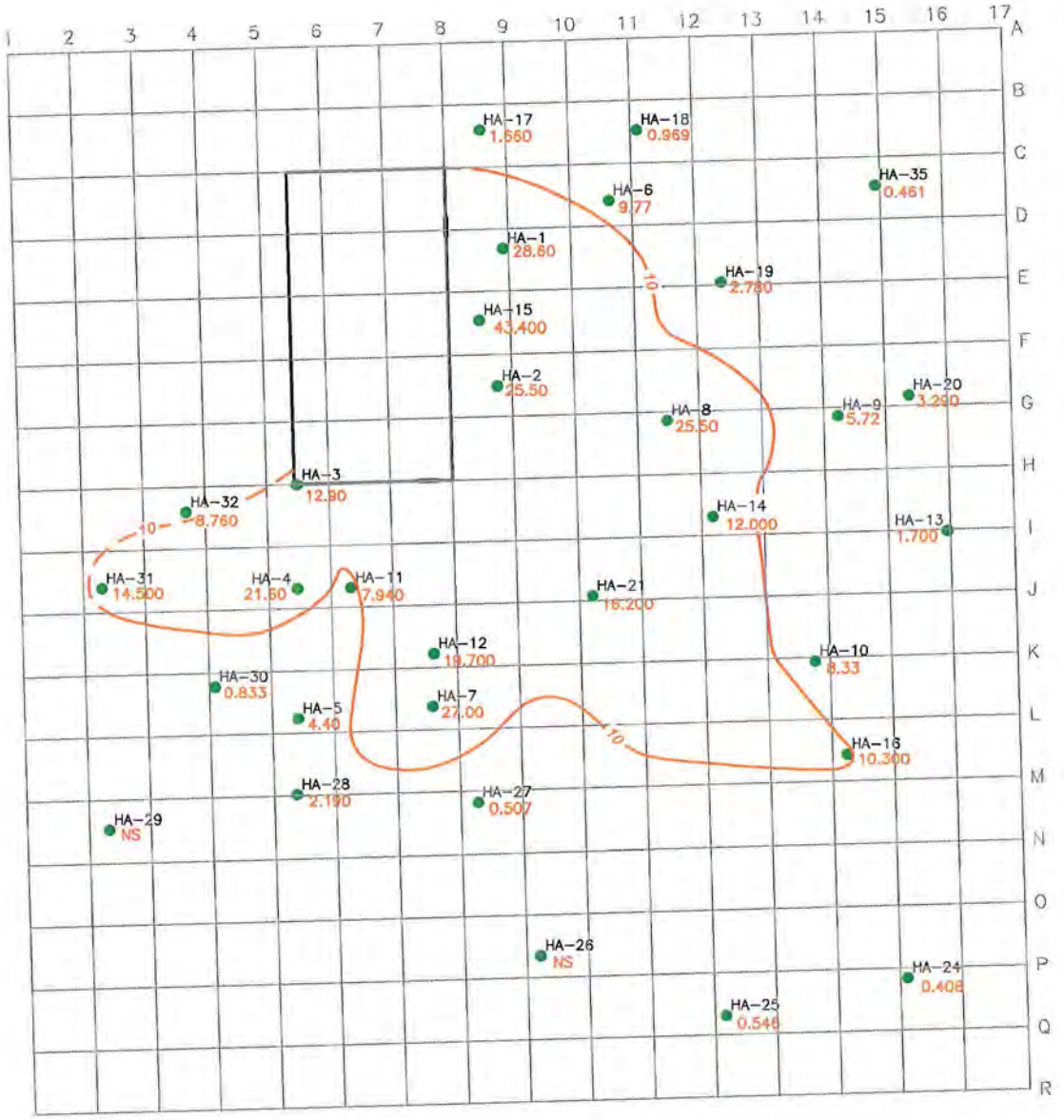

LEGEND

HA-11 7.940 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 2/4/09 AND 5/5-7/09)

10 — CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

-N-

15 0 15 30
SCALE FEET

P:\TUL\ENV\2004\4100417112_EPNGJal4Impact\20_DESGN\40_CAD\FIG02-09_SITE.dwg on Nov 06, 2009-10:14am

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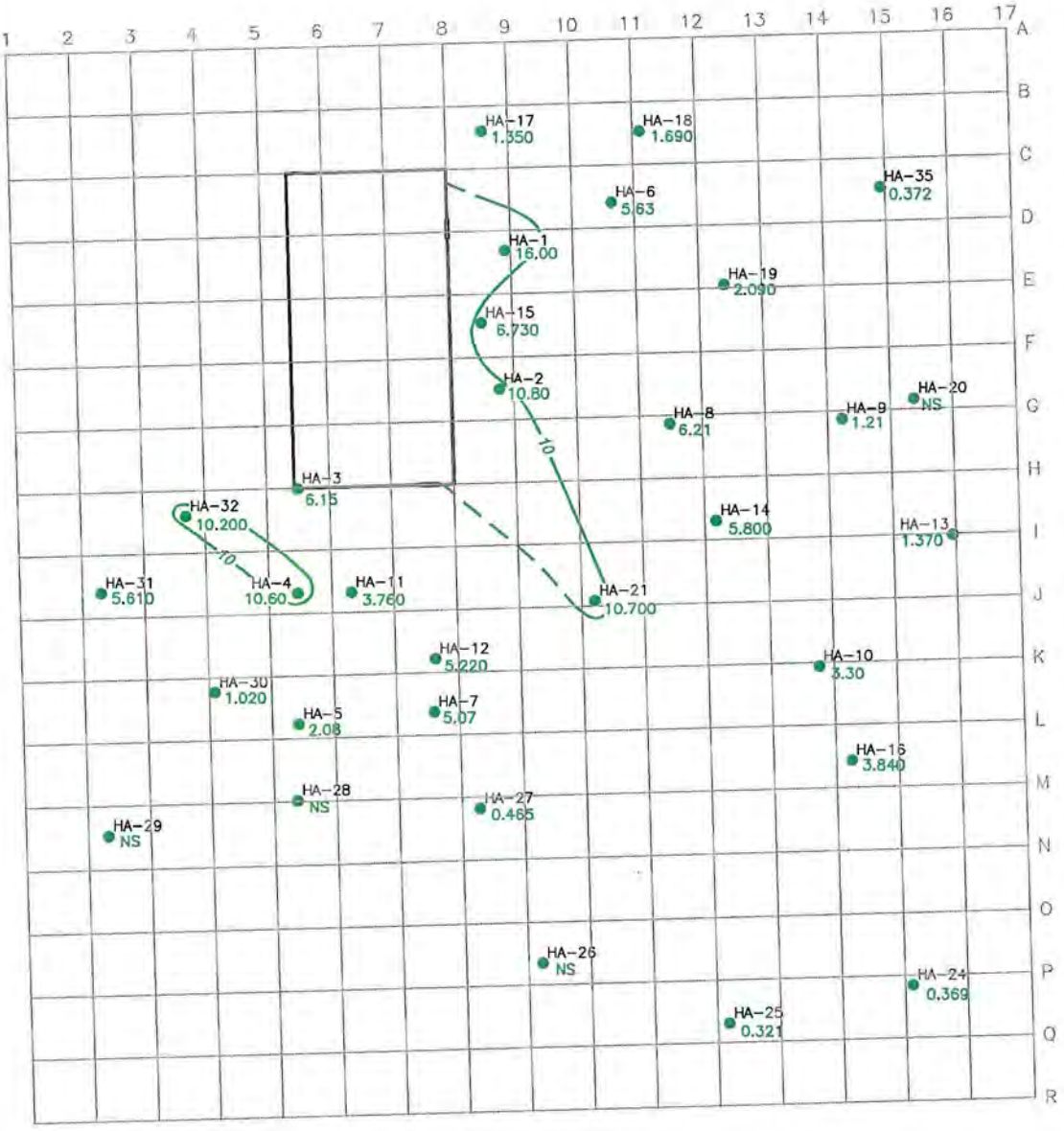
FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 0 TO 1 FOOT BGL, FEBRUARY 4 AND MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	3



LEGEND

HA-11 3.760 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 2/4/09 AND 5/5-7/09)

10 — CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

15 0 15 30
SCALE FEET

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 1 TO 2 FOOT BGL, FEBRUARY 4 AND MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	4

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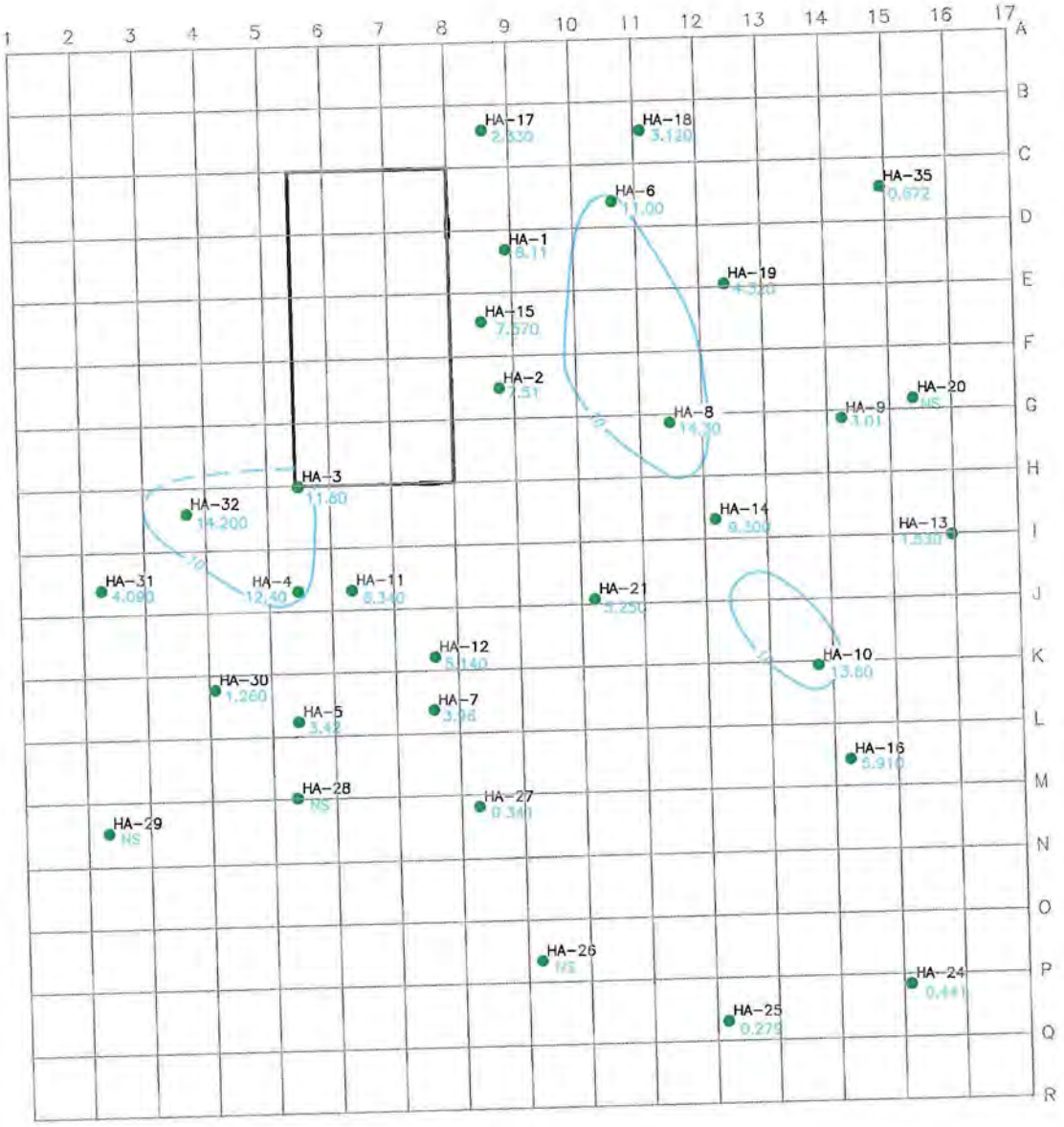

LEGEND

HA–11 / 6.340 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 2/4/09 AND 5/5–7/09)

CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

15 0 15 30
SCALE FEET

P:\TUL\ENV\2004\4100417112_EPNGJal4Impact\20_DESGN\40_CAD\FIG02-09_SITE.dwg on Nov 06, 2009-10:13am

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 2 TO 3 FOOT BGL, FEBRUARY 4 AND MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	
4100417112	
FIGURE NUMBER	
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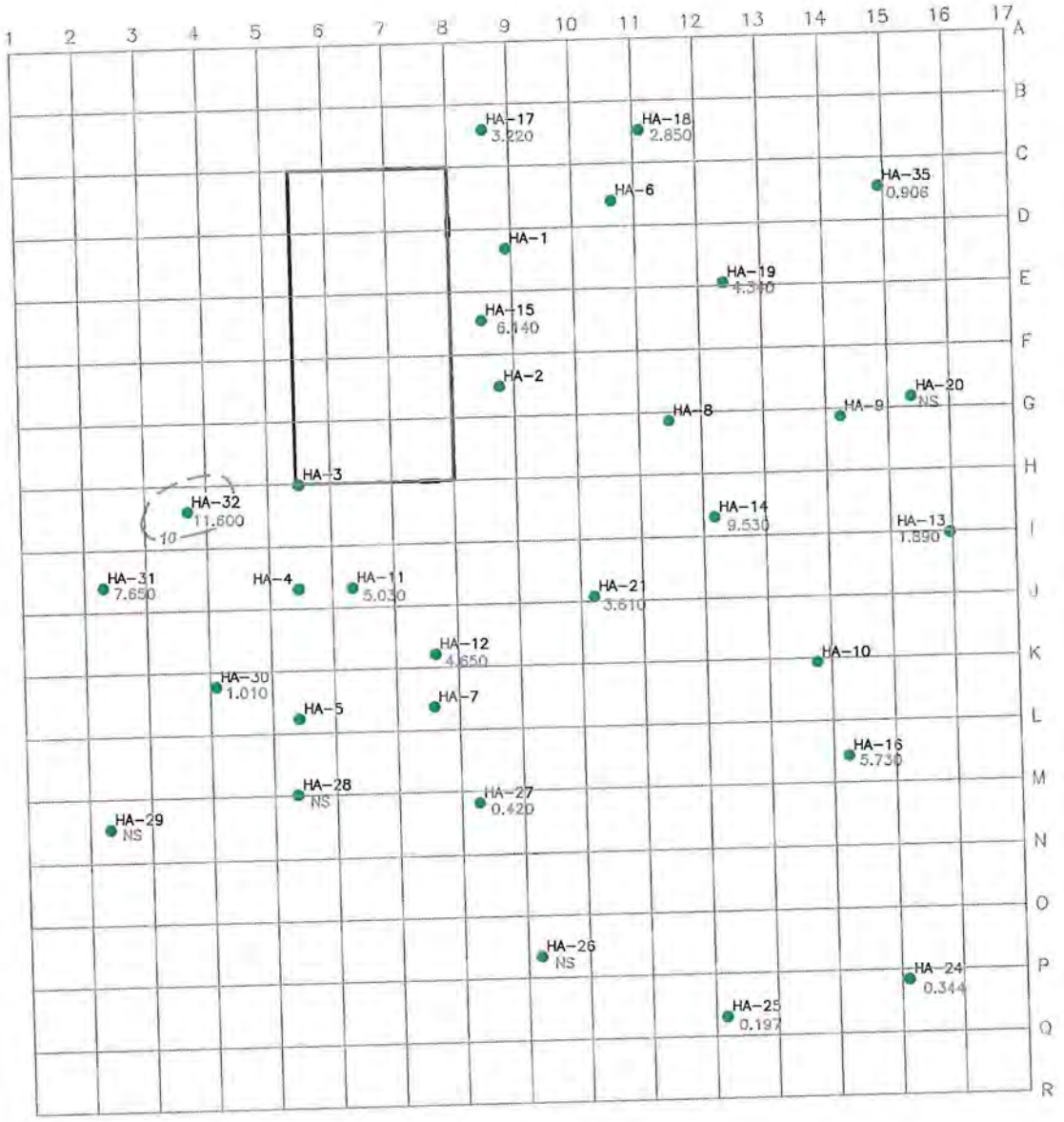

LEGEND

HA-11 5.030 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 5/5-7/09)

10 — CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

15 0 15 30
SCALE FEET

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 3 TO 4 FOOT BGL, MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	6

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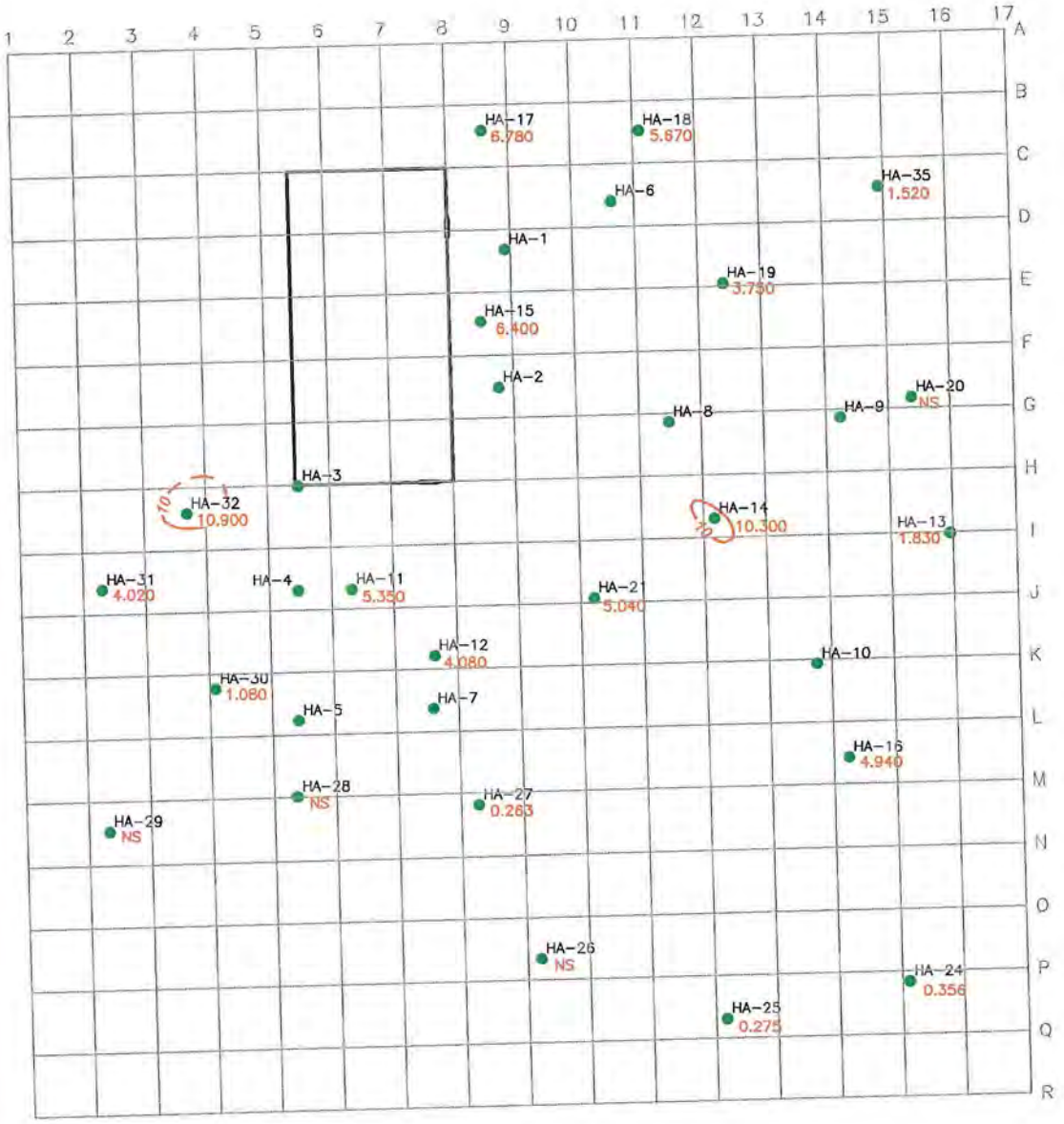

LEGEND

HA-11 5.350 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 5/5-7/09)

10 — CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

15 0 15 30
SCALE FEET

P:\TUL\ENV\2004\4100417112_EPNGJal4Impact\20_DESGN\40_CAD\FIG02-09_SITE.dwg on Nov 06, 2009 - 10:13am

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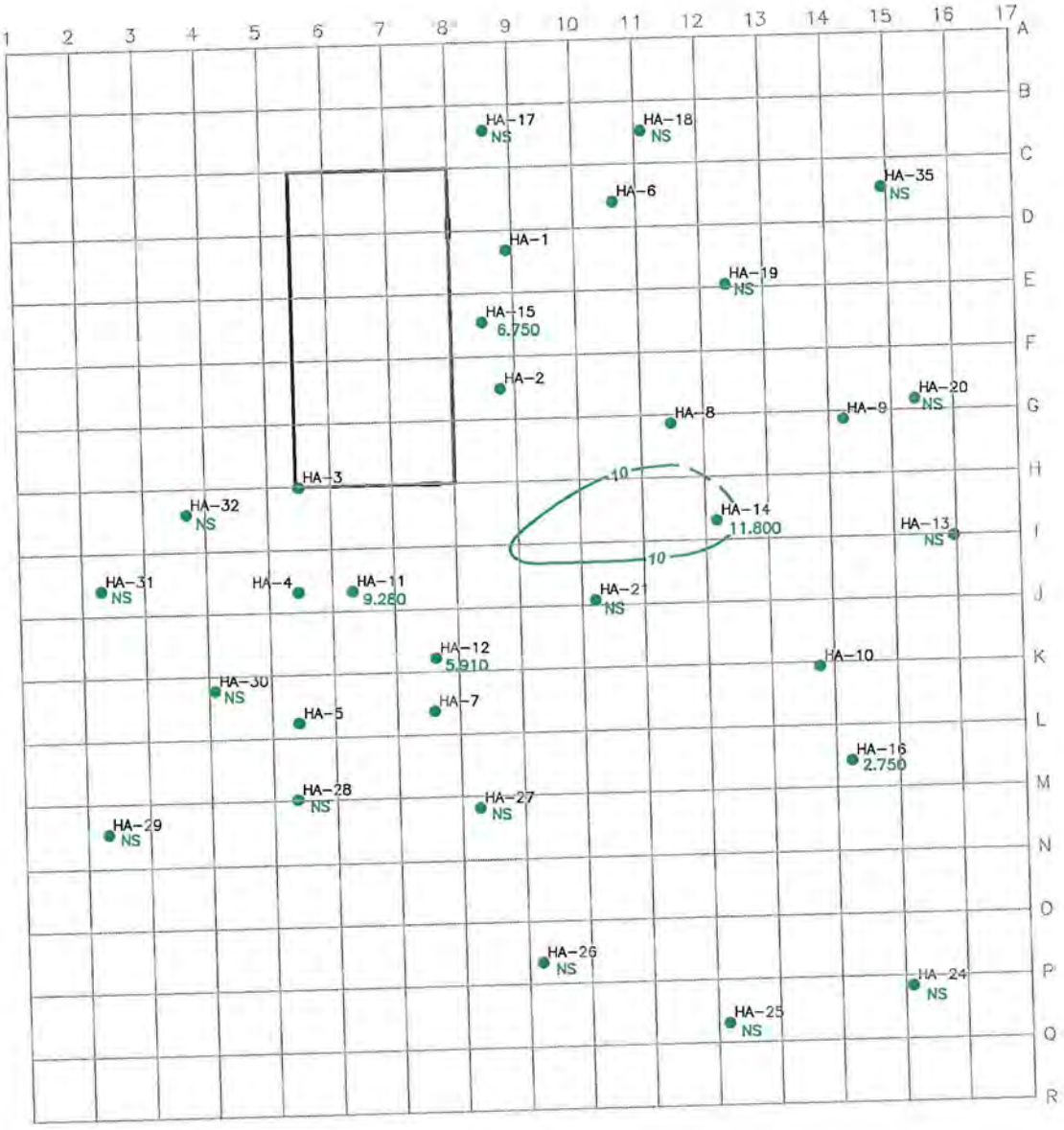
FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 4 TO 5 FOOT BGL, MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	7



LEGEND

HA-11 / 9.280 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 5/5-7/09)

10 — CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

15 0 15 30
SCALE FEET

P:\TUL\ENV\2004\4100417112_EPNGJal4Impact\20_DESGN\40_CAD\FIG02-09_SITE.dwg on Nov 06, 2009 - 10:12am

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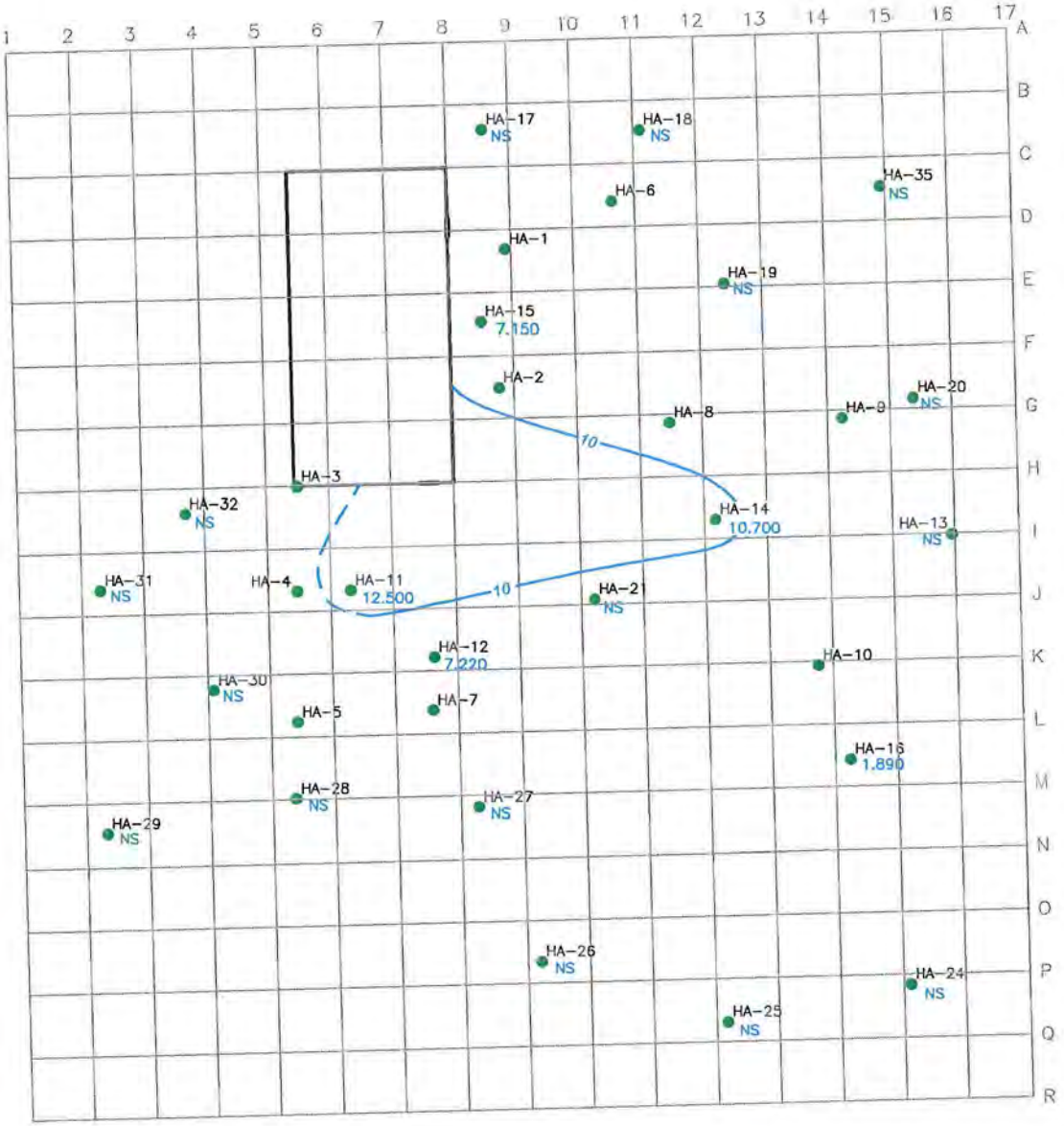
FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 5 TO 6 FOOT BGL, MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	8



LEGEND

HA-11 / 12.500 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 5/5-7/09)

10 — CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

15 0 15 30
SCALE FEET

P:\TUL\ENV\2004\4100417112_EPNGJal4Impact\20_DESGN\40_CAD\FIG02-09_SITE.dwg on Nov 06, 2009 - 10:12am

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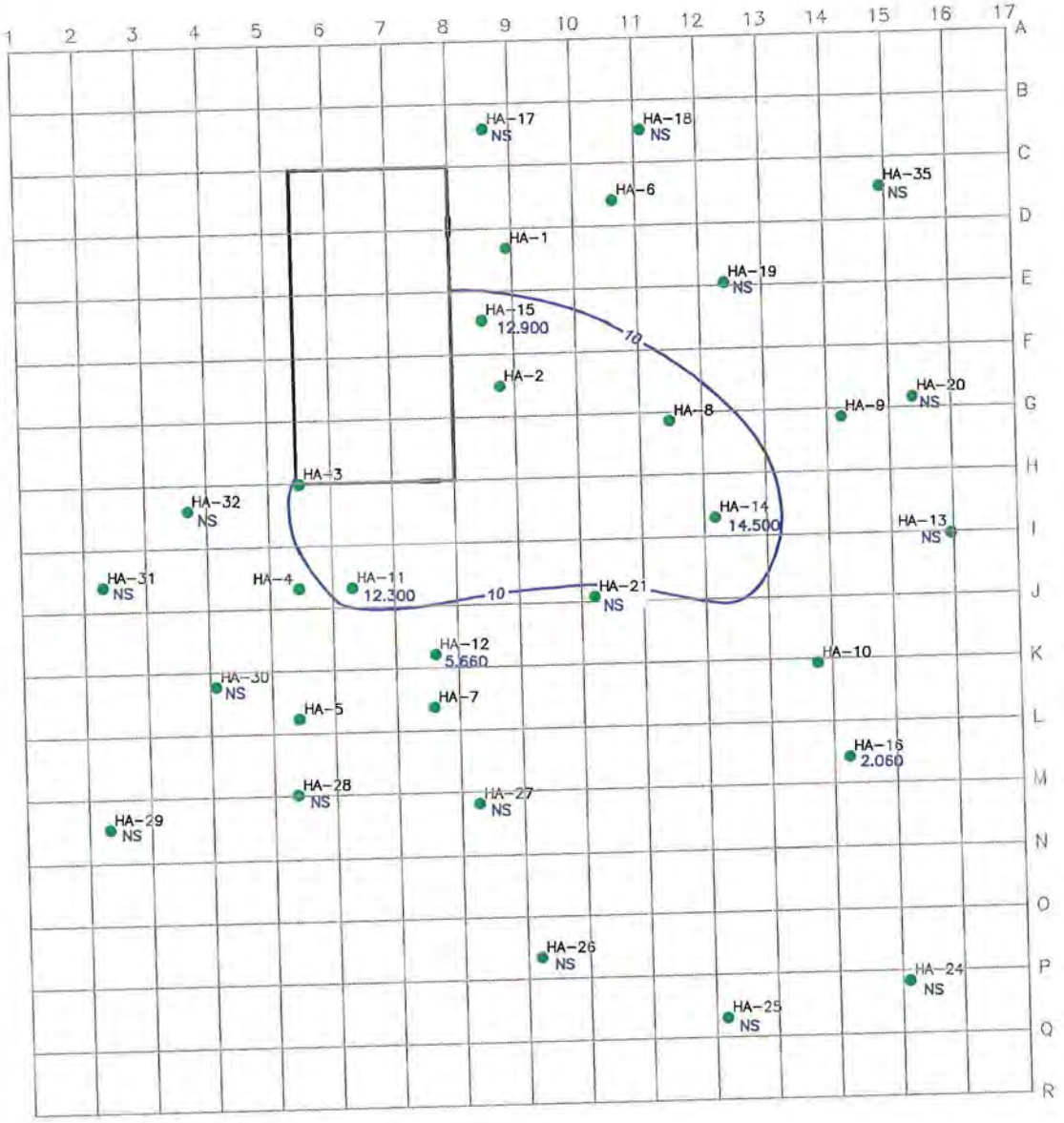
FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 6 TO 7 FOOT BGL, MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	9



LEGEND

HA-11 / 12.300 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 5/5-7/09)

10 — CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

15 0 15 30
SCALE FEET

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 7 TO 8 FOOT BGL, MAY 5 - 7, 2009

DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	11/6/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	
4100417112	
FIGURE NUMBER	
10	

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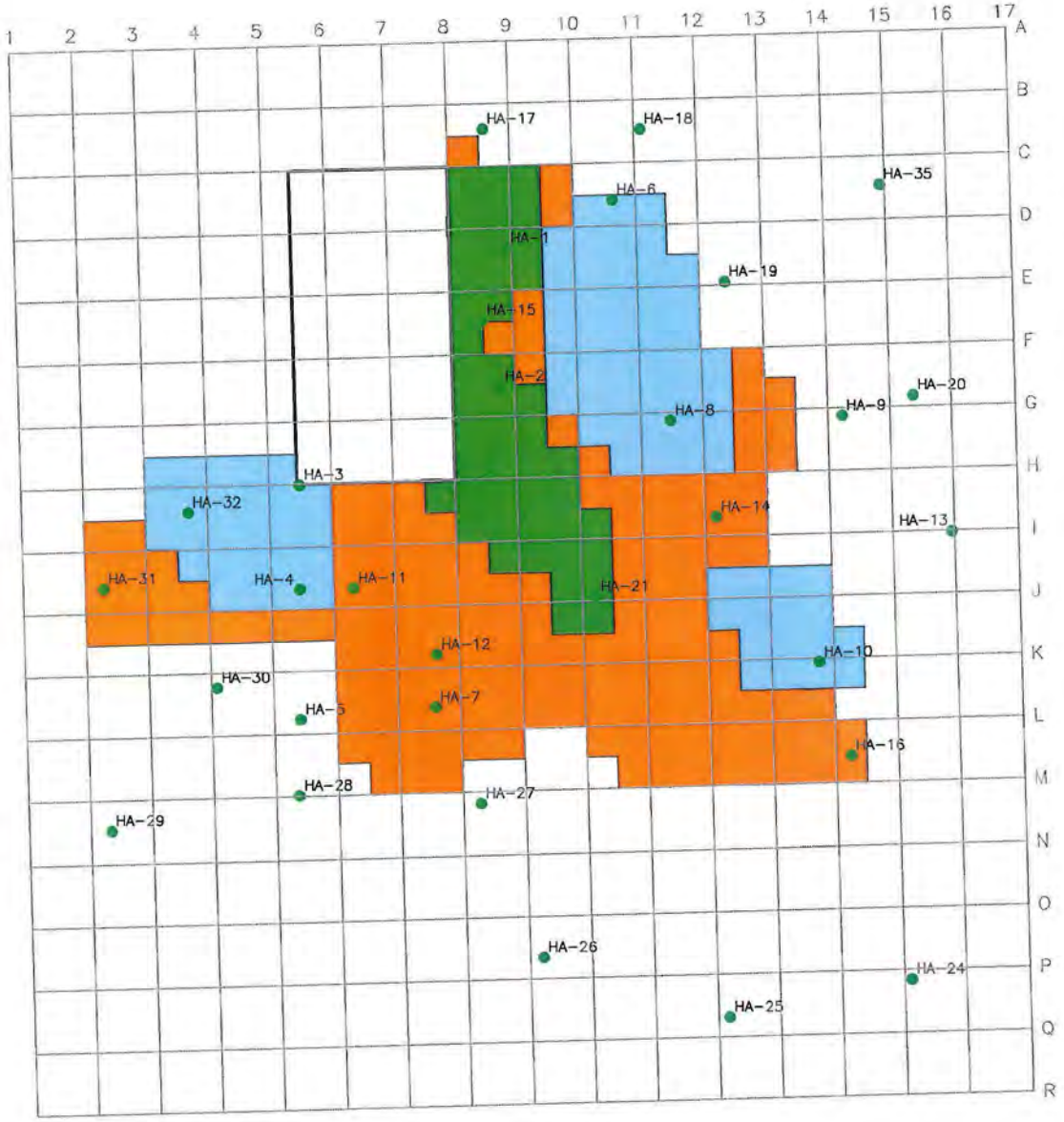


LEGEND

HA-11 SOIL SAMPLE LOCATION WITH IDENTIFICATION COLLECTED 2/4/09 AND 5/5-7/09

PROPOSED AREA OF EXCAVATION TO DEPTH OF:

- 1 FOOT
- 2 FEET
- 3 FEET

N

15 0 15 30

SCALE FEET

BENHAM
an SAIC company

The Benham Companies, LLC
One West Third Street, Suite 100
Tulsa, Oklahoma 74103
(918) 492-1600

www.benham.com

FIGURE TITLE
PROPOSED AREA FOR EXCAVATION OF IMPACTED SOILS WITH EC VALUES GREATER THAN 10 mmhos/cm

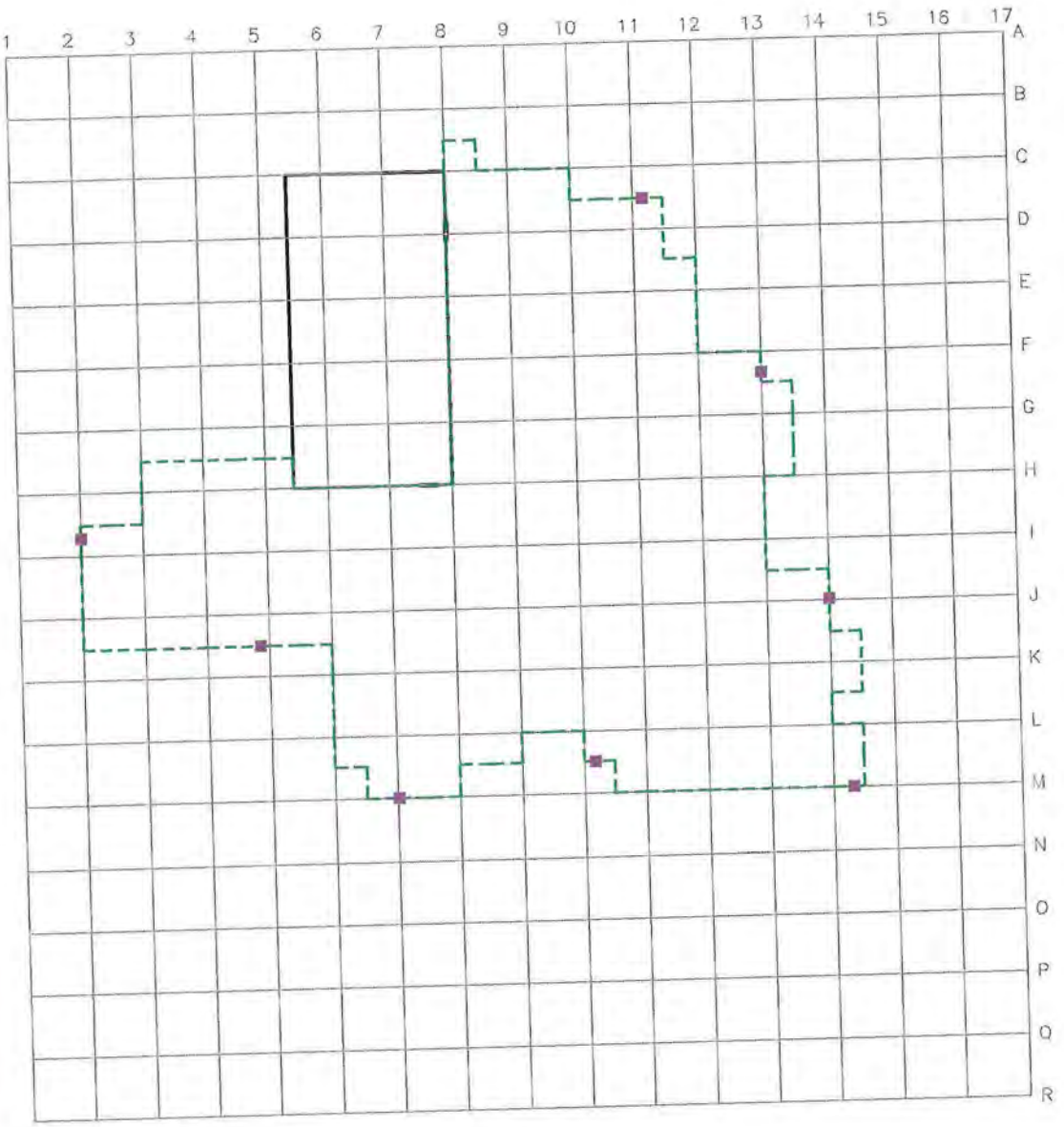
DOCUMENT TITLE
REMEDIAL ACTION PLAN
BRINE IMPACTED SOIL - IRP #2026

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	10/27/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	
4100417112	
FIGURE NUMBER	
11	

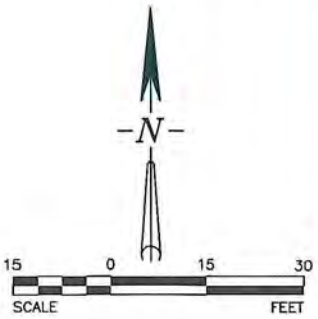
P:\TUL\ENV\2004\4100417112_EPNGJal4Impact\20_DESGN\40_CAD\FIG02-09_SITE.dwg on Nov 06, 2009-10:11am



LEGEND

PROPOSED EXCAVATION LIMITS BASED ON SOIL EC LEVELS, 10 mmhos/cm OR GREATER

PROPOSED WALL SAMPLE LOCATION FOR LABORATORY EC CONFIRMATION



BENHAM
an SAIC company
The Benham Companies, LLC
One West Third Street, Suite 100
Tulsa, Oklahoma 74103
(918) 492-1600
www.benham.com

FIGURE TITLE	***PROPOSED LABORATORY EC CONFIRMATION SAMPLE LOCATIONS***
DOCUMENT TITLE	REMEDIAL ACTION PLAN BRINE IMPACTED SOIL - IRP #2026
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 GAS PLANT LEA COUNTY, NEW MEXICO

DATE	10/27/09
SCALE	1"=30'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417112
FIGURE NUMBER	12

P:\TUL\ENV\2004\4100417112_EPNGJal4Impact\20_DESGN\40_CAD\FIG02-09_SITE.dwg on Nov 06, 2009-10:10am

APPENDIX A

STATE OF NEW MEXICO RELEASE NOTIFICATION AND CORRECTIVE ACTION FORM

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

RECEIVED
NOV 10 2008
HOBBS

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: El Paso Natural Gas Company	Contact: Doug Stavinoha
Address: 1001 Louisiana Street, Houston, Texas 77002	Telephone No.: (713) 420-5150
Facility Name: Jal #4 Groundwater Remediation Project	Facility Type: Pump and Inject Remediation System

Surface Owner: State of New Mexico	Mineral Owner: N/A	Lease No.: N/A

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
SE/4 NW/4 SW/4 L	32	23S	37E	1,903	South	682	West	Lea

Latitude: 32° 15' 31" N **Longitude:** 103° 11' 28" W

NATURE OF RELEASE

Type of Release: Water high in chlorides.	Volume of Release: Approximately 35 barrels	Volume Recovered: Approximately 25 barrels
Source of Release: Corroded filter housing on groundwater remediation system.	Date and Hour of Occurrence: 10/27/08 @ 1200 hr	Date and Hour of Discovery: 10/27/08 @ 1500 hr
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Larry Johnson	
By Whom? Bruce E. McKenzie, The Benham Companies, LLC	Date and Hour: 10/28/08 @ 1647 hr	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Corroded filter housing on groundwater remediation system leaked, releasing water that was high in chlorides. Remedial actions taken at time of discovery included shutting the groundwater remediation system down, calling a vac-truck to vacuum up approximately 25 barrels of fluid that had collected in a low spot of the access road, and replacing the corroded filter housing.

Describe Area Affected and Cleanup Action Taken.*

Area affected by release was a low spot of a caliche access road, and was approximately 100 feet long and 40 feet wide. Soil samples will be collected from the affected area and analyzed for chlorides. Remedial action will depend upon the results of these soil samples.

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:	OIL CONSERVATION DIVISION
Printed Name: Doug Stavinoha	Approved by District Supervisor: ENVIRONMENTAL ENGINEER
Title: Project Manager	Approval Date: 12-12-08 Expiration Date: 2-12-09
E-mail Address: doug.stavinoha@elpaso.com	Conditions of Approval: SUBMIT FINAL C-141 W/ DOCUMENTATION Attached ☐
Date: 11/5/08 Phone: (713) 420-5150	IRP # 2026

* Attach Additional Sheets If Necessary

INCLUDE THIS TRACKING # ON ALL FUTURE CORRESPONDENCE PERTAINING TO THIS INCIDENT

C:\Documents and Settings\DXS1036\My Documents\Jal 4 Spl Rpt Frm doc

APPENDIX B

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

El Paso

Certificate of Analysis Number:

09020166

Report To:		Project Name:	W-BEN-01-30-09-SAH-01/4100417111
El Paso Energy		Site:	Jal#4--1st quarter
Doug Stavinoha		Site Address:	
1001 Louisiana			
Houston		PO Number:	West-SPL0-Jal #4-002
TX		State:	New Mexico
77002-		State Cert. No.:	
ph:	fax:	Date Reported:	2/16/2009

This Report Contains A Total Of 20 Pages

Excluding This Page, Chain Of Custody

And

Any Attachments

2/16/2009

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:

El Paso

Certificate of Analysis Number:

09020166

Report To:		Project Name:	W-BEN-01-30-09-SAH-01/4100417111
El Paso Energy		Site:	Jal#4--1st quarter
Doug Stavinoha		Site Address:	
1001 Louisiana			
Houston		PO Number:	West-SPL0-Jal #4-002
TX		State:	New Mexico
77002-		State Cert. No.:	
ph:	fax:	Date Reported:	2/16/2009

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report (" mg\kg-dry " or " ug\kg-dry ").

Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Some of the percent recoveries and RPD's on the QC report for the MS/MSD may be different than the calculated recoveries and RPD's using the sample result and the MS/MSD results that appear on the report because, the actual raw result is used to perform the calculations for percent recovery and RPD.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Elessa Sommers
Senior Project Manager

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

El Paso

Certificate of Analysis Number:

09020166

Report To:	El Paso Energy Doug Stavinoha 1001 Louisiana Houston TX 77002- ph: fax:	**Project Name:**	W-BEN-01-30-09-SAH-01/4100417111
		Site:	Jal#4--1st quarter
		Site Address:	
		PO Number:	West-SPL0-Jal #4-002
		State:	New Mexico
		State Cert. No.:	
Fax To:		**Date Reported:**	2/16/2009

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
HA-1 (0-1)	09020166-01	Soil	2/3/2009 2:45:00 PM	2/5/2009 10:00:00 AM	11494	☐
HA-2 (0-1)	09020166-02	Soil	2/3/2009 2:58:00 PM	2/5/2009 10:00:00 AM	11494	☐
HA-3 (0-1)	09020166-03	Soil	2/3/2009 3:10:00 PM	2/5/2009 10:00:00 AM	11494	☐
HA-4 (0-1)	09020166-04	Soil	2/3/2009 3:20:00 PM	2/5/2009 10:00:00 AM	11494	☐
HA-5 (0-1)	09020166-05	Soil	2/3/2009 3:31:00 PM	2/5/2009 10:00:00 AM	11494	☐
HA-6 (0-1)	09020166-06	Soil	2/3/2009 3:46:00 PM	2/5/2009 10:00:00 AM	11494	☐
HA-7 (0-1)	09020166-07	Soil	2/3/2009 4:05:00 PM	2/5/2009 10:00:00 AM	11494	☐
HA-8	09020166-08	Soil	2/4/2009 11:50:00 AM	2/5/2009 10:00:00 AM	11494	☐
HA-9	09020166-09	Soil	2/4/2009 11:30:00 AM	2/5/2009 10:00:00 AM	11494	☐
HA-10	09020166-10	Soil	2/4/2009 11:43:00 AM	2/5/2009 10:00:00 AM	11494	☐

2/16/2009

Elessa Sommers
Senior Project Manager

Date

Richard R. Reed
Laboratory Director

Ted Yen
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-1 (0-1) **Collected:** 02/03/2009 14:45 **SPL Sample ID:** 09020166-01

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	1.08		0	1	02/06/09 18:04	CFS	4896955
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		1.4	1	02/11/09 14:22	NMa	4904283
Toluene	1.9		1.4	1	02/11/09 14:22	NMa	4904283
Ethylbenzene	ND		1.4	1	02/11/09 14:22	NMa	4904283
m,p-Xylene	ND		1.4	1	02/11/09 14:22	NMa	4904283
o-Xylene	ND		1.4	1	02/11/09 14:22	NMa	4904283
Xylenes,Total	ND		1.4	1	02/11/09 14:22	NMa	4904283
Surr: 1,4-Difluorobenzene	106		% 77-126	1	02/11/09 14:22	NMa	4904283
Surr: 4-Bromofluorobenzene	113		% 60-160	1	02/11/09 14:22	NMa	4904283

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/03/2009 14:45	Field	1.35

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-2 (0-1) **Collected:** 02/03/2009 14:58 **SPL Sample ID:** 09020166-02

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	1.73		0	1	02/06/09 18:04	CFS	4896953
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		1.1	1	02/11/09 14:51	NMa	4904284
Toluene	ND		1.1	1	02/11/09 14:51	NMa	4904284
Ethylbenzene	ND		1.1	1	02/11/09 14:51	NMa	4904284
m,p-Xylene	ND		1.1	1	02/11/09 14:51	NMa	4904284
o-Xylene	ND		1.1	1	02/11/09 14:51	NMa	4904284
Xylenes,Total	ND		1.1	1	02/11/09 14:51	NMa	4904284
Surr: 1,4-Difluorobenzene	108		% 77-126	1	02/11/09 14:51	NMa	4904284
Surr: 4-Bromofluorobenzene	115		% 60-160	1	02/11/09 14:51	NMa	4904284

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 14:58	Field	1.11

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-3 (0-1) **Collected:** 02/03/2009 15:10 **SPL Sample ID:** 09020166-03

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	0.914		0	1	02/06/09 18:04	CFS	4896952
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		1.2	1	02/11/09 15:20	NMa	4904285
Toluene	ND		1.2	1	02/11/09 15:20	NMa	4904285
Ethylbenzene	ND		1.2	1	02/11/09 15:20	NMa	4904285
m,p-Xylene	ND		1.2	1	02/11/09 15:20	NMa	4904285
o-Xylene	ND		1.2	1	02/11/09 15:20	NMa	4904285
Xylenes,Total	ND		1.2	1	02/11/09 15:20	NMa	4904285
Surr: 1,4-Difluorobenzene	108		% 77-126	1	02/11/09 15:20	NMa	4904285
Surr: 4-Bromofluorobenzene	116		% 60-160	1	02/11/09 15:20	NMa	4904285

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 15:10	Field	1.16

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-4 (0-1) **Collected:** 02/03/2009 15:20 **SPL Sample ID:** 09020166-04

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	2.65		0	1	02/06/09 18:04	CFS	4896951
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		1	1	02/11/09 15:50	NMa	4904286
Toluene	ND		1	1	02/11/09 15:50	NMa	4904286
Ethylbenzene	ND		1	1	02/11/09 15:50	NMa	4904286
m,p-Xylene	ND		1	1	02/11/09 15:50	NMa	4904286
o-Xylene	ND		1	1	02/11/09 15:50	NMa	4904286
Xylenes,Total	ND		1	1	02/11/09 15:50	NMa	4904286
Surr: 1,4-Difluorobenzene	107		% 77-126	1	02/11/09 15:50	NMa	4904286
Surr: 4-Bromofluorobenzene	115		% 60-160	1	02/11/09 15:50	NMa	4904286

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 15:20	Field	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-5 (0-1) **Collected:** 02/03/2009 15:31 **SPL Sample ID:** 09020166-05

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE				**MCL**		**D2216**	**Units: wt%**	
Percent Moisture	2.34		0		1	02/06/09 18:04	CFS	4896950
PURGEABLE AROMATICS				**MCL**		**SW8021B**	**Units: ug/Kg-dry**	
Benzene	ND		1		1	02/07/09 17:35	EMB	4898650
Toluene	ND		1		1	02/07/09 17:35	EMB	4898650
Ethylbenzene	ND		1		1	02/07/09 17:35	EMB	4898650
m,p-Xylene	ND		1		1	02/07/09 17:35	EMB	4898650
o-Xylene	ND		1		1	02/07/09 17:35	EMB	4898650
Xylenes,Total	ND		1		1	02/07/09 17:35	EMB	4898650
Surr: 1,4-Difluorobenzene	100		% 77-126		1	02/07/09 17:35	EMB	4898650
Surr: 4-Bromofluorobenzene	101		% 60-160		1	02/07/09 17:35	EMB	4898650

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 15:31	Field	1.02

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-6 (0-1) **Collected:** 02/03/2009 15:46 **SPL Sample ID:** 09020166-06

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	3.85		0	1	02/06/09 18:04	CFS	4896949
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		0.98	1	02/07/09 18:04	EMB	4898651
Toluene	ND		0.98	1	02/07/09 18:04	EMB	4898651
Ethylbenzene	ND		0.98	1	02/07/09 18:04	EMB	4898651
m,p-Xylene	ND		0.98	1	02/07/09 18:04	EMB	4898651
o-Xylene	ND		0.98	1	02/07/09 18:04	EMB	4898651
Xylenes,Total	ND		0.98	1	02/07/09 18:04	EMB	4898651
Surr: 1,4-Difluorobenzene	99.9		% 77-126	1	02/07/09 18:04	EMB	4898651
Surr: 4-Bromofluorobenzene	100		% 60-160	1	02/07/09 18:04	EMB	4898651

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 15:46	Field	0.94

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-7 (0-1) **Collected:** 02/03/2009 16:05 **SPL Sample ID:** 09020166-07

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	4.48		0	1	02/06/09 18:04	CFS	4896948
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		1	1	02/07/09 18:33	EMB	4898652
Toluene	ND		1	1	02/07/09 18:33	EMB	4898652
Ethylbenzene	ND		1	1	02/07/09 18:33	EMB	4898652
m,p-Xylene	ND		1	1	02/07/09 18:33	EMB	4898652
o-Xylene	ND		1	1	02/07/09 18:33	EMB	4898652
Xylenes,Total	ND		1	1	02/07/09 18:33	EMB	4898652
Surr: 1,4-Difluorobenzene	99.6		% 77-126	1	02/07/09 18:33	EMB	4898652
Surr: 4-Bromofluorobenzene	101		% 60-160	1	02/07/09 18:33	EMB	4898652

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 16:05	Field	0.98

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-8 **Collected:** 02/04/2009 11:50 **SPL Sample ID:** 09020166-08

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	1.75		0	1	02/06/09 18:04	CFS	4896947
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		1.1	1	02/07/09 19:01	EMB	4898653
Toluene	ND		1.1	1	02/07/09 19:01	EMB	4898653
Ethylbenzene	ND		1.1	1	02/07/09 19:01	EMB	4898653
m,p-Xylene	ND		1.1	1	02/07/09 19:01	EMB	4898653
o-Xylene	ND		1.1	1	02/07/09 19:01	EMB	4898653
Xylenes,Total	ND		1.1	1	02/07/09 19:01	EMB	4898653
Surr: 1,4-Difluorobenzene	100		% 77-126	1	02/07/09 19:01	EMB	4898653
Surr: 4-Bromofluorobenzene	101		% 60-160	1	02/07/09 19:01	EMB	4898653

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 11:50	Field	1.06

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-9 **Collected:** 02/04/2009 11:30 **SPL Sample ID:** 09020166-09

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE				**MCL**	**D2216**	**Units: wt%**	
Percent Moisture	2.96		0	1	02/06/09 18:04	CFS	4896946
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/Kg-dry**	
Benzene	ND		1	1	02/07/09 19:30	EMB	4898654
Toluene	ND		1	1	02/07/09 19:30	EMB	4898654
Ethylbenzene	ND		1	1	02/07/09 19:30	EMB	4898654
m,p-Xylene	ND		1	1	02/07/09 19:30	EMB	4898654
o-Xylene	ND		1	1	02/07/09 19:30	EMB	4898654
Xylenes,Total	ND		1	1	02/07/09 19:30	EMB	4898654
Surr: 1,4-Difluorobenzene	99.9		% 77-126	1	02/07/09 19:30	EMB	4898654
Surr: 4-Bromofluorobenzene	100		% 60-160	1	02/07/09 19:30	EMB	4898654

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 11:30	Field	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-10 **Collected:** 02/04/2009 11:43 **SPL Sample ID:** 09020166-10

Site: Jal#4--1st quarter

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**D2216**	**Units: wt%**		
Percent Moisture	7.42		0	1	02/06/09 18:04	CFS	4896945
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/Kg-dry**		
Benzene	ND		1.1	1	02/07/09 19:59	EMB	4898655
Toluene	ND		1.1	1	02/07/09 19:59	EMB	4898655
Ethylbenzene	ND		1.1	1	02/07/09 19:59	EMB	4898655
m,p-Xylene	ND		1.1	1	02/07/09 19:59	EMB	4898655
o-Xylene	ND		1.1	1	02/07/09 19:59	EMB	4898655
Xylenes,Total	ND		1.1	1	02/07/09 19:59	EMB	4898655
Surr: 1,4-Difluorobenzene	100		% 77-126	1	02/07/09 19:59	EMB	4898655
Surr: 4-Bromofluorobenzene	103		% 60-160	1	02/07/09 19:59	EMB	4898655

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5035A	02/04/2009 11:43	Field	0.98

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

Quality Control Documentation

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso

W-BEN-01-30-09-SAH-01/4100417111

Analysis: Purgeable Aromatics
Method: SW8021B
WorkOrder: 09020166
Lab Batch ID: R264706

Method Blank

RunID: HP_O_090206B-4898635 Units: ug/kg
Analysis Date: 02/06/2009 20:18 Analyst: EMB

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	1.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,4-Difluorobenzene	100.2	85-115
Surr: 4-Bromofluorobenzene	99.9	85-115

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09020166-05A	HA-5 (0-1)
09020166-06A	HA-6 (0-1)
09020166-07A	HA-7 (0-1)
09020166-08A	HA-8
09020166-09A	HA-9
09020166-10A	HA-10

Laboratory Control Sample (LCS)

RunID: HP_O_090206B-4898636 Units: ug/Kg
Analysis Date: 02/06/2009 20:46 Analyst: EMB
Preparation Date: 02/06/2009 20:46 Prep By: Method SW5030B

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	20.8	104	70	130
Ethylbenzene	20.0	21.1	106	70	130
Toluene	20.0	20.4	102	70	130
m,p-Xylene	40.0	41.4	103	70	130
o-Xylene	20.0	20.3	101	70	130
Xylenes,Total	60.0	61.7	103	70	130
Surr: 1,4-Difluorobenzene	100	99.8	99.8	77	126
Surr: 4-Bromofluorobenzene	100	101	101	60	160

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09020175-01
RunID: HP_O_090206B-4898639 Units: ug/Kg
Analysis Date: 02/06/2009 22:13 Analyst: EMB
Preparation Date: 02/06/2009 15:34 Prep By: XML Method SW5030B

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso

W-BEN-01-30-09-SAH-01/4100417111

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 09020166
Lab Batch ID: R264706

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	20	16.2	81.1	20	18.7	93.7	14.4	32	36	139
Ethylbenzene	ND	20	14.8	73.9	20	18.2	91.0	20.7	32	25	138
Toluene	ND	20	15.0	74.9	20	18.0	89.8	18.0	34	31	138
m,p-Xylene	ND	40	27.9	69.8	40	35.1	87.7	22.6	34	25	139
o-Xylene	ND	20	13.6	68.0	20	17.2	86.1	23.5	32	19	144
Xylenes,Total	ND	60	41.5	69.2	60	52.3	87.1	22.9	32	19	144
Surr: 1,4-Difluorobenzene	ND	100	101	101	100	100	100	0.228	30	77	126
Surr: 4-Bromofluorobenzene	ND	100	102	102	100	98.0	98.0	4.05	30	60	160

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

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HOUSTON, TX 77054
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Quality Control Report

El Paso

W-BEN-01-30-09-SAH-01/4100417111

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 09020166
Lab Batch ID: R265005

Method Blank

RunID: HP_U_090211B-4904282 Units: ug/Kg
Analysis Date: 02/11/2009 13:43 Analyst: NMa
Preparation Date: 02/11/2009 13:43 Prep By: Method

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	1.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,4-Difluorobenzene	105.9	77-126
Surr: 4-Bromofluorobenzene	113.4	60-160

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09020166-01A	HA-1 (0-1)
09020166-02A	HA-2 (0-1)
09020166-03A	HA-3 (0-1)
09020166-04A	HA-4 (0-1)

Laboratory Control Sample (LCS)

RunID: HP_U_090211B-4904281 Units: ug/Kg
Analysis Date: 02/11/2009 13:13 Analyst: NMa
Preparation Date: 02/11/2009 13:13 Prep By: Method SW5030B

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	20.9	104	70	130
Ethylbenzene	20.0	21.6	108	70	130
Toluene	20.0	20.6	103	70	130
m,p-Xylene	40.0	42.4	106	70	130
o-Xylene	20.0	20.5	102	70	130
Xylenes,Total	60.0	62.9	105	70	130
Surr: 1,4-Difluorobenzene	100	107	107	77	126
Surr: 4-Bromofluorobenzene	100	114	114	60	160

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09020214-01
RunID: HP_U_090211B-4904293 Units: ug/Kg
Analysis Date: 02/11/2009 21:42 Analyst: NMa
Preparation Date: 02/11/2009 14:04 Prep By: XML Method SW5030B

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso

W-BEN-01-30-09-SAH-01/4100417111

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 09020166
Lab Batch ID: R265005

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	20	19.7	98.3	20	18.7	93.7	4.76	32	36	139
Ethylbenzene	ND	20	17.4	82.7	20	17.8	84.7	2.32	32	25	138
Toluene	ND	20	17.7	88.3	20	17.5	87.5	0.865	34	31	138
m,p-Xylene	ND	40	30.8	77.0	40	32.7	81.8	6.02	34	25	139
o-Xylene	ND	20	14.5	72.3	20	16.0	80.1	10.2	32	19	144
Xylenes,Total	ND	60	45.3	75.5	60	48.7	81.2	7.38	32	19	144
Surr: 1,4-Difluorobenzene	ND	100	112	112	100	112	112	0.132	30	77	126
Surr: 4-Bromofluorobenzene	ND	100	116	116	100	122	122	5.01	30	60	160

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso

W-BEN-01-30-09-SAH-01/4100417111

Analysis: PERCENT MOISTURE
Method: D2216

WorkOrder: 09020166
Lab Batch ID: R264627C

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09020166-01B	HA-1 (0-1)
09020166-02B	HA-2 (0-1)
09020166-03B	HA-3 (0-1)
09020166-04B	HA-4 (0-1)
09020166-05B	HA-5 (0-1)
09020166-06B	HA-6 (0-1)
09020166-07B	HA-7 (0-1)
09020166-08B	HA-8
09020166-09B	HA-9
09020166-10B	HA-10

Sample Duplicate

Original Sample: 09020166-01
RunID: WET_090206K-4896955 Units: wt%
Analysis Date: 02/06/2009 18:04 Analyst: CFS

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Percent Moisture	1.08	1.075	0.134	20

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Sample Receipt Checklist

And

Chain of Custody

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	**09020166**	Received By:	**RE**
Date and Time Received:	**2/5/2009 10:00:00 AM**	Carrier name:	**Fedex-Standard Overnight**
Temperature:	**3.0°C**	Chilled by:	**Water Ice**

1. **Shipping container/cooler in good condition?**	Yes ☑	No ☐	Not Present ☐	
2. **Custody seals intact on shippping container/cooler?**	Yes ☑	No ☐	Not Present ☐	
3. **Custody seals intact on sample bottles?**	Yes ☐	No ☐	Not Present ☑	
4. **Chain of custody present?**	Yes ☑	No ☐		
5. **Chain of custody signed when relinquished and received?**	Yes ☑	No ☐		
6. **Chain of custody agrees with sample labels?**	Yes ☑	No ☐		
7. **Samples in proper container/bottle?**	Yes ☑	No ☐		
8. **Sample containers intact?**	Yes ☑	No ☐		
9. **Sufficient sample volume for indicated test?**	Yes ☑	No ☐		
10. **All samples received within holding time?**	Yes ☑	No ☐		
11. **Container/Temp Blank temperature in compliance?**	Yes ☑	No ☐		
12. **Water - VOA vials have zero headspace?**	Yes ☑	No ☐	VOA Vials Not Present ☐	
13. **Water - Preservation checked upon receipt (except VOA*)?**	Yes ☐	No ☐	Not Applicable ☑	

***VOA Preservation Checked After Sample Analysis**

SPL Representative: _____ **Contact Date & Time:** _____

Client Name Contacted: _____

Non Conformance Issues: _____

Client Instructions: _____

09020166 11494

CHAIN-OF-CUSTODY RECORD

BENHAM
- Norman, OK 405/321-3895
- Tulsa, OK 918/492-1600
- Arlington, TX 817/640-6407
- Houston, TX 832/252-1144
- Ardmore, OK 580/224-2984

(Complete Addresses on reverse side of form)

CLIENT NAME:	SITE MANAGER:
El Paso	Bruce McKenzie
PROJECT NO: 410041711	PROJECT NAME: JAL #4
PAGE: 1 PAGE: 1	LAB: PO#

DATE	TIME	MATRIX	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: BTEX 8021B (5035)	LAB I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E. FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE
2-3-09	1445	Soil	JA-1 {0-1}	4	X		
2-3-09	1458	Soil	JA-2 {0-1}	4	X		
2-3-09	1510	Soil	JA-3 {0-1}	4	X		
2-3-09	1520	Soil	JA-4 {0-1}	4	X		
2-3-09	1531	Soil	JA-5 {0-1}	4	X		
2-3-09	1546	Soil	JA-6 {0-1}	4	X		
2-3-09	1605	Soil	JA-7 {0-1}	4	X		
2-4-09	1150	Soil	JA-8	4	X		
2-4-09	1130	Soil	JA-9	4	X		
2-4-09	1143	Soil	JA-10	4	X		

SAMPLED BY: (Signature) TERRY FISHER	DATE: TIME:	RELINQUISHED BY: (Signature)	DATE: 2-4-9 TIME: 1630
RECEIVED BY: (Signature)	DATE: TIME:	RELINQUISHED BY: (Signature)	DATE: TIME:
RECEIVED BY: (Signature)	DATE: TIME:		

SAMPLE SHIPPED BY: (Circle) AIRBILL # 868047298 18

FEDEX PONY XPS VEL XPS

HAND DELIVERED UPS OTHER

COMMENTS: ARF # W-BEN-01-30-09-SAH-01

TURN AROUND TIME NEEDED: Standard

RECEIVING LABORATORY: SPL

ADDRESS: 8880 Interchange Dr.

CITY: Houston STATE: TX ZIP: 77054

CONTACT: Elessa Sommers

PHONE: 610 935 5577

RECEIVED BY LABORATORY:

(Signature)

DATE: 2/ /09 TIME:

SAMPLE CONDITION UPON RECEIPT: (Lab Use Only)

Temperature Wet Ice Present: Y N

VOA's Free of Headspace Y N

Comments:

BENHAM CONTACT PERSON(S): Scott Haas

PHONE #: 405-321-3895

POINT OF ORIGIN: ☐ NORMAN ☒ TULSA ☐ ARLINGTON ☐ ARDMORE ☐ HOUSTON ☐ OTHER:

PAGE #1 - RECEIVING LAB PAGE #2 - RETURN TO BENHAM PAGE #3 - PROJECT MANAGER PAGE #4 - QA/QC COORDINATOR

Environmental Testing Inc. 488-2400
4619 N. Santa Fe, OKC, OK 73118 - (405) 488-2400 - (405) 488-2404 fax

Analytical Report

Report Date:	02/16/2009
Order #	2009020083
Project #	4100417111

Laboratory Certificate # 7211

Client: **Mr. Scott Haas**
Benham
3700 W. Robinson, Ste. 200
Norman, OK 73072

Project: **Jal #4**

Analytical Results

Client Sample ID: **HA-1 (0-1)** ETI ID: **1**
Sample Collected : **02/03/2009 @ 08:18** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	28600	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-1 (1-2)** ETI ID: **2**
Sample Collected : **02/03/2009 @ 08:25** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	16000	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-1 (2-3)** ETI ID: **3**
Sample Collected : **02/03/2009 @ 08:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	8110	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Analytical Results

Client Sample ID: **HA-2 (0-1)** ETI ID: **4**
Sample Collected : **02/03/2009 @ 09:03** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	25500	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-2 (1-2)** ETI ID: **5**
Sample Collected : **02/03/2009 @ 09:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10800	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-2 (2-3)** ETI ID: **6**
Sample Collected : **02/03/2009 @ 09:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	7510	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-3 (0-1)** ETI ID: **7**
Sample Collected : **02/03/2009 @ 09:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	12900	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-3 (1-2)** ETI ID: **8**
Sample Collected : **02/03/2009 @ 09:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6150	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-3 (2-3)** ETI ID: **9**
Sample Collected : **02/03/2009 @ 10:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	11800	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Analytical Results

Client Sample ID: **HA-4 (0-1)** ETI ID: **10**
Sample Collected : **02/03/2009 @ 11:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	21600	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-4 (1-2)** ETI ID: **11**
Sample Collected : **02/03/2009 @ 11:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10600	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-4 (2-3)** ETI ID: **12**
Sample Collected : **02/03/2009 @ 11:22** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	12400	µmhos/cm	02/11/2009 03:25:00 PM	LH	120.1

Client Sample ID: **HA-5 (0-1)** ETI ID: **13**
Sample Collected : **02/03/2009 @ 11:35** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4400	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-5 (1-2)** ETI ID: **14**
Sample Collected : **02/03/2009 @ 11:43** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	2080	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-5 (2-3)** ETI ID: **15**
Sample Collected : **02/03/2009 @ 11:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3420	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Analytical Results

Client Sample ID: **HA-6 (0-1)** ETI ID: **16**
Sample Collected : **02/03/2009 @ 12:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	9770	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-6 (1-2)** ETI ID: **17**
Sample Collected : **02/03/2009 @ 12:53** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5630	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-6 (2-3)** ETI ID: **18**
Sample Collected : **02/03/2009 @ 13:01** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	11000	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-7 (0-1)** ETI ID: **19**
Sample Collected : **02/03/2009 @ 14:13** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	27000	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-7 (1-2)** ETI ID: **20**
Sample Collected : **02/03/2009 @ 14:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5070	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-7 (2-3)** ETI ID: **21**
Sample Collected : **02/03/2009 @ 14:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3960	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Analytical Results

Client Sample ID: **HA-8 (0-1)** ETI ID: **22**
Sample Collected : **02/04/2009 @ 09:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	25500	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-8 (1-2)** ETI ID: **23**
Sample Collected : **02/04/2009 @ 09:09** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6210	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-8 (2-3)** ETI ID: **24**
Sample Collected : **02/04/2009 @ 09:16** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	14300	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-9 (0-1)** ETI ID: **25**
Sample Collected : **02/04/2009 @ 09:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5720	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-9 (1-2)** ETI ID: **26**
Sample Collected : **02/04/2009 @ 09:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1210	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-9 (2-3)** ETI ID: **27**
Sample Collected : **02/04/2009 @ 10:03** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3010	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Analytical Results

Client Sample ID: **HA-10 (0-1)** ETI ID: **28**

Sample Collected : **02/04/2009 @ 10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	8330	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-10 (1-2)** ETI ID: **29**

Sample Collected : **02/04/2009 @ 10:22** Matrix: **Solids**

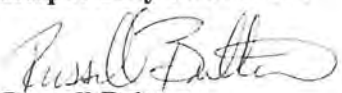
Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3300	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Client Sample ID: **HA-10 (2-3)** ETI ID: **30**

Sample Collected : **02/04/2009 @ 10:27** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	13600	µmhos/cm	02/13/2009 09:00:00 AM	LH	120.1

Respectfully Submitted:



Russell Britten
President

Unless ETI receives prior notification, all sample material not consumed in analysis will be retained for a period of 30 days before disposal.

Environmental Testing Inc. 488-2400
4619 N. Santa Fe, OKC, OK 73118 - (405) 488-2400 - (405) 488-2404 fax

Analytical Report

Report Date:	07/27/2009
Order #	2009050169
Project #	4100417112

Laboratory Certificate # 7211

Client: **Mr. Scott Haas**
Benham
3700 W. Robinson, Ste. 200
Norman, OK 73072

Project: **El Paso Natural Gas Jal #4**

Analytical Results

Client Sample ID: **HA-11 (0-1)** ETI ID: **1**
Sample Collected : **05/05/2009 @ 11:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	7940	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-11 (1-2)** ETI ID: **2**
Sample Collected : **05/05/2009 @ 11:35** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3760	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-11 (2-3)** ETI ID: **3**
Sample Collected : **05/05/2009 @ 11:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6340	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-11 (3-4)** ETI ID: **4**
Sample Collected : **05/05/2009 @ 11:48** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5030	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-11 (4-5)** ETI ID: **5**
Sample Collected : **05/05/2009 @ 11:57** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5350	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-11 (5-6)** ETI ID: **6**
Sample Collected : **05/05/2009 @ 12:07** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	9280	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-11 (6-7)** ETI ID: **7**
Sample Collected : **05/05/2009 @ 12:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	12500	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-11 (7-8)** ETI ID: **8**
Sample Collected : **05/05/2009 @ 12:26** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	12300	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-17 (0-1)** ETI ID: **9**
Sample Collected : **05/06/2009 @ 09:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1660	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-17 (1-2)** ETI ID: **10**
Sample Collected : **05/06/2009 @ 09:05** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1350	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-17 (2-3)** ETI ID: **11**
Sample Collected : **05/06/2009 @ 09:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	2330	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-17 (3-4)** ETI ID: **12**
Sample Collected : **05/06/2009 @ 09:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3220	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-17 (4-5)** ETI ID: **13**
Sample Collected : **05/06/2009 @ 09:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6780	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-28 (0-1)** ETI ID: **14**
Sample Collected : **05/06/2009 @ 16:05** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	2190	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-12 (0-1)** ETI ID: **15**
Sample Collected : **05/05/2009 @ 12:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	19700	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-12 (1-2)** ETI ID: **16**
Sample Collected : **05/05/2009 @ 12:51** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5220	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-12 (2-3)** ETI ID: **17**
Sample Collected : **05/05/2009 @ 13:02** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5140	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-12 (3-4)** ETI ID: **18**
Sample Collected : **05/05/2009 @ 13:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4650	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-12 (4-5)** ETI ID: **19**
Sample Collected : **05/05/2009 @ 13:16** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4080	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-12 (5-6)** ETI ID: **20**
Sample Collected : **05/05/2009 @ 13:22** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5910	µmhos/cm	05/15/2009 10:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-12 (6-7)** ETI ID: **21**
Sample Collected : **05/05/2009 @ 13:25** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	7220	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-12 (7-8)** ETI ID: **22**
Sample Collected : **05/05/2009 @ 13:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5660	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-19 (0-1)** ETI ID: **23**
Sample Collected : **05/06/2009 @ 10:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	2780	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-19 (1-2)** ETI ID: **24**
Sample Collected : **05/06/2009 @ 10:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	2090	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-19 (2-3)** ETI ID: **25**
Sample Collected : **05/06/2009 @ 10:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4320	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-19 (3-4)** ETI ID: **26**
Sample Collected : **05/06/2009 @ 10:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4340	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-19 (4-5)** ETI ID: **27**
Sample Collected : **05/06/2009 @ 10:58** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3750	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-14 (0-1)** ETI ID: **28**
Sample Collected : **05/05/2009 @ 14:24** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	941	mg/Kg	07/24/2009 10:36:51 AM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	12000	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-14 (1-2)** ETI ID: **29**
Sample Collected : **05/05/2009 @ 14:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5800	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-14 (2-3)** ETI ID: **30**
Sample Collected : **05/05/2009 @ 14:35** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	9300	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-14 (3-4)** ETI ID: **31**
Sample Collected : **05/05/2009 @ 14:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	9530	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-14 (4-5)** ETI ID: **32**
Sample Collected : **05/05/2009 @ 14:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10300	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-14 (5-6)** ETI ID: **33**
Sample Collected : **05/05/2009 @ 14:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	11800	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-14 (6-7)** ETI ID: **34**
Sample Collected : **05/05/2009 @ 15:02** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10700	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-14 (7-8)** ETI ID: **35**
Sample Collected : **05/05/2009 @ 15:07** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	14500	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-13 (0-1)** ETI ID: **36**
Sample Collected : **05/06/2009 @ 11:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1700	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-13 (1-2)** ETI ID: **37**
Sample Collected : **05/06/2009 @ 11:25** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1370	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-13 (2-3)** ETI ID: **38**
Sample Collected : **05/06/2009 @ 11:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1530	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-13 (3-4)** ETI ID: **39**
Sample Collected : **05/06/2009 @ 11:35** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1890	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-13 (4-5)** ETI ID: **40**
Sample Collected : **05/06/2009 @ 11:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1830	µmhos/cm	05/15/2009 11:15:00 AM	LH	2510 B Mod

Client Sample ID: **HA-20 (0-1)** ETI ID: **41**
Sample Collected : **05/06/2009 @ 10:38** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3290	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-15 (0-1)** ETI ID: **42**
Sample Collected : **05/05/2009 @ 15:26** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	11300	mg/Kg	07/23/2009 06:09:13 PM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	43400	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-15 (1-2)** ETI ID: **43**
Sample Collected : **05/05/2009 @ 15:32** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6730	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-15 (2-3)** ETI ID: **44**
Sample Collected : **05/05/2009 @ 15:35** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	7570	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-15 (3-4)** ETI ID: **45**
Sample Collected : **05/05/2009 @ 15:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6140	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-15 (4-5)** ETI ID: **46**
Sample Collected : **05/05/2009 @ 15:48** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6400	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-15 (5-6)** ETI ID: **47**
Sample Collected : **05/05/2009 @ 15:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	6750	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-15 (6-7)** ETI ID: **48**
Sample Collected : **05/05/2009 @ 16:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	7150	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-15 (7-8)** ETI ID: **49**
Sample Collected : **05/05/2009 @ 16:08** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	12900	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-25 (0-1)** ETI ID: **50**
Sample Collected : **05/06/2009 @ 14:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	546	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-25 (1-2)** ETI ID: **51**
Sample Collected : **05/06/2009 @ 14:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	321	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-25 (2-3)** ETI ID: **52**
Sample Collected : **05/06/2009 @ 14:25** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	279	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-25 (3-4)** ETI ID: **53**
Sample Collected : **05/06/2009 @ 14:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	197	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-25 (4-5)** ETI ID: **54**
Sample Collected : **05/06/2009 @ 14:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	275	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-16 (0-1)** ETI ID: **55**
Sample Collected : **05/05/2009 @ 16:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10300	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-16 (1-2)** ETI ID: **56**
Sample Collected : **05/05/2009 @ 16:13** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3840	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-16 (2-3)** ETI ID: **57**
Sample Collected : **05/05/2009 @ 16:16** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5910	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-16 (3-4)** ETI ID: **58**
Sample Collected : **05/05/2009 @ 16:19** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5730	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-16 (4-5)** ETI ID: **59**
Sample Collected : **05/05/2009 @ 16:23** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4940	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-16 (5-6)** ETI ID: **60**
Sample Collected : **05/05/2009 @ 16:26** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	5020	mg/Kg	07/23/2009 05:26:57 PM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	2750	µmhos/cm	05/15/2009 11:45:00 AM	LH	2510 B Mod

Client Sample ID: **HA-16 (6-7)** ETI ID: **61**
Sample Collected : **05/05/2009 @ 16:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1890	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-16 (7-8)** ETI ID: **62**
Sample Collected : **05/05/2009 @ 16:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	2060	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-22 (0-1)** ETI ID: **63**
Sample Collected : **05/06/2009 @ 12:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	938	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-22 (1-2)** ETI ID: **64**
Sample Collected : **05/06/2009 @ 12:52** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	563	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-22 (2-3)** ETI ID: **65**
Sample Collected : **05/06/2009 @ 12:56** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	556	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-22 (3-4)** ETI ID: **66**
Sample Collected : **05/06/2009 @ 13:05** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	385	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-22 (4-5)** ETI ID: **67**
Sample Collected : **05/06/2009 @ 13:12** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	430	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-24 (0-1)** ETI ID: **68**
Sample Collected : **05/06/2009 @ 13:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	408	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-24 (1-2)** ETI ID: **69**
Sample Collected : **05/06/2009 @ 13:56** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	369	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-24 (2-3)** ETI ID: **70**
Sample Collected : **05/06/2009 @ 13:58** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	441	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-24 (3-4)** ETI ID: **71**
Sample Collected : **05/06/2009 @ 14:04** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	344	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-24 (4-5)** ETI ID: **72**
Sample Collected : **05/06/2009 @ 14:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	356	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-27 (0-1)** ETI ID: **73**
Sample Collected : **05/06/2009 @ 15:40** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	507	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-27 (1-2)** ETI ID: **74**
Sample Collected : **05/06/2009 @ 15:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	465	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-27 (2-3)** ETI ID: **75**
Sample Collected : **05/06/2009 @ 15:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	341	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-27 (3-4)** ETI ID: **76**

Sample Collected : **05/06/2009 @ 15:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	36.0	mg/Kg	07/24/2009 09:40:36 AM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	420	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-27 (4-5)** ETI ID: **77**

Sample Collected : **05/06/2009 @ 16:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	263	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-30 (0-1)** ETI ID: **78**

Sample Collected : **05/07/2009 @ 08:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	833	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-30 (1-2)** ETI ID: **79**

Sample Collected : **05/07/2009 @ 08:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1020	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-30 (2-3)** ETI ID: **80**

Sample Collected : **05/07/2009 @ 09:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1260	µmhos/cm	05/15/2009 02:20:00 PM	LH	2510 B Mod

Client Sample ID: **HA-30 (3-4)** ETI ID: **81**

Sample Collected : **05/07/2009 @ 09:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1010	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-30 (4-5)** ETI ID: **82**
Sample Collected : **05/07/2009 @ 09:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1080	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-32 (0-1)** ETI ID: **83**
Sample Collected : **05/07/2009 @ 10:05** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	3450	mg/Kg	07/24/2009 10:22:45 AM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	8760	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-32 (1-2)** ETI ID: **84**
Sample Collected : **05/07/2009 @ 10:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10200	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-32 (2-3)** ETI ID: **85**
Sample Collected : **05/07/2009 @ 10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	14200	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-32 (3-4)** ETI ID: **86**
Sample Collected : **05/07/2009 @ 10:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	11600	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-32 (4-5)** ETI ID: **87**
Sample Collected : **05/07/2009 @ 10:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10900	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-33 (0-1)** ETI ID: **88**
Sample Collected : **05/07/2009 @ 11:42** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	273	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-33 (1-2)** ETI ID: **89**
Sample Collected : **05/07/2009 @ 11:46** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	289	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-33 (2-3)** ETI ID: **90**
Sample Collected : **05/07/2009 @ 11:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	229	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-34 (0-1)** ETI ID: **91**
Sample Collected : **05/07/2009 @ 11:20** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	265	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-34 (1-2)** ETI ID: **92**
Sample Collected : **05/07/2009 @ 11:25** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	189	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Client Sample ID: **HA-34 (2-3)** ETI ID: **93**
Sample Collected : **05/07/2009 @ 11:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	50.5	mg/Kg	07/24/2009 10:50:55 AM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	161	µmhos/cm	05/15/2009 04:30:00 PM	LH	2510 B Mod

Respectfully Submitted:

Russell Britten
President

Unless ETI receives prior notification, all sample material not consumed in analysis will be retained for a period of 30 days before disposal.

Environmental Testing Inc. 488-2400
4619 N. Santa Fe, OKC, OK 73118 - (405) 488-2400 - (405) 488-2404 fax

Analytical Report

Report Date:	07/27/2009
Order #	2009060032
Project #	4100417112

Laboratory Certificate # 7211

Client: **Mr. Scott Haas**
Benham
3700 W. Robinson, Ste. 200
Norman, OK 73072

Project: **El Paso, Jal #4**

Analytical Results

Client Sample ID: **HA-18 (0-1)** ETI ID: **1**
Sample Collected : **05/06/2009 @ 10:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	2060	mg/Kg	07/24/2009 11:04:58 AM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	14200	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-18 (1-2)** ETI ID: **2**
Sample Collected : **05/06/2009 @ 10:03** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1690	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-18 (2-3)** ETI ID: **3**
Sample Collected : **05/06/2009 @ 10:07** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3120	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-18 (3-4)** ETI ID: **4**
Sample Collected : **05/06/2009 @ 10:11** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	2850	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-18 (4-5)** ETI ID: **5**
Sample Collected : **05/06/2009 @ 10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5670	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-21 (0-1)** ETI ID: **6**
Sample Collected : **05/05/2009 @ 13:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	16200	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-21 (1-2)** ETI ID: **7**
Sample Collected : **05/05/2009 @ 13:47** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	10700	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-21 (2-3)** ETI ID: **8**
Sample Collected : **05/05/2009 @ 14:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Chloride - Saturated Paste	2170	mg/Kg	07/24/2009 11:19:04 AM	LH	300.0
* Analyzed Out of Hold Time					
Conductivity on Saturated Paste	5250	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-21 (3-4)** ETI ID: **9**
Sample Collected : **05/05/2009 @ 14:03** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	3610	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-21 (4-5)** ETI ID: **10**
Sample Collected : **05/05/2009 @ 14:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5040	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-31 (0-1)** ETI ID: **11**
Sample Collected : **05/07/2009 @ 09:30** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	14500	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-31 (1-2)** ETI ID: **12**
Sample Collected : **05/07/2009 @ 09:35** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	5610	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-31 (2-3)** ETI ID: **13**
Sample Collected : **05/07/2009 @ 09:38** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4090	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-31 (3-4)** ETI ID: **14**
Sample Collected : **05/07/2009 @ 09:44** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	7650	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-31 (4-5)** ETI ID: **15**
Sample Collected : **05/07/2009 @ 09:50** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	4020	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Analytical Results

Client Sample ID: **HA-35 (0-1)** ETI ID: **16**

Sample Collected : **05/07/2009 @ 10:48** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	461	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-35 (1-2)** ETI ID: **17**

Sample Collected : **05/07/2009 @ 10:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	372	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-35 (2-3)** ETI ID: **18**

Sample Collected : **05/07/2009 @ 11:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	672	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-35 (3-4)** ETI ID: **19**

Sample Collected : **05/07/2009 @ 11:05** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	906	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Client Sample ID: **HA-35 (4-5)** ETI ID: **20**

Sample Collected : **05/07/2009 @ 11:10** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity on Saturated Paste	1520	µmhos/cm	06/08/2009 02:40:00 PM	LH	2510 B Mod

Respectfully Submitted:

Russell Britten
President

Unless ETI receives prior notification, all sample material not consumed in analysis will be retained for a period of 30 days before disposal.

Environmental Testing Inc. 488-2400
4619 N. Santa Fe, OKC, OK 73118 - (405) 488-2400 - (405) 488-2404 fax

Quality Control Report

Report Date: 06/09/2009
Order # 2009060032

Laboratory Certificate # 7211

Quality Control

Solids

Duplicate

Parameter	QC Value	Units	ETI ID
Conductivity on Saturated Paste	0.103	% dif.	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20

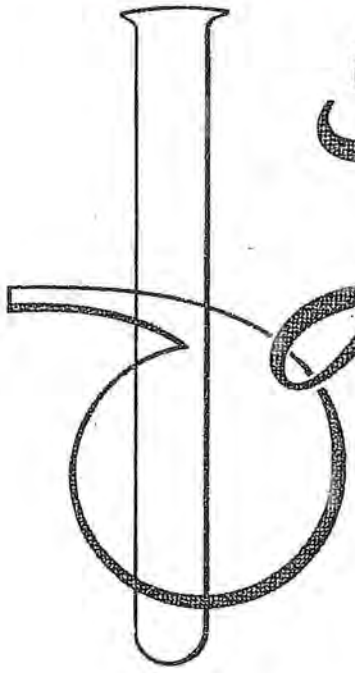
E = Estimated Value (above linear range)
M = Out of Control Due to Matrix Effect
D = Surrogate or Matrix Spike Diluted Out
Q = Outside of QC Limits on Both Original and Rerun
C = Possible Laboratory Contamination
* = Out of Control

J = Estimated Value (below linear range)
*TA = Lab ID: 9412
*ER = Lab ID: 8727

APPENDIX C

PORTION OF USDA HANDBOOK 60

Diagnosis and Improvement of



Saline and Alkali Soils

United States Salinity Laboratory Staff

Contributing Authors:

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L. A. Richards, Editor

Soil and Water Conservation Research Branch

Agricultural Research Service

Agriculture Handbook No. 60 Issued February 1954

UNITED STATES DEPARTMENT OF AGRICULTURE

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price $2.00

textures which may be puddled and underlain with hardpan. Usually found on moist seep lands with high water tables but may occur on better drained land. Moisture-holding capacity is intermediate to high (*SP* 30 to 60). The soils are saline or saline-alkali, with high concentrations of salt in the first foot (0.6 to 3.2 percent) and decreasing amounts with depth, but the average salinity for a 4-foot profile may exceed 1 percent where the growth is luxuriant. The soils may contain exchangeable sodium. Indications: Where virgin growth is vigorous, seepweed is a good indicator of highly saline or saline-alkali soil. Drainage and leaching are essential, and amendments may be required.

ALKALI SACATON, or TUSSOCKGRASS (*Sporobolus airoides*).—Range: South Dakota to Washington, south to Texas, Arizona, and southern California. In low, wet areas, and river valleys. Occurs on loamy and clayey soils that have an intermediate to high moisture-holding capacity (*SP* 45 to 75). The soil surface is moist a great part of the year, and the water table is usually high. The salinity of the soil may vary within wide limits (0.3 to >3.0 percent), the higher values being in the first foot; but the plant grows best in the lower range (0.3 to 0.5 percent). Exchangeable sodium may be present, and this grass is very tolerant to it. Indications: In pure, vigorous stands, this plant is a good indicator of wet, very saline or saline-alkali soils, with a high water table. It may occur on soils without a high moisture content in the subsoil on sites receiving runoff water. The land requires drainage and leaching, and soil amendments may be needed unless gypsum is present.

SAMPHIRE, or GLASSWORT (*Salicornia* spp.).—Range: Saskatchewan to British Columbia, south through Colorado and Nevada. On salt flats and along shores of saline ponds and lakes. Occurs on fine-textured clayey soils that are very wet throughout the profile, with high water tables. The salinity is very high, and this plant grows well where salt may average 1 to 4 percent in the 4-foot profile. Exchangeable sodium may be present in varying amounts. Indications: Soils are usually very wet, with excessive salinity. Useless for agriculture without drainage and prolonged leaching.

PICKLEWEED, or IODINEBUSH (*Allenrolfea occidentalis*).—Range: Oregon to Baja California, Mexico, east through Arizona and New Mexico to western Texas. On saline flats. Occurs on a wide range of soil textures (loamy and clayey soils), but usually on fine-textured soils. The soils are moist or wet throughout the year, with high water tables that may be close to the surface. The soils are excessively saline in the first foot (1.0 to >2.5 percent) and are very saline throughout the 4-foot profile (average 1.0 to 1.5 percent), but the salinity decreases somewhat with depth. Exchangeable sodium may be present in varying amounts. Indications: Soils are usually fine-textured, very wet, and excessively saline. If the stand is good, the land is not suited for agriculture without drainage and prolonged leaching.

Crop Response on Saline Soils

A field of crop plants growing on saline soil usually has barren spots, stunted growth of the plants with considerable variability in size, and a deep blue-green foliage; but these features are not invariable indications of salinity. For example, barren spots may occur in nonsaline fields because of faulty leveling and the resultant inadequacy of irrigation; and retarded growth and abnormal color may result from nutrient deficiencies.

The extent and frequency of bare spots in many areas may be taken as an index of the concentration of salt in the soil. Inasmuch as most plants are more sensitive to salinity during germination than in later stages of growth, barren spots are more indicative of salinity around the seed during germination than they are of the general salinity status of the soil profile. Frequently, cultural practices contribute to an accumulation of salt around the germinating seed with resultant failure in germination. The vigor of the plants adjacent to barren spots may indicate the distribution of salt in the soil. Full-sized vigorous plants immediately adjacent to a bare spot suggest a local concentration of salt, while stunted plants in this position indicate a more general distribution of salinity in the area. If the level of salinity is not sufficiently high to result in barren spots, the major characteristic in the appearance of the crop may be a marked irregularity in vegetative vigor.

Caution should be exercised to avoid confusion between effects of low soil fertility and those caused by salinity. Plants that are stunted because of low fertility are usually yellowish green, whereas those stunted owing to salinity are characteristically blue green. The bluish appearance is the result of an unusually heavy waxy coating on the surface of the leaves, and the darker color to an increase in the chlorophyll content on a surface-area or fresh-weight basis. Sugar beets, crucifers (cabbage, mustards, and related species), alfalfa, some clovers, grasses, and other crops generally develop a noticeable blue-green coloration when grown on saline soils.

There are many regions where plants may develop an intense chlorosis because of certain soil conditions. The causes of chlorosis are not fully understood, but this condition is frequently associated with calcareous soils or, in some cases, with the use of irrigation waters of high bicarbonate content (Harley and Lindner, 1945). Although calcium carbonate is relatively insoluble, much crop injury is associated with its presence. Since this soil condition frequently occurs in the absence of an accumulation of soluble salts, chlorosis cannot be regarded as a definite symptom of salinity.

Some species of plants develop characteristic necrotic areas, tipburn, and firing of the margins of the leaves when grown on saline soil. Many stone fruits, avocado, grapefruit, and some of the less salt-tolerant varieties of cotton belong in this category.

The cupping or rolling of leaves is a common manifestation of moisture deficiency in plants, but these

symptoms may be indicative of salinity when they occur in the presence of apparently adequate soil moisture; however, other factors that cause malfunction of the root system, such as root diseases and high water tables, may produce similar leaf symptoms. While the appearance of the crop may, therefore, be indicative of saline conditions, a reliable diagnosis of salinity usually requires additional evidence derived from appropriate soil and plant tests.

Salinity and Water Availability

Numerous laboratory experiments with sand and water cultures have demonstrated the close relationship between plant growth and the osmotic pressure of the culture solution. On a weight or equivalent basis, chloride salts are generally more inhibitory to the growth of plants than sulfate salts, but this difference tends to disappear when concentrations are expressed on an osmotic basis. These relationships indicate that it is the total concentration of solute particles in the solution rather than their chemical nature which is mainly responsible for the inhibitory effects of saline solutions on the growth of crop plants. Direct experimental evidence of the influence of osmotic concentration on water uptake by plant roots has been reported by Hayward and Spurr (1944). In addition to the osmotic pressure of the solution, the nature of the salts present may exert an important influence on plant growth. Such specific ion effects are discussed in a subsequent section.

There is much evidence to indicate that an increase in the osmotic pressure of the soil solution may result in a decrease in the water uptake by plant roots, but an additional factor must be taken into account in dealing with the soil system; that is, soil-moisture tension, or the molecular attraction of the surface of the soil particles for water. Soil-moisture tension increases as the soil becomes drier and the water films around the soil particles become thinner. This equivalent negative pressure is apparently additive to the osmotic pressure of the soil solution in limiting the availability of water to plant roots. The sum of soil-moisture tension and the osmotic pressure of the soil solution is termed "total soil-moisture stress." Studies on the effects on growth of several moisture treatments and

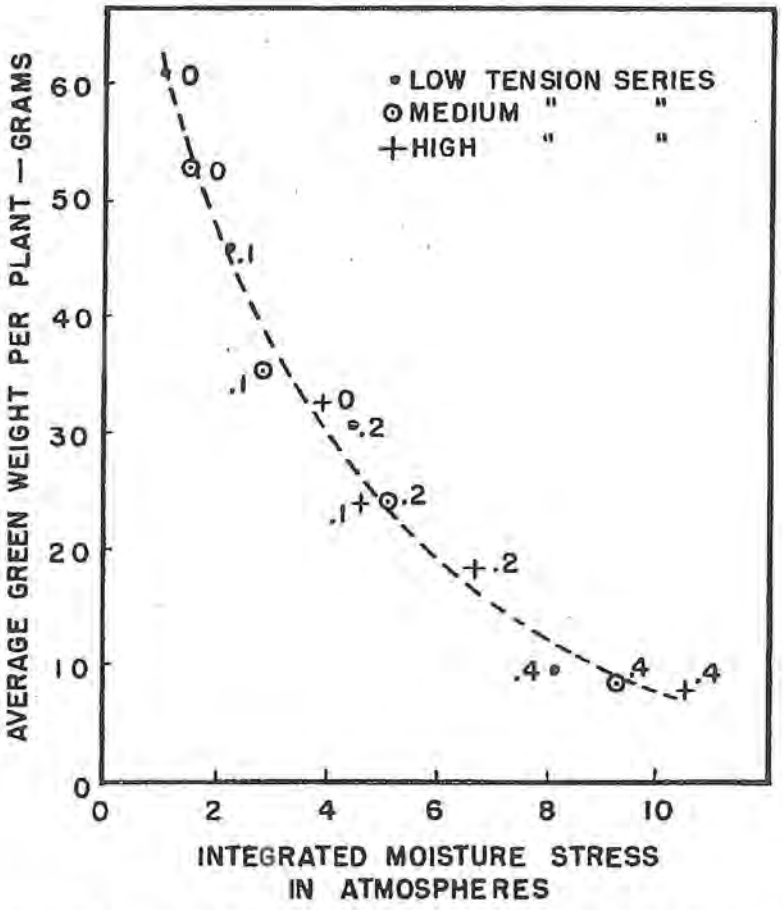

FIGURE 17.—Growth of bean plants as influenced by total soil-moisture stress. The salinity level for each treatment is indicated as percentage on a dry-soil basis (Wadleigh and Ayers, 1945).

salinity levels indicate that plant growth is a function of total soil-moisture stress, regardless of whether this stress arises primarily from salinity or moisture tension (fig. 17).

It is possible to extract the soil solution and determine its osmotic pressure, but this procedure is seldom used because it is simpler to estimate salt concentration by determining the electrical conductivity of the saturation extract (EC_e). Since saturation percentage is related to the field-moisture range, EC_e bears a close relationship to the *EC* of the soil solution. The relationship between *EC* and the osmotic pressure of saturation extracts is given in figure 6. The EC_e, therefore, provides information on the concentration of salt in the soil solution and its osmotic properties. The yield of orchardgrass when grown on soil to which various single salts had been added indicated that growth was simply related to salinity, expressed in terms of EC_e for various neutral salts (fig. 18). The response to sodium bicarbonate was, however, exceptional. In this case, calcium and magnesium ions from the soil exchange complex were precipitated as carbonates, thereby greatly increasing the exchangeable-sodium-percentage and producing an alkali soil.

The Scofield scale, in which crop response to salinity under average conditions is expressed in terms of the conductivity of the saturation extract, was discussed in chapter 2. This salinity scale has been widely used for a number of years and has been found to be satisfactory for salinity appraisal. To facilitate the discussion of plant response on saline soils, this salinity scale in its latest modified form is given again.

Salinity effects mostly negligible	Yields of very sensitive crops may be restricted	Yields of many crops restricted	Only tolerant crops yield satisfactorily	Only a few very tolerant crops yield satisfactorily

0 2 4 8 16

Scale of conductivity (millimhos per centimeter at 25° C.)

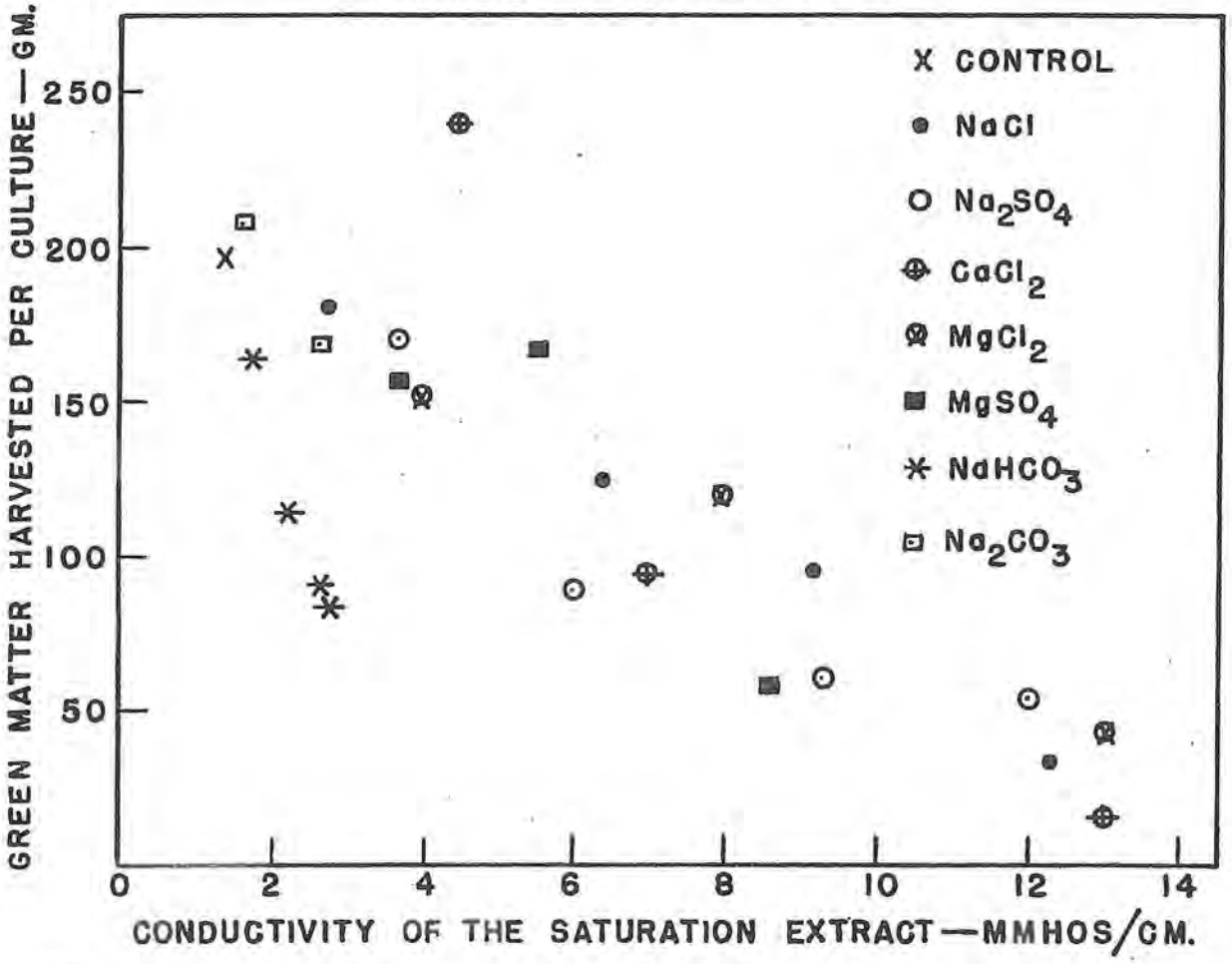

FIGURE 18.—Growth of orchardgrass, as influenced by various salts added to a sandy loam soil (Wadleigh and others, 1951).

It should be emphasized that this classification of plant growth in relation to various salinity levels refers to the salt status of the soil in the active root zone. It is possible to obtain samples from the surface soil around the base of row crops that may contain 5 percent salt or more with EC_e values of 50 mmhos/cm. or higher. This high concentration of salt represents an accumulation in the bed during the growth of the plants and not the salt concentration in the active root zone. Therefore, in correlating crop growth with salinity, care should be exercised to take soil samples from the active root zone that are uncontaminated by surface incrustations of salt. With row crops, the mass of soil making up the bed is frequently more saline than the soil below the furrow, and studies of root distribution and water uptake by plants indicate that under such conditions the major root activity occurs in the less saline parts of the soil, as shown in figure 14. These considerations should be borne in mind in determining the salt status of a soil with reference to plant response.

A technique for measuring the freezing point of soil moisture has been developed that provides a rapid, useful method for obtaining, by a single determination, the total moisture stress in a soil sample at field-moisture conditions (Method 6b). This eliminates errors caused by dilution of the soil solution and the resultant dissolving of moderately soluble salts, such as gypsum. Total soil-moisture-stress values obtained by freezing-point measurements are in good agreement with previously used methods involving determination of EC_e and moisture tension for the soil studied (Wadleigh, 1946, and Ayers and Campbell, 1951).

The experimental evidence cited above supports the concept that decreased growth on saline substrates is related to decreased water availability, but certain relationships between plant and substrate are still not fully understood. Despite marked decreases in growth with increasing concentration of the substrate, osmotic gradients between tops of plants and substrate are sometimes unaffected by increased osmotic pressure or total soil-moisture stress of the substrate. This is caused by increases in osmotic pressure of aerial parts of the plant that parallel increases in osmotic pressure of the substrate (Eaton, 1942). In addition, the osmotic pressure of expressed tissue fluids from the tops of plants does not appear to be correlated with the salt tolerance of some species. It is possible, however, that such measurements of osmotic gradient between plant tops and substrate may not represent the effective osmotic force which limits water absorption by the roots.

Specific Ion Effects

The previous discussion has dealt primarily with the effect of soluble salts in limiting the availability of moisture to plants. Other effects of salt may be equally important in restricting the growth of certain species. Injury or growth depression of plants, which cannot be accounted for on the basis of the osmotic pressure of the solution, will be referred to as a toxic effect of the salt in question. It should be recognized that toxicity so defined need not involve a direct effect of the salt or ions, either on surface membranes of plant roots or in the plant tissues. Frequently, toxicity may be caused, in part, at least, through effects on the uptake or metabolism of essential nutrients. As it is not always possible to distinguish clearly the mechanism underlying specific ion effects, it is convenient to refer to such phenomena as toxicities in contrast to the general osmotic effect of salt on plant growth.

The influence of excessive concentrations of specific salts on plant growth is an extremely complex subject involving many fundamental principles of plant nutrition. It is beyond the scope of this handbook to review the voluminous and diversified literature bearing on this subject. Much of the pertinent literature is cited in a review by Hayward and Wadleigh (1949). Literature citations in the following discussion are restricted mainly to papers of special significance in connection with certain topics not considered in the review cited above.

Ions that are frequently found in excess in saline soils include chloride, sulfate, bicarbonate, sodium, calcium, and magnesium. Less frequently encountered in excessive amounts are potassium and nitrate. The effects of all these ions on plant growth are being investigated by comparing plant response to isosmotic solutions of different salts. Species and even varietal differences among plants make it difficult to generalize regarding the toxicity of various salts or ions. It appears, however, that differences in plant tolerance to excessive concentrations of ions in the substrate are related, in some degree, to specific selectivity in ion absorption and nutrient requirements of the plants. In addition to these factors, there is also a marked difference among species in the amounts of such ions as sodium and chloride that can be accumulated without toxic effects.

Before considering specific toxic effects caused by excessive concentrations of soluble salts, other effects of certain ions deserve some mention. Although not considered essential plant nutrients, sodium and chloride, when present in relatively small concentrations, may stimulate the productivity of certain crops. Thus, Harmer and Benne (1941) have attributed increased yields of beets, celery, Swiss chard, and turnips to sodium. These authors consider sodium to be "nearly as much needed as a nutrient for these crops as is the potassium ion." Other investigators believe the effect of sodium to be more indirect, either substituting to some degree where potassium is deficient (Lehr, 1949; Dorph-Petersen and Steenbjerg, 1950) or limiting excessive accumulation of calcium, which with beets results in the development of a "calcium-type plant" characterized by a blue-green color and stunted growth (Lehr, 1942). Chloride, like sodium, has been observed to increase yields of some crops, notably beets, spinach, and tomato (Hayward and Wadleigh, 1949). On the other hand, chloride salts have long been known to affect adversely the quality of such crops as potatoes and tobacco. However, on saline soils, chloride and sodium ions occur in much higher concentrations than

Appendix I

SAIC, 2011. Remedial Action Plan.

SAIC
From Science to Solutions

April 22, 2011

Mr. Geoffrey Leking
Environmental Engineer
New Mexico Oil Conservation Division
District 1 Office
1625 North French Drive
Hobbs, New Mexico 88240

Re: Remedial Action Plan
Chloride Impacted Soil
Jal No. 4 Gas Plant
Lea County, New Mexico
1RP-04-01-2697

Dear Mr. Leking:

SAIC Energy, Environment & Infrastructure, LLC, on behalf of El Paso Natural Gas Company (EPNG), hereby submits the enclosed Remedial Action Plan (RAP) for Chloride Impacted Soil at the Jal No.4 Gas Plant (Site) located in Lea County, New Mexico for your approval. This RAP has been prepared in response to the chloride impacted water release that occurred on October 16, 2010 on the discharge line associated with groundwater recovery well RW-2 at the Site. The enclosed RAP details the proposed remediation of the soil impacted by the spill.

EPNG requests written approval of the RAP so that preparations for the field remedial activities can be initiated as soon as possible. If you have any questions regarding the RAP, please do not hesitate to contact me at (918) 599-4383 or Mr. Ian Yanagisawa at (713) 420-7361.

Sincerely,
SAIC Energy, Environment & Infrastructure, LLC

Bruce E. McKenzie, P.G.
Project Manager

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REMEDIAL ACTION PLAN
CHLORIDE IMPACTED SOIL
JAL NO. 4 GAS PLANT
LEA COUNTY, NEW MEXICO
1RP-04-01-2697

APRIL 22, 2011

Prepared for:

El Paso Natural Gas Company
1001 Louisiana Street
Houston, Texas 77002

Prepared by:

SAIC Energy, Environment & Infrastructure, LLC
One West Third Street, Suite 100
Tulsa, Oklahoma 74103

SAIC®
From Science to Solutions

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EL PASO NATURAL GAS COMPANY
JAL NO. 4 GAS PLANT, LEA COUNTY, NEW MEXICO
REMEDIAL ACTION PLAN FOR CHLORIDE IMPACTED SOIL
April 22, 2011

1.0 INTRODUCTION

The Jal No. 4 Gas Plant (Plant) was constructed by El Paso Natural Gas Company (EPNG) in 1952 to treat, compress and transport natural gas to EPNG's main transmission lines. EPNG discontinued use of the Plant in 1987, leasing portions of the Plant property to Christie Gas Corporation (Christie) that same year. The Plant was eventually sold to Christie in 1991. In December 2002, Christie sold the Plant to Texas LPG Storage Company (Texas LPG). In March 2008, Texas LPG sold the plant to Western Refining, Inc. (WFI). WFI is the current owner of the Jal No. 4 Plant property. Throughout these transactions, EPNG has retained the environmental liability for groundwater impacts due to historic operations at the Plant. The location of the Plant property and topographic features are shown on **Figure 1**.

Brine and wastewater at the Plant were managed in 8 unlined retention ponds from 1952 to 1981. Beginning in 1981, brine at the Plant was managed in 3 synthetic-lined retention ponds. In 1989, a leak was detected in one of the brine retention ponds and EPNG elected to close 2 of the ponds. In response to the detected leak, the New Mexico Oil Conservation Division (NMOCD) requested that EPNG perform a hydrologic study. This request led to the drilling of 3 groundwater monitoring wells and a limited groundwater study at the site in May 1989. The preliminary findings of this study indicated that brine-impacted groundwater was present beneath the Plant. Subsequent to this discovery, numerous investigations have been conducted by EPNG at the Plant to characterize and delineate the affected groundwater plume.

To date, 18 groundwater monitoring wells and 1 piezometer have been installed. These wells are located generally along the east side of the Plant property, and on off-site properties located east and southeast of the Plant. In addition to these groundwater monitoring wells, 2 groundwater recovery wells (RW-1 and RW-2) have been installed and 3 monitoring wells (ENSR-2, ACW-3 and ACW-8) have been converted to recover impacted groundwater and to prevent downgradient migration. The locations of the monitoring and recovery wells are shown on **Figure 2**. Impacted groundwater recovery was initiated in recovery well RW-1 in October 1999, and in recovery well RW-2 in January 2000. ENSR-2 commenced groundwater recovery in 2000, and ACW-3 and ACW-8 commenced groundwater recovery in 2005. Groundwater recovered by the remediation system is disposed via an existing on-site injection well that is currently owned by WFI.

On October 16, 2010, a pipe broke between the check-valve and cut-off valve located on the discharge line associated with groundwater recovery well RW-2 resulting in the release of an estimated 71 barrels of high chloride water to the ground surface west of recovery well RW-2. The recovered groundwater release encompassed an approximate 20 by 20-feet area. RW-2 is located east of the Plant as shown of **Figure 2**. On October 21, 2010, EPNG submitted a *Release Notification and Corrective Action Form C-141* to the New Mexico Oil Conservation Division (NMOCD) reporting the release. This Remedial Action Plan (RAP) presents analytical data generated to delineate the lateral and vertical extent of the brine impacted soils, the mechanism utilized by the NMOCD to rank and develop remediation goals for the site, and the methodologies to be employed to remediate the affected soils.

1.1 SITE DESCRIPTION

The Plant property is comprised of approximately 181 acres of land located west of State Highway 18, approximately 9 miles north of the town of Jal, New Mexico. As shown on **Figure 1**, the Plant property occupies portions of Sections 31 and 32 of Township 23 South, Range 37 East, and Sections 5 and 6 of Township 24 South, Range 37 East in Lea County, New Mexico.

Off-site groundwater monitoring and recovery wells installed to delineate and remediate the brine impacted groundwater are located east of State Highway 18. These off-site monitoring wells are located in Sections 5 and 6 of Township 24 South, Range 37 East. The area affected by the impacted groundwater release is located in Section 5 of Township 24 South, Range 37 East and is shown on **Figure 2**.

1.2 INVESTIGATION

As previously stated, on approximately October 16, 2010, a pipe broke between the check-valve and cut-off valve located on the discharge line associated with groundwater recovery well RW-2, and that the recovered groundwater release encompassed an approximate 20-feet by 20-feet area. On October 20, 2010, EPNG submitted a *Release Notification and Corrective Action Form C-141* to the NMOCD reporting the release. The activities performed to implement the impacted soil investigation are described below. A copy of the Form C-141 filed by EPNG has been provided in **Appendix A**.

1.2.1 January 2011 Investigation

On January 20, 2011, to delineate the horizontal and vertical extent of the impacted soil, SAIC Energy, Environment & Infrastructure, LLC (SEE&I), formerly The Benham Companies, LLC (Benham), on behalf of EPNG, installed nine soil borings to an approximate depth of 5 feet below ground level (bgl) in the potentially impacted area. Soil samples were collected on one foot intervals from the surface to total depth within each borehole. Field electrical conductance (EC) tests were conducted on each sample

interval. A total of 45 field EC measurements were conducted during this phase of the investigation. These field EC tests were used as a screening tool to ensure that the boring/sampling activities progressed to a depth interval below the lower limit of the impacted soil. Each field EC test was conducted by combining equal volumes of soil and de-ionized water within a clean, sealable, plastic bag. Following soil and water combination, the plastic bag was sealed and labeled as to source. The soil/water mixture was then mixed thoroughly and allowed to stand for approximately 30 minutes. Following this period, the EC of the soil/water mixture was measured with an electrical conductance meter. An EC value of 4 milliSiemens per centimeter (mS/cm) or less indicated that the sample collected was below the lower limit. It should be noted that the field meter EC units of mS/cm are, in general, equivalent to the laboratory EC units of millimhos per centimeter (mmhos/cm).

A total of 45 soil samples were collected from the 9 borings. Upon collection, an aliquot of each soil sample was placed directly into a clean, sealable, plastic bag, labeled as to source and placed under chain-of-custody control for transport to the analytical laboratory (Environmental Testing, Inc., Oklahoma City, Oklahoma) for analysis of EC. An additional aliquot of each soil sample was placed into a clean, sealable, plastic bag. After approximately 30 minutes at ambient temperature, the headspace within each bag was evaluated with an organic vapor meter (OVM). In each boring, the sampled interval exhibiting the highest OVM headspace reading was selected for submittal to the analytical laboratory (Southern Petroleum Laboratories, Houston, Texas) for benzene, toluene, ethylbenzene, and total xylenes (BTEX) analyses. A total of 9 soil samples were submitted to the laboratory for BTEX analysis.

Upon completion of soil boring/sampling activities, the soil borings were plugged from total depth to the surface.

1.2.2 January 2011 Investigation Results

Field EC measurements were obtained from the 0-1' bgl interval, the 1'-2' bgl interval, the 2'-3' bgl interval, the 3'-4' bgl interval and the 4'-5' bgl interval of each of the nine borings. None of the soil samples collected for field EC measurements contained EC field values greater than 4 mS/cm, a common screening level for brine impacts to soil further discussed in Section 1.6. These field measurements are summarized in **Table 1**.

Of the 45 samples submitted to the analytical laboratory, six contained laboratory EC results greater than 4 mmhos/cm. These samples included: HA-1 (3'-4') (4.060 mmhos/cm), HA-2 (0'-1') (7.320 mmhos/cm), HA-2 (1'-2') (5.620 mmhos/cm), HA-2 (2'-3') (4.840 mmhos/cm), HA-4 (2'-3') (4.210 mmhos/cm) and HA-6 (4'-5') (5.360 mmhos/cm).

The following summary presents the number of samples from each depth interval that contained levels of EC greater than 4 mmhos/cm and the total number of samples submitted for that depth interval.

- (0-1') 1 of 9 samples > 4 mmhos/cm
- (1'-2') 1 of 9 samples > 4 mmhos/cm
- (2'-3') 2 of 9 samples > 4 mmhos/cm
- (3'-4') 1 of 9 samples > 4 mmhos/cm
- (4'-5') 1 of 9 samples > 4 mmhos/cm

The remaining 39 samples exhibited EC levels below 4 mmhos/cm. These laboratory analytical results are summarized in **Table 2**, and complete copies of the laboratory analytical reports are provided in **Appendix B**.

No concentrations of BTEX were observed in the nine soil samples submitted for analysis. These laboratory analytical results are summarized in **Table 3**, and complete copies of the laboratory analytical reports are provided in **Appendix B**. Based upon the laboratory analytical results for these soil samples, BTEX has been eliminated as a potential constituent of concern (COC) for this RAP.

Isopleth maps of laboratory EC results for the 0-1' bgl, 1'-2' bgl, 2'-3' bgl, 3'-4' bgl and 4'-5' bgl depth intervals have been prepared and are presented on **Figures 3, 4, 5, 6** and **7**, respectively. As can be seen on these figures, the impacted soil at the Site has been substantially delineated.

1.3 SITE HYDROGEOLOGICAL CONDITIONS

Site hydrogeological conditions are described in *Expanded Hydrogeology Study for the El Paso Natural Gas Company Jal 4 Facility*, dated August 1990, prepared by K. W. Brown & Associates, Inc.

1.4 REMEDIATION GUIDELINES

The *Guidelines for Remediation of Leaks, Spills and Releases* (Guidelines), dated August 13, 1993, published by NMOCD provide guidance for evaluating hydrocarbon impacts to determine remediation goals for benzene, BTEX and total petroleum hydrocarbon (TPH). These Guidelines evaluate the potential threat to water sources such as depth to groundwater, wellhead protection area and distance to surface water bodies.

Each factor is provided with a ranking score based upon the distance from the source to the potentially threatened water. With these ranking scores, a remediation standard was established.

The ranking scores and established remediation standards resulting from these factors are located in **Table 4**. While these Guidelines are not applicable to this COC, an evaluation of the criteria will demonstrate the potential level of threat to these water sources.

1.4.1 Depth to Groundwater

As previously stated, EPNG has been conducting groundwater monitoring and remediation at the Jal #4 Plant for many years. During these activities, EPNG routinely measures the depths to groundwater (DTW) within 17 monitoring wells, 1 piezometer and 3 water supply wells located in and around the Jal #4 Plant. In general, the DTW observed in these wells are 100 feet or greater.

Monitoring well ACW-09, the monitoring well located closest to the release area, has routinely been monitored for DTW since 1997. Historical DTW measurements taken by EPNG within this well show that the DTW has ranged from 110.24 feet top of casing (TOC) in February 1997 to 112.92 feet TOC in August 2009 with an average DTW of 111.58 feet TOC. The TOC stick-up for monitoring well ACW-09 is approximately 3 feet above ground level. A summary of the DTW measurements for ACW-09 is shown on **Table 5**.

In accordance with the Guidelines, Section IV.A.2.a, the DTW component receives a ranking score of zero because the DTW is greater than 100 feet.

1.4.2 Wellhead Protection Area

Wellhead protection area is defined in the Guidelines as "...the horizontal distance from all water sources including private and domestic water sources. Water sources are defined as wells, springs, or other sources of fresh water extraction." The closest water source is the OXY Production Well, located in the center of Section 5 of Township 24 South, Range 37 East. This production well is located approximately 1,817 feet southeast (downgradient) of the affected area as shown on **Figure 2**.

In accordance with the Guidelines, Section IV.A.2.a, the wellhead protection area component receives a ranking score of zero because the distance from the investigation area is greater than 1,000 feet to the nearest water source or greater than 200 feet from the nearest private domestic water source.

1.4.3 Distance to Nearest Surface Water Body

Surface water bodies are defined in the Guidelines as "...perennial rivers, streams, creeks, irrigation canals and ditches, lakes, ponds and playas." There are no surface water bodies within 1,000 feet of the affected area.

In accordance with the Guidelines, Section IV.A.2.a, the distance to nearest surface water body component receives a ranking score of zero because the nearest surface water body is greater than 1,000 feet downgradient.

1.5 REMEDIAL OBJECTIVE

A common standard used by numerous states when evaluating chloride impacts to soil is published by the United States Department of Agriculture as Agriculture Handbook No. 60, Diagnosis and Improvement of Saline and Alkali Soils, (USDA Handbook 60) issued in February 1954. USDA Handbook 60 describes the EC range of 4 mmhos/cm to 8 mmhos/cm as "yields of many crops restricted". A pertinent section of the USDA Handbook 60 is provided in **Appendix C**.

The objective of this remedial action is to excavate and remove the soils from the affected area exhibiting EC values greater than 4 mmhos/cm. This soil will be excavated and disposed at an approved disposal site. The area will be backfilled with clean material, graded to minimize erosion but encourage surface water runoff, and revegetated with an appropriate seed mixture.

2.0 SCOPE OF WORK

The following section outlines the scope of work that is planned for this remedial action. All field activities will be conducted under the supervision of a SEE&I hydrogeologist or engineer and in accordance with the Site-specific Health and Safety Plan (HASP). A copy of the HASP will be kept on-site by the SEE&I Site Safety Officer at all times. Field activities will be documented in a dedicated field log book.

2.1 ESTABLISHING THE LIMITS OF EXCAVATION

To accurately locate the limits of excavation, the affected area will be overlain with a grid system. The grid system will consist of 10-foot by 10-foot grid pattern with grid crossing points having unique letter/number identifications as shown on **Figure 8**.

After establishing the grid, the limits of excavation will be marked. These limits of excavation will be marked with different colored marking flags or wooden stakes to indicate the various proposed depths of excavation. It is estimated that approximately 65 cubic yards of material (in-place) will be excavated.

2.2 EXCAVATION AND DISPOSAL OF BRINE IMPACTED SOIL

Prior to the start of excavation activities, the limits of the excavation will be surveyed using a transit to determine the existing elevations at the corners, approximate center of the excavation and at other control points as necessary. Upon completion of the excavation activities, the elevations of the excavated surface at the previously surveyed points will be established to verify that the proposed excavation depth has been achieved.

Two permanent structures exist adjacent to the area to be excavated. The structures are monitoring well ACW-09 and recovery well RW-2. To prevent the potential for comprising the structural integrity of these wells, potentially impacted soils immediately surrounding ACW-09 and RW-2 will not be excavated. Excavations in close proximity to these permanent structures will be adequately stabilized throughout the excavation, testing and backfilling operations to protect the structural integrity of these structures.

The brine impacted soil material will be excavated with a rubber-tired backhoe or hydraulic excavator to the proposed excavation depths indicated on **Figure 8**. After the proposed excavation depth in each area has been obtained, confirmatory soil samples will be collected from the floor and walls of the excavation for submittal to the analytical laboratory. The locations of the proposed confirmation soil samples are shown on **Figure 9**. The confirmation soil samples will be collected from the 0 to 1 foot bgl depth interval and will be placed into clean, sealable bags, properly labeled and shipped under chain-of-custody control to the analytical laboratory (Environmental Testing, Inc., Oklahoma City, Oklahoma) and analyzed for EC. If a soil EC level

greater than 4 mmhos/cm is observed in a confirmation soil sample, the soil from the area immediately surrounding the initial sample location will be over-excavated. Following these additional excavation activities, an additional soil sample for EC analysis will be collected from the newly excavated surfaces and submitted to the laboratory for EC analysis.

The impacted soil materials will be excavated, loaded directly onto dump-trucks, manifested and transported to a permitted disposal facility.

2.3 BACKFILL AND RESTORATION

Upon receipt of analytical data indicating that the impacted soil has been removed, the excavated area will be restored. Restoration will consist of the placement, compaction and contouring of soil backfill material derived from an off-site source. Prior to the placement of any backfill material, a sample of the backfill material will be collected and submitted to the analytical laboratory for analysis to ensure the backfill material is not impacted. The analyses will include EC, TCLP metals, BTEX and total petroleum hydrocarbons (TPH) (Diesel Range Organics and Gasoline Range Organics). The standards for the testing of the backfill are as follows:

- EC: less than 4 mmhos/cm,
- TCLP metals: less than 40 CFR 261.24, Table 1-Maximum Concentration of Contaminants for Toxicity Characteristic,
- BTEX: less than laboratory practical quantification limit, and
- TPH: less than laboratory quantification limit.

Upon completion of backfilling operations, the area will be graded to minimize erosion but encourage surface water runoff. Upon completion of grading operations, the area will be restored to its pre-excavation state.

3.0 PROJECT SCHEDULE

It is anticipated that the excavation, backfilling and restoration of the area will be completed in two phases. The first phase will include the excavation, removal and disposal of the impacted soil material, as well as, the collection of laboratory confirmation samples to demonstrate that the soil exhibiting EC levels greater than 4 mmhos/cm has been removed. The second phase will include backfilling and restoration of the excavation area.

The first phase is expected to take approximately two days. The first day will be used to establish the limits of excavation and gather the survey information. The second day will be used to excavate, remove and dispose of the brine impacted material and to collect laboratory confirmation samples. The second phase, backfilling and site restoration, will take approximately two days. There will be a delay of approximately three days between the two phases while the laboratory analyzes the soil confirmation samples and provides preliminary results.

4.0 REPORTING

Upon completion of the remedial action, a Closure Report will be prepared and submitted to NMOCD for review and approval. The Closure Report will describe the activities conducted during implementation of this RAP. The report will also include figures showing the final limits of excavation, locations of laboratory confirmatory samples and laboratory analytical results.

Upon receipt of approval of the Closure Report, a final Form C-141 will be submitted to the NMOCD.

TABLES

Table 1 : Summary of Field EC Readings for Soil Samples
Remedial Action Plan
Jal No. 4 Gas Plant
El Paso Natural Gas Company

Sample ID:	Depth	Sample Date:	Conductance mS/cm
HA-1	0-1'	20-Jan-11	0.623
HA-1	1'-2'	20-Jan-11	0.384
HA-1	2'-3'	20-Jan-11	0.677
HA-1	3'-4'	20-Jan-11	1.069
HA-1	4'-5'	20-Jan-11	1.240
HA-2	0-1'	20-Jan-11	1.043
HA-2	1'-2'	20-Jan-11	0.910
HA-2	2'-3'	20-Jan-11	0.951
HA-2	3'-4'	20-Jan-11	1.491
HA-2	4'-5'	20-Jan-11	0.992
HA-3	0-1'	20-Jan-11	0.852
HA-3	1'-2'	20-Jan-11	0.509
HA-3	2'-3'	20-Jan-11	0.907
HA-3	3'-4'	20-Jan-11	0.696
HA-3	4'-5'	20-Jan-11	0.660
HA-4	0-1'	20-Jan-11	0.095
HA-4	1'-2'	20-Jan-11	0.096
HA-4	2'-3'	20-Jan-11	0.914
HA-4	3'-4'	20-Jan-11	1.248
HA-4	4'-5'	20-Jan-11	1.331
HA-5	0-1'	20-Jan-11	0.299
HA-5	1'-2'	20-Jan-11	0.535
HA-5	2'-3'	20-Jan-11	0.721
HA-5	3'-4'	20-Jan-11	0.656
HA-5	4'-5'	20-Jan-11	0.639
HA-6	0-1'	20-Jan-11	0.133
HA-6	1'-2'	20-Jan-11	0.232
HA-6	2'-3'	20-Jan-11	0.909
HA-6	3'-4'	20-Jan-11	1.154
HA-6	4'-5'	20-Jan-11	1.531
HA-7	0-1'	20-Jan-11	0.408
HA-7	1'-2'	20-Jan-11	0.485
HA-7	2'-3'	20-Jan-11	0.705
HA-7	3'-4'	20-Jan-11	0.793
HA-7	4'-5'	20-Jan-11	0.729
HA-8	0-1'	20-Jan-11	0.420
HA-8	1'-2'	20-Jan-11	0.396
HA-8	2'-3'	20-Jan-11	0.551
HA-8	3'-4'	20-Jan-11	0.801
HA-8	4'-5'	20-Jan-11	0.504
HA-9	0-1'	20-Jan-11	0.133
HA-9	1'-2'	20-Jan-11	0.095
HA-9	2'-3'	20-Jan-11	0.182
HA-9	3'-4'	20-Jan-11	0.418
HA-9	4'-5'	20-Jan-11	0.436

Notes:
1. Analysis preformed by combing equal parts soil and de-ionized water into a clean, sealable bag, mixing the contents and allowing them to sit for 30 minutes. The field EC measurement was then taken by placing an EC probe into the mixture and recorded.

Table 2 : Summary of Laboratory EC Readings for Soil Samples
Remedial Action Plan
Jal No. 4 Gas Plant
El Paso Natural Gas Company

Sample ID	Depth, feet	Sample Date	Conductivity mmhos/cm
HA-1	0-1'	20-Jan-11	2.71
HA-1	1'-2'	20-Jan-11	1.70
HA-1	2'-3'	20-Jan-11	2.92
HA-1	3'-4'	20-Jan-11	4.06
HA-1	4'-5'	20-Jan-11	3.67
HA-2	0-1'	20-Jan-11	7.32
HA-2	1'-2'	20-Jan-11	5.62
HA-2	2'-3'	20-Jan-11	4.84
HA-2	3'-4'	20-Jan-11	3.23
HA-2	4'-5'	20-Jan-11	3.52
HA-3	0-1'	20-Jan-11	2.77
HA-3	1'-2'	20-Jan-11	2.61
HA-3	2'-3'	20-Jan-11	2.19
HA-3	3'-4'	20-Jan-11	2.13
HA-3	4'-5'	20-Jan-11	2.61
HA-4	0-1'	20-Jan-11	0.24
HA-4	1'-2'	20-Jan-11	2.10
HA-4	2'-3'	20-Jan-11	4.21
HA-4	3'-4'	20-Jan-11	3.77
HA-4	4'-5'	20-Jan-11	3.97
HA-5	0-1'	20-Jan-11	2.11
HA-5	1'-2'	20-Jan-11	1.97
HA-5	2'-3'	20-Jan-11	2.35
HA-5	3'-4'	20-Jan-11	2.82
HA-5	4'-5'	20-Jan-11	2.72
HA-6	0-1'	20-Jan-11	0.32
HA-6	1'-2'	20-Jan-11	2.07
HA-6	2'-3'	20-Jan-11	2.88
HA-6	3'-4'	20-Jan-11	3.99
HA-6	4'-5'	20-Jan-11	5.36
HA-7	0-1'	20-Jan-11	1.63
HA-7	1'-2'	20-Jan-11	1.82
HA-7	2'-3'	20-Jan-11	2.60
HA-7	3'-4'	20-Jan-11	2.63
HA-7	4'-5'	20-Jan-11	1.80
HA-8	0-1'	20-Jan-11	1.34
HA-8	1'-2'	20-Jan-11	1.34
HA-8	2'-3'	20-Jan-11	3.28
HA-8	3'-4'	20-Jan-11	2.06
HA-8	4'-5'	20-Jan-11	2.36
HA-9	0-1'	20-Jan-11	0.25
HA-9	1'-2'	20-Jan-11	0.38
HA-9	2'-3'	20-Jan-11	0.56
HA-9	3'-4'	20-Jan-11	0.91
HA-9	4'-5'	20-Jan-11	1.81

Notes:
1. Analysis based on saturated paste.

Table 3 : Summary of Laboratory Analysis for Soil Samples
Remedial Action Plan
Jal No. 4 Gas Plant
El Paso Natural Gas Company

Parameter	Sample ID: / Depth / Sample Date:	HA-1 (3'-4') 10-Jan-11	HA-2 (2'-3') 10-Jan-11	HA-3 (3'-4') 10-Jan-11	HA-4 (1'-2') 10-Jan-11	HA-5 (2'-3') 10-Jan-11	HA-6 (2'-3') 10-Jan-11	HA-7 (4'-5') 10-Jan-11	HA-8 (4'-5') 10-Jan-11	HA-9 (3'-4') 10-Jan-11
BTEX										
Benzene	µg/kg	<1.1	<1.2	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1
Toluene	µg/kg	<1.1	<1.2	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1
Ethylbenzene	µg/kg	<1.1	<1.2	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1
m,p-Xylene	µg/kg	<1.1	<1.2	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1
o-Xylene	µg/kg	<1.1	<1.2	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1
Xylene, total	µg/kg	<1.1	<1.2	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.1
Percent Moisture										
Percent Moisture	%	11.4	13.8	12.6	14.9	11.6	15.9	18.7	14.5	6.66

Notes:
1. Results are reported on a dry weight basis.
2. < : Denotes a sample value of less than the laboratory reporting limit.
3. µg/kg : Micrograms per kilogram.

Table 4 : New Mexico Oil Conservation Division
Remediation Standard Ranking Criteria
Remedial Action Plan
Jal No. 4 Gas Plant
El Paso Natural Gas Company

Ranking Criteria per the Guidelines			
Depth to Groundwater			
Criteria		**Ranking**	
<50 feet		20	
50 - 99 feet		10	
>100 feet		0	
Wellhead Protection Area			
Criteria		**Ranking**	
<1000 feet from a source or <200 feet from a private domestic source			
Yes		20	
No		0	
Distance to Surface Water Body			
Criteria		**Ranking**	
<200 horizontal feet		20	
200 - 1,000 horizontal feet		10	
>1,000 horizontal feet		0	
Recommended Remediation Levels			
	>19	**19-Oct**	**0 - 9**
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
TPH (ppm)	100	1,000	5,000

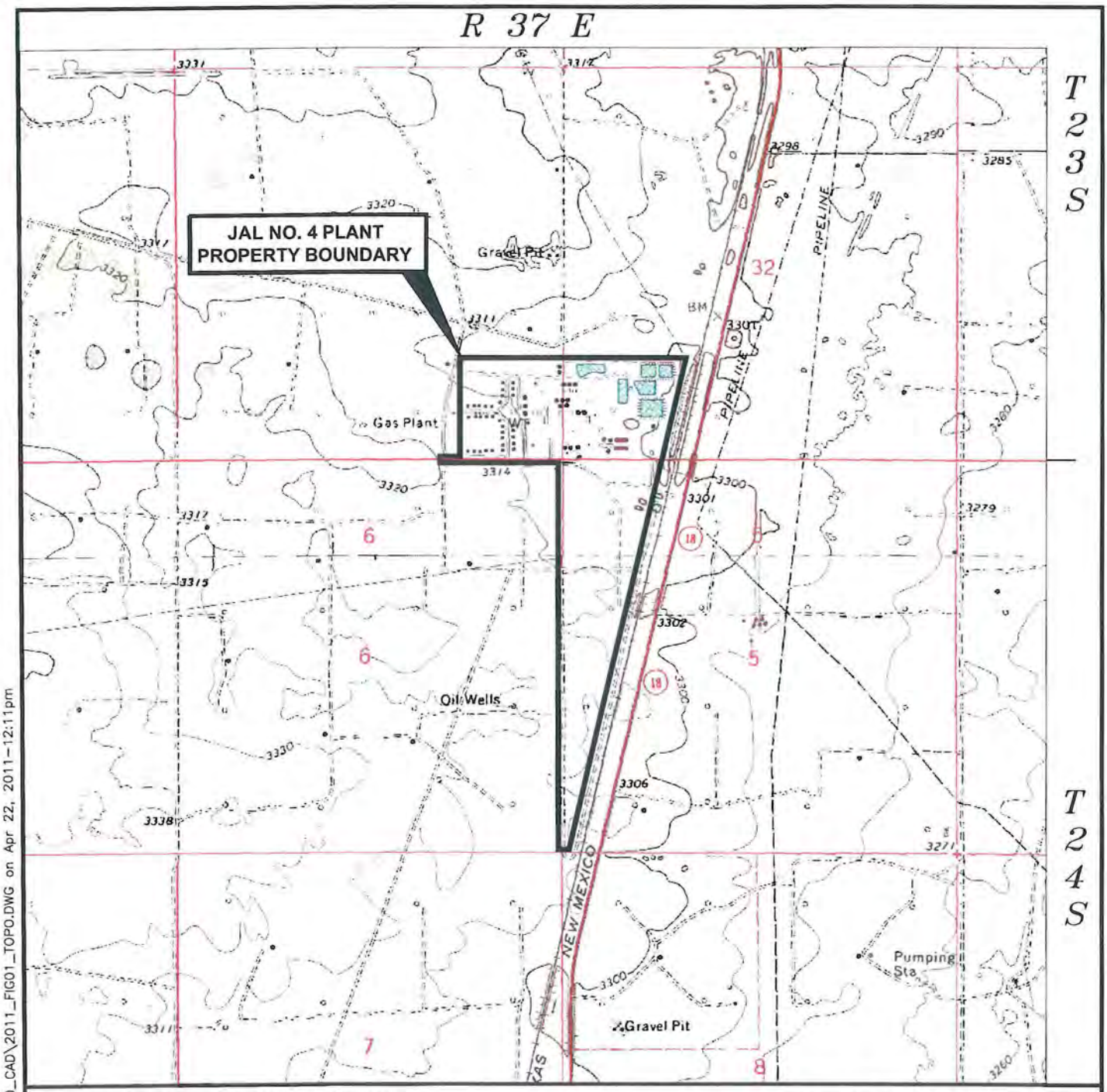
Table 5 : Summary of Monitor Well ACW-09
Historical Depth to Groundwater Measurements
Remedial Action Plan
Jal No. 4 Gas Plant
El Paso Natural Gas Company

Monitor Well	Screened Interval (Feet-BGL)	Top of Casing Elevation (Feet-AMSL)	Depth to Groundwater Measurement Date	Depth to Groundwater (Feet-TOC)	Groundwater Elevation (Feet-AMSL)
ACW-09	140 to 160	3302.47	02/19/97	110.24	3192.23
			05/08/97	110.25	3192.22
			08/19/97	110.26	3192.21
			10/23/97	110.28	3192.19
			02/24/98	110.29	3192.18
			05/13/98	110.30	3192.17
			08/11/98	110.32	3192.15
			10/21/98	110.40	3192.07
			02/23/99	110.54	3191.93
			05/13/99	110.45	3192.02
			08/11/99	110.45	3192.02
			10/22/99	110.50	3191.97
			02/22/00	111.18	3191.29
			05/12/00	111.89	3190.58
			08/07/00	111.22	3191.25
			10/26/00	112.20	3190.27
			02/20/01	112.41	3190.06
			05/04/01	110.85	3191.62
			08/01/01	110.70	3191.77
			10/25/01	112.17	3190.30
			02/20/02	111.98	3190.49
			05/01/02	111.29	3191.18
			09/24/02	111.08	3191.39
			11/06/02	112.11	3190.36
			03/31/03	111.56	3190.91
			05/20/03	111.90	3190.57
			08/18/03	111.17	3191.30
			11/06/03	110.99	3191.48
			02/25/04	111.01	3191.46
			05/13/04	110.99	3191.48
			08/25/04	112.52	3189.95
			11/10/04	112.42	3190.05
			02/15/05	112.16	3190.31
			05/25/05	112.49	3189.98
			08/23/05	111.81	3190.66
			12/14/05	112.46	3190.01
			02/14/06	111.38	3191.09
			05/09/06	111.36	3191.11
			08/23/06	112.58	3189.89
			12/13/06	112.22	3190.25
			03/07/07	112.89	3189.58
			05/16/07	112.85	3189.62
			08/23/07	112.12	3190.35
			11/15/07	111.43	3191.04
			02/20/08	111.27	3191.20
			06/10/08	111.84	3190.63
			08/08/08	112.03	3190.44
			11/19/08	112.90	3189.57
			03/04/09	112.34	3190.13
			05/18/09	112.24	3190.23
			08/27/09	112.92	3189.55
			02/24/10	112.11	3190.36
			06/28/10	112.80	3189.67
			09/20/10	112.60	3189.87
			12/06/10	112.03	3190.44

Notes:

1. TOC : Measured from top of casing.
2. AMSL : Above mean sea level.
3. NM : No measurement taken.
4. BGL: Below ground level.

FIGURES



SOURCE: U.S.G.S. 7.5 MIN. TOPOGRAPHIC QUADRANGLES - RATTLESNAKE CANYON, N.M. 1979 AND JAL NW, N.M., 1979

SCALE
0 1/2 1 MILE

NEW MEXICO

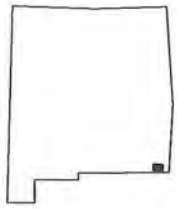


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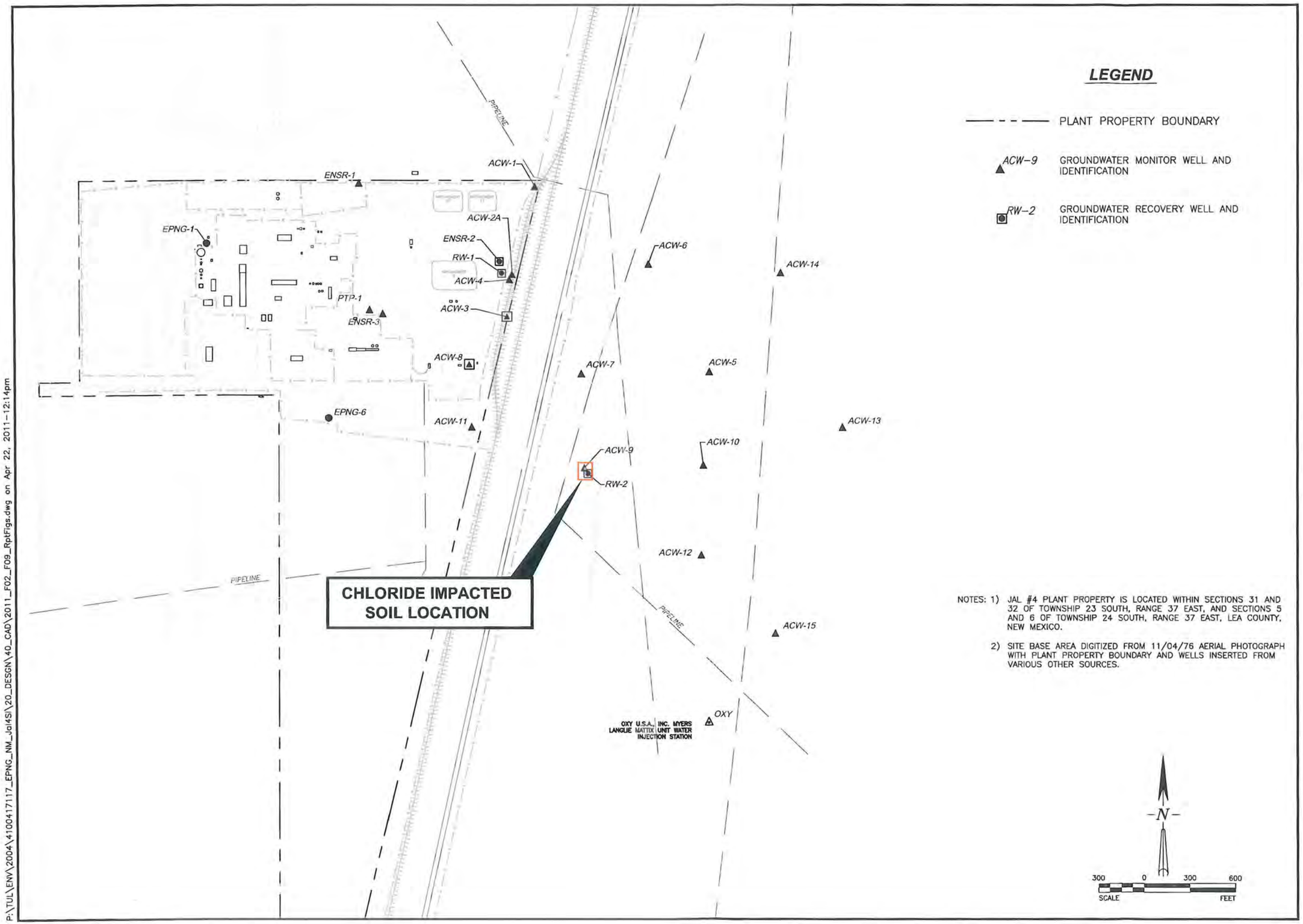
FIGURE TITLE	***PLANT LOCATION AND TOPOGRAPHIC FEATURES***
DOCUMENT TITLE	REMEDIAL ACTION PLAN CHLORIDE IMPACTED SOIL
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 PLANT LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	AS SHOWN
DESIGNED BY	BEM
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417117
FIGURE NUMBER	1



NOTES: 1) JAL #4 PLANT PROPERTY IS LOCATED WITHIN SECTIONS 31 AND 32 OF TOWNSHIP 23 SOUTH, RANGE 37 EAST, AND SECTIONS 5 AND 6 OF TOWNSHIP 24 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO.

2) SITE BASE AREA DIGITIZED FROM 11/04/76 AERIAL PHOTOGRAPH WITH PLANT PROPERTY BOUNDARY AND WELLS INSERTED FROM VARIOUS OTHER SOURCES.

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FIGURE TITLE	SITE BASE MAP
DOCUMENT TITLE	REMEDIAL ACTION PLAN CHLORIDE IMPACTED SOIL
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 GAS PLANT LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=600'
DESIGNED BY	BEM
APPROVED BY	BEM
DRAWN BY	SKG

PROJECT NUMBER
4100417117
FIGURE NUMBER
2

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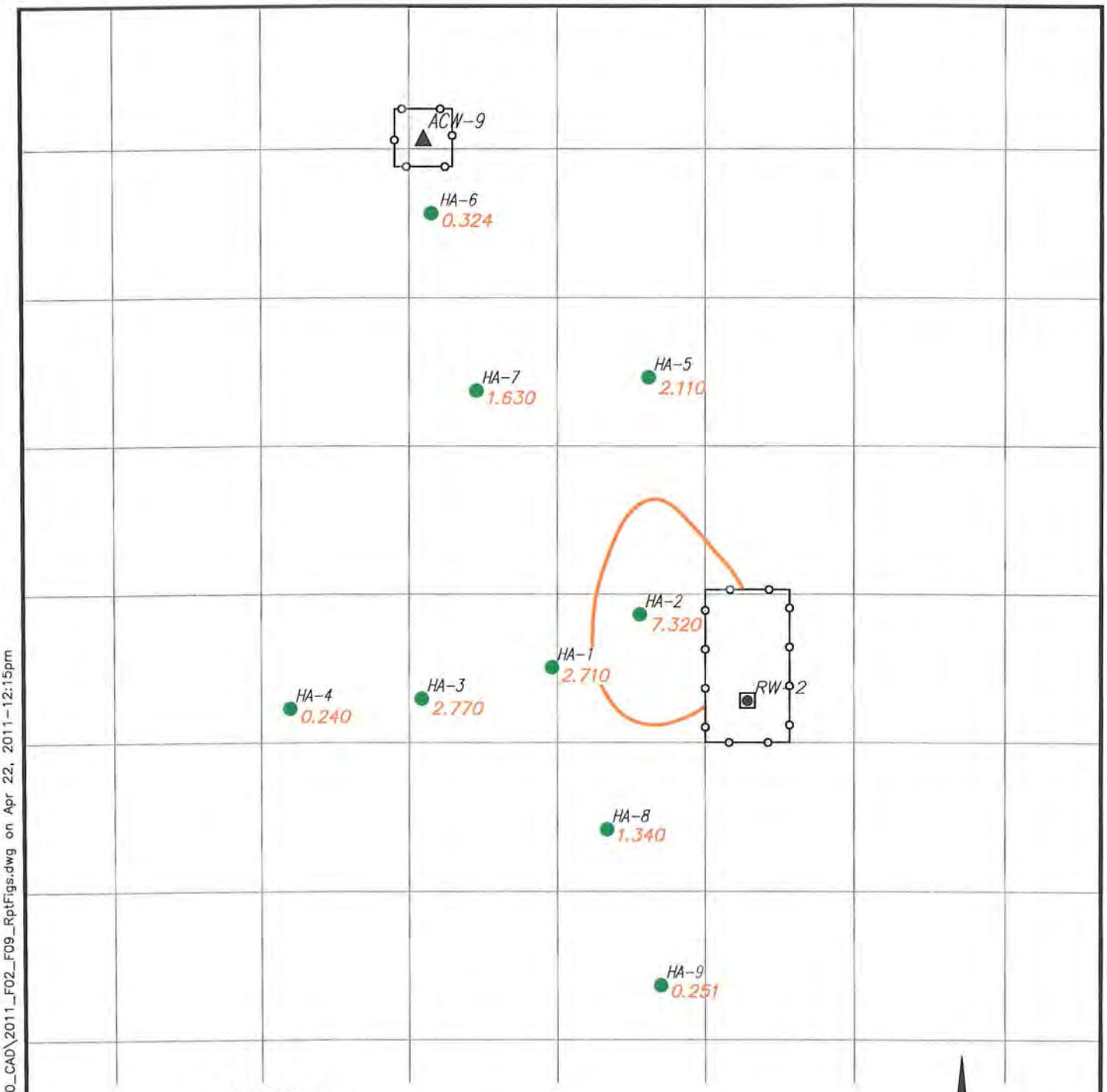

LEGEND

HA-5 2.110 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 1/20/2011)

CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

-N-

5 0 5 10
SCALE FEET

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS DEPTH INTERVAL 0 TO 1 FOOT BGL

DOCUMENT TITLE
REMEDIAL ACTION PLAN
CHLORIDE IMPACTED SOIL

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=10'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417117
FIGURE NUMBER	3

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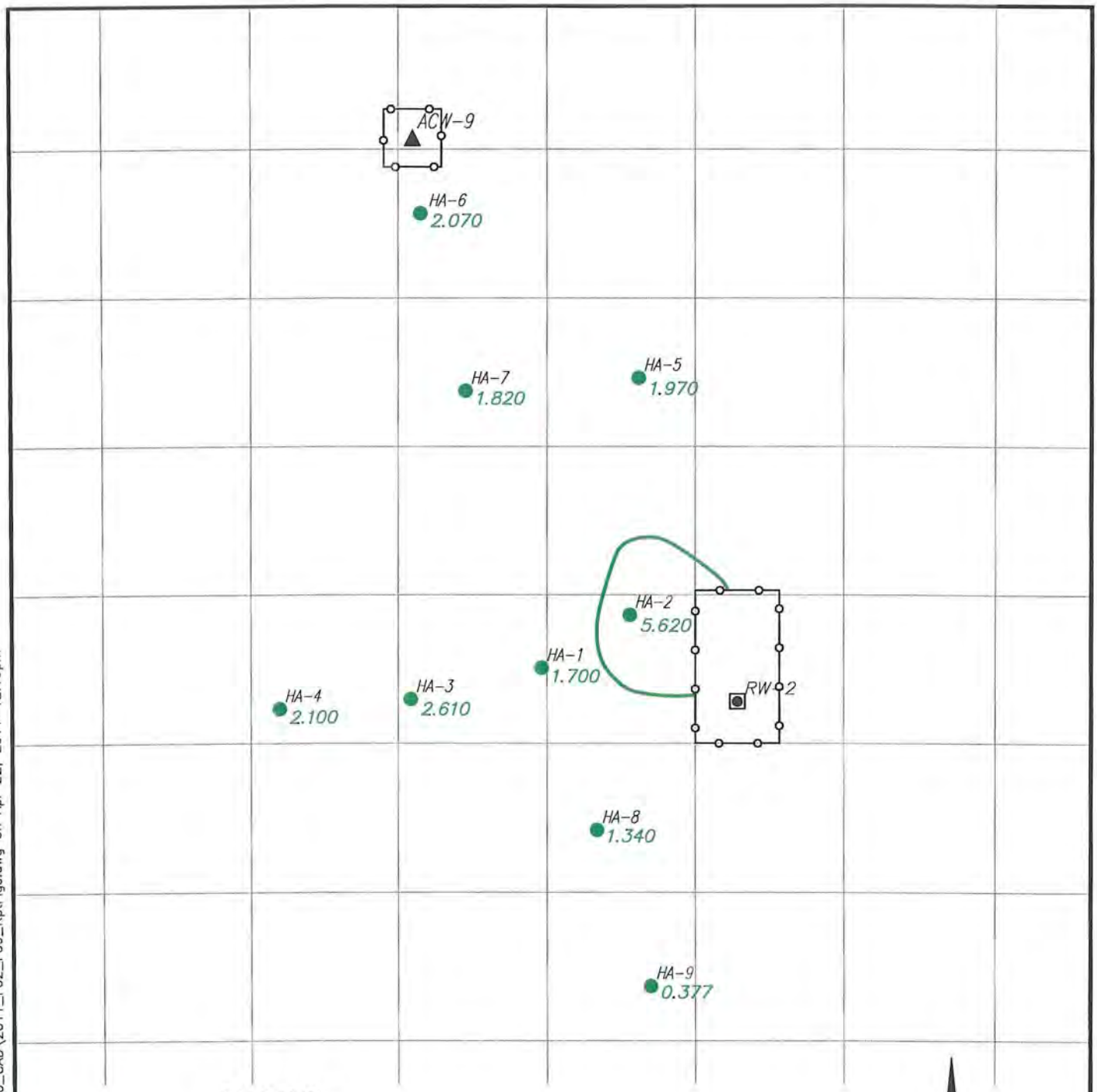

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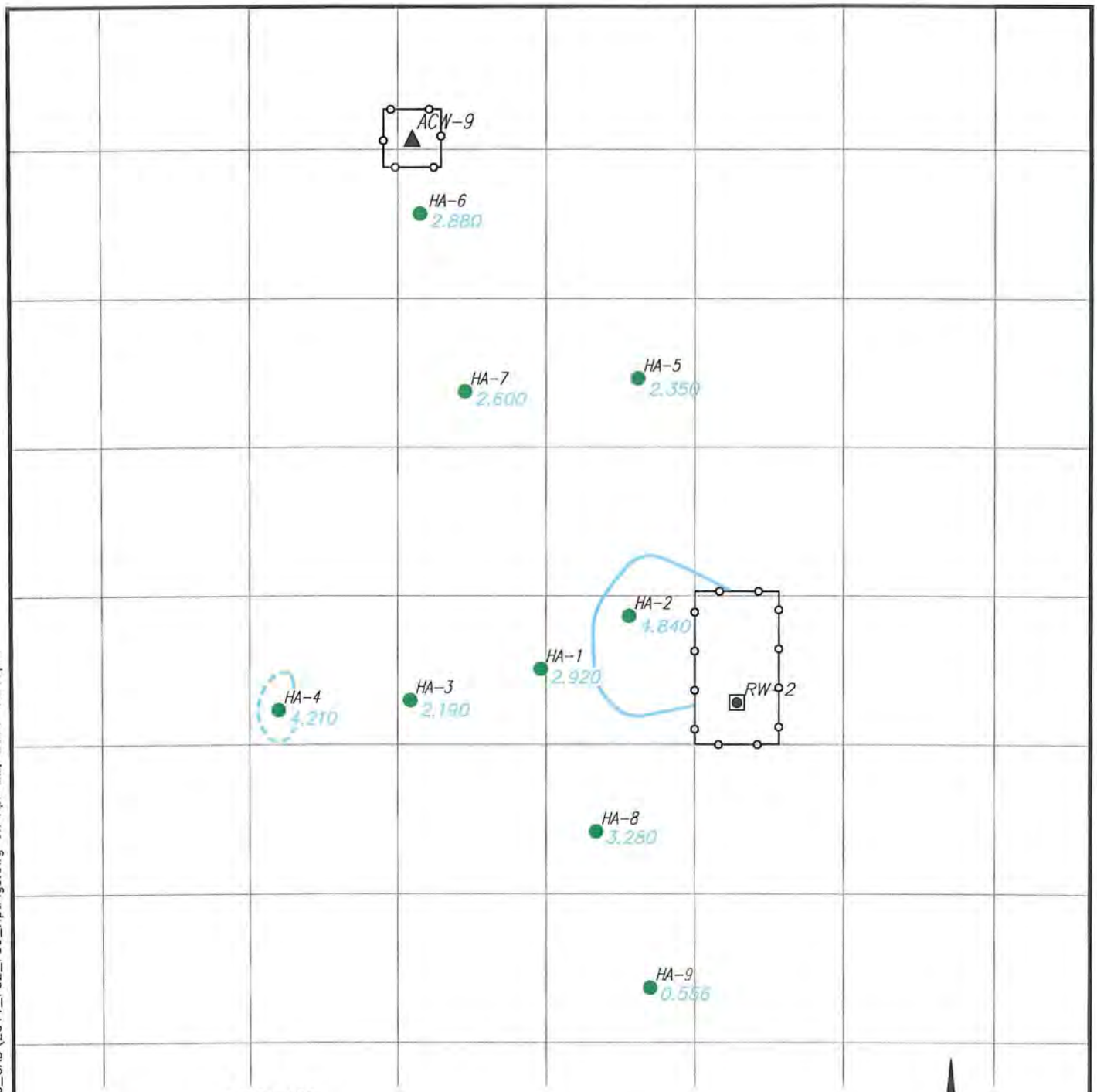
FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 1 TO 2 FOOT BGL

DOCUMENT TITLE
REMEDIAL ACTION PLAN
CHLORIDE IMPACTED SOIL

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=10'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417117
FIGURE NUMBER	4



LEGEND

HA–5 / 2.350 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 1/20/2011)

CONTOUR OF SOIL EC LEVELS, mmhos/cm (DASHED WHERE INFERRED)

N

5 0 5 10
SCALE FEET

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS DEPTH INTERVAL 2 TO 3 FOOT BGL

DOCUMENT TITLE
REMEDIAL ACTION PLAN
CHLORIDE IMPACTED SOIL

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=10'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417117
FIGURE NUMBER	5

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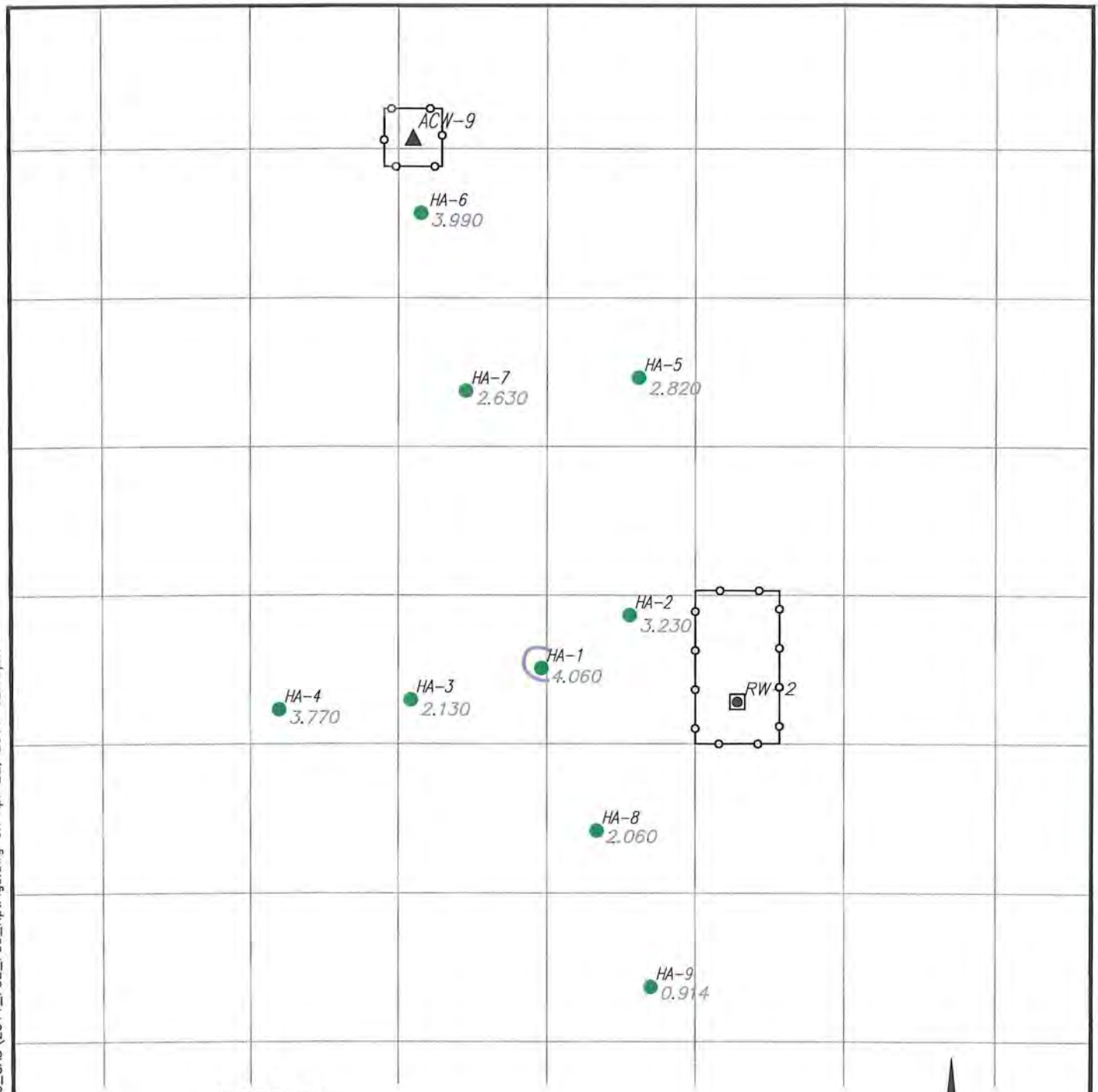

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS DEPTH INTERVAL 3 TO 4 FOOT BGL

DOCUMENT TITLE
REMEDIAL ACTION PLAN
CHLORIDE IMPACTED SOIL

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=10'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417117
FIGURE NUMBER	6

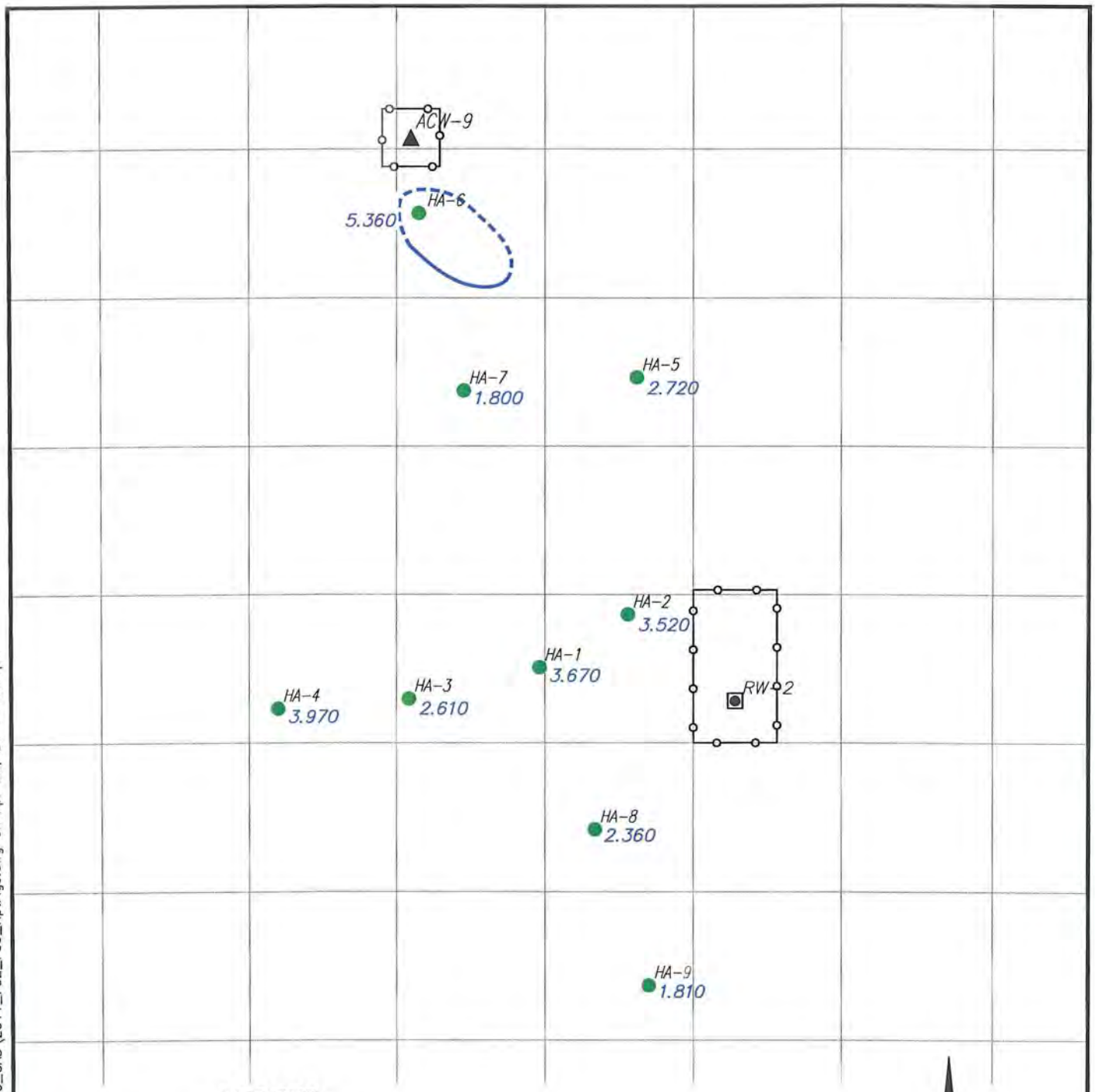

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FIGURE TITLE
ISOPLETH OF LABORATORY EC RESULTS
DEPTH INTERVAL 4 TO 5 FOOT BGL

DOCUMENT TITLE
REMEDIAL ACTION PLAN
CHLORIDE IMPACTED SOIL

CLIENT
EL PASO NATURAL GAS COMPANY

LOCATION
JAL #4 GAS PLANT
LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=10'
DESIGNED BY	BEM\PCR
APPROVED BY	BEM
DRAWN BY	SKG
PROJECT NUMBER	4100417117
FIGURE NUMBER	7

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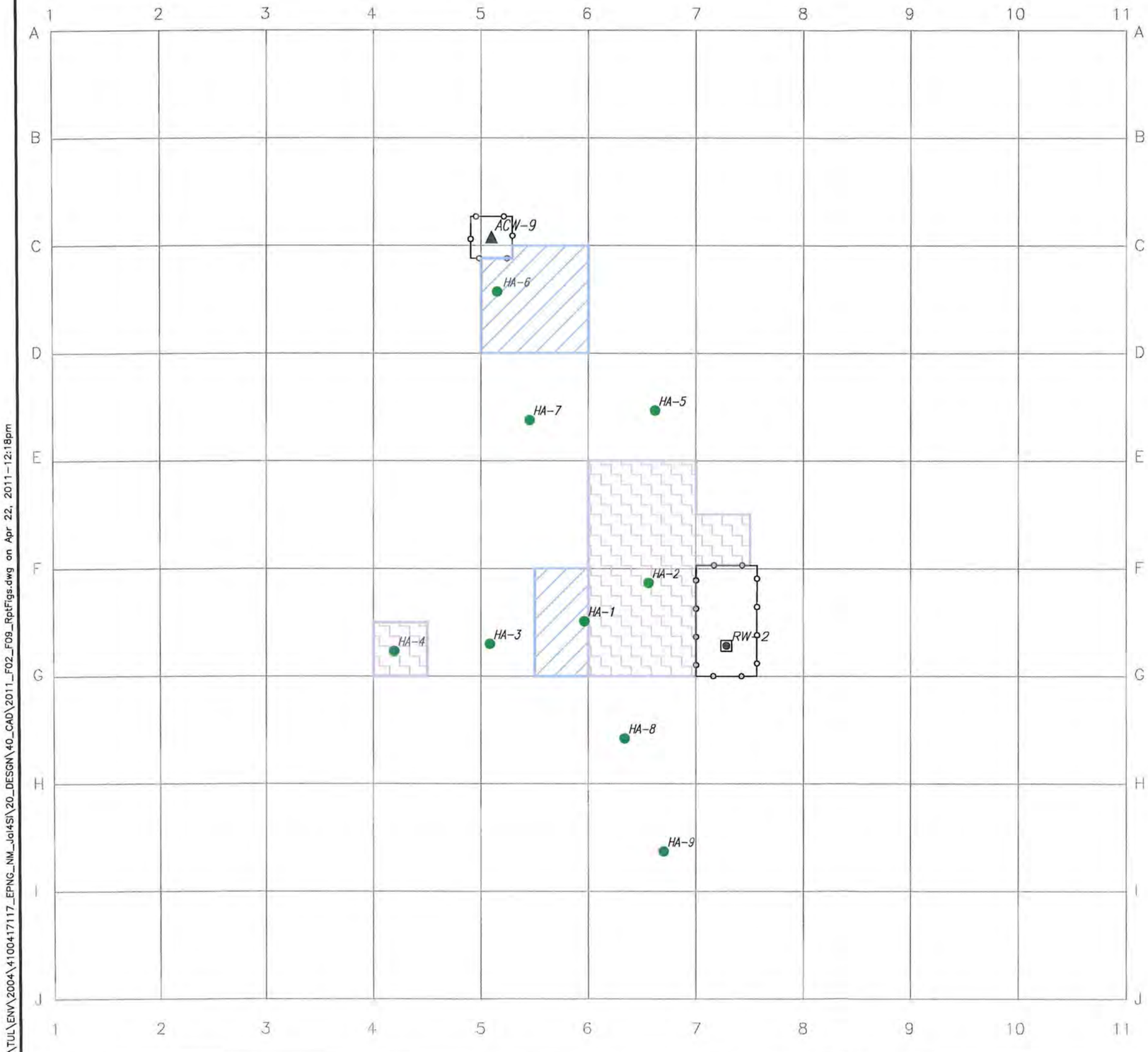

LEGEND

- ACW-9 — GROUNDWATER MONITOR WELL AND IDENTIFICATION
- RW-2 — GROUNDWATER RECOVERY WELL AND IDENTIFICATION
- HA-5 — SOIL SAMPLE LOCATION WITH IDENTIFICATION AND SOIL EC, mmhos/cm (SAMPLES COLLECTED 1/20/2011)
- WELL HEAD PROTECTION RAILS AND POSTS
- PROPOSED LIMITS OF EXCAVATION TO 4.0 FEET DEPTH
- PROPOSED LIMITS OF EXCAVATION TO 5.0 FEET DEPTH

NOTES: 1) SAMPLE GRID ESTABLISHED ON 10' x 10' INTERSECTS
2) COMPASS DIRECTION APPROXIMATE

-N-

SCALE 5 0 5 10 FEET

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FIGURE TITLE	PROPOSED AREA FOR EXCAVATION OF IMPACTED SOILS WITH EC VALUES GREATER THAN 4 MMHOS/CM
DOCUMENT TITLE	REMEDIAL ACTION PLAN CHLORIDE IMPACTED SOIL
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 GAS PLANT LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=10'
DESIGNED BY	BEM
APPROVED BY	BEM
DRAWN BY	SKG

PROJECT NUMBER
4100417117
FIGURE NUMBER
8

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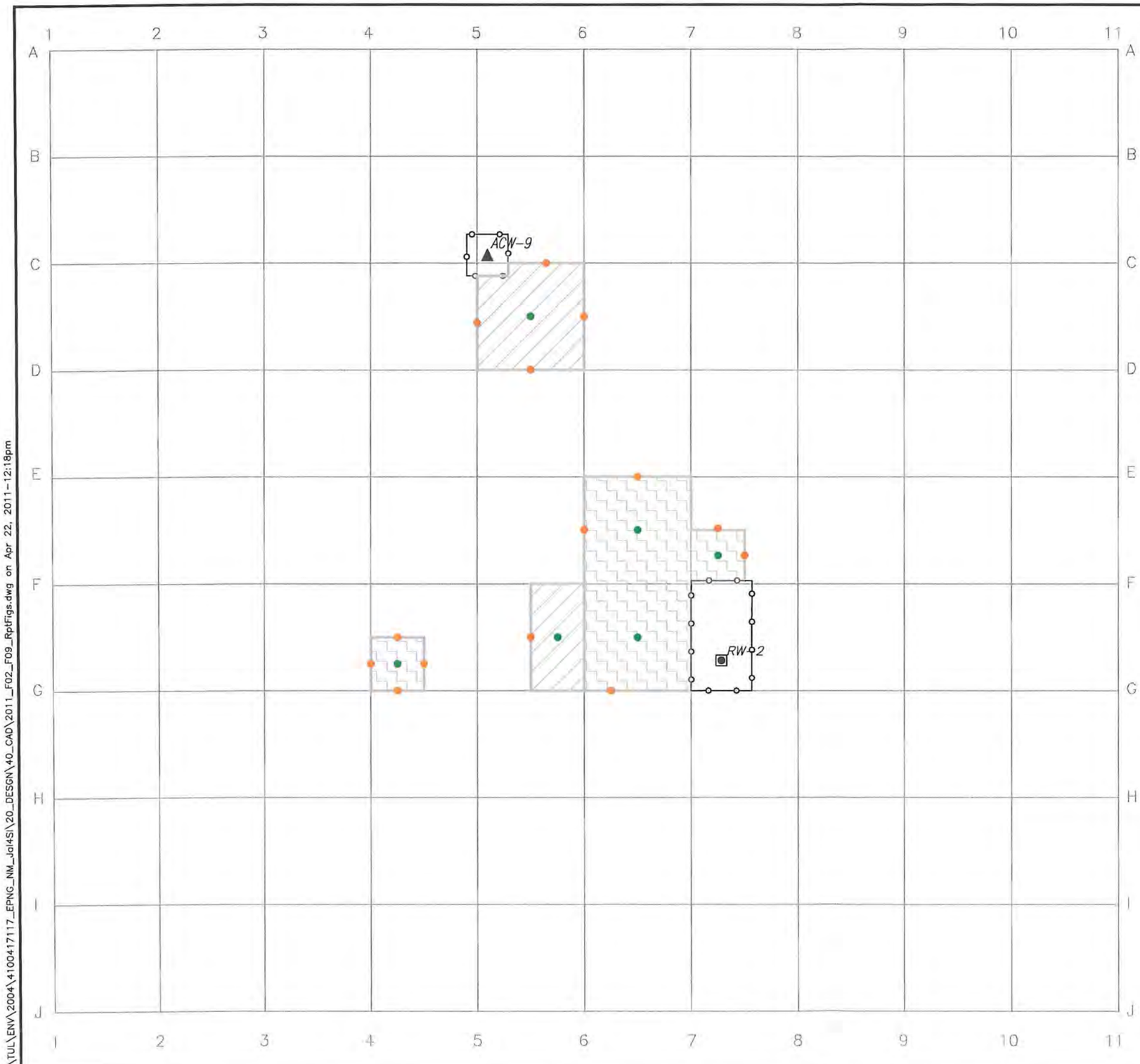

LEGEND

- PROPOSED FLOOR SOIL SAMPLE LOCATION FOR LABORATORY EC CONFIRMATION
- PROPOSED SIDEWALL SOIL SAMPLE LOCATION FOR LABORATORY EC CONFIRMATION
- ACW-9 — GROUNDWATER MONITOR WELL AND IDENTIFICATION
- RW-2 — GROUNDWATER RECOVERY WELL AND IDENTIFICATION
- WELL HEAD PROTECTION RAILS AND POSTS
- PROPOSED LIMITS OF EXCAVATION TO 4.0 FEET DEPTH
- PROPOSED LIMITS OF EXCAVATION TO 5.0 FEET DEPTH

NOTES: 1) SAMPLE GRID ESTABLISHED ON 10' x 10' INTERSECTS
2) COMPASS DIRECTION APPROXIMATE

-N-

5 0 5 10
SCALE FEET

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FIGURE TITLE	PROPOSED LABORATORY EC CONFIRMATION SAMPLE LOCATIONS
DOCUMENT TITLE	REMEDIAL ACTION PLAN CHLORIDE IMPACTED SOIL
CLIENT	EL PASO NATURAL GAS COMPANY
LOCATION	JAL #4 GAS PLANT LEA COUNTY, NEW MEXICO

DATE	4/22/2011
SCALE	1"=10'
DESIGNED BY	BEM
APPROVED BY	BEM
DRAWN BY	SKG

PROJECT NUMBER
4100417117
FIGURE NUMBER
9

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APPENDIX A

NMOCD RELEASE NOTIFICATION AND CORRECTIVE ACTION FORM C-141

McKenzie, Bruce E.

From: prvs=7077eae863=GeoffreyR.Leking@state.nm.us on behalf of Leking, Geoffrey R, EMNRD [GeoffreyR.Leking@state.nm.us]
Sent: Wednesday, April 06, 2011 3:10 PM
To: McKenzie, Bruce E.
Cc: Yanagisawa, Ian G
Subject: RE: EPNG Jal #4 - Completed Form C-141

Bruce

The 1RP # is 1RP-04-01-2697. The C-141 bearing my signature should be on the webpage in a few days. Thank you.

Geoffrey Leking
Environmental Engineer
NMOCD-Hobbs
1625 N. French Drive
Hobbs, NM 88240
Office: (575) 393-6161 Ext. 113
Cell: (575) 399-2990
email: geoffreyr.leking@state.nm.us

From: McKenzie, Bruce E. [mailto:BRUCE.E.MCKENZIE@saic.com]
Sent: Wednesday, April 06, 2011 1:31 PM
To: Leking, Geoffrey R, EMNRD
Cc: Yanagisawa, Ian G
Subject: EPNG Jal #4 - Completed Form C-141

Mr. Leking:

On October 21, 2010, my client Mr. Ian Yanagisawa with El Paso Natural Gas Company (EPNG) submitted to Larry Johnson a Form C-141 (copy attached) for the recovered groundwater release that occurred at recovery well RW-2 at the EPNG Jal #4 Site located in Lea County, New Mexico. Mr. Yanagisawa never received the fully executed form back from the NMOCD assigning this release an IRP number. On January 20, 2011, SAIC conducted an investigation of the soil impacted by the release of the recovered groundwater. We have received the analytical results from the soil samples collected during this investigation and will be presenting these data to the NMOCD in a summary report/remedial action plan (RAP) in the near future. Could you please forward me a copy of the completed Form C-141 so that I can update the project file and include a copy in the summary report/RAP we are preparing for the Site?

Bruce E. McKenzie, P.G.
Project Manager | Environment
SAIC Energy, Environment & Infrastructure, LLC (SEE&I)
office: 918.599.4383 | mobile: 918.906.6780

bruce.e.mckenzie@saic.com

One West Third Street, Suite 100
Tulsa, Oklahoma 74103

www.saic.com/EEandI

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: El Paso Natural Gas	Contact: Ian Yanagisawa
Address: 1001 Louisiana Street, Houston, TX 77002	Telephone No.: (713) 420-7361
Facility Name: Jal #4 Groundwater Remediation Project	Facility Type: Pump and Inject Remediation System

Surface Owner: Jimmy Doom	Mineral Owner: N/A	Lease No.: N/A

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	5	24 S	37 E		600 FNL		1980 FWL	Lea

Latitude 32° 15' 31: N Longitude 103° 11' 28" W

NATURE OF RELEASE

Type of Release: Water high in Chlorides.	Volume of Release: Approx 71 Barrels	Volume Recovered: None
Source of Release: Leak from the discharge line from groundwater recovery well RW-2.	Date and Hour of Occurrence: 10/16/10 @ ~2:00pm	Date and Hour of Discovery: 10/18/10 @ ~4:00pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Larry Johnson	
By Whom? Ian Yanagisawa	Date and Hour: 10/20/10 @ 10:11 am	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Pipe broken between the check-valve and cutoff-valve. It is believed that a cow got his head inside the barricade and rubbed up against the piping system around groundwater recovery well RW-2. Fresh cow manure was discovered north of the barricade. Hoof prints were discovered with water sitting in the prints and other hoof prints within the saturated soil.

Describe Area Affected and Cleanup Action Taken.*
Area affect by spill is approximately 20 feet by 20 feet. Remedial action will depend upon the results of soil samples. Soil samples will be collected and analyzed for EC.

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: Ian Yanagisawa	OIL CONSERVATION DIVISION	
Printed Name: Ian G. Yanagisawa, P.E., P.G.	Approved by District Supervisor:	
Title: Principle Environmental Engineer	Approval Date:	Expiration Date:
E-mail Address: Ian.Yanagisawa@elpaso.com	Conditions of Approval:	Attached ☐
Date: 10/21/2010 Phone: (713) 420-7361		

* Attach Additional Sheets If Necessary

APPENDIX B

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:

El Paso Energy

Certificate of Analysis Number:

11010645

Report To:		Project Name:	EPNG-Jal#4 4100417116
Benham Companies, Inc. Environmental Division		Site:	Jal, NM
Scott Haas		Site Address:	
3700 West Robinson			
Suite 200		PO Number:	
Norman		State:	New Mexico
OK		State Cert. No.:	
73072-		Date Reported:	2/7/2011
ph: (405) 321-3895	fax:		

I. SAMPLE RECEIPT:

All samples were received intact. The internal ice chest temperatures were measured on receipt and are recorded on the attached Sample Receipt Checklist.

II: ANALYSIS AND EXCEPTIONS:

SW8021B Purgeable Aromatics (BTEX):

No exceptions are noted.

III. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report (" mg\kg-dry " or " ug\kg-dry ").

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Some of the percent recoveries and RPD's on the QC report for the MS/MSD may be different than the calculated recoveries and RPD's using the sample result and the MS/MSD results that appear on the report because, the actual raw result is used to perform the calculations for percent recovery and RPD.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or by

Sonia West

2/7/2011

Sonia West
Senior Project Manager

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:

El Paso Energy

Certificate of Analysis Number:

11010645

his designee, as verified by the following signature.

Sonia West

Sonia West
Senior Project Manager

2/7/2011
Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

El Paso Energy

Certificate of Analysis Number:

11010645

Report To:	Benham Companies, Inc. Environmental Division Scott Haas 3700 West Robinson Suite 200 Norman OK 73072- ph: (405) 321-3895 fax: (405) 579-7847	**Project Name:**	EPNG-Jal#4 4100417116
		Site:	Jal, NM
		Site Address:	
		PO Number:	
		State:	New Mexico
		State Cert. No.:	
Fax To:		**Date Reported:**	2/7/2011

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
HA-1 (3-4)	11010645-01	Soil	01/20/2011 16:37	1/25/2011 9:18:00 AM	12695	☐
HA-2 (2-3)	11010645-02	Soil	01/20/2011 16:41	1/25/2011 9:18:00 AM		☐
HA-3 (3-4)	11010645-03	Soil	01/20/2011 16:43	1/25/2011 9:18:00 AM		☐
HA-4 (1-2)	11010645-04	Soil	01/20/2011 16:45	1/25/2011 9:18:00 AM		☐
HA-5 (2-3)	11010645-05	Soil	01/20/2011 16:47	1/25/2011 9:18:00 AM		☐
HA-6 (2-3)	11010645-06	Soil	01/20/2011 16:48	1/25/2011 9:18:00 AM		☐
HA-7 (4-5)	11010645-07	Soil	01/20/2011 16:49	1/25/2011 9:18:00 AM		☐
HA-8 (4-5)	11010645-08	Soil	01/20/2011 16:51	1/25/2011 9:18:00 AM		☐
HA-9 (3-4)	11010645-09	Soil	01/20/2011 16:53	1/25/2011 9:18:00 AM		☐
Trip Blank	11010645-10	Water	01/20/2011 0:00	1/25/2011 9:18:00 AM		☐

Sonia West
Senior Project Manager

2/7/2011
Date

Kesavalu M. Bagawandoss Ph.D., J.D.
Laboratory Director

Ted Yen
Quality Assurance Officer

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Client Sample ID: HA-1 (3-4) **Collected:** 01/20/2011 16:37 **SPL Sample ID:** 11010645-01

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**M2540G/SW846**	**Units: wt%**		
Percent Moisture	11.4		0	1	02/03/11 17:00	EB1	5717459
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/kg-dry**		
Benzene	ND		1.1	1	01/26/11 12:23	WLV	5714439
Toluene	ND		1.1	1	01/26/11 12:23	WLV	5714439
Ethylbenzene	ND		1.1	1	01/26/11 12:23	WLV	5714439
m,p-Xylene	ND		1.1	1	01/26/11 12:23	WLV	5714439
o-Xylene	ND		1.1	1	01/26/11 12:23	WLV	5714439
Xylenes,Total	ND		1.1	1	01/26/11 12:23	WLV	5714439
Surr: 1,4-Difluorobenzene	98.4		% 70-130	1	01/26/11 12:23	WLV	5714439
Surr: 4-Bromofluorobenzene	97.6		% 63-145	1	01/26/11 12:23	WLV	5714439

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 9:55	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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Client Sample ID: HA-2 (2-3) **Collected:** 01/20/2011 16:41 **SPL Sample ID:** 11010645-02

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**M2540G/SW846**	**Units: wt%**		
Percent Moisture	13.8		0	1	02/03/11 17:00	EB1	5717457
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/kg-dry**		
Benzene	ND		1.2	1	01/26/11 13:49	WLV	5714442
Toluene	ND		1.2	1	01/26/11 13:49	WLV	5714442
Ethylbenzene	ND		1.2	1	01/26/11 13:49	WLV	5714442
m,p-Xylene	ND		1.2	1	01/26/11 13:49	WLV	5714442
o-Xylene	ND		1.2	1	01/26/11 13:49	WLV	5714442
Xylenes, Total	ND		1.2	1	01/26/11 13:49	WLV	5714442
Surr: 1,4-Difluorobenzene	99.0		% 70-130	1	01/26/11 13:49	WLV	5714442
Surr: 4-Bromofluorobenzene	96.9		% 63-145	1	01/26/11 13:49	WLV	5714442

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 9:59	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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Client Sample ID: HA-3 (3-4) **Collected:** 01/20/2011 16:43 **SPL Sample ID:** 11010645-03

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE				**MCL**	**M2540G/SW846**	**Units: wt%**	
Percent Moisture	12.6		0	1	02/03/11 17:00	EB1	5717456
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/kg-dry**	
Benzene	ND		1.1	1	01/26/11 14:18	WLV	5714443
Toluene	ND		1.1	1	01/26/11 14:18	WLV	5714443
Ethylbenzene	ND		1.1	1	01/26/11 14:18	WLV	5714443
m,p-Xylene	ND		1.1	1	01/26/11 14:18	WLV	5714443
o-Xylene	ND		1.1	1	01/26/11 14:18	WLV	5714443
Xylenes,Total	ND		1.1	1	01/26/11 14:18	WLV	5714443
Surr: 1,4-Difluorobenzene	98.4		% 70-130	1	01/26/11 14:18	WLV	5714443
Surr: 4-Bromofluorobenzene	95.4		% 63-145	1	01/26/11 14:18	WLV	5714443

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 10:02	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
" - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
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Client Sample ID: HA-4 (1-2) **Collected:** 01/20/2011 16:45 **SPL Sample ID:** 11010645-04

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**M2540G/SW846**	**Units: wt%**		
Percent Moisture	14.9		0	1	02/03/11 17:00	EB1	5717455
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/kg-dry**		
Benzene	ND		1.2	1	01/26/11 14:47	WLV	5714444
Toluene	ND		1.2	1	01/26/11 14:47	WLV	5714444
Ethylbenzene	ND		1.2	1	01/26/11 14:47	WLV	5714444
m,p-Xylene	ND		1.2	1	01/26/11 14:47	WLV	5714444
o-Xylene	ND		1.2	1	01/26/11 14:47	WLV	5714444
Xylenes,Total	ND		1.2	1	01/26/11 14:47	WLV	5714444
Surr: 1,4-Difluorobenzene	98.7		% 70-130	1	01/26/11 14:47	WLV	5714444
Surr: 4-Bromofluorobenzene	95.1		% 63-145	1	01/26/11 14:47	WLV	5714444

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 10:04	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
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Client Sample ID: HA-5 (2-3) **Collected:** 01/20/2011 16:47 **SPL Sample ID:** 11010645-05

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**M2540G/SW846**	**Units: wt%**		
Percent Moisture	11.6		0	1	02/03/11 17:00	EB1	5717454
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/kg-dry**		
Benzene	ND		1.1	1	01/26/11 15:16	WLV	5714445
Toluene	ND		1.1	1	01/26/11 15:16	WLV	5714445
Ethylbenzene	ND		1.1	1	01/26/11 15:16	WLV	5714445
m,p-Xylene	ND		1.1	1	01/26/11 15:16	WLV	5714445
o-Xylene	ND		1.1	1	01/26/11 15:16	WLV	5714445
Xylenes,Total	ND		1.1	1	01/26/11 15:16	WLV	5714445
Surr: 1,4-Difluorobenzene	98.9		% 70-130	1	01/26/11 15:16	WLV	5714445
Surr: 4-Bromofluorobenzene	96.9		% 63-145	1	01/26/11 15:16	WLV	5714445

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 10:05	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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Client Sample ID: HA-6 (2-3) **Collected:** 01/20/2011 16:48 **SPL Sample ID:** 11010645-06

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**M2540G/SW846**	**Units: wt%**		
Percent Moisture	15.9		0	1	02/03/11 17:00	EB1	5717453
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/kg-dry**		
Benzene	ND		1.2	1	01/26/11 15:45	WLV	5714446
Toluene	ND		1.2	1	01/26/11 15:45	WLV	5714446
Ethylbenzene	ND		1.2	1	01/26/11 15:45	WLV	5714446
m,p-Xylene	ND		1.2	1	01/26/11 15:45	WLV	5714446
o-Xylene	ND		1.2	1	01/26/11 15:45	WLV	5714446
Xylenes,Total	ND		1.2	1	01/26/11 15:45	WLV	5714446
Surr: 1,4-Difluorobenzene	98.8		% 70-130	1	01/26/11 15:45	WLV	5714446
Surr: 4-Bromofluorobenzene	96.4		% 63-145	1	01/26/11 15:45	WLV	5714446

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 10:07	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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Client Sample ID: HA-7 (4-5) **Collected:** 01/20/2011 16:49 **SPL Sample ID:** 11010645-07

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL**	**M2540G/SW846**	**Units: wt%**		
Percent Moisture	18.7		0	1	02/03/11 17:00	EB1	5717452
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/kg-dry**		
Benzene	ND		1.2	1	01/26/11 17:11	WLV	5714449
Toluene	ND		1.2	1	01/26/11 17:11	WLV	5714449
Ethylbenzene	ND		1.2	1	01/26/11 17:11	WLV	5714449
m,p-Xylene	ND		1.2	1	01/26/11 17:11	WLV	5714449
o-Xylene	ND		1.2	1	01/26/11 17:11	WLV	5714449
Xylenes,Total	ND		1.2	1	01/26/11 17:11	WLV	5714449
Surr: 1,4-Difluorobenzene	97.9		% 70-130	1	01/26/11 17:11	WLV	5714449
Surr: 4-Bromofluorobenzene	95.8		% 63-145	1	01/26/11 17:11	WLV	5714449

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 10:09	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: HA-8 (4-5) **Collected:** 01/20/2011 16:51 **SPL Sample ID:** 11010645-08

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE				**MCL**	**M2540G/SW846**		**Units: wt%**	
Percent Moisture	14.5		0		1	02/03/11 17:00	EB1	5717451
PURGEABLE AROMATICS				**MCL**	**SW8021B**		**Units: ug/kg-dry**	
Benzene	ND		1.2		1	01/26/11 17:40	WLV	5714450
Toluene	ND		1.2		1	01/26/11 17:40	WLV	5714450
Ethylbenzene	ND		1.2		1	01/26/11 17:40	WLV	5714450
m,p-Xylene	ND		1.2		1	01/26/11 17:40	WLV	5714450
o-Xylene	ND		1.2		1	01/26/11 17:40	WLV	5714450
Xylenes,Total	ND		1.2		1	01/26/11 17:40	WLV	5714450
Surr: 1,4-Difluorobenzene	98.5		% 70-130		1	01/26/11 17:40	WLV	5714450
Surr: 4-Bromofluorobenzene	95.8		% 63-145		1	01/26/11 17:40	WLV	5714450

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 10:11	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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Client Sample ID: HA-9 (3-4) **Collected:** 01/20/2011 16:53 **SPL Sample ID:** 11010645-09

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PERCENT MOISTURE			**MCL M2540G/SW846**		**Units: wt%**		
Percent Moisture	6.66		0	1	02/03/11 17:00	EB1	5717450
PURGEABLE AROMATICS			**MCL SW8021B**		**Units: ug/kg-dry**		
Benzene	ND		1.1	1	01/26/11 18:09	WLV	5714451
Toluene	ND		1.1	1	01/26/11 18:09	WLV	5714451
Ethylbenzene	ND		1.1	1	01/26/11 18:09	WLV	5714451
m,p-Xylene	ND		1.1	1	01/26/11 18:09	WLV	5714451
o-Xylene	ND		1.1	1	01/26/11 18:09	WLV	5714451
Xylenes,Total	ND		1.1	1	01/26/11 18:09	WLV	5714451
Surr: 1,4-Difluorobenzene	98.3		% 70-130	1	01/26/11 18:09	WLV	5714451
Surr: 4-Bromofluorobenzene	96.2		% 63-145	1	01/26/11 18:09	WLV	5714451

Prep Method	Prep Date	Prep Initials	Prep Factor
SW5030B	01/26/2011 10:13	XML	1.00

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: Trip Blank **Collected:** 01/20/2011 0:00 **SPL Sample ID:** 11010645-10

Site: Jal, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1		1	01/26/11 17:24	NMa	5710744
Toluene	ND		1		1	01/26/11 17:24	NMa	5710744
Ethylbenzene	ND		1		1	01/26/11 17:24	NMa	5710744
m,p-Xylene	ND		1		1	01/26/11 17:24	NMa	5710744
o-Xylene	ND		1		1	01/26/11 17:24	NMa	5710744
Xylenes, Total	ND		1		1	01/26/11 17:24	NMa	5710744
Surr: 1,4-Difluorobenzene	99.3		% 70-130		1	01/26/11 17:24	NMa	5710744
Surr: 4-Bromofluorobenzene	97.7		% 70-130		1	01/26/11 17:24	NMa	5710744

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

Quality Control Documentation

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso Energy

EPNG-Jal#4 4100417116

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 11010645
Lab Batch ID: R315000

Method Blank

RunID: HP_R_110126A-5710741 Units: ug/L
Analysis Date: 01/26/2011 15:54 Analyst: NMa

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
11010645-10A	Trip Blank

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	1.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,4-Difluorobenzene	99.3	70-130
Surr: 4-Bromofluorobenzene	98.4	70-130

Laboratory Control Sample (LCS)

RunID: HP_R_110126A-5710742 Units: ug/L
Analysis Date: 01/26/2011 16:24 Analyst: NMa

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	20.8	104	70	130
Ethylbenzene	20.0	20.5	103	70	130
Toluene	20.0	20.0	100	70	130
m,p-Xylene	40.0	40.6	102	70	130
o-Xylene	20.0	20.6	103	70	130
Xylenes,Total	60.0	61.2	102	70	130
Surr: 1,4-Difluorobenzene	100	99.7	99.7	70	130
Surr: 4-Bromofluorobenzene	100	100	100	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 11010640-01
RunID: HP_R_110126A-5710747 Units: mg/L
Analysis Date: 01/26/2011 18:54 Analyst: NMa

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.0 - Modified December 23, 2010

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso Energy

EPNG-Jal#4 4100417116

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 11010645
Lab Batch ID: R315000

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	0.02	0.0218	109	0.02	0.0216	108	0.739	31	66	141
Ethylbenzene	ND	0.02	0.0212	106	0.02	0.0209	105	1.42	28	52	136
Toluene	ND	0.02	0.0210	105	0.02	0.0205	103	2.03	25	61	131
m,p-Xylene	ND	0.04	0.0417	104	0.04	0.0411	103	1.40	36	60	130
o-Xylene	ND	0.02	0.0211	106	0.02	0.0208	104	1.53	30	64	130
Xylenes,Total	ND	0.06	0.0628	105	0.06	0.0619	103	1.44	36	60	130
Surr: 1,4-Difluorobenzene	ND	100	101	101	100	99.8	99.8	0.967	30	70	130
Surr: 4-Bromofluorobenzene	ND	100	99.5	99.5	100	98.6	98.6	0.913	30	70	130

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.0 - Modified December 23, 2010

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso Energy

EPNG-Jal#4 4100417116

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 11010645
Lab Batch ID: R315231

Method Blank

RunID: HP_O_110126B-5714438 Units: ug/kg
Analysis Date: 01/26/2011 11:39 Analyst: WLV
Preparation Date: 01/26/2011 11:39 Prep By: Method: SW5030B

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	1.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,4-Difluorobenzene	98.4	70-130
Surr: 4-Bromofluorobenzene	98.9	63-145

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
11010645-01A	HA-1 (3-4)
11010645-02A	HA-2 (2-3)
11010645-03A	HA-3 (3-4)
11010645-04A	HA-4 (1-2)
11010645-05A	HA-5 (2-3)
11010645-06A	HA-6 (2-3)
11010645-07A	HA-7 (4-5)
11010645-08A	HA-8 (4-5)
11010645-09A	HA-9 (3-4)

Laboratory Control Sample (LCS)

RunID: HP_O_110126B-5714437 Units: ug/kg
Analysis Date: 01/26/2011 11:10 Analyst: WLV
Preparation Date: 01/26/2011 11:10 Prep By: Method: SW5030B

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	19.6	97.9	70	130
Ethylbenzene	20.0	19.4	96.8	75	122
Toluene	20.0	19.3	96.3	75	123
m,p-Xylene	40.0	39.7	99.2	74	122
o-Xylene	20.0	19.0	95.0	70	130
Xylenes,Total	60.0	58.7	97.8	70	130
Surr: 1,4-Difluorobenzene	100	98.6	98.6	70	130
Surr: 4-Bromofluorobenzene	100	99.5	99.5	63	145

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 11010645-01
RunID: HP_O_110126B-5714440 Units: ug/kg-dry
Analysis Date: 01/26/2011 12:52 Analyst: WLV
Preparation Date: 01/26/2011 9:56 Prep By: XML Method: SW5030B

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.0 - Modified December 23, 2010

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso Energy

EPNG-Jal#4 4100417116

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 11010645
Lab Batch ID: R315231

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	22.6	19.2	95.9	22.6	19.4	97.1	1.23	31	41	133
Ethylbenzene	ND	22.6	18.8	93.9	22.6	21.4	94.8	0.917	39	31	129
Toluene	ND	22.6	18.8	93.8	22.6	18.9	94.7	0.944	25	34	130
m,p-Xylene	ND	45.1	43.4	96.1	45.1	43.7	96.8	0.672	26	35	123
o-Xylene	ND	22.6	20.6	91.2	22.6	20.8	92.2	1.08	35	33	124
Xylenes,Total	ND	67.7	64.0	94.5	67.7	64.5	95.3	0.803	35	33	124
Surr: 1,4-Difluorobenzene	ND	113	111	98.6	113	111	98.7	0.0416	30	70	130
Surr: 4-Bromofluorobenzene	ND	113	110	97.9	113	110	97.6	0.257	30	63	145

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso Energy

EPNG-Jal#4 4100417116

Analysis: PERCENT MOISTURE
Method: SM2540G/SW846

WorkOrder: 11010645
Lab Batch ID: R315386F

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
11010645-01A	HA-1 (3-4)

Sample Duplicate

Original Sample: 11010645-01
RunID: WET_110203F-5717459 Units: wt%
Analysis Date: 02/03/2011 17:00 Analyst: EB1

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Percent Moisture	11.4	11.42	0.116	20

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.0 - Modified December 23, 2010

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

El Paso Energy

EPNG-Jal#4 4100417116

Analysis: PERCENT MOISTURE
Method: SM2540G/SW846

WorkOrder: 11010645
Lab Batch ID: R315386G

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
11010645-02A	HA-2 (2-3)
11010645-03A	HA-3 (3-4)
11010645-04A	HA-4 (1-2)
11010645-05A	HA-5 (2-3)
11010645-06A	HA-6 (2-3)
11010645-07A	HA-7 (4-5)
11010645-08A	HA-8 (4-5)
11010645-09A	HA-9 (3-4)

Sample Duplicate

Original Sample: 11020047-02
RunID: WET_110203F-5717448 Units: wt%
Analysis Date: 02/03/2011 17:00 Analyst: EB1

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Percent Moisture	14.5	14.46	0.271	20

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

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Sample Receipt Checklist
And
Chain of Custody

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	**11010645**	Received By:	**T_B**
Date and Time Received:	**1/25/2011 9:18:00 AM**	Carrier name:	**Fedex-Standard Overnight**
Temperature:	**4.0/4.0°C**	Chilled by:	**Water Ice**

1.	**Shipping container/cooler in good condition?**	Yes ☑	No ☐	Not Present ☐
2.	**Custody seals intact on shippping container/cooler?**	Yes ☑	No ☐	Not Present ☐
3.	**Custody seals intact on sample bottles?**	Yes ☐	No ☐	Not Present ☑
4.	**Chain of custody present?**	Yes ☑	No ☐	
5.	**Chain of custody signed when relinquished and received?**	Yes ☑	No ☐	
6.	**Chain of custody agrees with sample labels?**	Yes ☑	No ☐	
7.	**Samples in proper container/bottle?**	Yes ☑	No ☐	
8.	**Sample containers intact?**	Yes ☑	No ☐	
9.	**Sufficient sample volume for indicated test?**	Yes ☑	No ☐	
10.	**All samples received within holding time?**	Yes ☑	No ☐	
11.	**Container/Temp Blank temperature in compliance?**	Yes ☑	No ☐	
12.	**Water - VOA vials have zero headspace?**	Yes ☐	No ☐	VOA Vials Not Present ☑
13.	**Water - Preservation checked upon receipt (except VOA*)?**	Yes ☐	No ☐	Not Applicable ☑

***VOA Preservation Checked After Sample Analysis**

SPL Representative: _____ **Contact Date & Time:** _____

Client Name Contacted: _____

Non Conformance Issues: _____

Client Instructions: _____

1101064S 12695

CHAIN-OF-CUSTODY RECORD

BENHAM

- Norman, OK 405/321-3895
- Tulsa, OK 918/492-1600
- Arlington, TX 817/640-6407
- Houston, TX 713/835-3500

(Complete Addresses on reverse side of form)

CLIENT NAME: Benham	SITE MANAGER: Bruce McKenzie
PROJECT NO.: 410041711	PROJECT NAME: EPNG-Jal #4
PAGE: PAGE:	LAB: PO#

DATE	TIME	MATRIX	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: BTEX (8021B)	LAB I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E. FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE
1-20-11	1637	Soil	HA-1 (3-4')	1	X		
1-20-11	1641	Soil	HA-2 (2'-3)	1	X		
1-20-11	1643	Soil	HA-3 (3'-4')	1	X		
1-20-11	1645	Soil	HA-4 (1'-2')	1	X		
1-20-11	1647	Soil	HA-5 (2'-3')	1	X		
1-20-11	1648	Soil	HA-6 (2-3')	1	X		
1-20-11	1649	Soil	HA-7 (4-5')	1	X		
1-20-11	1651	Soil	HA-8 (4'-5')	1	X		
1-20-11	1653	Soil	HA-9 (3-4')	1	X		
—	—	water	Trip Blank	2	X		
—	—	water	Temp				

SAMPLED BY: (Signature) Same As Above	DATE: Same As TIME: Above	RELINQUISHED BY: (Signature)	DATE: 1-24-11 TIME: 1200
RECEIVED BY: (Signature)	DATE: TIME:	RELINQUISHED BY: (Signature)	DATE: TIME:
RECEIVED BY: (Signature)	DATE: 1-25-11 TIME: 9 13	SAMPLE SHIPPED BY: (Circle) AIRBILL #	
COMMENTS:		TURN AROUND TIME NEEDED: Standard	FEDEX HAND DELIVERED

RECEIVING LABORATORY: Accutest GC / SPL Laboratory ADDRESS: 8880 Interchange Dr CITY: Houston STATE: TX ZIP: 77054 CONTACT: Sonia West PHONE: 713.660.0901	RECEIVED BY LABORATORY: (Signature) DATE: TIME:	SAMPLE CONDITION UPON RECEIPT: (Lab Use Only) Temperature Wet Ice Present: Y N VOA's Free of Headspace Y N Comments:

BENHAM CONTACT PERSON(S): Aria Archie

PHONE #: 405-321-3895

POINT OF ORIGIN: ☐ NORMAN ☐ TULSA ☐ ARLINGTON ☐ HOUSTON ☐ OTHER:

PAGE #1 - RECEIVING LAB

PAGE #2 - RETURN TO BENHAM

Environmental Testing Inc. 488-2400
4619 N. Santa Fe, OKC, OK 73118 - (405) 488-2400 - (405) 488-2404 fax

Analytical Report

Report Date:	01/31/2011
Order #	2011010320
Project #	4100417117

Laboratory Certificate # 7211

Client: **Ms. Aria Archie**
Benham
3700 W. Robinson, Ste. 200
Norman, OK 73072

Project: **EPNG-Jal #4**

Analytical Results

Client Sample ID: **HA-1 (0-1)** ETI ID: **1**
Sample Collected : **01/20/2011 @ 10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2710	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	23.5	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-1 (1-2)** ETI ID: **2**
Sample Collected : **01/20/2011 @ 10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1700	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	23.0	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-1 (2-3)** ETI ID: **3**
Sample Collected : **01/20/2011 @ 10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2920	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	22.5	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Analytical Results

Client Sample ID: **HA-1 (3-4)** ETI ID: **4**
Sample Collected : **01/20/2011 @10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	4060	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	30.8	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-1 (4-5)** ETI ID: **5**
Sample Collected : **01/20/2011 @10:15** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	3670	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	28.6	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-2 (0-1)** ETI ID: **6**
Sample Collected : **01/20/2011 @11:52** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	7320	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	21.9	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-2 (1-2)** ETI ID: **7**
Sample Collected : **01/20/2011 @11:52** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	5620	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	21.8	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-2 (2-3)** ETI ID: **8**
Sample Collected : **01/20/2011 @11:52** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	4840	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	28.4	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-2 (3-4)** ETI ID: **9**
Sample Collected : **01/20/2011 @11:52** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	3230	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	36.9	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Analytical Results

Client Sample ID: **HA-2 (4-5)** ETI ID: **10**
Sample Collected : **01/20/2011 @ 11:52** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	3520	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	35.5	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-3 (0-1)** ETI ID: **11**
Sample Collected : **01/20/2011 @ 12:08** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2770	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	22.2	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-3 (1-2)** ETI ID: **12**
Sample Collected : **01/20/2011 @ 12:08** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2610	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	24.9	%	01/27/2011 03:48:00 PM	DS	AgHandbk60

Client Sample ID: **HA-3 (2-3)** ETI ID: **13**
Sample Collected : **01/20/2011 @ 12:08** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2190	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	34.7	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-3 (3-4)** ETI ID: **14**
Sample Collected : **01/20/2011 @ 12:08** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2130	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	34.5	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-3 (4-5)** ETI ID: **15**
Sample Collected : **01/20/2011 @ 12:08** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2610	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	31.1	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Analytical Results

Client Sample ID: **HA-4 (0-1)** ETI ID: **16**
Sample Collected : **01/20/2011 @ 12:29** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	240	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	22.3	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-4 (1-2)** ETI ID: **17**
Sample Collected : **01/20/2011 @ 12:29** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2100	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	30.9	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-4 (2-3)** ETI ID: **18**
Sample Collected : **01/20/2011 @ 12:29** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	4210	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	37.9	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-4 (3-4)** ETI ID: **19**
Sample Collected : **01/20/2011 @ 12:29** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	3770	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	41.1	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-4 (4-5)** ETI ID: **20**
Sample Collected : **01/20/2011 @ 12:29** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	3970	µmhos/cm	01/31/2011 08:50:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	39.3	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-5 (0-1)** ETI ID: **21**
Sample Collected : **01/20/2011 @ 12:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2110	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	21.9	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Analytical Results

Client Sample ID: **HA-5 (1-2)** ETI ID: **22**
Sample Collected : **01/20/2011 @ 12:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1970	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	22.1	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-5 (2-3)** ETI ID: **23**
Sample Collected : **01/20/2011 @ 12:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2350	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	27.3	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-5 (3-4)** ETI ID: **24**
Sample Collected : **01/20/2011 @ 12:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2820	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	29.4	%	01/28/2011 11:20:00 AM	DS	AgHandbk60

Client Sample ID: **HA-5 (4-5)** ETI ID: **25**
Sample Collected : **01/20/2011 @ 12:55** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2720	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	30.3	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-6 (0-1)** ETI ID: **26**
Sample Collected : **01/20/2011 @ 13:18** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	324	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	21.9	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-6 (1-2)** ETI ID: **27**
Sample Collected : **01/20/2011 @ 13:18** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2070	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	25.2	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Analytical Results

Client Sample ID: **HA-6 (2-3)** ETI ID: **28**
Sample Collected : **01/20/2011 @ 13:18** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2880	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	34.1	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-6 (3-4)** ETI ID: **29**
Sample Collected : **01/20/2011 @ 13:18** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	3990	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	38.9	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-6 (4-5)** ETI ID: **30**
Sample Collected : **01/20/2011 @ 13:18** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	5360	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	33.7	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-7 (0-1)** ETI ID: **31**
Sample Collected : **01/20/2011 @ 13:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1630	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	22.2	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-7 (1-2)** ETI ID: **32**
Sample Collected : **01/20/2011 @ 13:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1820	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	22.8	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-7 (2-3)** ETI ID: **33**
Sample Collected : **01/20/2011 @ 13:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2600	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	24.0	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Analytical Results

Client Sample ID: **HA-7 (3-4)** ETI ID: **34**
Sample Collected : **01/20/2011 @ 13:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2630	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	27.6	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-7 (4-5)** ETI ID: **35**
Sample Collected : **01/20/2011 @ 13:45** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1800	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	37.3	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-8 (0-1)** ETI ID: **36**
Sample Collected : **01/20/2011 @ 14:24** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1340	µmhos/cm	01/31/2011 09:40:00 AM	DS	2510 B Mod
Saturation Percentage (S.P.)	23.9	%	01/28/2011 03:55:00 PM	DS	AgHandbk60

Client Sample ID: **HA-8 (1-2)** ETI ID: **37**
Sample Collected : **01/20/2011 @ 14:24** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1340	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	22.2	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Client Sample ID: **HA-8 (2-3)** ETI ID: **38**
Sample Collected : **01/20/2011 @ 14:24** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	3280	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	25.9	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Client Sample ID: **HA-8 (3-4)** ETI ID: **39**
Sample Collected : **01/20/2011 @ 14:24** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2060	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	31.5	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Analytical Results

Client Sample ID: **HA-8 (4-5)** ETI ID: **40**

Sample Collected : **01/20/2011 @ 14:24** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	2360	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	28.7	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Client Sample ID: **HA-9 (0-1)** ETI ID: **41**

Sample Collected : **01/20/2011 @ 15:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	251	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	19.4	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Client Sample ID: **HA-9 (1-2)** ETI ID: **42**

Sample Collected : **01/20/2011 @ 15:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	377	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	23.6	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Client Sample ID: **HA-9 (2-3)** ETI ID: **43**

Sample Collected : **01/20/2011 @ 15:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	556	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	34.3	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Client Sample ID: **HA-9 (3-4)** ETI ID: **44**

Sample Collected : **01/20/2011 @ 15:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	914	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	33.7	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Client Sample ID: **HA-9 (4-5)** ETI ID: **45**

Sample Collected : **01/20/2011 @ 15:00** Matrix: **Solids**

Parameter	Result	Units	Analyzed On	Analyst	Method
Conductivity (S.P.)	1810	µmhos/cm	01/31/2011 03:00:00 PM	DS	2510 B Mod
Saturation Percentage (S.P.)	28.1	%	01/31/2011 11:00:00 AM	DS	AgHandbk60

Samples not received on ice and outside regulatory temperature requirements.

Respectfully Submitted:

Russell Britten

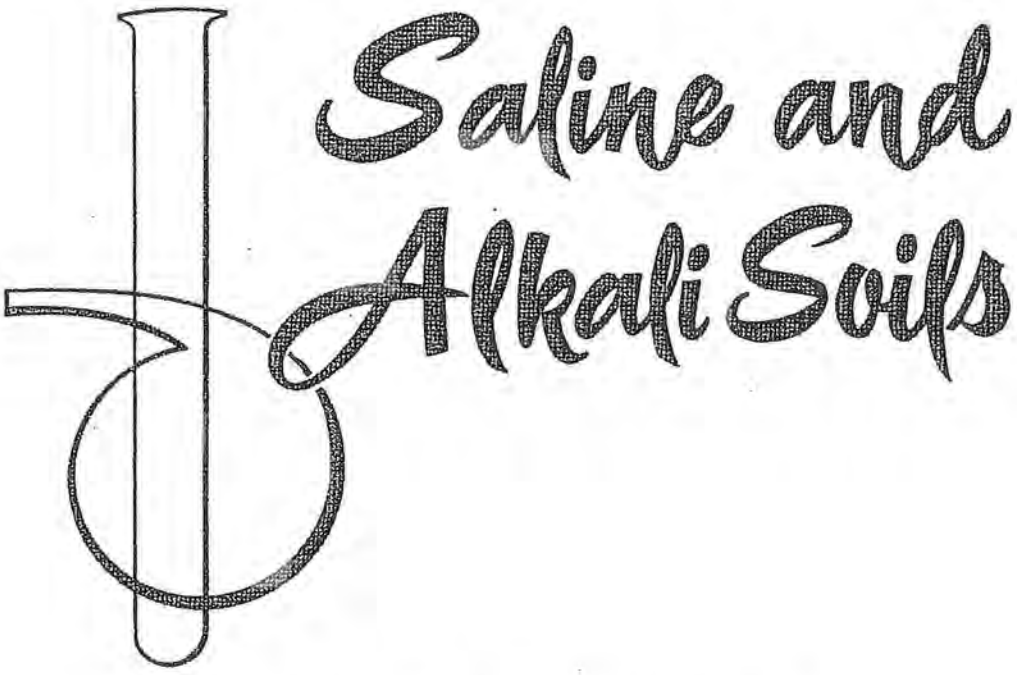
President

Unless ETI receives prior notification, all sample material not consumed in analysis will be retained for a period of 30 days before disposal.

APPENDIX C

PORTION OF USDA HANDBOOK 60

Diagnosis and Improvement of



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Soil and Water Conservation Research Branch

Agricultural Research Service

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textures which may be puddled and underlain with hardpan. Usually found on moist seep lands with high water tables but may occur on better drained land. Moisture-holding capacity is intermediate to high (*SP* 30 to 60). The soils are saline or saline-alkali, with high concentrations of salt in the first foot (0.6 to 3.2 percent) and decreasing amounts with depth, but the average salinity for a 4-foot profile may exceed 1 percent where the growth is luxuriant. The soils may contain exchangeable sodium. Indications: Where virgin growth is vigorous, seepweed is a good indicator of highly saline or saline-alkali soil. Drainage and leaching are essential, and amendments may be required.

ALKALI SACATON, or TUSSOCKGRASS (*Sporobolus airoides*).—Range: South Dakota to Washington, south to Texas, Arizona, and southern California. In low, wet areas, and river valleys. Occurs on loamy and clayey soils that have an intermediate to high moisture-holding capacity (*SP* 45 to 75). The soil surface is moist a great part of the year, and the water table is usually high. The salinity of the soil may vary within wide limits (0.3 to >3.0 percent), the higher values being in the first foot; but the plant grows best in the lower range (0.3 to 0.5 percent). Exchangeable sodium may be present, and this grass is very tolerant to it. Indications: In pure, vigorous stands, this plant is a good indicator of wet, very saline or saline-alkali soils, with a high water table. It may occur on soils without a high moisture content in the subsoil on sites receiving runoff water. The land requires drainage and leaching, and soil amendments may be needed unless gypsum is present.

SAMPHIRE, or GLASSWORT (*Salicornia* spp.).—Range: Saskatchewan to British Columbia, south through Colorado and Nevada. On salt flats and along shores of saline ponds and lakes. Occurs on fine-textured clayey soils that are very wet throughout the profile, with high water tables. The salinity is very high, and this plant grows well where salt may average 1 to 4 percent in the 4-foot profile. Exchangeable sodium may be present in varying amounts. Indications: Soils are usually very wet, with excessive salinity. Useless for agriculture without drainage and prolonged leaching.

PICKLEWEED, or IODINEBUSH (*Allenrolfea occidentalis*).—Range: Oregon to Baja California, Mexico, east through Arizona and New Mexico to western Texas. On saline flats. Occurs on a wide range of soil textures (loamy and clayey soils), but usually on fine-textured soils. The soils are moist or wet throughout the year, with high water tables that may be close to the surface. The soils are excessively saline in the first foot (1.0 to >2.5 percent) and are very saline throughout the 4-foot profile (average 1.0 to 1.5 percent), but the salinity decreases somewhat with depth. Exchangeable sodium may be present in varying amounts. Indications: Soils are usually fine-textured, very wet, and excessively saline. If the stand is good, the land is not suited for agriculture without drainage and prolonged leaching.

Crop Response on Saline Soils

A field of crop plants growing on saline soil usually has barren spots, stunted growth of the plants with considerable variability in size, and a deep blue-green foliage; but these features are not invariable indications of salinity. For example, barren spots may occur in nonsaline fields because of faulty leveling and the resultant inadequacy of irrigation; and retarded growth and abnormal color may result from nutrient deficiencies.

The extent and frequency of bare spots in many areas may be taken as an index of the concentration of salt in the soil. Inasmuch as most plants are more sensitive to salinity during germination than in later stages of growth, barren spots are more indicative of salinity around the seed during germination than they are of the general salinity status of the soil profile. Frequently, cultural practices contribute to an accumulation of salt around the germinating seed with resultant failure in germination. The vigor of the plants adjacent to barren spots may indicate the distribution of salt in the soil. Full-sized vigorous plants immediately adjacent to a bare spot suggest a local concentration of salt, while stunted plants in this position indicate a more general distribution of salinity in the area. If the level of salinity is not sufficiently high to result in barren spots, the major characteristic in the appearance of the crop may be a marked irregularity in vegetative vigor.

Caution should be exercised to avoid confusion between effects of low soil fertility and those caused by salinity. Plants that are stunted because of low fertility are usually yellowish green, whereas those stunted owing to salinity are characteristically blue green. The bluish appearance is the result of an unusually heavy waxy coating on the surface of the leaves, and the darker color to an increase in the chlorophyll content on a surface-area or fresh-weight basis. Sugar beets, crucifers (cabbage, mustards, and related species), alfalfa, some clovers, grasses, and other crops generally develop a noticeable blue-green coloration when grown on saline soils.

There are many regions where plants may develop an intense chlorosis because of certain soil conditions. The causes of chlorosis are not fully understood, but this condition is frequently associated with calcareous soils or, in some cases, with the use of irrigation waters of high bicarbonate content (Harley and Lindner, 1945). Although calcium carbonate is relatively insoluble, much crop injury is associated with its presence. Since this soil condition frequently occurs in the absence of an accumulation of soluble salts, chlorosis cannot be regarded as a definite symptom of salinity.

Some species of plants develop characteristic necrotic areas, tipburn, and firing of the margins of the leaves when grown on saline soil. Many stone fruits, avocado, grapefruit, and some of the less salt-tolerant varieties of cotton belong in this category.

The cupping or rolling of leaves is a common manifestation of moisture deficiency in plants, but these

symptoms may be indicative of salinity when they occur in the presence of apparently adequate soil moisture; however, other factors that cause malfunction of the root system, such as root diseases and high water tables, may produce similar leaf symptoms. While the appearance of the crop may, therefore, be indicative of saline conditions, a reliable diagnosis of salinity usually requires additional evidence derived from appropriate soil and plant tests.

Salinity and Water Availability

Numerous laboratory experiments with sand and water cultures have demonstrated the close relationship between plant growth and the osmotic pressure of the culture solution. On a weight or equivalent basis, chloride salts are generally more inhibitory to the growth of plants than sulfate salts, but this difference tends to disappear when concentrations are expressed on an osmotic basis. These relationships indicate that it is the total concentration of solute particles in the solution rather than their chemical nature which is mainly responsible for the inhibitory effects of saline solutions on the growth of crop plants. Direct experimental evidence of the influence of osmotic concentration on water uptake by plant roots has been reported by Hayward and Spurr (1944). In addition to the osmotic pressure of the solution, the nature of the salts present may exert an important influence on plant growth. Such specific ion effects are discussed in a subsequent section.

There is much evidence to indicate that an increase in the osmotic pressure of the soil solution may result in a decrease in the water uptake by plant roots, but an additional factor must be taken into account in dealing with the soil system; that is, soil-moisture tension, or the molecular attraction of the surface of the soil particles for water. Soil-moisture tension increases as the soil becomes drier and the water films around the soil particles become thinner. This equivalent negative pressure is apparently additive to the osmotic pressure of the soil solution in limiting the availability of water to plant roots. The sum of soil-moisture tension and the osmotic pressure of the soil solution is termed "total soil-moisture stress." Studies on the effects on growth of several moisture treatments and

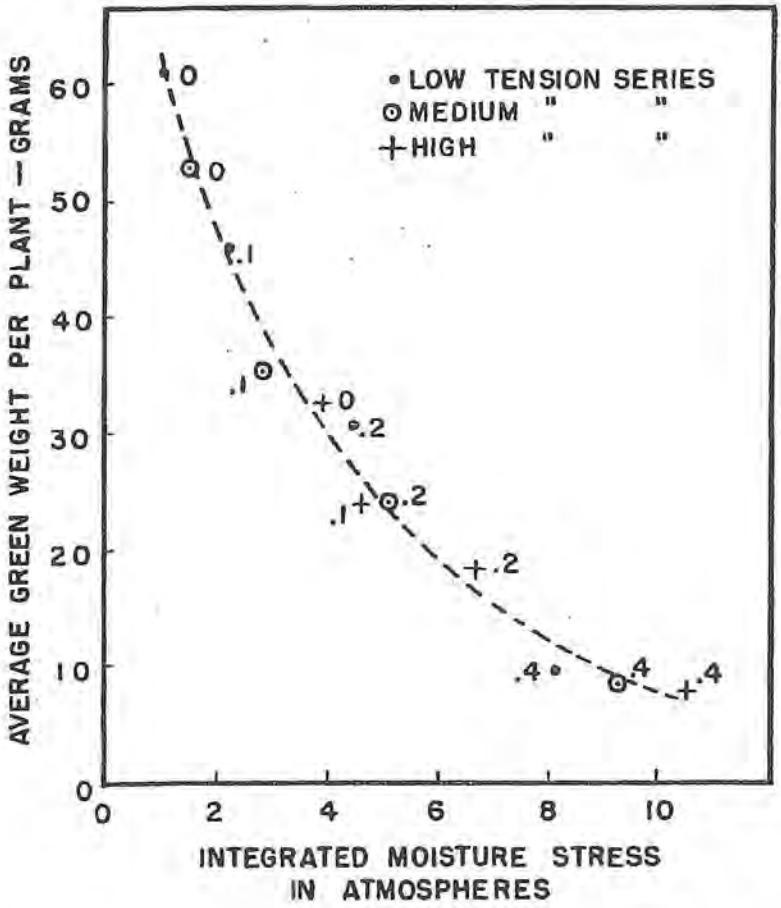

FIGURE 17.—Growth of bean plants as influenced by total soil-moisture stress. The salinity level for each treatment is indicated as percentage on a dry-soil basis (Wadleigh and Ayers, 1945).

salinity levels indicate that plant growth is a function of total soil-moisture stress, regardless of whether this stress arises primarily from salinity or moisture tension (fig. 17).

It is possible to extract the soil solution and determine its osmotic pressure, but this procedure is seldom used because it is simpler to estimate salt concentration by determining the electrical conductivity of the saturation extract (EC_e). Since saturation percentage is related to the field-moisture range, EC_e bears a close relationship to the EC of the soil solution. The relationship between EC and the osmotic pressure of saturation extracts is given in figure 6. The EC_e, therefore, provides information on the concentration of salt in the soil solution and its osmotic properties. The yield of orchardgrass when grown on soil to which various single salts had been added indicated that growth was simply related to salinity, expressed in terms of EC_e for various neutral salts (fig. 18). The response to sodium bicarbonate was, however, exceptional. In this case, calcium and magnesium ions from the soil exchange complex were precipitated as carbonates, thereby greatly increasing the exchangeable-sodium-percentage and producing an alkali soil.

The Scofield scale, in which crop response to salinity under average conditions is expressed in terms of the conductivity of the saturation extract, was discussed in chapter 2. This salinity scale has been widely used for a number of years and has been found to be satisfactory for salinity appraisal. To facilitate the discussion of plant response on saline soils, this salinity scale in its latest modified form is given again.

Salinity effects mostly negligible	Yields of very sensitive crops may be restricted	Yields of many crops restricted	Only tolerant crops yield satisfactorily	Only a few very tolerant crops yield satisfactorily

0 2 4 8 16

Scale of conductivity (millimhos per centimeter at 25° C.)

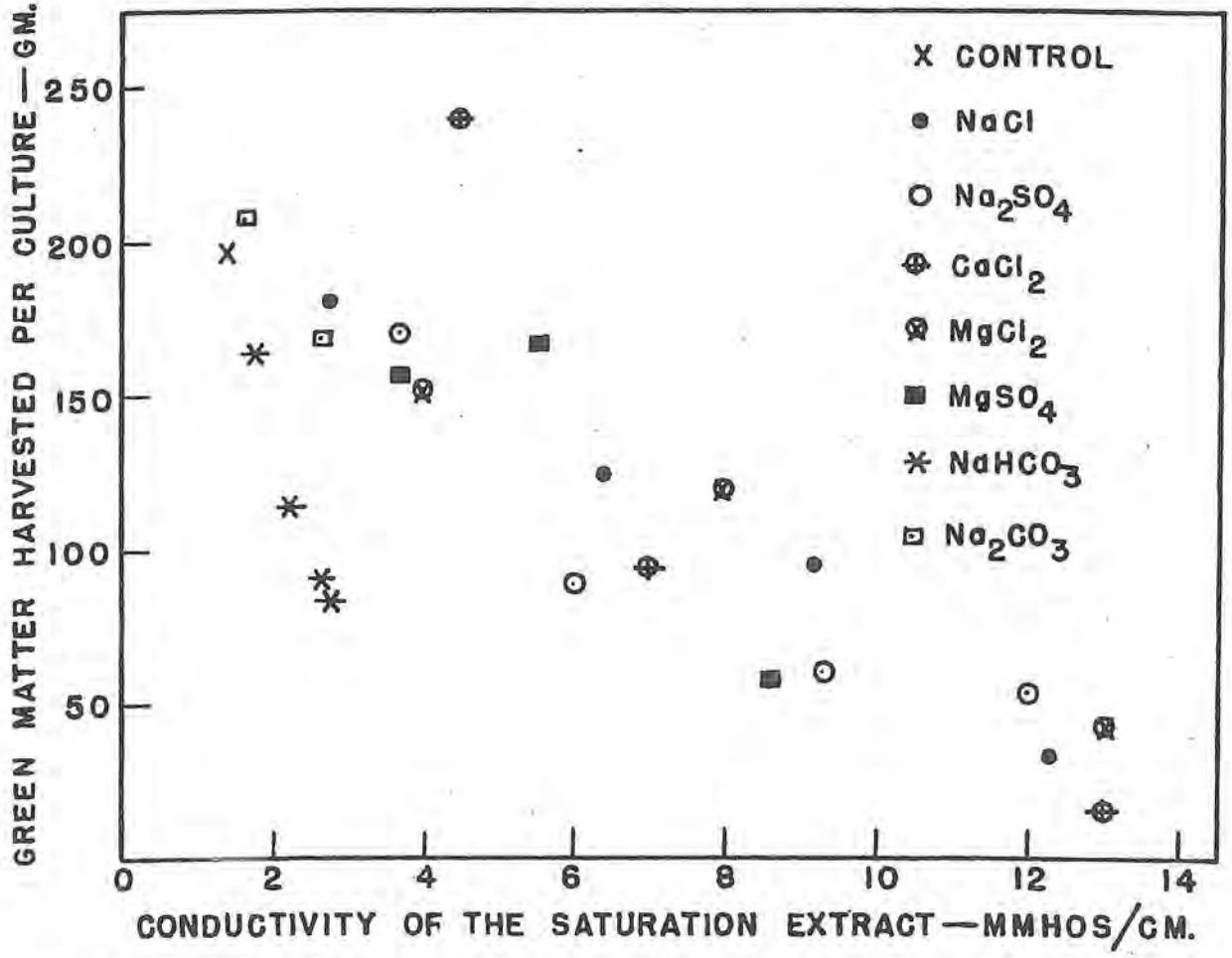

FIGURE 18.—Growth of orchardgrass, as influenced by various salts added to a sandy loam soil (Wadleigh and others, 1951).

It should be emphasized that this classification of plant growth in relation to various salinity levels refers to the salt status of the soil in the active root zone. It is possible to obtain samples from the surface soil around the base of row crops that may contain 5 percent salt or more with EC_e values of 50 mmhos/cm. or higher. This high concentration of salt represents an accumulation in the bed during the growth of the plants and not the salt concentration in the active root zone. Therefore, in correlating crop growth with salinity, care should be exercised to take soil samples from the active root zone that are uncontaminated by surface incrustations of salt. With row crops, the mass of soil making up the bed is frequently more saline than the soil below the furrow, and studies of root distribution and water uptake by plants indicate that under such conditions the major root activity occurs in the less saline parts of the soil, as shown in figure 14. These considerations should be borne in mind in determining the salt status of a soil with reference to plant response.

A technique for measuring the freezing point of soil moisture has been developed that provides a rapid, useful method for obtaining, by a single determination, the total moisture stress in a soil sample at field-moisture conditions (Method 6b). This eliminates errors caused by dilution of the soil solution and the resultant dissolving of moderately soluble salts, such as gypsum. Total soil-moisture-stress values obtained by freezing-point measurements are in good agreement with previously used methods involving determination of EC_e and moisture tension for the soil studied (Wadleigh, 1946, and Ayers and Campbell, 1951).

The experimental evidence cited above supports the concept that decreased growth on saline substrates is related to decreased water availability, but certain relationships between plant and substrate are still not fully understood. Despite marked decreases in growth with increasing concentration of the substrate, osmotic gradients between tops of plants and substrate are sometimes unaffected by increased osmotic pressure or total soil-moisture stress of the substrate. This is caused by increases in osmotic pressure of aerial parts of the plant that parallel increases in osmotic pressure of the substrate (Eaton, 1942). In addition, the osmotic pressure of expressed tissue fluids from the tops of plants does not appear to be correlated with the salt tolerance of some species. It is possible, however, that such measurements of osmotic gradient between plant tops and substrate may not represent the effective osmotic force which limits water absorption by the roots.

Specific Ion Effects

The previous discussion has dealt primarily with the effect of soluble salts in limiting the availability of moisture to plants. Other effects of salt may be equally important in restricting the growth of certain species. Injury or growth depression of plants, which cannot be accounted for on the basis of the osmotic pressure of the solution, will be referred to as a toxic effect of the salt in question. It should be recognized that toxicity so defined need not involve a direct effect of the salt or ions, either on surface membranes of plant roots or in the plant tissues. Frequently, toxicity may be caused, in part, at least, through effects on the uptake or metabolism of essential nutrients. As it is not always possible to distinguish clearly the mechanism underlying specific ion effects, it is convenient to refer to such phenomena as toxicities in contrast to the general osmotic effect of salt on plant growth.

The influence of excessive concentrations of specific salts on plant growth is an extremely complex subject involving many fundamental principles of plant nutrition. It is beyond the scope of this handbook to review the voluminous and diversified literature bearing on this subject. Much of the pertinent literature is cited in a review by Hayward and Wadleigh (1949). Literature citations in the following discussion are restricted mainly to papers of special significance in connection with certain topics not considered in the review cited above.

Ions that are frequently found in excess in saline soils include chloride, sulfate, bicarbonate, sodium, calcium, and magnesium. Less frequently encountered in excessive amounts are potassium and nitrate. The effects of all these ions on plant growth are being investigated by comparing plant response to isosmotic solutions of different salts. Species and even varietal differences among plants make it difficult to generalize regarding the toxicity of various salts or ions. It appears, however, that differences in plant tolerance to excessive concentrations of ions in the substrate are related, in some degree, to specific selectivity in ion absorption and nutrient requirements of the plants. In addition to these factors, there is also a marked difference among species in the amounts of such ions as sodium and chloride that can be accumulated without toxic effects.

Before considering specific toxic effects caused by excessive concentrations of soluble salts, other effects of certain ions deserve some mention. Although not considered essential plant nutrients, sodium and chloride, when present in relatively small concentrations, may stimulate the productivity of certain crops. Thus, Harmer and Benne (1941) have attributed increased yields of beets, celery, Swiss chard, and turnips to sodium. These authors consider sodium to be "nearly as much needed as a nutrient for these crops as is the potassium ion." Other investigators believe the effect of sodium to be more indirect, either substituting to some degree where potassium is deficient (Lehr, 1949; Dorph-Petersen and Steenbjerg, 1950) or limiting excessive accumulation of calcium, which with beets results in the development of a "calcium-type plant" characterized by a blue-green color and stunted growth (Lehr, 1942). Chloride, like sodium, has been observed to increase yields of some crops, notably beets, spinach, and tomato (Hayward and Wadleigh, 1949). On the other hand, chloride salts have long been known to affect adversely the quality of such crops as potatoes and tobacco. However, on saline soils, chloride and sodium ions occur in much higher concentrations than