May 19, 2015

Mr. Jim Griswold
Senior Hydrologist
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: First Annual Groundwater Monitoring Report
State M-1 Tank Battery Site (AP-72)
Lea County, New Mexico

Dear Mr. Griswold:

Enviro Clean Cardinal, LLC (EC^2), formerly Enviro Clean Services, LLC on behalf of our client Chesapeake Energy Corporation (Chesapeake), is pleased to submit to the New Mexico Oil Conservation Division (NMOCD) one (1) copy of the ***First Annual Groundwater Monitoring Report*** (Report) detailing the first year of groundwater monitoring and remediation activities conducted at the State M-1 Tank Battery Site (AP-72) located in the SE-SW-SE of Section 18, Township 17 South, Range 36 East, Lea County, New Mexico. These activities were conducted in accordance with the Stage 2 Abatement Plan for the Site approved by the NMOCD on June 27, 2013.

If you have any questions or comments regarding this Report, please do not hesitate to contact me at (918) 906-6780.

Sincerely,
Enviro Clean Cardinal, LLC

Bruce E. McKenzie, P.G.
Senior Project Manager

Enclosure: First Annual Groundwater Monitoring Report

xc: Patrick McMahon - Heidel, Samberson, Newell, Cox & McMahon (2 copies)
Chase Acker - Chesapeake (4 copies)

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FIRST ANNUAL GROUNDWATER MONITORING REPORT
CHESAPEAKE ENERGY CORPORATION
STATE M-1 TANK BATTERY (AP-72)
LEA COUNTY, NEW MEXICO

Prepared for:

Chesapeake Energy Corporation
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May 19, 2015

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CHESAPEAKE ENERGY CORPORATION, INC.
STATE M-1 TANK BATTERY (AP-72)
FIRST ANNUAL GROUNDWATER MONITORING REPORT
MAY 19, 2015

1.0 INTRODUCTION

Chesapeake Energy Corporation (Chesapeake) retained Enviro Clean Cardinal, LLC (EC^2), to perform impacted groundwater monitoring and light, non-aqueous phase liquid (LNAPL) hydrocarbon remediation at Chesapeake's former State M-1 Tank Battery site (Site) located in Lea County, New Mexico. The Site is located approximately 8 miles south-southwest of Lovington, New Mexico in the SE-SW-SE of Section 18, Township 17 South, Range 36 East, Lea County, New Mexico (coordinates 32.828061º latitude, -103.391012º longitude). The Site location and topographic features are shown on **Figure 1**. An oil and gas production tank battery was formerly located at the Site. Chesapeake purchased the Site in 2004, but never operated the tank battery. Chesapeake began abandonment and environmental investigation activities at the Site in 2007.

Initial Site investigation activities were conducted in May 2007. These investigation activities consisted of conducting EM-31 and EM-34 ground conductivity surveys, the collection of soil samples from nine boreholes, and the installation and sampling of seven groundwater monitoring wells. In August 2007 following the investigation, Chesapeake submitted to the New Mexico Oil Conservation Division (NMOCD) a Stage 1 Abatement Plan for the Site. In May 2010, the NMOCD responded to Chesapeake that the agency was not adequately staffed to review the abatement plan in a timely manner and advised Chesapeake that they could proceed with abatement operations at risk. In July 2010, Chesapeake notified the NMOCD of their intent to proceed with the Stage 1 Abatement activities. On March 20, 2012, following implementation of these activities, Chesapeake submitted the Stage 1 Abatement Report for the Site.

On March 27, 2012, Chesapeake submitted to the NMOCD the ***Stage 2 Abatement Plan*** (Plan) for the Site. A copy of the Plan is provided in **Appendix A**. In this Plan, Chesapeake proposed the following abatement activities at the Site:

- Excavate and remove the near-surface soils at the Site containing concentrations of chloride exceeding 1,000 milligrams per kilogram (mg/kg),

- Excavate and remove the near-surface soils at the Site containing concentrations of TPH exceeding 1,000 mg/kg,
- Install clay liners in areas where chloride and/or TPH concentrations exceed 1,000 mg/kg at depths greater than five feet below ground level,
- Install one additional groundwater monitoring well downgradient of the Site,
- Monitor the groundwater at the Site until the concentrations of chloride and benzene are below the New Mexico Water Quality Control Commission standards.

On March 7, 2013, NMOCD notified Chesapeake that the Plan was administratively complete and that Chesapeake should proceed with public notice of the Plan. On March 30, 2013, Chesapeake published a notice of the proposed activities in the Albuquerque Journal, the Hobbs-Daily News Sun and the Lovington Leader. In addition, written notification of the Plan submittal was sent to all surface owners of record within a 1-mile radius of the Site. On June 27, 2013 upon completion of the notification activities, the NMOCD approved the Plan for the Site. A copy of the NMOCD correspondence approving the Plan is included in **Appendix B**.

The soil remediation activities outlined in the Plan were conducted at the Site during the period January 15, 2014 through March 27, 2014. The soil remediation activities were summarized in the document titled ***Soil Remediation Summary Report***, submitted to the NMOCD on August 6, 2014.

This ***First Annual Groundwater Monitoring Report*** (Report) summarizes the groundwater monitoring activities conducted at the Site during the following quarterly sampling events:

- June 3 - 8, 2014,
- September 22 - 25, 2014,
- December 10 - 11, 2014 and
- March 11 - 12, 2015.

2.0 WELL INSTALLATION

2.1 MONITORING WELL INSTALLATION

As outlined in the Plan, EC[2] installed one additional monitoring well to further delineate the groundwater impacts at the Site. In addition, 2-inch diameter monitoring well MW-1 was plugged and abandoned and MW-1R was completed as a 4-inch diameter well to enhance recovery of the LNAPL observed in this area. During the period March 24-27, 2014, EC[2] oversaw New Mexico licensed (WD-1188) drilling contractor John Scarborough Drilling, Inc. (Lamesa, Texas) during drilling and completion of one monitoring well (MW-8) and the plugging and replacement of MW-1 at the Site.

Monitoring well MW-8 was drilled to a depth of 57 feet below ground surface (BGS), terminating approximately 13 feet below groundwater saturation. Drilling activities were conducted using a truck-mounted air rotary drilling rig and the well was installed per the specifications of New Mexico Administrative Code Title 19, Chapter 27. MW-8 was constructed with 2-inch diameter Schedule 40 PVC screen (0.020-inch) and casing. The screen is approximately 20 feet in length. The annulus space between the screens and casings was filled with filter sand pack material (across and 2 feet above the top slot of the screen), a 2-foot minimum bentonite seal placed above the filter pack, and the remaining annulus was filled to the surface with a cement-bentonite grout. A locking well protector was cemented in-place within a 4-inch thick, 2 foot by 2 foot concrete surface pad.

Monitoring well MW-1 was plugged and abandoned to facilitate impacted soil excavation/remediation in this area. Replacement monitoring well MW-1R was drilled and completed approximately 5 feet south of the former MW-1 location after this area had been restored following soil excavation/remediation. The monitoring well MW-1R area was left unlined during the soil remediation activities conducted in this area to prevent drilling through the liner. Monitoring well MW-1R was drilled to a depth of 61 feet BGS, terminating approximately 15 feet below groundwater saturation. Drilling activities were conducted using a truck-mounted air-rotary drilling rig and the well was installed per the specifications of New Mexico Administrative Code Title 19, Chapter 27. MW-1R was constructed with 4-inch diameter Schedule 40 PVC screen (0.020-inch) and casing. The screen is approximately 20 feet in length. The annulus space between the screens and casings was filled with filter sand pack material (across and 2 feet above the top slot of the screen), a 2-foot minimum bentonite seal placed above the filter pack, and the remaining annulus was filled to the surface with a cement-

bentonite grout. A locking well protector was cemented in-place within a 4-inch thick, 2 foot by 2 foot concrete surface pad.

The locations of the Site monitoring wells are shown on attached **Figure 2**. Monitoring well completion records are provided in **Appendix C**.

2.2 SVE WELL INSTALLATION

As documented in the Plan, a portion of the Site located in proximity to monitoring well MW-1R was impacted with crude oil (LNAPL) from the land surface to the top of the groundwater surface. The proposed remedial strategy to address the LNAPL in this area was to install and make operational a soil vapor extraction/air-sparge (SVE/AS) remediation system (System). Historical aerial photograph review indicates that a former pit once occupied this area of the Site and monitoring well MW-1R is situated in the approximate center of the former pit area. During the period March 24-28, 2014, to facilitate the removal of hydrocarbon vapors from within the vadose zone and to accelerate the removal of the LNAPL, EC^2 drilled and installed 8 SVE wells at the Site. The SVE wells were installed around monitoring well MW-1R in a pattern that would place them along the outer edges of the former pit area. The spacing of the Site SVE wells was based upon the historical aerial photograph review, previous visual observations of LNAPL within monitoring well MW-1, the Site subsurface soil characteristics and an assumed radius of influence of each SVE well of approximately 25 feet.

The SVE wells were drilled to depths ranging from approximately 40 to 42 feet BGS (top of capillary fringe). Drilling activities were conducted using a truck-mounted air-rotary drilling rig. The SVE wells were installed in a manner such that the bottom of each well was positioned approximately 1.5 feet above groundwater saturation. Each SVE well was constructed with 2-inch diameter Schedule 40 PVC screen (0.020-inch) and casing. Each screen is approximately 5 feet in length. The annulus space between the screens and casings were filled with filter sand pack material (across and 2 feet above the top slot of the screen), a 2-foot minimum bentonite seal placed above the filter pack and the remaining annulus was filled to the surface with a cement-bentonite grout. A well protector was cemented in-place within a 4-inch thick, 2 foot by 2 foot concrete surface pad. The locations of the SVE wells are shown on attached **Figure 2**. SVE well completion records are provided in **Appendix C**.

3.0 REMEDIATION

3.1 SVE SYSTEM

During the period May 12-14, 2014, EC[2] installed and made operational the System at the Site. The 8 SVE wells are connected through a manifold system constructed of two and three inch Schedule 80 PVC piping and plumbed to a 10-horsepower 3-phase SVE Regenerative Blower housed within the System Building. The location of the System Building is shown on attached **Figure 2**. Specification sheets for the System are provided in **Appendix D**. Within the System, soil vapor from the SVE wells is drawn through a moisture knock out/separator and a particulate filter prior to reaching the blower. An air-flow meter is installed downstream of the blower in the air-exhaust line and an air sample port is located on the air-exhaust line at a location upstream of its exit from the System Building.

Installation was completed and System start-up conducted on June 6, 2014. Initial field readings utilizing a field photo-ionization detector (PID) indicated an air-discharge concentration of 596 parts per million (PPM) of volatile organic compounds (VOC). A discharge rate of 518 actual cubic feet per minute (ACFM) was recorded from the air-flow meter integral to the System. Field readings also indicated that H_2S concentrations were below the detection levels of the instruments.

Routine checks of the System are conducted to record the blower run times, discharge rate/ACFM and VOC concentration of the discharge-air stream. These field readings are presented on **Table 1** and are used to document the VOCs extracted from the soil and discharged from the System. **Figure 3** presents a graph of the VOC concentrations observed in the discharge air stream versus time. As can be seen on this figure, the levels of VOC observed in the air discharge stream have decreased dramatically since startup. These data indicate that the System is effective at removing the hydrocarbon vapors from the subsurface. Removal of hydrocarbon vapors coupled with the influx of oxygen drawn into the impacted area by the System enhances biodegradation of the hydrocarbon impacts observed in this area.

3.2 MW-1R LNAPL RECOVERY

As previously discussed in Section 2.1, to enhance LNAPL recovery in the MW-1R area, 2-inch monitoring well MW-1 was plugged and replaced with 4-inch monitoring well MW-1R. On June 5, 2014, a QED Environmental Genie LNAPL recovery pump was placed and made operational in monitoring well MW-1R. The Genie LNAPL recovery pump is an air-actuated bladder pump with a floating intake (skimmer), set at a depth that produces the maximum

amount of LNAPL recovery per cycle. Air is provided to the Genie LNAPL recovery pump from a compressor located within the System Building.

During the reporting period, approximately 4 drums (220 gallons) of LNAPL were recovered from monitoring well MW-1R. During each quarterly monitoring event, the Genie LNAPL recovery pump is inspected, cleaned and adjusted to maximize LNAPL recovery.

4.0 QUARTERLY GROUNDWATER MONITORING

This Report describes the findings from four quarterly groundwater sampling events conducted at the Site from June 3, 2014 through March 12, 2015.

4.1 GROUNDWATER MONITORING METHODOLOGY

Prior to collecting groundwater samples during each quarterly event, EC[2] gauged all 8 monitoring wells (MW-1R through MW-8) at the Site using an electronic interface probe to determine the depth-to-water (DTW) and LNAPL thickness within each well. The locations of these monitoring wells are shown on **Figure 2**. DTWs were measured from the surveyed top-of-casing (TOC) of each well and converted to elevations relative to mean sea level. These data are presented in **Table 2**. Potentiometric surface maps were constructed utilizing these data to illustrate the groundwater flow direction within the shallow groundwater system beneath the Site.

Upon completion of DTW measurement activities, EC[2] field personnel collected groundwater samples from monitoring wells MW-1R through MW-8. Due to the LNAPL present in monitoring well MW-1R, a disposable polyethylene bailer was used to evacuate the LNAPL from the well casing and a new bailer was then used to collect the groundwater sample. Groundwater samples were collected from monitoring wells MW-2 through MW-8 utilizing EPA approved low-flow purging/sampling methodologies. Field parameters consisting of pH, specific conductivity, temperature, and dissolved oxygen (DO) were measured during field activities utilizing an In-Situ smarTROLL™ multi-parameter meter and air-tight flow-through cell. Upon stabilization of the field parameters, groundwater samples were collected into laboratory prepared containers, labeled as to source and contents, placed on ice for preservation, placed under chain-of-custody control and shipped via overnight courier to the analytical laboratory (TestAmerica Inc., Nashville, Tennessee). As per the Plan, groundwater samples collected from monitoring wells MW-1R through MW-8 during each sampling event were analyzed for chloride (EPA Method 300.0). During the first quarterly sampling event conducted in June 2014 monitoring well MW-1R was inadvertently not sampled. A summary of the laboratory analytical results for chloride analyses is presented in **Table 3**, and complete copies of the laboratory analytical reports and chain-of-custody documentation is proved in **Appendix E**. The laboratory analytical results from these groundwater sampling events have been screened against the New Mexico Administrative Code 20.6.2, Standards for Groundwater of 10,000 mg/L TDS Concentration or Less (Limit) for chloride of 250 mg/L.

As specified in the Plan, chloride is the primary constituent of concern (COC) at the Site until the LNAPL has been adequately eliminated from monitoring well MW-1R. When the LNAPL has been adequately eliminated from monitoring well MW-1R, the groundwater within this well will be monitored for benzene, toluene, ethylbenzene and total xylenes (BTEX) until the levels of BTEX fall below the Limits of 0.01 mg/L, 0.75 mg/L, 0.75 mg/L and 0.62 mg/L, respectively.

4.2 FIRST QUARTERLY GROUNDWATER SAMPLING RESULTS

The first quarterly groundwater sampling event was conducted at the Site during the period June 3-8, 2014. In addition to the sampling procedures discussed in Section 3.0, monitoring wells MW-1R through MW-8 were re-developed after liquid level measurements and prior to purging and sampling. These wells were re-developed because they had not been purged/sampled in approximately two years. Development was conducted using an air-lift pump to remove sediments that had accumulated within the well sump.

A potentiometric surface map was constructed utilizing the DTW measurements collected during this sampling event and is presented on **Figure 4**. Groundwater flow during this sampling event was, in general, from the northwest to the southeast.

As can be seen in **Table 3**, the groundwater samples collected from monitoring wells MW-4 (586 mg/L), MW-6 (282 mg/L) and MW-8 (409 mg/L) contained concentrations of chloride that exceed the Limit of 250 mg/L.

During the first quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 5.32 feet. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

4.3 SECOND QUARTERLY GROUNDWATER SAMPLING RESULTS

The second quarterly groundwater sampling event was conducted at the Site during the period September 22-25, 2014.

A potentiometric surface map was constructed utilizing the DTW measurements collected during this sampling event and is presented on **Figure 5**. Groundwater flow during this sampling event was, in general, from the northwest to the southeast.

As can be seen in **Table 3**, the groundwater samples collected from monitoring wells MW-4 (534 mg/L), MW-6 (263 mg/L) and MW-8 (442 mg/L) contained concentrations of chloride that exceed the Limit of 250 mg/L.

During the second quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 4.04 feet. The measurement from this event indicates a decrease of 1.28 feet in the observed LNAPL thickness from the previous event. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

4.4 THIRD QUARTERLY GROUNDWATER SAMPLING RESULTS

The third quarterly groundwater sampling event was conducted at the Site during the period December 10-11, 2014.

A potentiometric surface map was constructed utilizing the DTW measurements collected during this sampling event and is presented on **Figure 6**. Groundwater flow during this sampling event was, in general, from the northwest to the southeast.

As can be seen in **Table 3**, the groundwater samples collected from monitoring wells MW-4 (535 mg/L), MW-6 (268 mg/L) and MW-8 (463 mg/L) contained concentrations of chloride that exceed the Limit of 250 mg/L.

During the third quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 0.50 feet. The measurement from this event indicates a decrease of 3.54 feet in the observed LNAPL thickness from the previous event. The LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

4.5 FOURTH QUARTERLY GROUNDWATER SAMPLING RESULTS

The fourth quarterly groundwater sampling event was conducted at the Site during the period March 11-12, 2015.

A potentiometric surface map was constructed utilizing the DTW measurements collected during this sampling event and is presented on **Figure 7**. Groundwater flow during this sampling event was, in general, from the northwest to the southeast.

As can be seen in **Table 3**, the groundwater samples collected from monitoring wells MW-4 (543 mg/L), MW-6 (261 mg/L) and MW-8 (485 mg/L) contained concentrations of chloride that exceed the Limit of 250 mg/L. **Figure 8** presents an isopleth of the chloride concentrations observed in the groundwater samples collected during this sampling event. As can be seen on

this figure, the highest levels of chloride observed in the groundwater are located in the southeast portion of the Site.

Figure 9 presents chloride concentration trend graphs for each of the monitoring wells sampled at the Site. A review of this figure indicates that the levels of chloride observed in the groundwater samples are decreasing in two wells, increasing in one well, and stable in five wells. The soil remediation activities conducted in the first quarter of 2014 have removed the continuing source of chloride impacts to the groundwater at the Site. Removal of the source will allow the chloride concentrations already present in the Site groundwater to naturally attenuate via the physical attenuation mechanisms of dispersion and dilution.

During the fourth quarterly groundwater sampling event, LNAPL was observed in monitoring well MW-1R at a thickness of 1.71 feet. The measurement from this event indicates an increase of 1.21 feet in the observed LNAPL thickness from the previous event. The increase in LNAPL observed in monitoring well MW-1R during this period is likely the result of the LNAPL skimmer pump being inoperable due to air-source issues within the System Building. The air-source issues experienced during this quarter have been resolved and the LNAPL skimmer pump within monitoring well MW-1R was adjusted after sampling to maximize the efficiency of LNAPL removal.

5.0 CONCLUSIONS

Based upon the data presented herein, the following conclusions are presented:

- Groundwater beneath the Site is encountered at depths ranging from approximately 45 to 48 feet BGS.

- The direction of groundwater flow at the Site is, in general, from the northwest to the southeast.

- During the reporting period, concentrations of chloride greater than the Limit of 250 mg/L were observed in the groundwater samples collected from monitoring wells MW-4 (ranging from 534 mg/L to 586 mg/L), MW-6 (ranging from 261 mg/L to 282 mg/L) and MW-8 (ranging from 409 mg/L to 485 mg/L).

- The SVE System is operating as designed and has removed approximately 3,751 pounds of VOCs since start-up on June 6, 2014.

- During the reporting period, approximately 4 drums (220 gallons) of LNAPL have been recovered from monitoring well MW-1R.

6.0 RECOMMENDATIONS

Based upon a review of the data presented within this report, the following recommendations have been developed:

- Operation of the SVE System at the Site should continue until the LNAPL observed on the groundwater in the monitoring well MW-1R area has been adequately eliminated.

- As specified in the Plan, LNAPL recovery within monitoring well MW-1R should be continued until the LNAPL observed within this well has been adequately eliminated. Efforts to optimize LNAPL recovery while minimizing pump down-time should be implemented.

- As specified in the Plan, quarterly monitoring of the groundwater within the eight monitoring wells at the Site should be continued until the levels of chloride observed in the groundwater samples fall below the Limit of 250 mg/L for eight quarters. The next groundwater monitoring event at the Site is scheduled to be conducted in June 2015.

- As specified in the Plan, when the LNAPL has been adequately eliminated from monitoring well MW-1R, the groundwater within this well should be monitored for BTEX until the levels of these constituents fall below the Limits of 0.01 mg/L, 0.75 mg/L, 0.75 mg/L and 0.62 mg/L, respectively, for eight quarters.

TABLES

Table 1 : Summary of SVE System Field Readings
Chesapeake Energy Corporation Inc., State M-1 Tank Battery (AP-72)
Lea County, New Mexico

Date	Time	Run Time Reading	Operating Hours		Discharge Readings	
			since last reading	Total	PPM	CFM
06/07/14	8:00	4131.73	19.73	19.73	596.4	518.8
06/08/14	7:10	4154.69	22.96	42.69	398	482.6
06/08/14	9:15	4156.94	2.25	44.94	5000	489
06/12/14	12:40	4256.45	99.51	144.45	1817	120
06/12/14	12:43	4259.65	3.20	147.65	1561	117
06/13/14	7:15	4274.90	18.45	162.90	1804	122
06/13/14	7:17	4276.27	1.37	164.27	3390	121
06/13/14	7:18	4277.08	0.81	165.08	2301	120
06/19/14	12:05	4422.02	144.94	310.02	1153	120
06/19/14	13:30	4423.74	1.72	311.74	1117	107
06/19/14	16:00	4426.00	2.26	314.00	1448	121
06/24/14	12:05	4543.27	117.27	431.27	---	---
06/26/14	12:40	4591.01	165.01	479.01	1970	127
06/26/14	12:42	4593.20	2.19	481.20	1968	120
07/03/14	9:35	4755.92	162.72	643.92	1650	126
07/03/14	9:37	4757.95	2.03	645.95	1318	126
07/09/14	11:40	4901.77	143.82	789.77	874.5	126
07/09/14	11:42	4903.69	1.92	791.69	795.1	124
07/17/14	12:33	5094.48	190.79	982.48	---	124
07/17/14	12:34	5095.13	0.65	983.13	---	127
07/17/14	12:36	5097.75	2.62	985.75	---	127
08/01/14	11:00	5452.10	354.35	1340.10	1078	139
08/01/14	11:42	5454.03	1.93	1342.03	938	150
08/01/14	11:44	5456.32	2.29	1344.32	2314	14
10/10/14	13:00	7118.38	1662.06	3006.38	130	51.3
10/10/14	13:02	7120.15	1.77	3008.15	216	58.2
10/31/14	13:00	7622.85	502.70	3510.85	161	48
10/31/14	13:04	7624.49	1.64	3512.49	78	53.7
12/11/14	13:50	8607.53	983.04	4495.53	352	131
01/15/15	10:11	9441.32	833.79	5329.32	46.7	131
01/15/15	10:12	9442.31	0.99	5330.31	173	152
01/15/15	10:15	9445.26	2.95	5333.26	388	136
01/29/15	11:50	9778.04	332.78	5666.04	240	53.5
01/29/15	11:52	9780.13	2.09	5668.13	239	50
02/26/15	11:00	10448.98	668.85	6336.98	72	137
02/26/15	11:02	10450.10	1.12	6338.10	178.2	155
03/12/15	10:15	10780.66	330.56	6668.66	483	155

Notes:

1. --- : No reading was recorded.

Table 2 : Summary of Liquid Level Measurements
Chesapeake Energy Corporation Inc., State M-1 Tank Battery (AP-72)
Lea County, New Mexico

Monitoring Well	Top of Casing Elevation (AMSL-Feet)	Depth to Liquid Measurement Date	Depth to LNAPL (Feet-TOC)	Depth to Groundwater (Feet-TOC)	LNAPL Thickness (Feet)	Groundwater Elevation (AMSL-Feet)
MW-1R	3888.97	06/03/14	44.57	49.89	5.32	3839.08
	3888.97	09/22/14	44.87	48.91	4.04	3840.06
	3888.97	12/10/14	45.80	46.30	0.50	3842.67
	3888.97	03/11/15	45.12	46.83	1.71	3842.14
MW-2	3890.51	06/03/14	--	47.23	--	3843.28
	3890.51	09/22/14	--	46.37	--	3844.14
	3890.51	12/10/14	--	45.91	--	3844.60
	3890.51	03/11/15	--	46.03	--	3844.48
MW-3	3889.34	06/03/14	--	46.35	--	3842.99
	3889.34	09/22/14	--	46.49	--	3842.85
	3889.34	12/10/14	--	46.08	--	3843.26
	3889.34	03/11/15	--	46.28	--	3843.06
MW-4	3888.90	06/03/14	--	46.38	--	3842.52
	3888.90	09/22/14	--	46.50	--	3842.40
	3888.90	12/10/14	--	46.14	--	3842.76
	3888.90	03/11/15	--	46.35	--	3842.55
MW-5	3890.41	06/03/14	--	46.56	--	3843.85
	3890.41	09/22/14	--	46.70	--	3843.71
	3890.41	12/10/14	--	46.29	--	3844.12
	3890.41	03/11/15	--	46.44	--	3843.97
MW-6	3888.25	06/03/14	--	46.25	--	3842.00
	3888.25	09/22/14	--	46.39	--	3841.86
	3888.25	12/10/14	--	46.09	--	3842.16
	3888.25	03/11/15	--	46.23	--	3842.02
MW-7	3889.23	06/03/14	--	45.94	--	3843.29
	3889.23	09/22/14	--	46.08	--	3843.15
	3889.23	12/10/14	--	45.70	--	3843.53
	3889.23	03/11/15	--	45.36	--	3843.87
MW-8	3887.06	06/03/14	--	44.94	--	3842.12
	3887.06	09/22/14	--	45.11	--	3841.95
	3887.06	12/10/14	--	44.79	--	3842.27
	3887.06	03/11/15	--	44.94	--	3842.12

Notes:
1. TOC : Measured from top of casing.
2. LNAPL : Light non aqueous phase liquid.
3. -- : Denotes Not Measured.
4. AMSL : Denotes above mean sea level (AMSL)

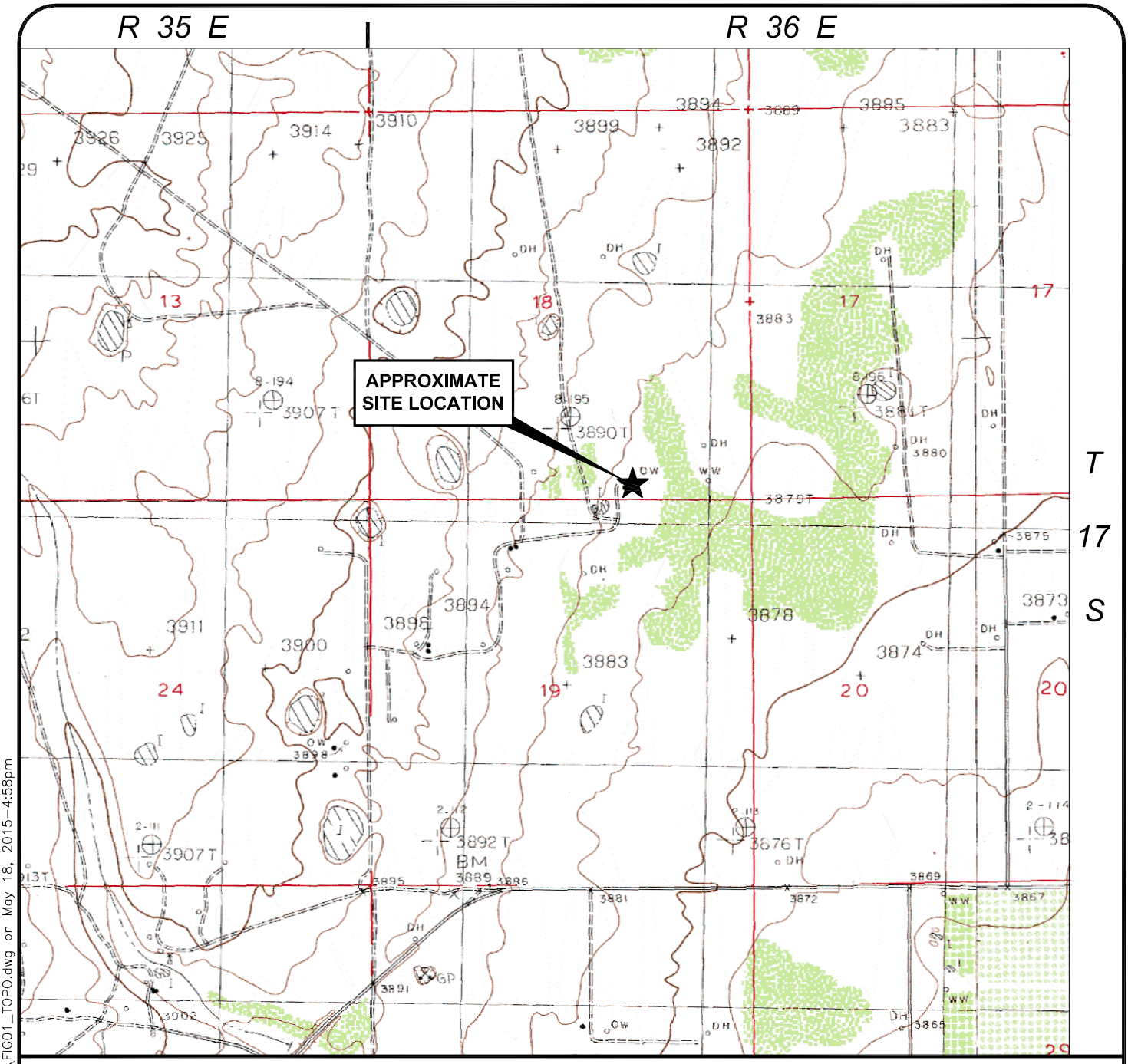
Table 3 : Summary of Laboratory Analytical Results for Groundwater Samples
Chesapeake Energy Corporation, State M-1
Lea County, New Mexico

Sample ID	*Sample Date:*	Chloride mg/L
MW-1R	25-Sep-14	51.4
	11-Dec-14	116
	11-Mar-15	39.0
MW-2	6-Jun-14	17.7
	24-Sep-14	17.4
	10-Dec-14	18.3
	11-Mar-15	16.6
MW-3	6-Jun-14	59.7
	24-Sep-14	59.7
	10-Dec-14	58.9
	11-Mar-15	57.0
MW-4	6-Jun-14	**586**
	24-Sep-14	**534**
	10-Dec-14	**535**
	11-Mar-15	**543**
MW-5	6-Jun-14	28.6
	24-Sep-14	27.3
	10-Dec-14	27.9
	11-Mar-15	26.1
MW-6	6-Jun-14	**282**
	24-Sep-14	**263**
	10-Dec-14	**268**
	11-Mar-15	**261**
MW-7	6-Jun-14	42.7
	24-Sep-14	29.6
	10-Dec-14	36.0
	11-Mar-15	39.7
MW-8	6-Jun-14	**409**
DUP	6-Jun-14	**383**
	24-Sep-14	**442**
DUP	24-Sep-14	**439**
	10-Dec-14	**463**
DUP	10-Dec-14	**466**
	11-Mar-15	**485**
DUP	11-Mar-15	**483**
EQ Blank	6-Jun-14	<1.00
	24-Sep-14	<1.00
	10-Dec-14	<1.00
	11-Mar-15	<1.00

Notes:

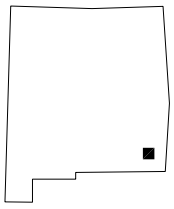
1. mg/L: milligrams per liter.
2. <: Analyte not detected at the laboratory reporting limit.
3. All analyses performed by TestAmerica Laboratories in Nashville, Tennessee.
4. Cells shaded in blue indicate results that are above the laboratory reporting limit.
5. Cells with text **bolded** indicate results that exceed the New Mexico Administrative Code 20.6.2, Standards for Groundwater, for chloride of 250 mg/L.

FIGURES



SOURCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLES
LOVINGTON SW, NEW MEXICO - PROVISIONAL EDITION 1985 AND
LOVINGTON SE, NEW MEXICO - PROVISIONAL EDITION 1985

NEW MEXICO



SCALE
0 1/2 1 MILE

N

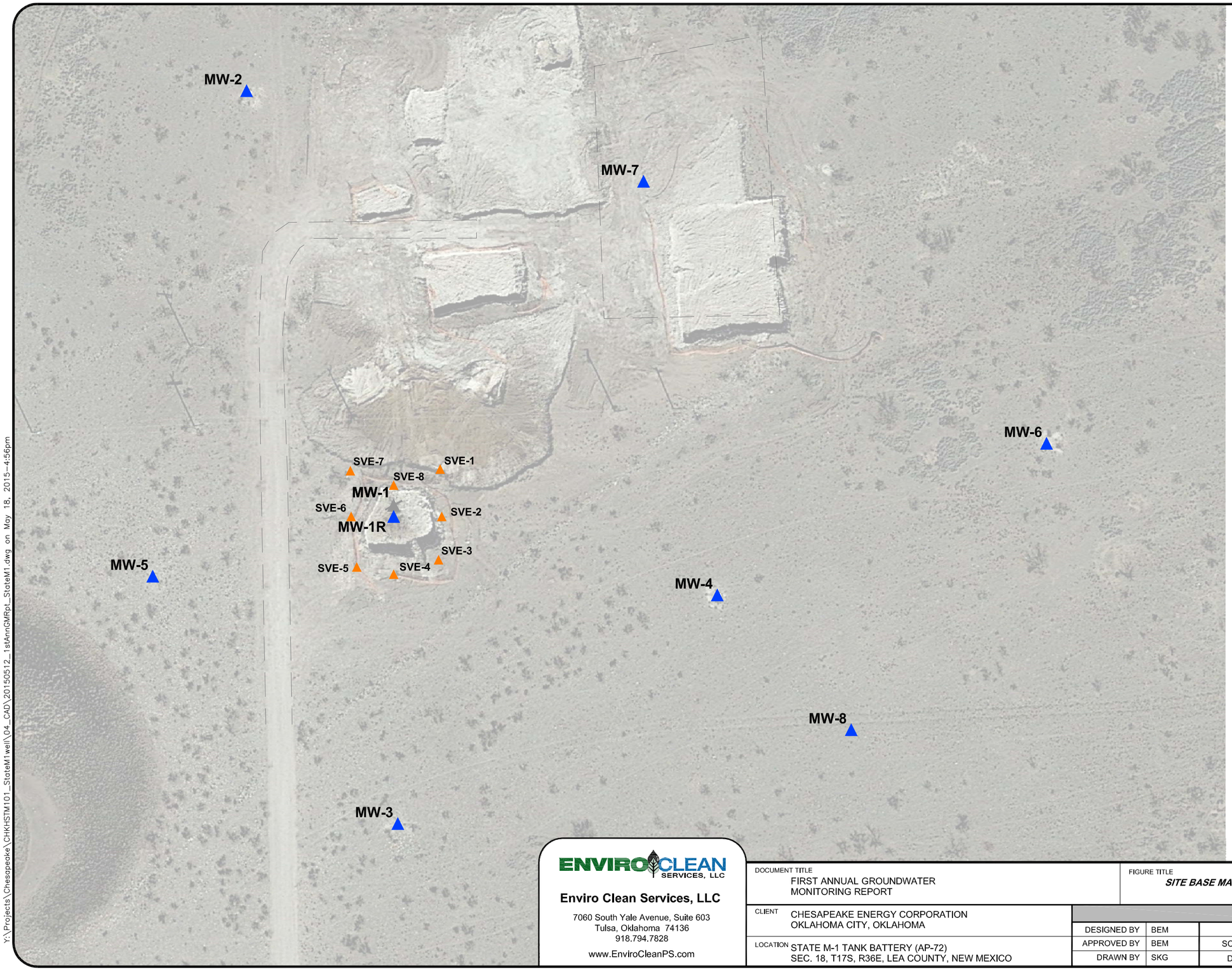
CLIENT CHESAPEAKE ENERGY CORPORATION OKLAHOMA CITY, OKLAHOMA	FIGURE TITLE ***SITE LOCATION AND TOPOGRAPHIC FEATURES***
LOCATION STATE M-1 TANK BATTERY (AP-72) SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO	DOCUMENT TITLE FIRST ANNUAL GROUNDWATER MONITORING REPORT

ENVIRO CLEAN SERVICES, LLC

Enviro Clean Services, LLC
7060 South Yale Ave, Suite 603
Tulsa, Oklahoma 74136
918.794.7828
www.EnviroCleanPS.com

		DESIGNED BY	BEM
DATE	5/19/2015	APPROVED BY	BEM
SCALE	AS SHOWN	DRAWN BY	SKG
PROJECT NUMBER		FIGURE NUMBER	
CHKHSTM101		1	

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\FIG01_TOPO.dwg on May 18, 2015 - 4:58pm



LEGEND

- MW-5 — LOCATION OF MONITORING WELL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- SVE-1 — LOCATION OF SVE SYSTEM WELL

N

30 0 30 60
SCALE FEET

SOURCES:
1) AERIAL DATED FEBRUARY 13, 2014 - GOOGLE EARTH PRO SCREEN CAPTURE

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DOCUMENT TITLE: FIRST ANNUAL GROUNDWATER MONITORING REPORT

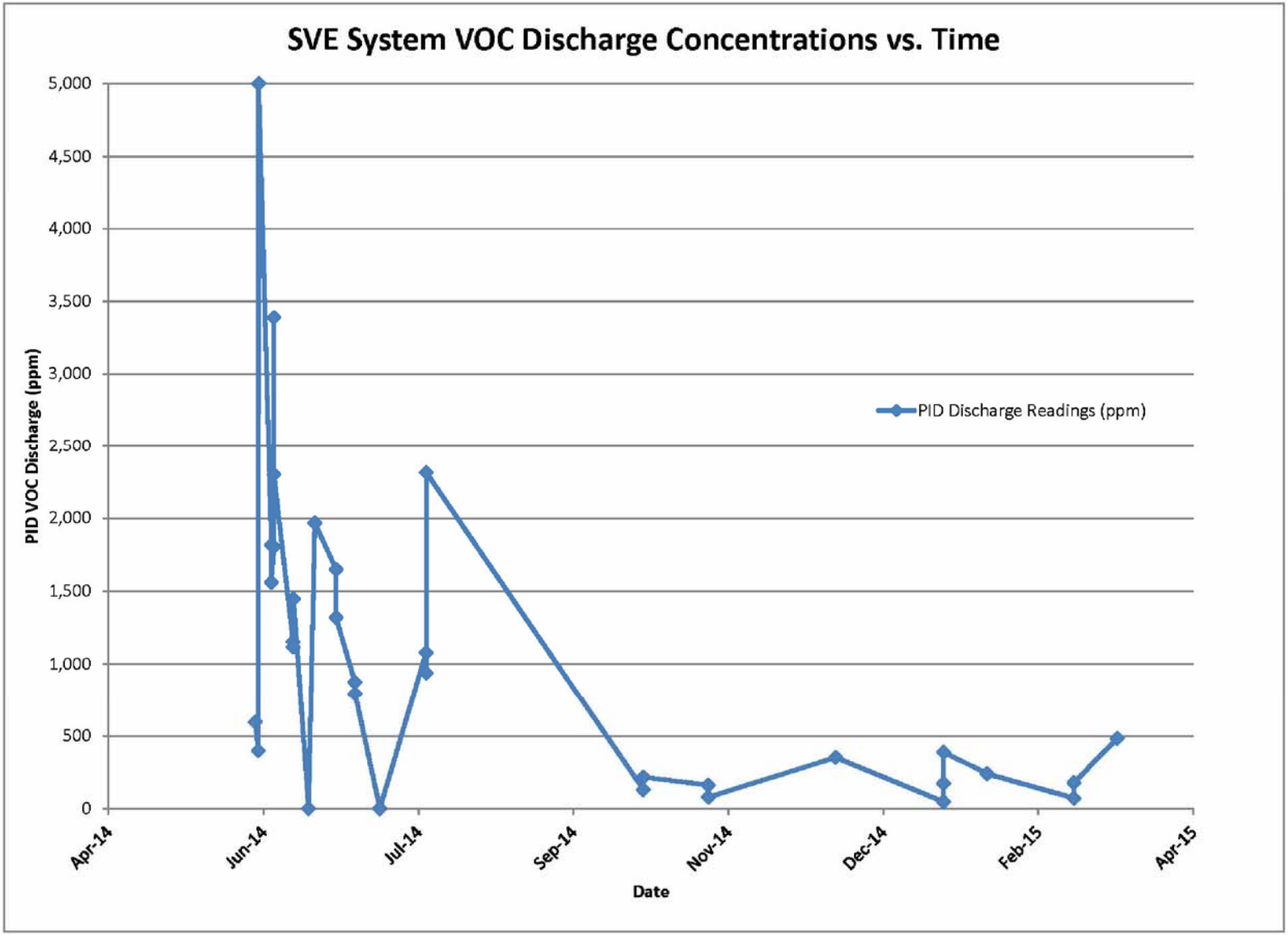
FIGURE TITLE: ***SITE BASE MAP***

CLIENT: CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M-1 TANK BATTERY (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	2



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DOCUMENT TITLE
FIRST ANNUAL GROUNDWATER MONITORING REPORT

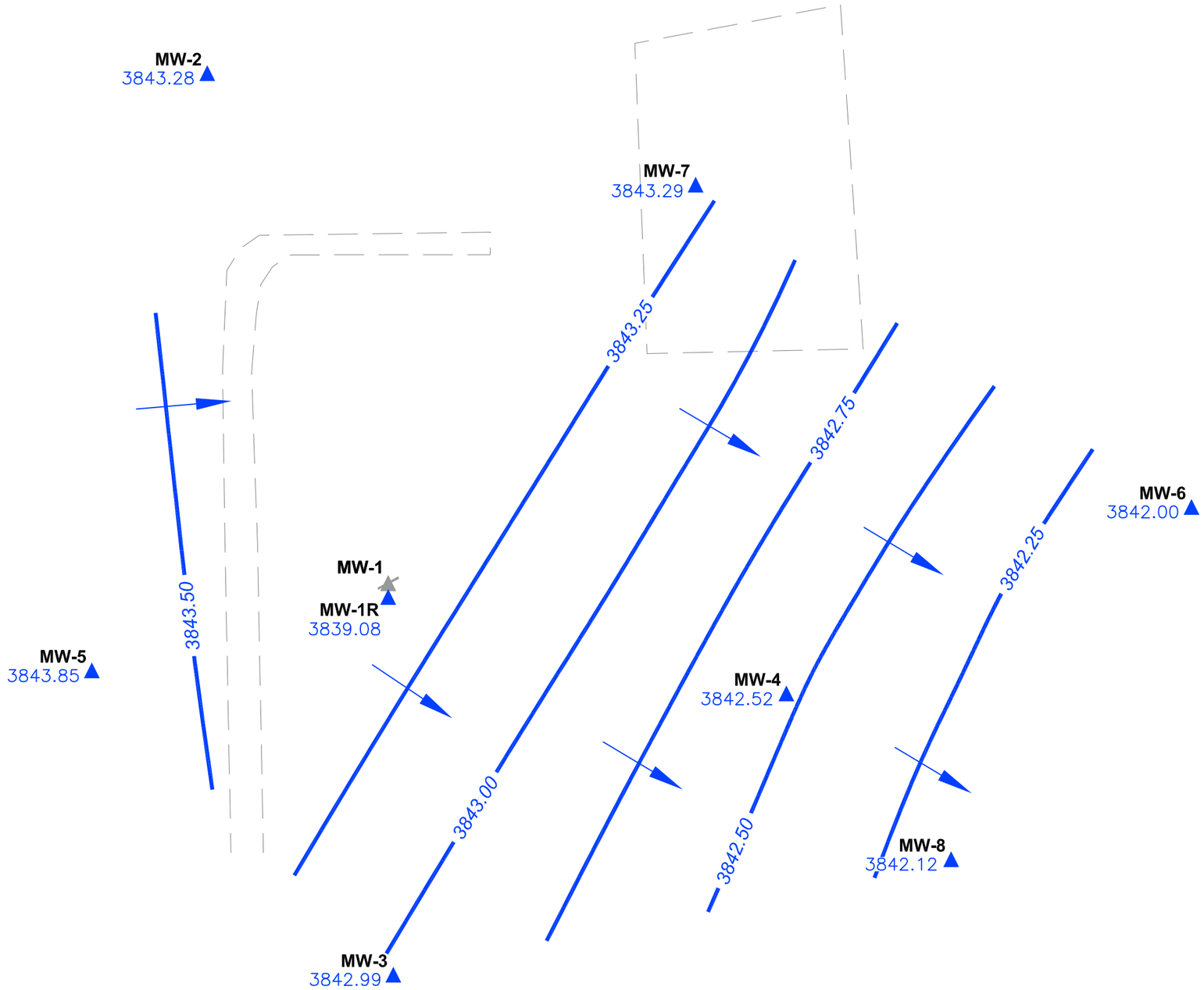
FIGURE TITLE
SVE SYSTEM VOC DISCHARGE CONCENTRATIONS VERSUS TIME

CLIENT
CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION
STATE M-1 TANK BATTERY (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	CNA		
APPROVED BY	BEM	SCALE	NTS
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	3



LEGEND

- **MW-5** 3843.85 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 6/3/2014, FEET AMSL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

NOTES:
1) MW-1R NOT HONORED DUE TO LNAPL DEPRESSION.

N

30 0 30 60
SCALE FEET

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Tulsa, Oklahoma 74136
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DOCUMENT TITLE: FIRST ANNUAL GROUNDWATER MONITORING REPORT

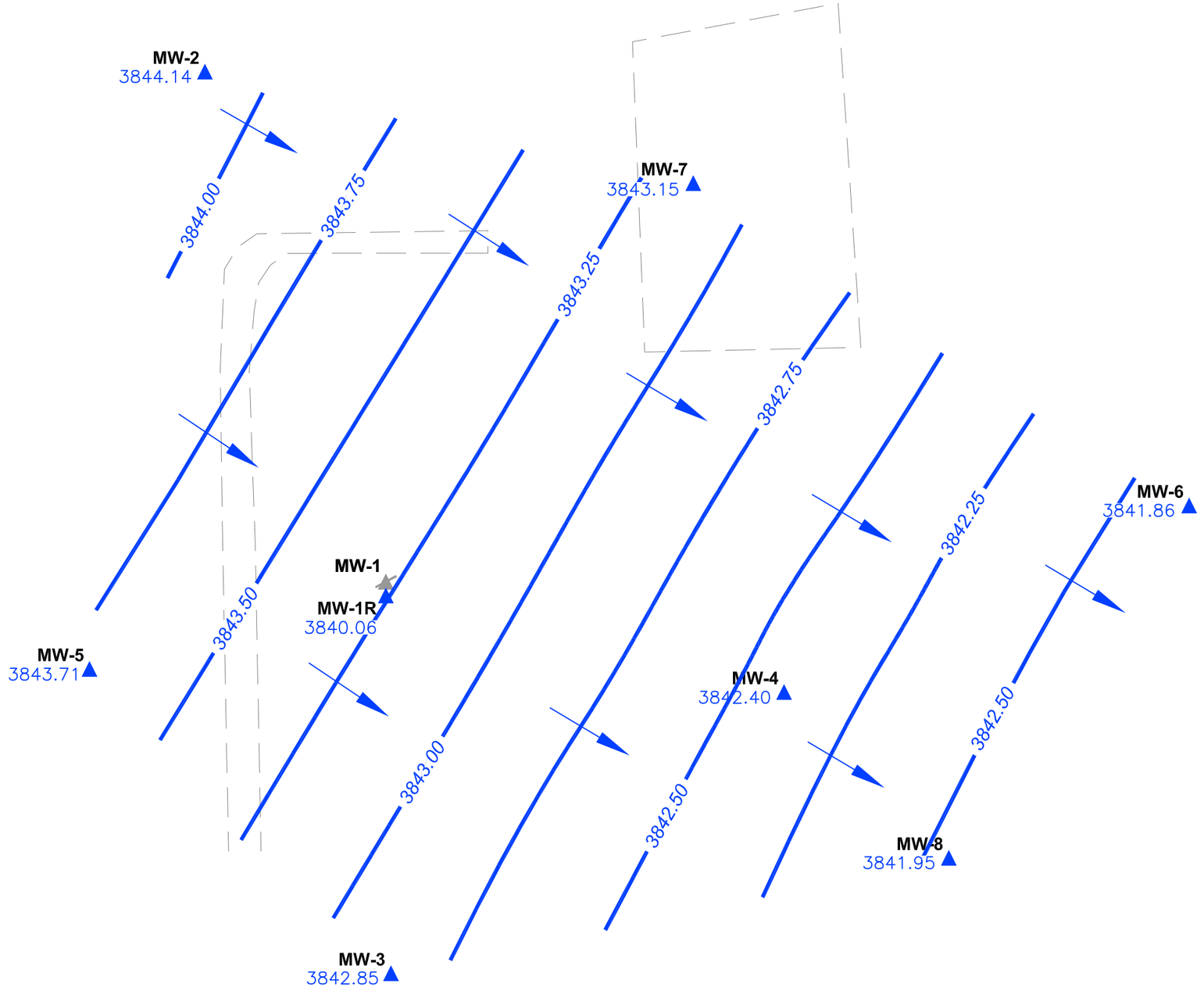
FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, JUNE 3, 2014***

CLIENT: CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M-1 TANK BATTERY (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	4



LEGEND

- **MW-5** 3843.71 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 9/22/2014, FEET AMSL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

NOTES:
1) MW-1R NOT HONORED DUE TO LNAPL DEPRESSION.

N

30 0 30 60
SCALE FEET

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Enviro Clean Services, LLC

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Tulsa, Oklahoma 74136
918.794.7828
www.EnviroCleanPS.com

DOCUMENT TITLE: FIRST ANNUAL GROUNDWATER MONITORING REPORT

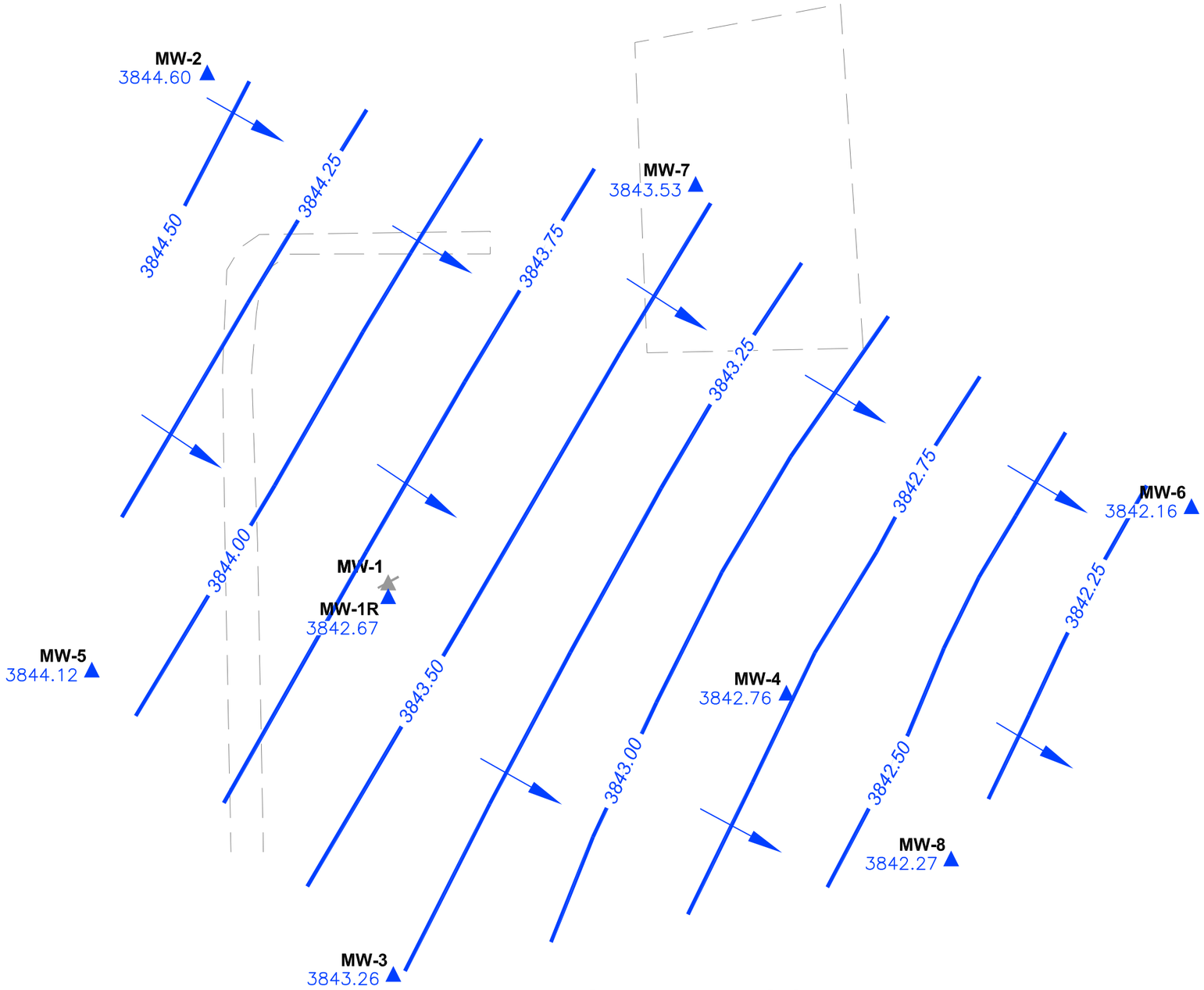
FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, SEPTEMBER 22, 2014***

CLIENT: CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M-1 TANK BATTERY (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	5



LEGEND

- **MW-5** 3844.12 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 12/10/2014, FEET AMSL
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

NOTES:
1) MW-1R NOT HONORED DUE TO LNAPL DEPRESSION.

N

30 0 30 60
SCALE FEET

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Tulsa, Oklahoma 74136
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www.EnviroCleanPS.com

DOCUMENT TITLE: FIRST ANNUAL GROUNDWATER MONITORING REPORT

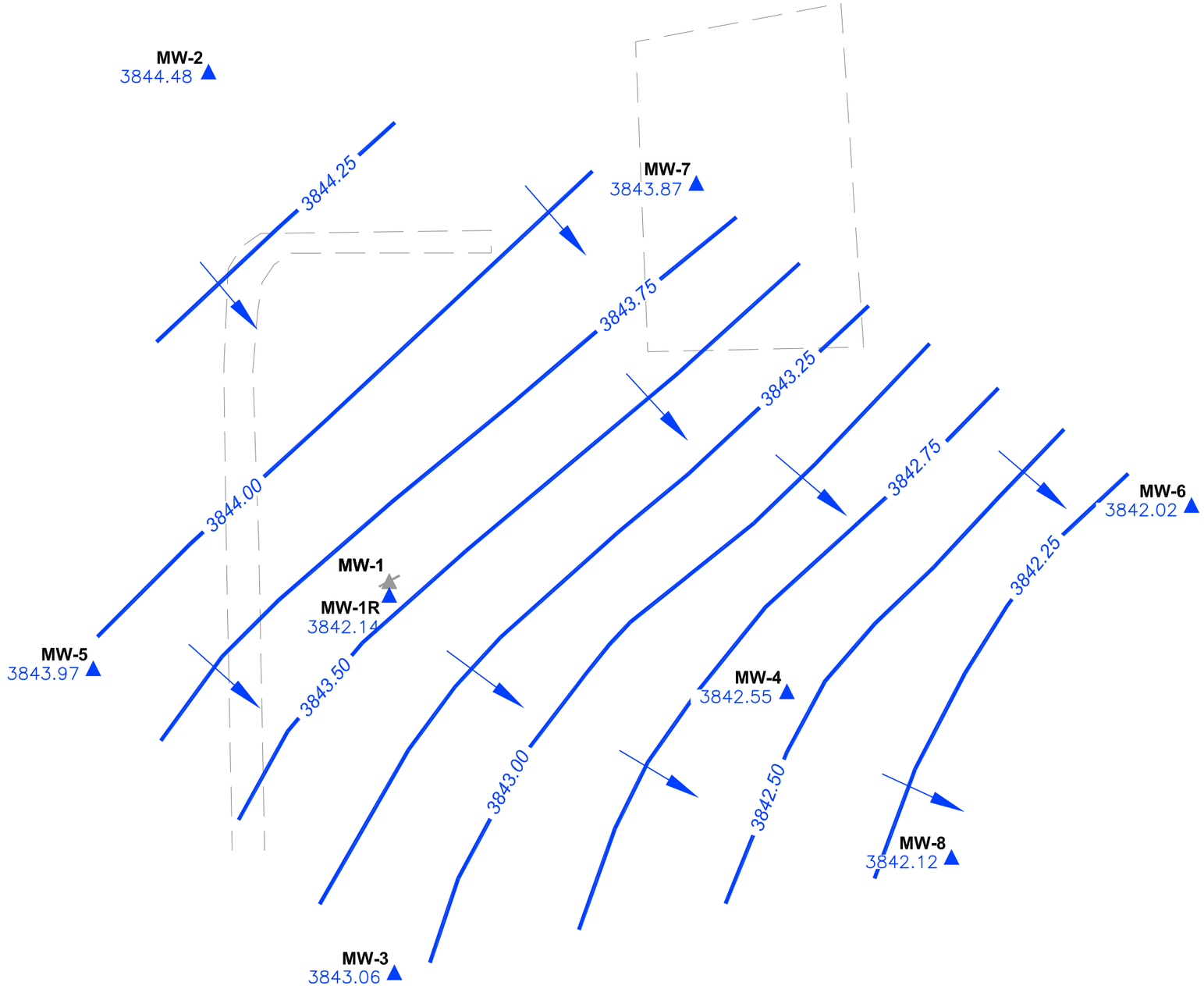
FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, DECEMBER 10, 2014***

CLIENT: CHESAPEAKE ENERGY CORPORATION, OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M-1 TANK BATTERY (AP-72), SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	6



LEGEND

MW-5 3843.97 — LOCATION OF MONITORING WELL AND GROUNDWATER ELEVATION 3/11/2015, FEET AMSL

MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL

3842.00 — GROUNDWATER POTENTIOMETRIC SURFACE

NOTES:
1) MW-1R NOT HONORED DUE TO LNAPL DEPRESSION.

N

30 0 30 60
SCALE FEET

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www.EnviroCleanPS.com

DOCUMENT TITLE: FIRST ANNUAL GROUNDWATER MONITORING REPORT

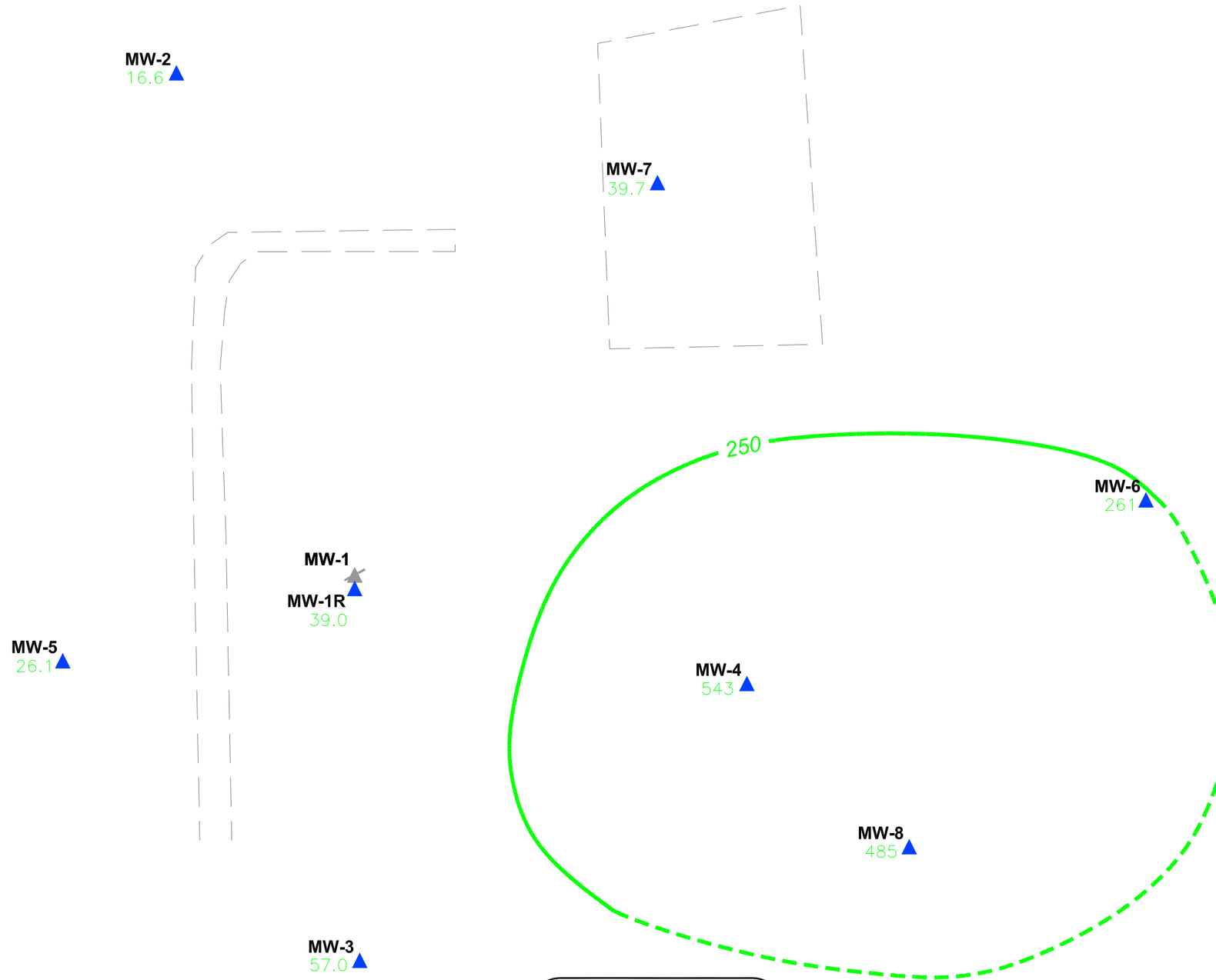
FIGURE TITLE: ***GROUNDWATER POTENTIOMETRIC SURFACE, MARCH 11, 2015***

CLIENT: CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M-1 TANK BATTERY (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	7



LEGEND

- **MW-5** 26.1 — LOCATION OF MONITORING WELL AND CONCENTRATION OF CHLORIDE IN GROUNDWATER 3/11–12/2015, mg/L
- MW-1 — LOCATION OF PLUGGED AND ABANDONED MONITORING WELL
- 250 — CONTOUR LINE SHOWING EQUAL CONCENTRATIONS OF CHLORIDE IN GROUNDWATER, mg/L. (DASHED WHERE INFERRED)
- NS — NOT SAMPLED

N

30 0 30 60
SCALE FEET

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Tulsa, Oklahoma 74136
918.794.7828
www.EnviroCleanPS.com

DOCUMENT TITLE: FIRST ANNUAL GROUNDWATER MONITORING REPORT

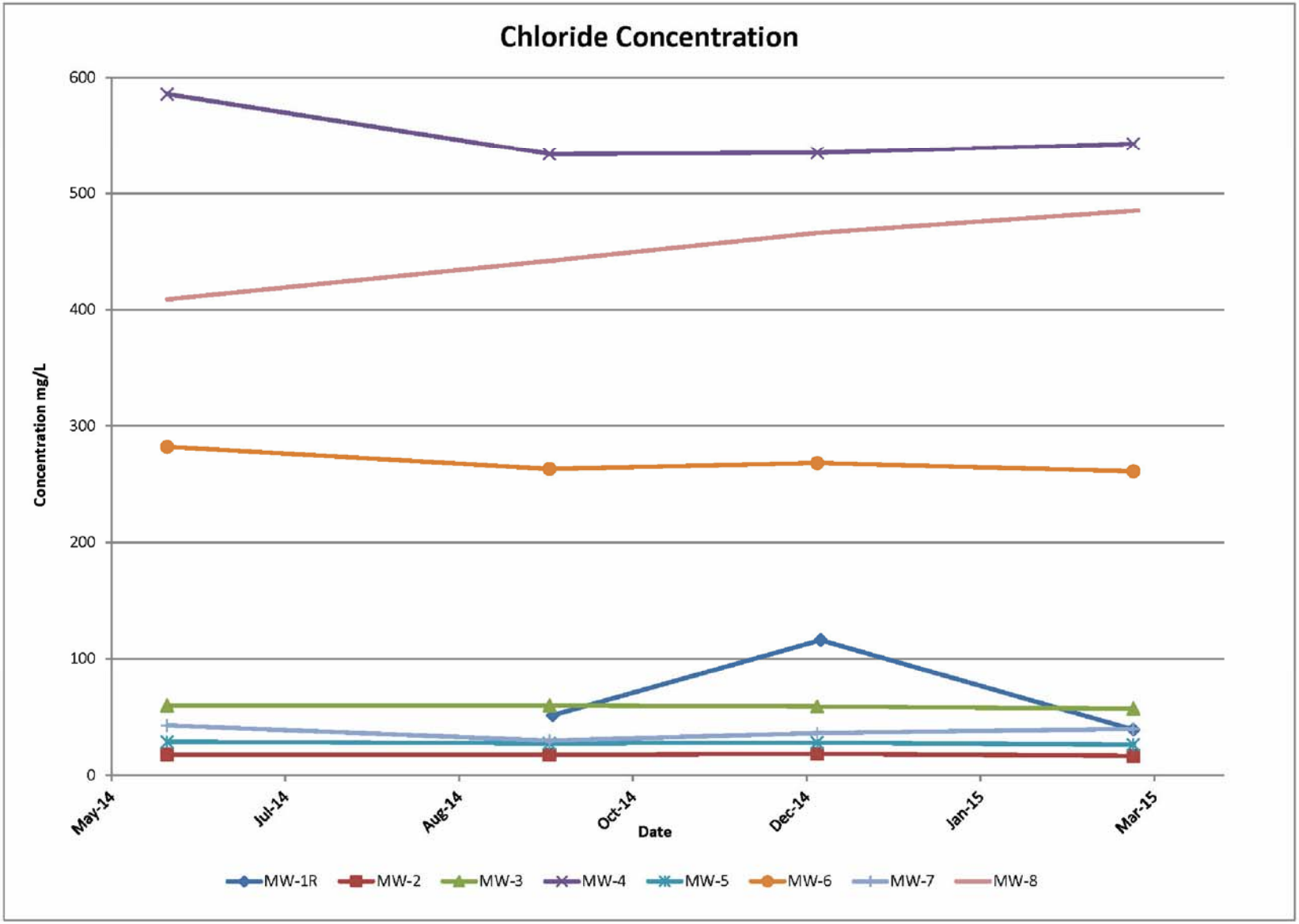
FIGURE TITLE: ***ISOPLETH OF CHLORIDE CONCENTRATIONS IN GROUNDWATER, MARCH 11-12, 2015***

CLIENT: CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION: STATE M-1 TANK BATTERY (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	BEM		
APPROVED BY	BEM	SCALE	1"= 60'
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	8



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DOCUMENT TITLE
FIRST ANNUAL GROUNDWATER MONITORING REPORT

FIGURE TITLE
CHLORIDE CONCENTRATION TREND GRAPHS

CLIENT
CHESAPEAKE ENERGY CORPORATION
OKLAHOMA CITY, OKLAHOMA

LOCATION
STATE M-1 TANK BATTERY (AP-72)
SEC. 18, T17S, R36E, LEA COUNTY, NEW MEXICO

DESIGNED BY	CNA		
APPROVED BY	BEM	SCALE	NTS
DRAWN BY	SKG	DATE	5/19/2015

PROJECT NUMBER	FIGURE NUMBER
CHKHSTM101	9

APPENDICES

APPENDIX A

STAGE 2 ABATEMENT PLAN

ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS U.S., Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432 687 5400
Fax 432 687 5401
www.arcadis-us.com

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

ENVIRONMENT

Subject:
State M-1 AP-072
Stage 2 Abatement Plan

Date:
March 27, 2012

Dear Mr. Von Gonten:

On behalf of Chesapeake Energy Corporation, ARCCADIS U.S. Inc. respectfully submits the enclosed Stage 2 Abatement plan for the State M-1 site (AP-072). A Stage 1 Abatement Plan Report was submitted on March 20, 2012. Your review and approval of this Abatement Plan will be appreciated. The landowner, Darr Angell, is anxious for us to complete soil remediation at this site.

If you have any questions please do not hesitate to contact Bradley Blevins at (575) 391-1462 or via e-mail at bblevins@chkenergy or me at (432) 687-5400, e-mail address shall@aracdis-us.com.

Contact:
Sharon Hall

Phone:
432 687-5400

Email:
shall@aracdis-us.com

Our ref:
MT001088

ARCADIS U.S., Inc.
TX Engineering License # F-533

Sincerely,

ARCADIS U.S., Inc.

Sharon E. Hall

Sharon E. Hall
Associate Vice President

Copies:
Bradley Blevins- Chesapeake, Hobbs

g:\aproject\chesapeake\m-1 stage 2 plan\transmitall letter.doc

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Chesapeake Energy Corporation

State M-1 AP-072
Stage 2 Abatement
Plan Proposal

Hobbs, New Mexico

March 27, 2012

ARCADIS

Sharon Hall
Associate Vice President

State M-1 AP-072

Stage 2 Abatement
Plan Proposal

Prepared for:
Chesapeake Energy
Corporation
Hobbs, New Mexico

Prepared by:
ARCADIS U.S., Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432 687 5400
Fax 432 687 5401

Our Ref.:
MT001088.0001.00001

Date:
March 27, 2012

Table of Contents

Figures

Appendices

ARCADIS

1. INTRODUCTION

The subject site is a former tank battery site located east of Buckeye, New Mexico. The site was purchased by Chesapeake Energy Corporation (Chesapeake) in April 2004. Chesapeake did not operate the tank battery or the associated well field and began the process of facility abandonment in 2007.

Seven monitor wells and nine soil borings have been drilled at the site. Elevated chloride concentrations and limited hydrocarbon compounds were detected in soil samples collected from soil borings and monitoring wells. Elevated chlorides were detected in the down gradient monitor wells and light non-aqueous phase liquid (LNAPL) occurs in monitoring well MW-1. LNAPL recovery activities have been piloted at the site and will commence again upon completion of surface reclamation activities.

2. SUMMARY OF STAGE 1 ABATEMENT ACTIVITIES

Initial site investigation activities were conducted in May of 2007 following abandonment of the tank battery. Stage 1 Abatement activities were conducted during the period of May 2007 through September 2011. Stage 1 Abatement activities included drilling and soil sampling of nine boreholes, drilling and sampling of seven monitor wells, EM 31 and EM 34 surveys, conversion of one monitoring well into a recovery well and recovery of phase-separated hydrocarbons from the recovery well.

New Mexico Oil Conservation Division (NMOCD) was notified of impacts to groundwater at the site via e-mail on May 30, 2007. NMOCD notified Chesapeake in a letter dated June 19, 2007 that a Stage 1 Abatement Plan was required for the site in accordance with Rule 19.

The Stage 1 Abatement Plan was submitted to NMOCD on August 22, 2007. The plan summarized site activities taken to date. The plan proposed the drilling and sampling of a minimum of three additional soil borings and installation and sampling of nine groundwater monitoring wells.

BBC contacted NMOCD via email on April 24, 2010 to inquire about the status of the Stage 1 Abatement Plan approval and Chesapeake's desire to conduct the proposed Stage 1 Abatement Plan activities. On May 27, 2010, NMOCD responded via email that the State was not staffed to review the Abatement Plans (APs) in a timely manner. On June 23, 2010, BBC contacted NMOCD via email to request a waiver of the Public Notice requirement and inform NMOCD that Chesapeake and the landowner were

anxious to move forward with the proposed AP activities. NMOCD replied via email on June 23, 2010 stating they were still understaffed to review the AP and could not waive the Public Notice requirement. They advised BBC that Chesapeake could proceed "at risk." On July 12, 2010 BBC informed NMOCD by registered letter that Chesapeake was planning to start the Stage 1 Assessment on or about August 23, 2010. They further informed NMOCD they would be submitting the required Public Notices, a copy of which was attached to the letter. NMOCD did not respond to the registered letter.

The public notices were published in the Hobbs News-Sun and Lovington Leader on July 22, 2010 and the Albuquerque Journal on July 24, 2010. No comments were received from the public or NMOCD during the 30-day comment period and Chesapeake proceeded with the proposed Stage 1 Abatement Plan activities on August 26, 2010. Copies of correspondence and Public Notice are included in Appendix A.

A detailed description of site activities and results can be found in the report submitted to NMOCD dated March 20, 2012 entitled State M-1 AP-072, Stage 1 Abatement Report (Site Assessment Investigation). Analytical results for soil and groundwater sampling are summarized on Figure 1.

3. STAGE 2 ABATEMENT PLAN PROPOSAL

After review of various remedial options, we propose the following Stage 2 Abatement Plan. The plan addresses soil and groundwater remediation.

3.1 Soil Remediation

The selected remedial option will be the excavation of near-surface soils and installation of clay liners. The anticipated extent and depth of excavation is based on assessment activities (laboratory analysis and visual observation) and is shown in Figure 2. Near surface soils (to a depth of 5 feet below ground surface) with chloride concentrations in excess of 1,000 milligrams per kilogram (mg/kg) and a Total Petroleum Hydrocarbons (TPH) concentration in excess of 1,000 mg/kg will be excavated and disposed. Excavated soils will be disposed at Lea Land Landfill.

Areas where chloride or TPH concentrations are expected to exceed 1,000 mg/kg at depths greater than 5 feet below ground surface soils will be excavated to a depth of 5

feet below ground surface. Soils will be screened in the field for chlorides using chloride field test kits and for TPH using a photoionization. Critical samples (samples used to delineate the excavations) will be submitted for laboratory analysis of chlorides and/or TPH. Following excavation, a 12-inch compacted clay layer that meets or exceeds a permeability of equal to or less than 1×10^{-8} centimeters per second will be installed in the excavations. The lined excavations will be backfilled with four feet of locally obtained native soil. All of the excavated areas will be re-seeded with native vegetation. Areas that are supporting vegetation will not be disturbed.

Use of the USEPA Multi-Med model demonstrates that the clay liners will mitigate the leaching of chlorides to groundwater. The model predicts that after 7000 years of infiltration through the liner the maximum concentration of chlorides in groundwater will be 221.8 milligrams per liter (mg/L). The Multi-Med inputs and outputs are included in Appendix A.

3.2 Groundwater Remediation and Monitoring

One additional groundwater monitoring well will be installed downgradient of the site. The monitoring well will be designated MW-8.

Groundwater samples will be collected from all of the monitoring wells and analyzed for chlorides using USEPA method 9056 for each of four quarters. Based on sample results for one year (four quarters), sampling frequency will be reviewed and may be revised.

Sampling will be discontinued when eight quarters of sample results indicate chloride concentrations are below New Mexico Water Quality Control Commission, Title 20, Chapter 6, Part 2 standards. Sample results will be submitted to the NMOCD annually on June 15.

Following removal of LNAPL from MW-1, groundwater samples will be collected from MW-1 and analyzed for benzene, toluene ethylbenzene and xylenes (BTEX) using USEPA method 8260B for each of four quarters. Based on sample results for one year (four quarters), sampling frequency will be reviewed and may be revised.

Sampling of MW-1 for BTEX will be discontinued when eight quarters of sample results indicate BTEX concentrations are below New Mexico Water Quality Control Commission, Title 20, Chapter 6, Part 2 standards. Sample results will be submitted to

the NMOCD annually on June 15. Proposed groundwater remediation is presented in Sections 3.2.1 and 3.2.2.

3.2.1 Chlorides

Chloride concentrations in groundwater exceed New Mexico Water Quality Control Commission standards in two wells (MW-1 411mg/L and MW-4 472mg/L).

Removal of near-surface soils that are a potential source of chlorides and BTEX in groundwater and lining of excavations with chloride and TPH concentrations in excess of 1,000 mg/kg will mitigate leaching of chlorides to groundwater. Considering the relatively low concentrations of chlorides in groundwater and the fact that soil removal and clay liner infiltration barrier installation will be conducted at this site, we propose monitoring the site for a period of two years before considering pumping of groundwater at this site. With the proposed source removal and mitigation and the severe drought conditions being experienced in this area, we believe it prudent to evaluate if chloride mass removal by pumping is warranted at this site.

3.2.2 Hydrocarbons

A pilot LNAPL recovery test will take place over a three week period and will be used to develop long-term recovery procedures. LNAPL will be recovered from MW-1 and disposed in a NMOCD approved facility. Additionally, two soil vent borings equipped with wind turbines will be installed in the area near MW-1.

4. PUBLIC NOTIFICATION

Written notification of submittal of the Stage 2 Abatement Plan Proposal and site activities will be sent to all surface owners of record within a one-mile radius of the site. NMOCD will be supplied with a list of parties to be notified. Publication of notice of activities will be published in a state-wide circulated newspaper, the Albuquerque Journal, and two county newspapers, the Hobbs-Daily News Sun and the Lovington Leader.

5. REMEDIATION WORK SCHEDULE

Soil remediation activities are expected to be completed in 15 working days (Monday through Friday). Groundwater remediation activities will be ongoing. An estimated completion date for groundwater remediation is not available.

6. REFERENCES

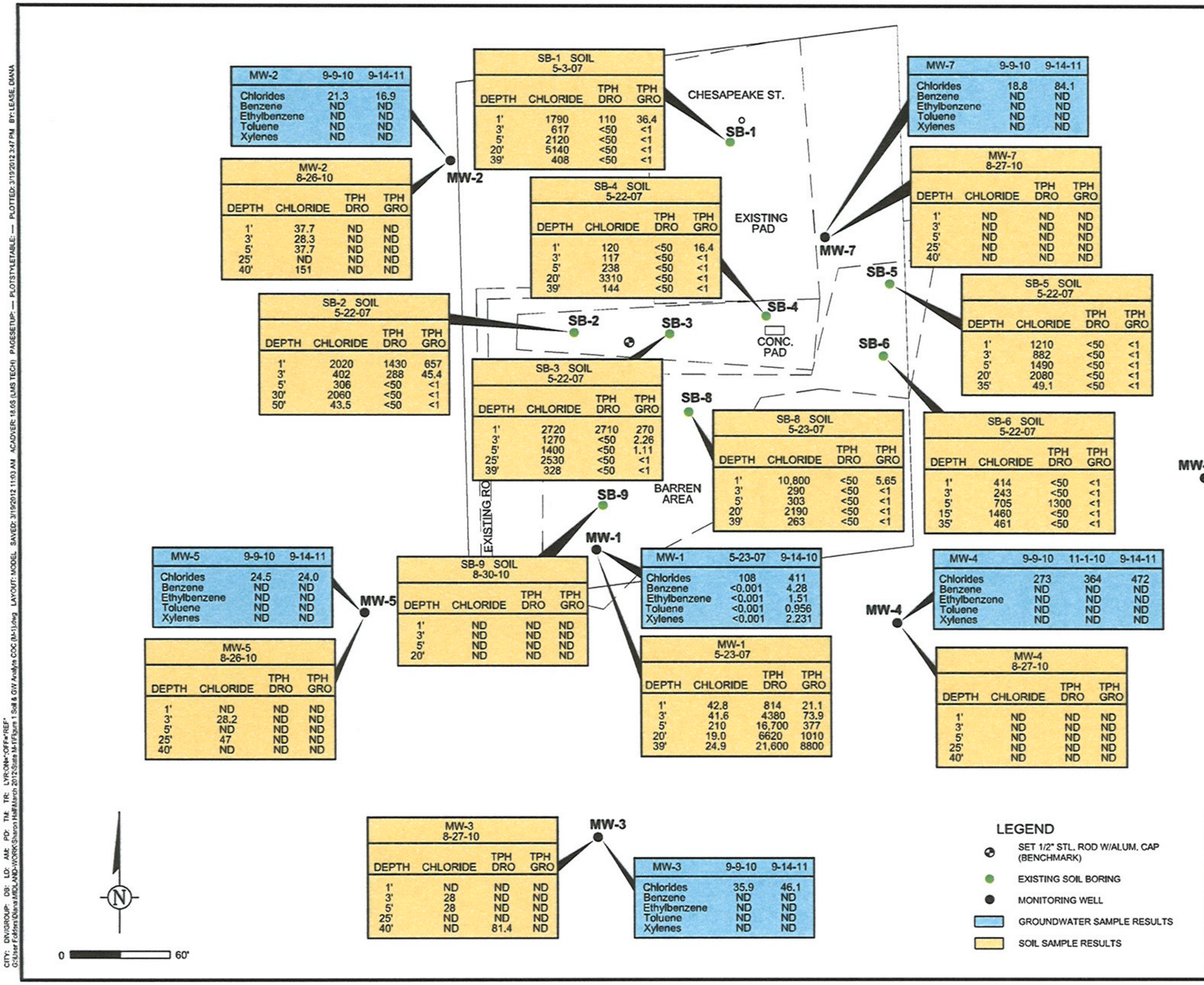
Groundwater Handbook; United States Environmental Protection Agency, Office of Research and Development, Center for Environmental Research Information; 1992

New Mexico Water Quality Control Commission, Title 20 Chapter 6, Part 2, Subpart I

State M-1 AP-072 Stage 1 Abatement Report (Site Assessment Investigation); ARCADIS; March 2012

State M-1Salt Water Disposal Tank Battery, Stage 1 Abatement Plan (Ap-072), BBC International; August 2007

New Mexico Water Quality Control Commission, Title 20 Chapter 6, Part 2, Subpart I



MW-2

	9-9-10	9-14-11
Chlorides	21.3	16.9
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

MW-2 8-26-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	37.7	ND	ND
3'	28.3	ND	ND
5'	37.7	ND	ND
25'	ND	ND	ND
40'	151	ND	ND

SB-1 SOIL 5-3-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	1790	110	36.4
3'	617	<50	<1
5'	2120	<50	<1
20'	5140	<50	<1
39'	408	<50	<1

SB-4 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	120	<50	16.4
3'	117	<50	<1
5'	238	<50	<1
20'	3310	<50	<1
39'	144	<50	<1

MW-7

	9-9-10	9-14-11
Chlorides	18.8	84.1
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

MW-7 8-27-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
25'	ND	ND	ND
40'	ND	ND	ND

SB-2 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	2020	1430	657
3'	402	288	45.4
5'	306	<50	<1
30'	2060	<50	<1
50'	43.5	<50	<1

SB-5 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	1210	<50	<1
3'	882	<50	<1
5'	1490	<50	<1
20'	2080	<50	<1
35'	49.1	<50	<1

SB-3 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	2720	2710	270
3'	1270	<50	2.26
5'	1400	<50	1.11
25'	2530	<50	<1
39'	328	<50	<1

SB-8 SOIL 5-23-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	10,800	<50	5.65
3'	290	<50	<1
5'	303	<50	<1
20'	2190	<50	<1
39'	263	<50	<1

SB-6 SOIL 5-22-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	414	<50	<1
3'	243	<50	<1
5'	705	1300	<1
15'	1460	<50	<1
35'	461	<50	<1

MW-6

	9-9-10	11-1-10	9-14-11
Chlorides	193	239	164
Benzene	ND	ND	ND
Ethylbenzene	ND	ND	ND
Toluene	ND	ND	ND
Xylenes	ND	ND	ND

MW-6 8-26-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
25'	ND	ND	ND
40'	28.2	ND	ND

MW-5

	9-9-10	9-14-11
Chlorides	24.5	24.0
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

MW-5 8-26-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	28.2	ND	ND
5'	ND	ND	ND
25'	47	ND	ND
40'	ND	ND	ND

SB-9 SOIL 8-30-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
20'	ND	ND	ND

MW-1

	5-23-07	9-14-10
Chlorides	108	411
Benzene	<0.001	4.28
Ethylbenzene	<0.001	1.51
Toluene	<0.001	0.956
Xylenes	<0.001	2.231

MW-1 5-23-07

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	42.8	814	21.1
3'	41.6	4380	73.9
5'	210	16,700	377
20'	19.0	6620	1010
39'	24.9	21,600	8800

MW-4

	9-9-10	11-1-10	9-14-11
Chlorides	273	364	472
Benzene	ND	ND	ND
Ethylbenzene	ND	ND	ND
Toluene	ND	ND	ND
Xylenes	ND	ND	ND

MW-4 8-27-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	ND	ND	ND
5'	ND	ND	ND
25'	ND	ND	ND
40'	ND	ND	ND

MW-3 8-27-10

DEPTH	CHLORIDE	TPH DRO	TPH GRO
1'	ND	ND	ND
3'	28	ND	ND
5'	28	ND	ND
25'	ND	ND	ND
40'	ND	81.4	ND

MW-3

	9-9-10	9-14-11
Chlorides	35.9	46.1
Benzene	ND	ND
Ethylbenzene	ND	ND
Toluene	ND	ND
Xylenes	ND	ND

LEGEND

- SET 1/2" STL. ROD W/ALUM. CAP (BENCHMARK)
- EXISTING SOIL BORING
- MONITORING WELL
- GROUNDWATER SAMPLE RESULTS
- SOIL SAMPLE RESULTS

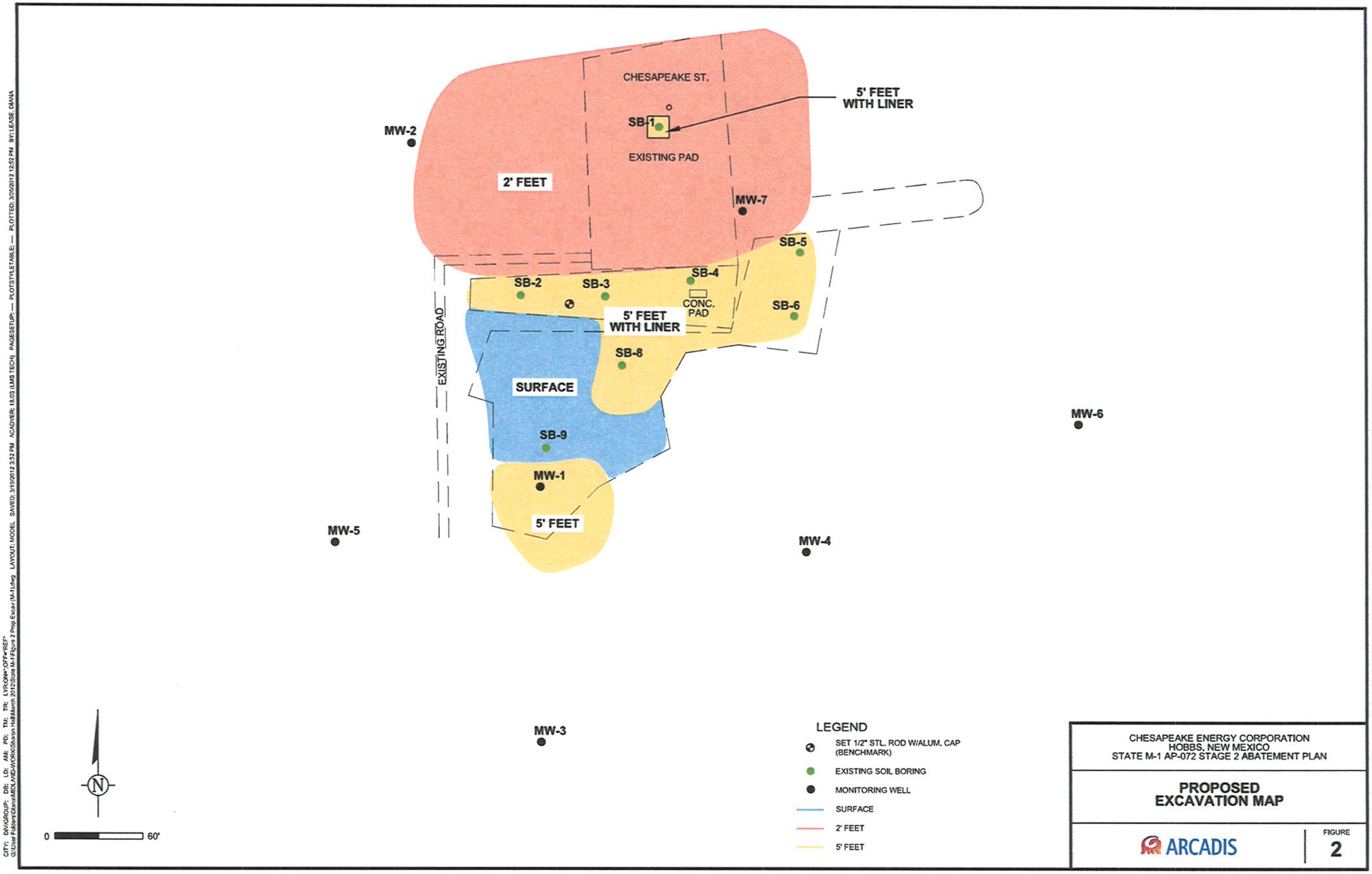
CHESAPEAKE ENERGY CORPORATION
HOBBS, NEW MEXICO
STATE M-1 AP-072 STAGE 2 ABATEMENT PLAN

SOIL & GROUNDWATER ANALYTE CONCENTRATIONS (Milligrams Per Kilogram & Milligrams Per Liter)

ARCADIS

FIGURE 1

CITY: DIV/GROUP: DB: LD: AM: PD: TM: TR: LYR:ON=*;OFF=*REF*
G:\User Folders\Diana\MIDLAND-WORK\Sharon Hall\March 2012\State M-1\Figure 1 Soil & GW Analyte COC (M-1).dwg LAYOUT: MODEL SAVED: 3/19/2012 11:03 AM ACADVER: 18.0S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: — PLOTTED: 3/19/2012 3:47 PM BY: LEASE, DIANA



CHESAPEAKE ENERGY CORPORATION
HOBBS, NEW MEXICO
STATE M-1 AP-072 STAGE 2 ABATEMENT PLAN

PROPOSED EXCAVATION MAP

ARCADIS

FIGURE 2

ARCADIS

Appendix A

Multi-Med Model Inputs and Outputs

Chesapeake State M-1
Chesapeake Energy Corporation
Buckeye, Lea County, New Mexico
Multimed Model Input and Output (With Liner)

MODEL INPUT AND OUTPUT						MODEL RANGE	
INPUT PARAMETERS						Minimum	Maximum
Unsaturated Zone Flow Parameters							
Depth of Unsaturated Zone	m	45	feet	13.7	m	0.000000001	None
Hydraulic Conductivity	cm/hr	2	ft/day	2.54	cm/hr	0.00000000001	10,000
Unsaturated Zone Porosity	fraction	0.05	fraction	0.05	fraction	0.000000001	0.99
Residual Water Content	fraction	0.01	fraction	0.010	fraction	0.000000001	1
Unsaturated Zone Transport Parameters							
Thickness of Layer	m	45	feet	13.7	m	0.000000001	None
Percent of Organic Matter	%	2.6	%	2.6	%	0	100
Bulk Density	g/cm^3	1.35	g/cm^3	1.35	g/cm^3	0.01	5
Biological Decay Coefficient	1/yr	0	1/yr	0	1/yr	0	None
Aquifer Parameters							
Aquifer Porosity	fraction	0.25	fraction	0.25	fraction	0.000000001	0.99
Bulk Density	g/cm^3	1.35	g/cm^3	1.35	g/cm^3	0.01	5
Aquifer Thickness	m	50	ft	15.24	m	0.000000001	100,000
Hydraulic Conductivity	m/yr	2	ft/day	223	m/yr	0.0000001	100,000,000
Hydraulic Gradient	m/m	0.007	m/m	0.007	m/m	0.00000001	None
Organic Carbon Content	fraction	0.00315	fraction	0.00315	fraction	0.000001	1
Temperature of Aquifer	°C	14.4	°C	14.4	°C	0.00000001	None
pH		6.2		6.2		0.3	14
x-distance Radial Distance from Site to Receptor	m	1	m	1	m	1	None
Source Parameters							
Infiltration Rate from the Facility	m/yr	0.124	in/yr	0.00315	m/yr	0.0000000001	10,000,000,000
Area of Waste Disposal Unit	m^2	46,800	ft^2	4348	m^2	0.01	None
Length Scale of Facility	m	240	feet	73.2	m	0.000000001	10,000,000,000
Width Scale of Facility	m	195	feet	59.4	m	0.000000001	10,000,000,000
Recharge Rate into the Plume	m/yr	16.71	in/yr	0.4244	m/yr	0	10,000,000,000
Duration of Pulse	yr	8,000	yr	8000	yr	0.000000001	None
Initial Concentration at Landfill	mg/L	6,000	mg/L	6,000	mg/L	0	None
Additional Parameters							
Method				Gaussian		Gaussian	Patch
Name of Chemical Specified				Chloride			

MODEL OUTPUT			
Final Concentration at Landfill	mg/L	221.8	mg/L

MODEL OUTPUT				
Concentration at Landfill	0.0 mg/L	Time	1 yr
	0.0 mg/L		10 yr
	0.0 mg/L		20 yr
	18.9 mg/L		50 yr
	36.6 mg/L		70 yr
	45.4 mg/L		80 yr
	61.8 mg/L		100 yr
	123.4 mg/L		200 yr
	154.1 mg/L		300 yr
	166.3 mg/L		400 yr
	178.5 mg/L		500 yr
	190.7 mg/L		600 yr
	204.8 mg/L		800 yr
	211.1 mg/L		1,000 yr
	220.4 mg/L		2,000 yr
	221.6 mg/L		3,000 yr
	221.8 mg/L		4,000 yr
	221.8 mg/L		5,000 yr
	221.8 mg/L		6,000 yr
	221.8 mg/L		7,000 yr

Chesapeake State M-1
Chesapeake Energy Corporation
Buckeye, Lea County, New Mexico

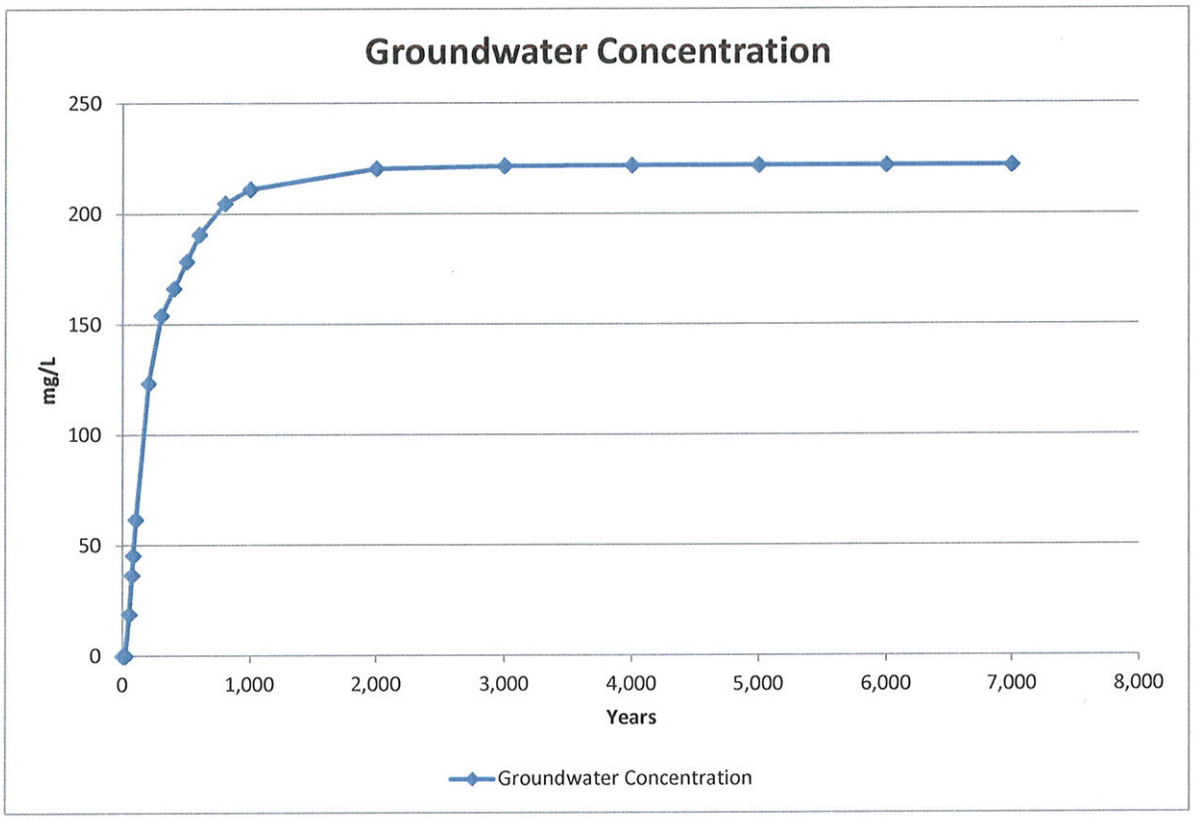


TABLE 6-3. TOTAL POROSITY OF VARIOUS MATERIALS

Material	No. of Analyses	Range	Arithmetic Mean
Igneous Rocks			
Weathered granite	8	0.34-0.57	0.45
Weathered gabbro	4	0.42-0.45	0.43
Basalt	94	0.03-0.35	0.17
Sedimentary Materials			
Sandstone	65	0.14-0.49	0.34
Siltstone	7	0.21-0.41	0.35
Sand (fine)	243	0.26-0.53	0.43
Sand (coarse)	26	0.31-0.46	0.39
Gravel (fine)	38	0.25-0.38	0.34
Gravel (coarse)	15	0.24-0.36	0.28
Silt	281	0.34-0.61	0.46
Clay	74	0.34-0.57	0.42
Limestone	74	0.07-0.56	0.3
Metamorphic Rocks			
Schist	18	0.04-0.49	0.38

Sources: From Mercer et al. (1982),
McWhorter and Sunada (1977),
Original reference Morris and Johnson, (1967).

Texture	Bulk Density g/cm^3	Average Wilting Point	Plant Available Water Inches/Ft
Sandy loam	1.6	0.057	1.66
Silt Loam	1.45	0.119	2
Loam	1.5	0.097	2.4
Sandy clay loam	1.45	0.137	1.66
Clay loam	1.45	0.157	1.9

TABLE 6-8. MEAN BULK DENSITY (g/cm3) FOR FIVE SOIL TEXTURAL CLASSIFICATIONSa,b

Soil Texture	Mean Value	Range Reported
Silt Loams	1.32	0.86 - 1.67
Clay and Clay Loams	1.3	0.94 - 1.54
Sandy Loams	1.49	1.25 - 1.76
Gravelly Silt Loams	1.22	1.02 - 1.58
Loams	1.42	1.16 - 1.58
All Soils	1.35	0.86 - 1.76

a Baes, C.F., III and R.D. Sharp. 1983. A Proposal for Estimation of Soil Leaching Constants for Use in Assessment Models. J. Environ. Qual. 12(1):17-28 (Original reference).

b From Dean et al. (1989)

TABLE 6-2. DESCRIPTIVE STATISTICS FOR SATURATED HYDRAULIC CONDUCTIVITY (cm hr-1)

Soil Type	Hydraulic Conductivity (Ks)* x	s	CV	n		
Clay**	0.2	0.42	210.3	114	cm/hr	17.52
Clay Loam	0.26	0.7	267.2	345	cm/hr	22.776
Loam	1.04	1.82	174.6	735	cm/hr	91.104
Loamy Sand	14.59	11.36	77.9	315	cm/hr	1278.084
Silt	0.25	0.33	129.9	88	cm/hr	21.9
Silt Loam	0.45	1.23	275.1	1093	cm/hr	39.42
Silty Clay	0.02	0.11	453.3	126	cm/hr	1.752
Silty Clay Loam	0.07	0.19	288.7	592	cm/hr	6.132
Sand	29.7	15.6	52.4	246	cm/hr	2601.72
Sandy Clay	0.12	0.28	234.1	46	cm/hr	10.512
Sandy Clay Loam	1.31	2.74	208.6	214	cm/hr	114.756
Sandy Loam	4.42	5.63	127	1183	cm/hr	387.192

* n = Sample size, = Mean, s = Standard deviation, CV = Coefficient of variation (percent)

** Agricultural soil, less than 60 percent clay

Sources: From Dean et al. (1989),
Original reference Carsel and Parrish (1988).

Saturated water content is the maximum volumetric amount of water in the soil when all pores are filled with water. Very often it is assumed that saturated water content equals the porosity n . However, in many cases qS is smaller than n due to the fact that small amounts of air will be trapped in very small pores. Residual water content can be defined as the asymptote of the pF-curve when h gets very high negative values. Usually qR is very small - on the order of 0.001--0.02 for coarse soils but gets as high values as 0.15..0.25 for heavy clay soils. Air entry point ha is

Soil texture. Fine-textured soils can hold much more organic matter than sandy soils for two reasons. First, clay particles form electrochemical bonds that hold organic compounds. Second, decomposition occurs faster in well-aerated sandy soils. A sandy loam rarely holds more than 2% organic matter.

The recharge rate in this model is the net amount of water that percolates directly into the aquifer system outside of the land disposal facility. The recharge is assumed to have no contamination and hence dilutes the groundwater contaminant plume. The recharge rate into the plume can be calculated in a variety of ways. One possibility is to use a model, such as HELP (Hydrologic Evaluation of Landfill Performance) (Schroeder et al., 1984), without any engineering controls (leachate collection system or a liner) to simulate the water balance for natural conditions.

The infiltration rate is the net amount of leachate that percolates into the aquifer system from a land disposal facility. Because of the use of engineering controls and the presence of non-native porous materials in the landfill facility, the infiltration rate will typically be different than the recharge rate. However, it can be estimated by similar

Most soils contain 2-10 percent organic matter. *The Importance of Soil Organic Matter: Key to Drought-Resistant Soil and Sustained Food Production. http://www.fao.org*

APPENDIX B

NMOCD APPROVAL OF STAGE 2 ABATEMENT PLAN

From:	Chase Acker
To:	Bruce McKenzie
Subject:	FW: Stage 2 Abatement Plan Approval: AP-72 Former State M-1 Tank Battery located in Unit Letter O of Section 18 in Township 17 South, Range 36 East, NMPM in Lea County, NM
Date:	Monday, April 14, 2014 1:56:01 PM

From: Griswold, Jim, EMNRD [mailto:Jim.Griswold@state.nm.us]
Sent: Thursday, June 27, 2013 5:14 PM
To: Larry Wooten
Cc: Hall, Sharon; Chase Acker
Subject: Stage 2 Abatement Plan Approval: AP-72 Former State M-1 Tank Battery located in Unit Letter O of Section 18 in Township 17 South, Range 36 East, NMPM in Lea County, NM

Mr. Wooten,

The Oil Conservation Division (OCD) has reviewed the Stage 2 Abatement Plan for the above-referenced site submitted on your behalf by Arcadis and dated 3/27/12. That plan has substantially met the requirements of 19.15.30 NMAC and is hereby approved. Please proceed with field activities.

Be advised this approval does not relieve Chesapeake of responsibility should the situation continue to pose a threat to groundwater, surface water, human health, or the environment. Furthermore, this approval does not relieve your responsibility for compliance with any federal, state, or local laws and/or regulations. Please retain a copy of this email for your files, as no hardcopy will be sent. If you have any questions, please feel free to contact me at any time.

Jim Griswold
Senior Hydrologist
EMNRD/Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505.476.3465
email: jim.griswold@state.nm.us

APPENDIX C

MONITORING AND SVE WELL COMPLETION RECORDS

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 5/2, 50% SILT, 40% CLAY, 10% FINE SANDS, DRY, FILL	CL	
	8.0	SILTY CLAY: LIGHT GRAY, 10YR 7/2, 50% SILT, 30% CLAY, 20% GRAVELS, HC ODOR, MOIST	CL	
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE: NUMBER | OVM READING | RECOVERY | DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (TIME OF BORING)
WATER TABLE (24 HOURS)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *MW-1R*

ENVIROCLEAN SERVICES, LLC
7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828
www.EnviroCleanPS.com

DATE DRILLED 3/25/2014
DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. MW01R_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\BORELOGS\MW01R_BORELOG.dwg on Apr 17, 2014-4:07pm

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SILTY CLAY: LIGHT GRAY, 10YR 7/2, 50% SILT, 30% CLAY, 20% GRAVELS, HC ODOR, MOIST (CONTINUED)	CL							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40									
	45									
	50									
	55									
	60									
	61.41	TOTAL DEPTH: 61.41 FEET							61.41	
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

WATER TABLE (24 HOURS)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *MW-1R*

ENVIRO CLEAN SERVICES, LLC

7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828

www.EnviroCleanPS.com

DATE DRILLED 3/25/2014

DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. MW01R_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION
	0		
	0.5	SILTY CLAY: BROWN, 7.5YR 5/3, 50% SILT, 40% CLAY, 10% FINE SANDS, DRY	CL
		CALICHE: LIGHT GRAY TO WHITE SOME TANS, HARD, DRY	
	5		
	9.0	CLAYEY SILT: PINK, 7.5YR 8/3, 80% SILT, 10% CLAY, 10% STRAY GRAVEL, SLIGHTLY MOIST, SOFT	ML
	10		
	15		
	20		
	25		
	27.0	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, CEMENTED, HARD, DRY	SC
	30	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST	SC
	35		

GRAPHIC LOG

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE: NUMBER | OVM READING | RECOVERY | DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

0 5 10 15 20 25 30 35

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (24 HOURS)
WATER TABLE (TIME OF BORING)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *MW-8*

ENVIRO CLEAN SERVICES, LLC
7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828
www.EnviroCleanPS.com

DATE DRILLED 3/24/2014
DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. MW08_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\BORELOGS\MW08_BORELOG.dwg on Apr 17, 2014-4:52pm

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
3/24/2014 ▽ 43.00	40									
	45									
	50									
	55									
	56.68	TOTAL DEPTH: 56.68 FEET							56.68	
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

WATER TABLE (24 HOURS)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *MW-8*

ENVIRO CLEAN SERVICES, LLC

7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828

www.EnviroCleanPS.com

DATE DRILLED 3/24/2014

DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. MW08_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SAND, DRY	CL	
	3.5	CALICHE: LIGHT GRAY TO WHITE, SOME BROWNS, HARD, DRY		
	5			
	6.0	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, CEMENTED, HARD, DRY	SC	
	10			
	15			
	20	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, GRAVELS, SLIGHTLY MOIST	SC	
	25	SAND: PINK, 7.5YR 8/3, 90% SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST	SC	
	30			
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE: NUMBER | OVM READING | RECOVERY | DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (24 HOURS)
WATER TABLE (TIME OF BORING)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-1*

ENVIROCLEAN SERVICES, LLC
7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828
www.EnviroCleanPS.com

DATE DRILLED 3/25/2014
DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. SVE01_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: PINK, 7.5YR 8/3, 90% SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40	STRONG HC ODOR AT 40 FEET								
	41.85	TOTAL DEPTH: 41.85 FEET							41.85	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-1*

ENVIROCLEAN SERVICES, LLC

7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828

www.EnviroCleanPS.com

DATE DRILLED 3/25/2014

DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE01_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SANDS, DRY	CL	
	4.0	CALICHE: LIGHT GRAY TO WHITE, SOME BROWN, MEDIUM HARD, DRY		
	14.0	SAND: WHITE, 7.5YR 8/1, 90% FINE SAND, 10% CLAY, PARTIALLY CEMENTED, DRY	SC	
	25	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST, HC ODOR	SC	
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE: NUMBER | OVM READING | RECOVERY | DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

0 5 10 15 20 25 30 35

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (TIME OF BORING)
WATER TABLE (24 HOURS)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-2*

ENVIRO CLEAN SERVICES, LLC
7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828
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DATE DRILLED 3/25/2014
DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. SVE02_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST, HC ODOR (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40									
	41.01	TOTAL DEPTH: 41.01 FEET							41.01	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

WATER TABLE (24 HOURS)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-2*

ENVIROCLEAN SERVICES, LLC

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DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE02_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SANDS, DRY	CL	
	2.5	CALICHE: LIGHT GRAY TO WHITE, SOME BROWNS, MEDIUM HARD, DRY		
	11.0	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, PARTIALLY CEMENTED, DRY	SC	
	24.0	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST	SC	
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (24 HOURS)
WATER TABLE (TIME OF BORING)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-3*

ENVIROCLEAN SERVICES, LLC
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DATE DRILLED 3/25/2014
DRILLING METHOD AIR ROTARY
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LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. SVE03_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\BORELOGS\SVE03_BORELOG.dwg on Apr 17, 2014-5:07pm

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40 40.11	TOTAL DEPTH: 40.11 FEET							40.11	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-3*

ENVIROCLEAN SERVICES, LLC

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CHECKED BY P.RICHARDSON DRAWING NO. SVE03_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SANDS, DRY	CL	
	2.5	CALICHE: LIGHT GRAY TO WHITE, SOME BROWNS, SOFT, DRY		
	15	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, PARTIALLY CEMENTED , DRY	SC	
	24.0	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST	SC	
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (24 HOURS)
WATER TABLE (TIME OF BORING)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-4*

ENVIRO CLEAN SERVICES, LLC
7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828
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DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. SVE04_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40									
	41.56	TOTAL DEPTH: 41.56 FEET							41.56	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

WATER TABLE (24 HOURS)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-4*

ENVIROCLEAN SERVICES, LLC

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DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE04_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SAND, DRY	CL	
	2.0	CALICHE: LIGHT GRAY TO WHITE, SOME BROWNS, SOFT, DRY		
	15	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, PARTIALLY CEMENTED, DRY	SC	
	22.0	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST	SC	
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE: NUMBER | OVM READING | RECOVERY | DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

0 5 10 15 20 25 30 35

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (TIME OF BORING)
WATER TABLE (24 HOURS)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-5*

ENVIRO CLEAN SERVICES, LLC
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DATE DRILLED 3/25/2014
DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON DRAWING NO. SVE05_LOG
DRAWN BY: S.GRAUE PAGE 1 OF 2

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\BORELOGS\SVE05_BORELOG.dwg on Apr 17, 2014-5:15pm

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40									
	40.73	TOTAL DEPTH: 40.73 FEET							40.73	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-5*

ENVIROCLEAN SERVICES, LLC

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DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE05_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SANDS, DRY	CL	
	4.0	CALICHE: LIGHT GRAY TO WHITE, SOME BROWNS, SOFT, DRY		
	13.0	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, PARTIALLY CEMENTED, DRY	SC	
	25	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST	SC	
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE: NUMBER | OVM READING | RECOVERY | DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

0 5 10 15 20 25 30 35

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (24 HOURS)
WATER TABLE (TIME OF BORING)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-6*

ENVIRO CLEAN SERVICES, LLC
7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828
www.EnviroCleanPS.com

DATE DRILLED 3/26/2014
DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. SVE06_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\BORELOGS\SVE06_BORELOG.dwg on Apr 17, 2014-6:12pm

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40 40.25	TOTAL DEPTH: 40.25 FEET							40.25	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

WATER TABLE (24 HOURS)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-6*

ENVIROCLEAN SERVICES, LLC

7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828

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DATE DRILLED 3/26/2014

DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE06_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SAND, DRY	CL	
	3.0	CALICHE: LIGHT GRAY TO WHITE, SOME BROWNS, HARD, DRY		
	5			
	10	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, CEMENTED, HARD, DRY	SC	
	15			
	19.0	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, STRAY GRAVELS, SLIGHTLY MOIST, HC ODOR	SC	
	20			
	25			
	30	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST, HC ODOR	SC	
	35			

OVM SOIL GAS PPM X 1.0
2 4 6 8 10 12 14 16 18

SAMPLE: NUMBER | OVM READING | RECOVERY | DEPTH

REMARKS
BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

CME CONTINUOUS AUGER SAMPLER
WATER TABLE (TIME OF BORING)
WATER TABLE (24 HOURS)
NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-7*

ENVIROCLEAN SERVICES, LLC
7060 S. Yale Ave., Suite 603 ▪ Tulsa, Oklahoma 74136 ▪ 918-794-7828
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DATE DRILLED 3/26/2014
DRILLING METHOD AIR ROTARY
DRILLED BY SCARBOROUGH DRILLING
LOGGED BY P.RICHARDSON
CHECKED BY P.RICHARDSON
DRAWING NO. SVE07_LOG
DRAWN BY: S.GRAUE
PAGE 1 OF 2

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\BORELOGS\SVE07_BORELOG.dwg on Apr 17, 2014–5:34pm

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: PINK, 7.5YR 8/3, 90% FINE SAND, 10% CLAY, LOOSE, SLIGHTLY MOIST, HC ODOR (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40									
	41.50	TOTAL DEPTH: 41.50 FEET							41.50	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-7*

ENVIROCLEAN SERVICES, LLC

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DATE DRILLED 3/26/2014

DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE07_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0	SILTY CLAY: BROWN, 7.5YR 4/2, 50% SILT, 40% CLAY, 10% FINE SANDS, DRY	CL	
	3.0	CALICHE: LIGHT GRAY TO WHITE, SOME BROWNS, HARD, DRY		
	9.0	SAND: PINK, 7.5YR 7/2, 90% FINE SAND, 10% CLAY, CEMENTED, HARD, DRY	SC	
	19.0	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, STRAY GRAVELS, SLIGHTLY MOIST, HC ODOR	SC	
	35			

OVM SOIL GAS PPM X 1.0

2 4 6 8 10 12 14 16 18

SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH

REMARKS

BACKGROUND OVM READING:

SOIL: _____ PPM

AIR: _____ PPM

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

WATER TABLE (24 HOURS)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-8*

ENVIRO CLEAN SERVICES, LLC

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DATE DRILLED 3/26/2014

DRILLING METHOD AIR ROTARY

DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE08_LOG

DRAWN BY: S.GRAUE PAGE 1 OF 2

Y:\Projects\Chesapeake\CHKHSTM101_StateM1well\04_CAD\BORELOGS\SVE08_BORELOG.dwg on Apr 17, 2014–5:55pm

BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 1.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
	35	SAND: GRAY, 2.5Y 5/1, 90% FINE SAND, 10% CLAY, LOOSE, STRAY GRAVELS, SLIGHTLY MOIST, HC ODOR (CONTINUED)	SC							BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	40									
	41.90	TOTAL DEPTH: 41.90 FEET							41.90	
	45									
	50									
	55									
	60									
	65									
	70									

CME CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

WATER TABLE (24 HOURS)

NR: NO RECOVERY

JOB NAME/NUMBER *CHESAPEAKE STATE M-1 CHKHSTM101*

BORING NUMBER *SVE-8*

ENVIROCLEAN SERVICES, LLC

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DRILLED BY SCARBOROUGH DRILLING

LOGGED BY P.RICHARDSON

CHECKED BY P.RICHARDSON DRAWING NO. SVE08_LOG

DRAWN BY: S.GRAUE PAGE 2 OF 2

APPENDIX D

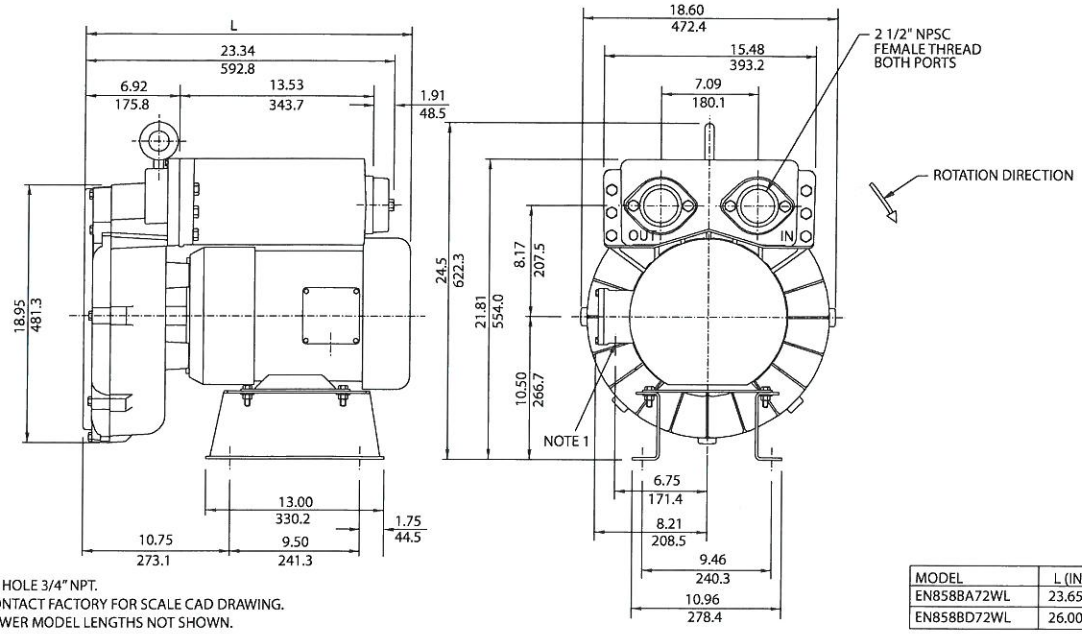
SVE SPECIFICATIONS

Environmental / Chemical Processing Blowers

ROTRON®

EN 858 & CP 858

7.5 / 10.0 HP Sealed Regenerative w/Explosion-Proof Motor



IN
MM

NOTES
1 TERMINAL BOX CONNECTOR HOLE 3/4" NPT.
2 DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3 CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

MODEL	L (IN/MM)
EN858BA72WL	23.65/600.7
EN858BD72WL	26.00/660.4

		Part/ Model Number			
		EN858BD72WL	EN858BD86WL	EN858BA72WL	CP858FZ72WLR
Specification	Units	038744	038745	080070	038980
Motor Enclosure - Shaft Mtl.	-	Explosion-proof-CS	Explosion-proof-CS	Explosion-proof-CS	Chem XP-SS
Horsepower	-	10.0	10.0	7.5	10.0
Phase - Frequency	-	Three-60 hz	Three-60 hz	Three-60 hz	Three-60 hz
Voltage	AC	230/460	575	230/460	230/460
Motor Nameplate Amps	Amps (A)	24/12	9.6	18.6/9.3	24/12
Max. Blower Amps	Amps (A)	30/15	11.6	26/13	30/15
Inrush Amps	Amps (A)	234/117	93	126/63	234/117
Service Factor	-	1.0	1.0	1.0	1.0
Starter Size	-	2/1	1	1/1	2/1
Thermal Protection	-	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty	Class B - Pilot Duty
XP Motor Class - Group	-	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G	I-D, II-F&G
Shipping Weight	Lbs Kg	338 153.3	338 153.3	326 147.9	338 153.3

Voltage - ROTRON motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

Operating Temperatures - Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

Maximum Blower Amps - Corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

XP Motor Class - Group - See Explosive Atmosphere Classification Chart in Section I

Sales department.

AMETEK TECHNICAL & INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477
USA: +1 215-256-6601 - Europe: +44 (0) 845 366 9664 - Asia: +86 21 5763 1258
Customer Service Fax: +1 215.256.1338
www.ametektip.com

AMETEK®
TECHNICAL & INDUSTRIAL PRODUCTS

Environmental / Chemical Processing Blowers

ROTRON®

EN 858 & CP 858

7.5 / 10.0 HP Sealed Regenerative w/Explosion-Proof Motor

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- Maximum flow: 380 SCFM
- Maximum pressure: 120 IWG
- Maximum vacuum: 95 IWG
- Standard motor: 10 HP, explosion-proof
- Cast aluminum blower housing, impeller , cover & manifold; cast iron flanges (threaded); teflon® lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

MOTOR OPTIONS

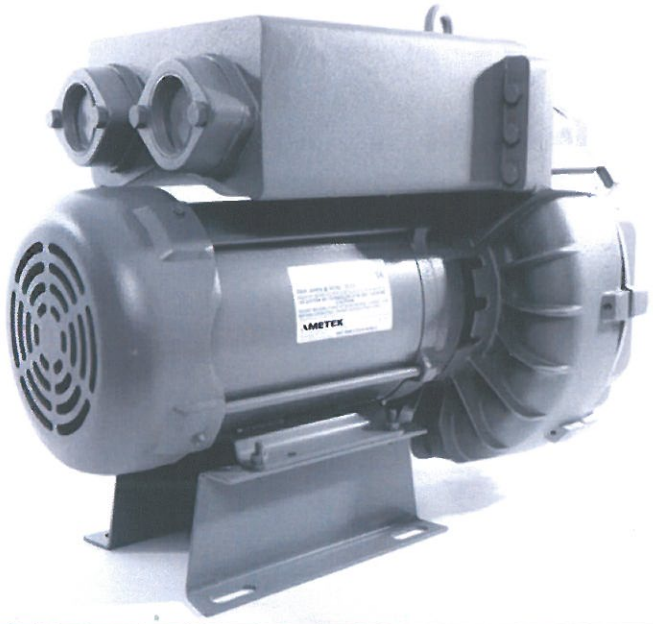
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS

- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

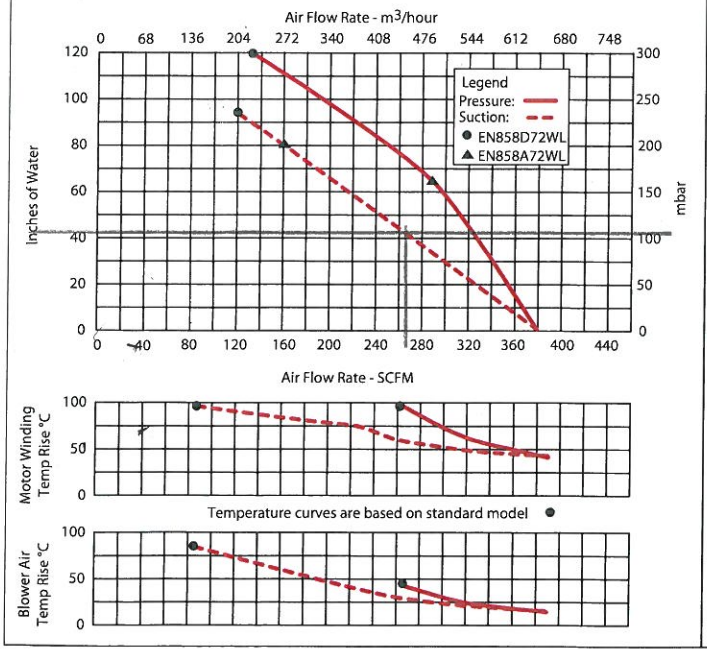
ACCESSORIES

- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

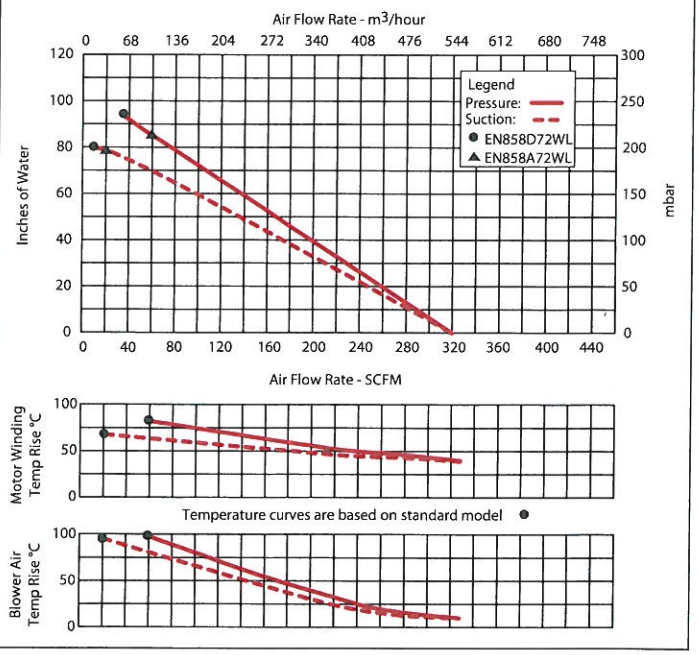


Blower Performance at Standard Conditions

60 Hz



50 Hz



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TECHNICAL & INDUSTRIAL PRODUCTS

APPENDIX E

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-54977-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: CHK State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Julie Czech

CathyGartner

Authorized for release by:
6/27/2014 5:42:06 PM

Cathy Gartner, Project Manager I
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-54977-1	MW-2	Water	06/06/14 08:05	06/10/14 08:30
490-54977-2	MW-7	Water	06/06/14 09:10	06/10/14 08:30
490-54977-3	MW-5	Water	06/06/14 10:25	06/10/14 08:30
490-54977-4	MW-3	Water	06/06/14 11:55	06/10/14 08:30
490-54977-5	MW-4	Water	06/06/14 13:25	06/10/14 08:30
490-54977-6	MW-6	Water	06/06/14 14:30	06/10/14 08:30
490-54977-7	MW-8	Water	06/06/14 15:20	06/10/14 08:30
490-54977-8	Dup	Water	06/06/14 00:01	06/10/14 08:30
490-54977-9	Eq Blank	Water	06/06/14 14:10	06/10/14 08:30

Job ID: 490-54977-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-54977-1

Comments
No additional comments.

Receipt
The samples were received on 6/10/2014 8:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.2º C.

HPLC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.

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
CFL	Contains Free Liquid
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 Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-2
Date Collected: 06/06/14 08:05
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17.7		1.00		mg/L			06/27/14 06:54	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-7
Date Collected: 06/06/14 09:10
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	42.7		1.00		mg/L			06/27/14 07:34	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-5
Date Collected: 06/06/14 10:25
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28.6		1.00		mg/L			06/27/14 07:55	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-3
Date Collected: 06/06/14 11:55
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	59.7		1.00		mg/L			06/27/14 08:15	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 06/06/14 13:25
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	586		10.0		mg/L			06/27/14 08:35	10

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-6
Date Collected: 06/06/14 14:30
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	282		20.0		mg/L			06/25/14 14:40	20

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 06/06/14 15:20
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	409		20.0		mg/L			06/25/14 15:00	20

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: Dup
Date Collected: 06/06/14 00:01
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	383		20.0		mg/L			06/25/14 15:20	20

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: Eq Blank
Date Collected: 06/06/14 14:10
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/25/14 15:40	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-172438/3
Matrix: Water
Analysis Batch: 172438

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/25/14 11:40	1

Lab Sample ID: LCS 490-172438/4
Matrix: Water
Analysis Batch: 172438

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.50		mg/L		103	90 - 110

Lab Sample ID: LCSD 490-172438/5
Matrix: Water
Analysis Batch: 172438

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	51.51		mg/L		103	90 - 110	0	20

Lab Sample ID: 490-54977-A-5 MS
Matrix: Water
Analysis Batch: 172438

Client Sample ID: 490-54977-A-5 MS
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	528		50.0	525.9	E 4	mg/L		-5	80 - 120

Lab Sample ID: MB 490-172966/3
Matrix: Water
Analysis Batch: 172966

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/27/14 05:54	1

Lab Sample ID: LCS 490-172966/4
Matrix: Water
Analysis Batch: 172966

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.55		mg/L		103	90 - 110

Lab Sample ID: LCSD 490-172966/5
Matrix: Water
Analysis Batch: 172966

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	51.98		mg/L		104	90 - 110	1	20

Lab Sample ID: 490-54977-1 MS
Matrix: Water
Analysis Batch: 172966

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	17.7		50.0	65.44		mg/L		95	80 - 120

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

HPLC/IC

Analysis Batch: 172438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54977-6	MW-6	Total/NA	Water	300.0	
490-54977-7	MW-8	Total/NA	Water	300.0	
490-54977-8	Dup	Total/NA	Water	300.0	
490-54977-9	Eq Blank	Total/NA	Water	300.0	
490-54977-A-5 MS	490-54977-A-5 MS	Total/NA	Water	300.0	
LCS 490-172438/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-172438/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 490-172438/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 172966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54977-1	MW-2	Total/NA	Water	300.0	
490-54977-1 MS	MW-2	Total/NA	Water	300.0	
490-54977-2	MW-7	Total/NA	Water	300.0	
490-54977-3	MW-5	Total/NA	Water	300.0	
490-54977-4	MW-3	Total/NA	Water	300.0	
490-54977-5	MW-4	Total/NA	Water	300.0	
LCS 490-172966/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-172966/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 490-172966/3	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-2
Date Collected: 06/06/14 08:05
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		172966	06/27/14 06:54	JHS	TAL NSH

Client Sample ID: MW-7
Date Collected: 06/06/14 09:10
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		172966	06/27/14 07:34	JHS	TAL NSH

Client Sample ID: MW-5
Date Collected: 06/06/14 10:25
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		172966	06/27/14 07:55	JHS	TAL NSH

Client Sample ID: MW-3
Date Collected: 06/06/14 11:55
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		172966	06/27/14 08:15	JHS	TAL NSH

Client Sample ID: MW-4
Date Collected: 06/06/14 13:25
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	10 mL		172966	06/27/14 08:35	JHS	TAL NSH

Client Sample ID: MW-6
Date Collected: 06/06/14 14:30
Date Received: 06/10/14 08:30

Lab Sample ID: 490-54977-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		172438	06/25/14 14:40	JHS	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Client Sample ID: MW-8

Lab Sample ID: 490-54977-7

Date Collected: 06/06/14 15:20
Matrix: Water
Date Received: 06/10/14 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		172438	06/25/14 15:00	JHS	TAL NSH

Client Sample ID: Dup

Lab Sample ID: 490-54977-8

Date Collected: 06/06/14 00:01
Matrix: Water
Date Received: 06/10/14 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		172438	06/25/14 15:20	JHS	TAL NSH

Client Sample ID: Eq Blank

Lab Sample ID: 490-54977-9

Date Collected: 06/06/14 14:10
Matrix: Water
Date Received: 06/10/14 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		172438	06/25/14 15:40	JHS	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-54977-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-15
Alaska (UST)	State Program	10	UST-087	07-24-14
Arizona	State Program	9	AZ0473	05-05-15
Arkansas DEQ	State Program	6	88-0737	04-25-15
California	NELAP	9	1168CA	10-31-14
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-14 *
Illinois	NELAP	5	200010	12-09-14
Iowa	State Program	7	131	05-01-14 *
Kansas	NELAP	7	E-10229	10-31-14
Kentucky (UST)	State Program	4	19	06-30-14 *
Louisiana	NELAP	6	30613	06-30-14 *
Maryland	State Program	3	316	03-31-15
Massachusetts	State Program	1	M-TN032	06-30-14 *
Minnesota	NELAP	5	047-999-345	12-31-14
Mississippi	State Program	4	N/A	06-30-14 *
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-14
New Hampshire	NELAP	1	2963	10-09-14
New Jersey	NELAP	2	TN965	06-30-15
New York	NELAP	2	11342	03-31-15
North Carolina (WW/SW)	State Program	4	387	12-31-14
North Dakota	State Program	8	R-146	06-30-14 *
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-14
Oregon	NELAP	10	TN200001	04-29-15
Pennsylvania	NELAP	3	68-00585	06-30-15
Rhode Island	State Program	1	LAO00268	12-30-14
South Carolina	State Program	4	84009 (001)	02-28-14 *
South Carolina (DW)	State Program	4	84009 (002)	02-23-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-14
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-14
Virginia	NELAP	3	460152	06-14-15
Washington	State Program	10	C789	07-19-14
West Virginia DEP	State Program	3	219	02-28-15
Wisconsin	State Program	5	998020430	08-31-14
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Certification renewal pending - certification considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-54977 Chain of Custody

Cooler Received/Opened On 6-10-14 @ 0830

1. Tracking # 2123 (last 4 digits, FedEx)
9621 01460
Courier: FedEx IR Gun ID ~~94660220~~ mdm 6-10-14

2. Temperature of rep. sample or temp blank when opened: 1.2 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA
If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA
Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

CHAIN OF CUSTODY RECORD

No. 00182

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM101	PROJECT NAME: CHK STATE M-1
SHIPPED TO: TA Nashville	PROJECT MANAGER: Bruce McKenzie
COC 1 of 1	TAT: STANDARD
ASOW: Loc: 490 54977	GEN/SUB: 750-521 PROP ID: 891077

SAMPLER'S PRINTED NAME: Terry Fisher

SAMPLER'S SIGNATURE:

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE (300)	REMARKS
6-6-14	805	MW-2	Water	1	X	01
6-6-14	910	MW-7	water	1	X	2
6-6-14	1025	MW-5	water	1	X	3
6-6-14	1155	MW-3	water	1	X	4
6-6-14	1325	MW-4	water	1	X	5
6-6-14	1430	MW-6	water	1	X	6
6-6-14	1520	MW-8	water	1	X	7
6-6-14	—	Dup	water	1	X	8
6-6-14	1410	Eq Blank	water	1	X	9

TOTAL NUMBER OF CONTAINERS → 9

RELINQUISHED BY: DATE 6-9-14 TIME 1350

RECEIVED BY: DATE 06/10/14 TIME 0830

RELINQUISHED BY: DATE TIME

RECEIVED BY: DATE TIME

METHOD OF SHIPMENT: FED-EX

AIRBILL NUMBER: 6038 1900 2123

RECEIVED IN LABORATORY BY: DATE TIME

Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at jczech@envirocleanps.com

LABORATORY CONTACT: (615) 726-0177

LABORATORY ADDRESS: 2960 Foster Creighton Dr., Nashville, TN 37204

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 490-54977-1
SDG Number: Property ID: 891077

Login Number: 54977
List Number: 1
Creator: Gambill, Shane

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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	1.2
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.	N/A	
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	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-62344-1
TestAmerica Sample Delivery Group: Property ID: 891077
Client Project/Site: CHK State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

Cathy Gartner

Authorized for release by:
10/14/2014 8:14:59 AM

Cathy Gartner, Project Manager I
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-62344-1	MW-1R	Water	09/25/14 11:40	09/26/14 09:00
490-62344-2	MW-2	Water	09/24/14 09:05	09/26/14 09:00
490-62344-3	MW-5	Water	09/24/14 10:15	09/26/14 09:00
490-62344-4	MW-3	Water	09/24/14 11:55	09/26/14 09:00
490-62344-5	MW-4	Water	09/24/14 13:20	09/26/14 09:00
490-62344-6	MW-8	Water	09/24/14 14:25	09/26/14 09:00
490-62344-7	MW-6	Water	09/24/14 15:40	09/26/14 09:00
490-62344-8	MW-7	Water	09/24/14 16:30	09/26/14 09:00
490-62344-9	EQ Blank	Water	09/24/14 13:30	09/26/14 09:00
490-62344-10	Dup	Water	09/24/14 00:01	09/26/14 09:00

Job ID: 490-62344-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-62344-1

Comments
No additional comments.

Receipt
The samples were received on 9/26/2014 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0º C.

HPLC/IC
Method(s) 300.0: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 196466 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
E	Result exceeded calibration range.
F1	MS and/or MSD Recovery 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
CFL	Contains Free Liquid
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 Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-1R
Date Collected: 09/25/14 11:40
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	51.4		1.00		mg/L			10/09/14 04:36	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-2
Date Collected: 09/24/14 09:05
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17.4		1.00		mg/L			10/09/14 05:36	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-5
Date Collected: 09/24/14 10:15
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.3		1.00		mg/L			10/09/14 05:56	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-3
Date Collected: 09/24/14 11:55
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	59.7		1.00		mg/L			10/09/14 06:16	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-4
Date Collected: 09/24/14 13:20
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	534		20.0		mg/L			10/09/14 06:36	20

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-8
Date Collected: 09/24/14 14:25
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	442		20.0		mg/L			10/09/14 06:56	20

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-6
Date Collected: 09/24/14 15:40
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	263		10.0		mg/L			10/11/14 15:46	10

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-7
Date Collected: 09/24/14 16:30
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.6		1.00		mg/L			10/09/14 07:36	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: EQ Blank
Date Collected: 09/24/14 13:30
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			10/09/14 07:56	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: Dup
Date Collected: 09/24/14 00:01
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-10
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	439		20.0		mg/L			10/09/14 08:16	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-196466/3
Matrix: Water
Analysis Batch: 196466

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			10/08/14 23:55	1

Lab Sample ID: LCS 490-196466/4
Matrix: Water
Analysis Batch: 196466

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.59		mg/L		101	90 - 110

Lab Sample ID: LCSD 490-196466/5
Matrix: Water
Analysis Batch: 196466

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	50.57		mg/L		101	90 - 110	0	20

Lab Sample ID: 490-62286-E-10 MS
Matrix: Water
Analysis Batch: 196466

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	ND		50.0	447.2	E F1	mg/L		894	80 - 120

Lab Sample ID: 490-62286-E-10 MSD
Matrix: Water
Analysis Batch: 196466

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	ND		50.0	449.0	E F1	mg/L		898	80 - 120	0	20

Lab Sample ID: MB 490-196925/3
Matrix: Water
Analysis Batch: 196925

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			10/11/14 12:54	1

Lab Sample ID: LCS 490-196925/4
Matrix: Water
Analysis Batch: 196925

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.97		mg/L		100	90 - 110

Lab Sample ID: LCSD 490-196925/5
Matrix: Water
Analysis Batch: 196925

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	50.09		mg/L		100	90 - 110	0	20

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

HPLC/IC

Analysis Batch: 196466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-62286-E-10 MS	Matrix Spike	Total/NA	Water	300.0	
490-62286-E-10 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	
490-62344-1	MW-1R	Total/NA	Water	300.0	
490-62344-2	MW-2	Total/NA	Water	300.0	
490-62344-3	MW-5	Total/NA	Water	300.0	
490-62344-4	MW-3	Total/NA	Water	300.0	
490-62344-5	MW-4	Total/NA	Water	300.0	
490-62344-6	MW-8	Total/NA	Water	300.0	
490-62344-8	MW-7	Total/NA	Water	300.0	
490-62344-9	EQ Blank	Total/NA	Water	300.0	
490-62344-10	Dup	Total/NA	Water	300.0	
LCS 490-196466/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-196466/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 490-196466/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 196925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-62344-7	MW-6	Total/NA	Water	300.0	
LCS 490-196925/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-196925/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 490-196925/3	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-1R
Date Collected: 09/25/14 11:40
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		196466	10/09/14 04:36	CLN	TAL NSH

Client Sample ID: MW-2
Date Collected: 09/24/14 09:05
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		196466	10/09/14 05:36	CLN	TAL NSH

Client Sample ID: MW-5
Date Collected: 09/24/14 10:15
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		196466	10/09/14 05:56	CLN	TAL NSH

Client Sample ID: MW-3
Date Collected: 09/24/14 11:55
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		196466	10/09/14 06:16	CLN	TAL NSH

Client Sample ID: MW-4
Date Collected: 09/24/14 13:20
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		196466	10/09/14 06:36	CLN	TAL NSH

Client Sample ID: MW-8
Date Collected: 09/24/14 14:25
Date Received: 09/26/14 09:00

Lab Sample ID: 490-62344-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		196466	10/09/14 06:56	CLN	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Client Sample ID: MW-6

Lab Sample ID: 490-62344-7

Date Collected: 09/24/14 15:40
Matrix: Water
Date Received: 09/26/14 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	10 mL		196925	10/11/14 15:46	JHS	TAL NSH

Client Sample ID: MW-7

Lab Sample ID: 490-62344-8

Date Collected: 09/24/14 16:30
Matrix: Water
Date Received: 09/26/14 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		196466	10/09/14 07:36	CLN	TAL NSH

Client Sample ID: EQ Blank

Lab Sample ID: 490-62344-9

Date Collected: 09/24/14 13:30
Matrix: Water
Date Received: 09/26/14 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		196466	10/09/14 07:56	CLN	TAL NSH

Client Sample ID: Dup

Lab Sample ID: 490-62344-10

Date Collected: 09/24/14 00:01
Matrix: Water
Date Received: 09/26/14 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		196466	10/09/14 08:16	CLN	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-62344-1
SDG: Property ID: 891077

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Oklahoma	State Program	6	9412	08-31-15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-62344 Chain of Custody

Cooler Received/Opened On : 9/26/2014 @ 0900

1. Tracking # 5166 (last 4 digits, FedEx)

Courier: Fed-ex IR Gun: 18290455

2. Temperature of rep. sample or temp blank when opened: 1.0 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 2 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES NO NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

CHAIN OF CUSTODY RECORD

No. 00201

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM101	PROJECT NAME: CHK STATE M-1	COC 1 of 1	
SHIPPED TO: TA Nashville	PROJECT MANAGER: Bruce McKenzie	TAT: STANDARD	

SAMPLER'S PRINTED NAME: Terry Fisher
SAMPLER'S SIGNATURE:

ASOW:
GEN/SUB: 750-521
PROP ID: 891077
Loc: 490
62344

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE (300)	REMARKS
9-25-14	1140	MW-1R	water	1	X	01
9-24-14	0905	MW-2	water	1	X	2
9-24-14	1015	MW-5	water	1	X	3
9-24-14	1155	MW-3	water	1	X	4
9-24-14	1320	MW-4	water	1	X	5
9-24-14	1425	MW-8	water	1	X	6
9-24-14	1540	MW-6	water	1	X	7
9-24-14	1630	MW-7	water	1	X	8
9-24-14	1330	EQ Blank	water	1	X	9
9-24-14	—	Dup	water	1	X	10

TOTAL NUMBER OF CONTAINERS → 10

RELINQUISHED BY:	DATE 9-25-14	RECEIVED BY: VITAN 1.0	DATE 09/26/14
	TIME 1400		TIME 0900
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME		TIME

METHOD OF SHIPMENT: FED-EX
AIRBILL NUMBER: Fedex 6169 5262 5166

RECEIVED IN LABORATORY BY: DATE / TIME

Send PDF, EDD, and INVOICE (if applicable) to:
JULIE CZECH at jczech@envirocleanps.com

LABORATORY CONTACT: (615) 726-0177
LABORATORY ADDRESS: 2960 Foster Creighton Dr., Nashville, TN 37204

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB
PAGE #2 - ENVIRO CLEAN PROJECT FILE
PAGE #3 - ENVIRO CLEAN QA/QC DEPT

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 490-62344-1
SDG Number: Property ID: 891077

Login Number: 62344
List Number: 1
Creator: Gambill, Shane

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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	1.0
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.	N/A	
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	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-68602-1
TestAmerica Sample Delivery Group: Property ID 891077
Client Project/Site: CHK STATE M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

Cathy Gartner

Authorized for release by:
12/31/2014 2:09:02 PM

Cathy Gartner, Project Manager I
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-68602-1	MW-R1	Water	12/11/14 10:00	12/13/14 08:45
490-68602-2	MW-2	Water	12/10/14 08:55	12/13/14 08:45
490-68602-3	MW-3	Water	12/10/14 13:30	12/13/14 08:45
490-68602-4	MW-4	Water	12/10/14 15:00	12/13/14 08:45
490-68602-5	MW-5	Water	12/10/14 12:30	12/13/14 08:45
490-68602-6	MW-6	Water	12/10/14 11:30	12/13/14 08:45
490-68602-7	MW-7	Water	12/10/14 10:10	12/13/14 08:45
490-68602-8	MW-8	Water	12/10/14 16:25	12/13/14 08:45
490-68602-9	EQ Blank	Water	12/10/14 13:50	12/13/14 08:45
490-68602-10	DUP	Water	12/10/14 00:01	12/13/14 08:45

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Job ID: 490-68602-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-68602-1

Comments
No additional comments.

Receipt
The samples were received on 12/13/2014 8:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.2º C.

HPLC/IC
Method(s) 300.0: The following samples were diluted due to the nature of the sample matrix: DUP (490-68602-10), MW-4 (490-68602-4), MW-6 (490-68602-6), MW-8 (490-68602-8), MW-R1 (490-68602-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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
CFL	Contains Free Liquid
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 Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-R1
Date Collected: 12/11/14 10:00
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	116		5.00		mg/L			12/30/14 00:01	5

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-2
Date Collected: 12/10/14 08:55
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18.3		1.00		mg/L			12/30/14 00:21	1

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-3
Date Collected: 12/10/14 13:30
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	58.9		1.00		mg/L			12/30/14 01:01	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-4
Date Collected: 12/10/14 15:00
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	535		20.0		mg/L			12/30/14 01:21	20

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-5
Date Collected: 12/10/14 12:30
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.9		1.00		mg/L			12/30/14 01:41	1

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-6
Date Collected: 12/10/14 11:30
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	268		10.0		mg/L			12/30/14 02:01	10

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-7
Date Collected: 12/10/14 10:10
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	36.0		1.00		mg/L			12/30/14 02:21	1

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-8
Date Collected: 12/10/14 16:25
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	463		20.0		mg/L			12/30/14 02:41	20

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: EQ Blank
Date Collected: 12/10/14 13:50
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/30/14 03:01	1

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: DUP
Date Collected: 12/10/14 00:01
Date Received: 12/13/14 08:45

Lab Sample ID: 490-68602-10
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	466		20.0		mg/L			12/30/14 03:21	20

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-217429/3
Matrix: Water
Analysis Batch: 217429

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/29/14 23:01	1

Lab Sample ID: LCS 490-217429/4
Matrix: Water
Analysis Batch: 217429

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			50.0	49.46		mg/L		99	90 - 110		

Lab Sample ID: LCSD 490-217429/5
Matrix: Water
Analysis Batch: 217429

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			50.0	49.54		mg/L		99	90 - 110	0	20

Lab Sample ID: 490-68602-2 MS
Matrix: Water
Analysis Batch: 217429

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	18.3		50.0	61.81		mg/L		87	80 - 120		

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

HPLC/IC

Analysis Batch: 217429

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-68602-1	MW-R1	Total/NA	Water	300.0	
490-68602-2	MW-2	Total/NA	Water	300.0	
490-68602-2 MS	MW-2	Total/NA	Water	300.0	
490-68602-3	MW-3	Total/NA	Water	300.0	
490-68602-4	MW-4	Total/NA	Water	300.0	
490-68602-5	MW-5	Total/NA	Water	300.0	
490-68602-6	MW-6	Total/NA	Water	300.0	
490-68602-7	MW-7	Total/NA	Water	300.0	
490-68602-8	MW-8	Total/NA	Water	300.0	
490-68602-9	EQ Blank	Total/NA	Water	300.0	
490-68602-10	DUP	Total/NA	Water	300.0	
LCS 490-217429/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 490-217429/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 490-217429/3	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-R1

Lab Sample ID: 490-68602-1

Date Collected: 12/11/14 10:00

Matrix: Water

Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		5	10 mL		217429	12/30/14 00:01	JHS	TAL NSH

Client Sample ID: MW-2

Lab Sample ID: 490-68602-2

Date Collected: 12/10/14 08:55

Matrix: Water

Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		217429	12/30/14 00:21	JHS	TAL NSH

Client Sample ID: MW-3

Lab Sample ID: 490-68602-3

Date Collected: 12/10/14 13:30

Matrix: Water

Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		217429	12/30/14 01:01	JHS	TAL NSH

Client Sample ID: MW-4

Lab Sample ID: 490-68602-4

Date Collected: 12/10/14 15:00

Matrix: Water

Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		217429	12/30/14 01:21	JHS	TAL NSH

Client Sample ID: MW-5

Lab Sample ID: 490-68602-5

Date Collected: 12/10/14 12:30

Matrix: Water

Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		217429	12/30/14 01:41	JHS	TAL NSH

Client Sample ID: MW-6

Lab Sample ID: 490-68602-6

Date Collected: 12/10/14 11:30

Matrix: Water

Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	10 mL		217429	12/30/14 02:01	JHS	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Client Sample ID: MW-7

Lab Sample ID: 490-68602-7

Date Collected: 12/10/14 10:10
Matrix: Water
Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		217429	12/30/14 02:21	JHS	TAL NSH

Client Sample ID: MW-8

Lab Sample ID: 490-68602-8

Date Collected: 12/10/14 16:25
Matrix: Water
Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		217429	12/30/14 02:41	JHS	TAL NSH

Client Sample ID: EQ Blank

Lab Sample ID: 490-68602-9

Date Collected: 12/10/14 13:50
Matrix: Water
Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		217429	12/30/14 03:01	JHS	TAL NSH

Client Sample ID: DUP

Lab Sample ID: 490-68602-10

Date Collected: 12/10/14 00:01
Matrix: Water
Date Received: 12/13/14 08:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		20	10 mL		217429	12/30/14 03:21	JHS	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Enviro Clean Services LLC
Project/Site: CHK STATE M-1

TestAmerica Job ID: 490-68602-1
SDG: Property ID 891077

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Oklahoma	State Program	6	9412	08-31-15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-68602 Chain of Custody

Cooler Received/Opened On : 12/12/2014 @ 0845

1. Tracking # 1517 (last 4 digits, FedEx)

Courier: Fed-ex IR Gun: 97310166

2. Temperature of rep. sample or temp blank when opened: 1.2 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? (YES) NO NA

If yes, how many and where: 1 Front / 1 Back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES (NO) and Intact YES NO (NA)

Were these signed and dated correctly? YES NO (NA)

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other (None)

9. Cooling process: Ice Ice-pack (Ice (direct contact)) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13a. Were VOA vials received? YES (NO) NA

b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) DA

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO (NA)

b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) DA

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) DA

I certify that I attached a label with the unique LIMS number to each container (intial) DA

21. Were there Non-Conformance issues at login? YES (NO) Was a NCM generated? YES (NO) #_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

CHAIN OF CUSTODY RECORD

No. 00181

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER: CHKHSTM101	PROJECT NAME: CHK STATE M-1	COC ____ of ____	
SHIPPED TO: TA Nashville	PROJECT MANAGER: Bruce McKenzie	TAT: STANDARD	

SAMPLER'S PRINTED NAME: Terry Fisher
SAMPLER'S SIGNATURE: Terry Fisher

ASOW: GENSUB: 750-521
PROP ID: 891077
Loc: 490
68602

	Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE (300)	REMARKS
1	12-11-14	1000	MW-R1	water	1	X	MW-R1 has Product
2	12-10-14	0855	MW-2	water	1	X	IN the well And Sample
3	12-10-14	1330	MW-3	water	1	X	
4	12-10-14	1500	MW-4	water	1	X	
5	12-10-14	1230	MW-5	water	1	X	
6	12-10-14	1130	MW-6	water	1	X	
7	12-10-14	1010	MW-7	water	1	X	
8	12-10-14	1625	MW-8	water	1	X	
9	12-10-14	1350	EQ Blank	water	1	X	
10	12-10-14	—	Dup	water	1	X	

TOTAL NUMBER OF CONTAINERS →

RELINQUISHED BY: Terry Fisher	DATE 12-11-14	RECEIVED BY: TAN	DATE 12-12-14	Temp: 1.2
	TIME 1800		TIME 0845	
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE	
	TIME		TIME	

METHOD OF SHIPMENT: FED-EX
AIRBILL NUMBER:

RECEIVED IN LABORATORY BY: DATE / TIME
Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at jczech@envirocleanps.com

LABORATORY CONTACT: (615) 726-0177
LABORATORY ADDRESS: 2960 Foster Creighton Dr., Nashville, TN 37204

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER: _____

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 490-68602-1
SDG Number: Property ID 891077

Login Number: 68602
List Number: 1
Creator: Armstrong, Daniel

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
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	1.2C
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.	N/A	
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	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-74229-1
TestAmerica Sample Delivery Group: Property ID 891077
Client Project/Site: CHK State M-1

For:
Enviro Clean Services LLC
7060 S. Yale Avenue, Suite 603
Tulsa, Oklahoma 74136

Attn: Ms. Julie Czech

CathyGartner

Authorized for release by:
3/23/2015 1:31:31 PM

Cathy Gartner, Project Manager I
(615)301-5041
cathy.gartner@testamericainc.com

Table of Contents

Sample Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-74229-1	MW-2	Water	03/11/15 09:10	03/13/15 09:00
490-74229-2	MW-5	Water	03/11/15 10:20	03/13/15 09:00
490-74229-3	MW-3	Water	03/11/15 11:35	03/13/15 09:00
490-74229-4	MW-4	Water	03/11/15 12:55	03/13/15 09:00
490-74229-5	MW-8	Water	03/11/15 14:35	03/13/15 09:00
490-74229-6	MW-6	Water	03/11/15 16:00	03/13/15 09:00
490-74229-7	MW-7	Water	03/11/15 16:55	03/13/15 09:00
490-74229-8	MW-1R	Water	03/12/15 11:30	03/13/15 09:00
490-74229-9	Eq Blank	Water	03/11/15 13:08	03/13/15 09:00
490-74229-10	Dup	Water	03/11/15 00:01	03/13/15 09:00

Job ID: 490-74229-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-74229-1

Comments
No additional comments.

Receipt
The samples were received on 3/13/2015 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 0.8º C.

HPLC/IC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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
CFL	Contains Free Liquid
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: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-2
Date Collected: 03/11/15 09:10
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16.6		1.00		mg/L			03/20/15 05:52	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-5
Date Collected: 03/11/15 10:20
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-2
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	26.1		1.00		mg/L			03/20/15 06:52	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-3
Date Collected: 03/11/15 11:35
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-3
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	57.0		1.00		mg/L			03/20/15 07:12	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-4
Date Collected: 03/11/15 12:55
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-4
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	543		10.0		mg/L			03/20/15 11:13	10

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-8
Date Collected: 03/11/15 14:35
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-5
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	485		1.00		mg/L			03/20/15 07:52	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-6
Date Collected: 03/11/15 16:00
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-6
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	261		1.00		mg/L			03/20/15 08:12	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-7
Date Collected: 03/11/15 16:55
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-7
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	39.7		1.00		mg/L			03/20/15 08:33	1

Client Sample Results

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-1R
Date Collected: 03/12/15 11:30
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-8
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	39.0		1.00		mg/L			03/20/15 09:30	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: Eq Blank
Date Collected: 03/11/15 13:08
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-9
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/20/15 08:53	1

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: Dup
Date Collected: 03/11/15 00:01
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-10
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	483		1.00		mg/L			03/20/15 10:33	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 490-235032/3
Matrix: Water
Analysis Batch: 235032

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/20/15 03:08	1

Lab Sample ID: LCS 490-235032/4
Matrix: Water
Analysis Batch: 235032

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.36		mg/L		99	90 - 110

Lab Sample ID: 490-74199-C-1 MS
Matrix: Water
Analysis Batch: 235032

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	4.81		100	102.8		mg/L		98	80 - 120

Lab Sample ID: 490-74199-C-1 MSD
Matrix: Water
Analysis Batch: 235032

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	4.81		100	107.9		mg/L		103	80 - 120	5	20

Lab Sample ID: MB 490-235060/3
Matrix: Water
Analysis Batch: 235060

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			03/20/15 05:12	1

Lab Sample ID: LCS 490-235060/4
Matrix: Water
Analysis Batch: 235060

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100.4		mg/L		100	90 - 110

Lab Sample ID: 490-74229-1 MS
Matrix: Water
Analysis Batch: 235060

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	16.6		100	112.6		mg/L		96	80 - 120

Lab Sample ID: 490-74229-1 MSD
Matrix: Water
Analysis Batch: 235060

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	16.6		100	117.4		mg/L		101	80 - 120	4	20

QC Association Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

HPLC/IC

Analysis Batch: 235032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-74199-C-1 MS	Matrix Spike	Total/NA	Water	300.0	
490-74199-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	
490-74229-8	MW-1R	Total/NA	Water	300.0	
LCS 490-235032/4	Lab Control Sample	Total/NA	Water	300.0	
MB 490-235032/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 235060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-74229-1	MW-2	Total/NA	Water	300.0	
490-74229-1 MS	MW-2	Total/NA	Water	300.0	
490-74229-1 MSD	MW-2	Total/NA	Water	300.0	
490-74229-2	MW-5	Total/NA	Water	300.0	
490-74229-3	MW-3	Total/NA	Water	300.0	
490-74229-4	MW-4	Total/NA	Water	300.0	
490-74229-5	MW-8	Total/NA	Water	300.0	
490-74229-6	MW-6	Total/NA	Water	300.0	
490-74229-7	MW-7	Total/NA	Water	300.0	
490-74229-9	Eq Blank	Total/NA	Water	300.0	
490-74229-10	Dup	Total/NA	Water	300.0	
LCS 490-235060/4	Lab Control Sample	Total/NA	Water	300.0	
MB 490-235060/3	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-2
Date Collected: 03/11/15 09:10
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235060	03/20/15 05:52	CLN	TAL NSH

Client Sample ID: MW-5
Date Collected: 03/11/15 10:20
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235060	03/20/15 06:52	CLN	TAL NSH

Client Sample ID: MW-3
Date Collected: 03/11/15 11:35
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235060	03/20/15 07:12	CLN	TAL NSH

Client Sample ID: MW-4
Date Collected: 03/11/15 12:55
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	10 mL		235060	03/20/15 11:13	CLN	TAL NSH

Client Sample ID: MW-8
Date Collected: 03/11/15 14:35
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235060	03/20/15 07:52	CLN	TAL NSH

Client Sample ID: MW-6
Date Collected: 03/11/15 16:00
Date Received: 03/13/15 09:00

Lab Sample ID: 490-74229-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235060	03/20/15 08:12	CLN	TAL NSH

Lab Chronicle

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Client Sample ID: MW-7

Lab Sample ID: 490-74229-7

Date Collected: 03/11/15 16:55
Matrix: Water
Date Received: 03/13/15 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235060	03/20/15 08:33	CLN	TAL NSH

Client Sample ID: MW-1R

Lab Sample ID: 490-74229-8

Date Collected: 03/12/15 11:30
Matrix: Water
Date Received: 03/13/15 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235032	03/20/15 09:30	JHS	TAL NSH

Client Sample ID: Eq Blank

Lab Sample ID: 490-74229-9

Date Collected: 03/11/15 13:08
Matrix: Water
Date Received: 03/13/15 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL		235060	03/20/15 08:53	CLN	TAL NSH

Client Sample ID: Dup

Lab Sample ID: 490-74229-10

Date Collected: 03/11/15 00:01
Matrix: Water
Date Received: 03/13/15 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	10 mL	1.0 mL	235060	03/20/15 10:33	CLN	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Enviro Clean Services LLC
Project/Site: CHK State M-1

TestAmerica Job ID: 490-74229-1
SDG: Property ID 891077

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Oklahoma	State Program	6	9412	08-31-15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-74229 Chain of Custody

Cooler Received/Opened On 3/13/2015 @ 0900

1. Tracking # 8280 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 18290455

2. Temperature of rep. sample or temp blank when opened: 0.8 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 (Front) 1 (back)

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a PIPE generated? YES...NO...#_____

BIS = Broken in shipment

CHAIN OF CUSTODY RECORD

No. 00222

ENVIRO CLEAN SERVICES, LLC
(918) 794-7828

PROJECT NUMBER:	CHKHSTM101
PROJECT NAME:	CHK STATE M-1
COC	1 of 1
SHIPPED TO:	TA Nashville
PROJECT MANAGER:	Bruce McKenzie
TAT:	STANDARD
SAMPLER'S PRINTED NAME:	TERRY Fisher
SAMPLER'S SIGNATURE:	
ASOW:	GEN/SUB: 750-521 PROP ID: 891077

Loc: 490
74229

Date	Time	Sample ID	Sample Matrix	# of Sample Containers	CHLORIDE (300)										REMARKS
3-11-15	910	MW-2	WATER	1	X									01	
3-11-15	1020	MW-5	WATER	1	X									2	MW-1R HAS Free Phase
3-11-15	1135	MW-3	WATER	1	X									3	
3-11-15	1255	MW-4	WATER	1	X									4	
3-11-15	1435	MW-8	WATER	1	X									5	
3-11-15	1600	MW-6	WATER	1	X									6	
3-11-15	1655	MW-7	WATER	1	X									7	
3-12-15	1130	MW-1R	WATER	1	X									8	
3-11-15	1308	EQ Blank	WATER	1	X									9	
3-11-15	—	Dup	WATER	1	X									10	
TOTAL NUMBER OF CONTAINERS →				10											

RELINQUISHED BY:	DATE 3-12-15	RECEIVED BY: 0,8	DATE 03/13/15
	TIME 1800		TIME 0900
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	TIME		TIME

METHOD OF SHIPMENT: FED-EX	AIRBILL NUMBER: 6329 1252 8280
RECEIVED IN LABORATORY BY:	DATE / TIME
	Send PDF, EDD, and INVOICE (if applicable) to: JULIE CZECH at jczech@envirocleanps.com
LABORATORY CONTACT: (615) 726-0177	LABORATORY ADDRESS: 2960 Foster Creighton Dr., Nashville, TN 37204

POINT OF ORIGIN: ☐ OKLAHOMA CITY ☒ TULSA ☐ NORMAN ☐ WOODWARD ☐ ARLINGTON ☐ MIDLAND ☐ OTHER:

PAGE #1 - RECEIVING LAB | PAGE #2 - ENVIRO CLEAN PROJECT FILE | PAGE #3 - ENVIRO CLEAN QA/QC DEPT

Login Sample Receipt Checklist

Client: Enviro Clean Services LLC

Job Number: 490-74229-1
SDG Number: Property ID 891077

Login Number: 74229
List Number: 1
Creator: Gambill, Shane

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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	0.8
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.	N/A	
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	