AP - 104

2011 AGWMR

OCT 2012

BUCKEYE VACUUM FIELD UNIT SITE--2011 ANNUAL GROUNDWATER MONITORING REPORT

SECTION 1--TOWNSHIP 18 SOUTH--RANGE 34 EAST LEA COUNTY, NM

Formerly NMOCD Groundwater Discharge Permit GW-029

Prepared for:

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1.0 INTRODUCTION

This annual report is a review of ground water monitoring at Buckeye Vacuum field Unit Site during 2011. Conestoga-Rovers & Associates, Inc. (CRA) has prepared this report on behalf of Chevron Environmental Management Company (CEMC). Data presented in this report were gathered during two semi-annual groundwater monitoring events that began on April 12 and on October 17, 2011.

The Buckeye Vacuum Field Unit Site is located in Section 1 of Township 18 South, Range 34 East in Lea County, New Mexico. Latitudinal and longitudinal coordinates are 32°46'57.05"N and 103°30'26.67"W, respectively. A map showing the general location of the site is in FIGURE 1.

2.0 HISTORY OF ACTIVITIES AT THE SITE

In 1989 twenty-three monitor wells (TW-1 through TW-23) were installed at Buckeye Vacuum to determine the source and delineate the extent of chloride concentrations in groundwater. Production well VG SAU #58 was determined to be the source of elevated chloride concentrations. The production well was repaired in 1990 and plugged and abandoned in 2000. To remediate the chloride groundwater impacts, two extraction wells, RW-1 and RW-2, were installed in proximity to VG SAU #58 and pumped continuously to remediate groundwater at the site. Water produced from these recovery wells was used in the waterflood operation in the Buckeye Unit.

Groundwater monitoring activities of all monitoring wells and the two extraction wells were conducted from 1990 through 1998. Thirteen monitoring wells were plugged and abandoned in 1999. Ten monitor wells remain—TW-9, TW-10, TW-11, TW-13, TW-14, TW-15, TW-17, TW-19, TW-20, and TW-23. These wells are shown on FIGURE 2. Nine of the remaining monitoring wells were sampled on a quarterly basis, while monitoring well TW-23 was sampled on a monthly basis. Six monitoring wells and RW-1 and RW-2 were sampled on a semi-annual frequency during 2000 and 2001 at the direction of the NMOCD, while TW-23 was sampled each quarter. Pumping from extraction wells RW-1 and RW-2 ceased in 2001, and a third extraction well, RW-3, was installed immediately adjacent to VG SAU #58 in 2001. Groundwater recovery from extraction well RW-3 was initiated shortly after installation. Water produced from RW-3 was also used in the waterflood operation in the Buckeye Unit.

The NMOCD directed that groundwater monitoring activities needed to continue during 2002. Closure of the site, which was requested by Chevron in December 2002, was denied by the NMOCD in March 2003.

Groundwater monitoring activities at Buckeye Vacuum continued during 2003. The number of wells and frequency of sampling was reduced in 2004 and continued that way through 2009. The monitoring schedule was again reduced in 2010 with approval by the NMOCD such that TW-10, TW-13, TW-14, TW-17, and RW-3 were analyzed for dissolved chloride only.

CRA was retained by CEMC to conduct activities at Buckeye Vacuum Field Unit Site in November 2010. Groundwater monitoring was conducted at wells TW-10, TW-13, TW-14, and RW-3 during 2011. TW-17 was not monitored in 2011 because its analytical history had demonstrated consistent levels of chloride and total dissolved solids (TDS) well below standards required by the New Mexico Water Quality Control Commission (NMWQCC). TDS was returned to the monitoring program because of increasing concentrations of TDS in TW-10, TW-13, and TW-14 during 2008 and 2009.

3.0 REGULATORY FRAMEWORK

The New Mexico Oil Conservation Division of the New Mexico Energy, Minerals, and Natural Resources Department (NMOCD) has regulatory jurisdiction over corrective actions being conducted at the Buckeye Vacuum Field Unit Site. Corrective actions follow guidance given by the NMOCD in *Guidelines for Remediation of Leaks, Spills, and Releases (August 13, 1993)*. These guidelines require remediation of groundwater to the human health standards of the New Mexico Water Quality Control Commission (NMWQCC) set forth in New Mexico Administrative Code (NMAC) 20.6.2.2103B that are shown in the following table.

Analyte	*NMWQCC Standard for Groundwater (mg/L)*
Chloride	250
Total Dissolved Solids	1000

4.0 GROUNDWATER MONITORING

The Buckeye Vacuum Field Unit Site includes 10 active monitor wells and three extraction wells. They are shown on FIGURE 2. Three monitor wells and one recovery well, TW-10, TW-13, TW-14, and RW-3, were both gauged and sampled during 2011. Groundwater at the site was monitored during two semi-annual events during 2011. The first took place on April 12. The second groundwater monitoring event was conducted on October 17 and 18.

4.1 FIELD METHODOLOGY

Fluid levels were measured before purging and sampling. They were measured to the nearest hundredth of a foot with an electronic water level meter. Fluid levels were measured from the permanent reference point on the top of the casing in each well or from the north side of the top of the casing where no permanent reference point had been marked.

Depth to water was measured, and conductivity was measured and recorded at intervals of 2 feet or 5 feet below the water table in each monitor well before any well was purged. A Solinst water level meter with a conductivity sensor was used for these purposes. Each monitor well was purged and sampled from the depth of the highest measured conductivity using a low-flow pump. Temperature, conductivity, and pH of purge water were measured during purging using a YSL 556MPS or a Hach MP60 meter. Purging continued until temperature, conductivity, and pH stabilized within 10% of previous readings. Recovery well RW-3 was purged and sampled through the sample port on the wellhead while the well was pumping. Temperature, conductivity, and pH of purge water from RW-3 were monitored as when purging the monitor wells. A sample was then collected from the sample port at RW-3. Each sample was labeled, recorded on a chain-of-custody form, and placed on ice in a cooler to maintain a temperature of 40°F (4°C) or lower. Field equipment was decontaminated with a Liquinox™ wash and distilled water rinse before beginning field activities and between wells. Samples of groundwater collected during the first monitoring event were sent for analyses to ALS Environmental in Houston, Texas. Samples of groundwater collected during the second monitoring event were submitted to Xenco Laboratories in Odessa, Texas for analyses. Proper chain-of-custody documentation was maintained throughout sampling and analytical processes and analyses were completed within required holding times.

Samples collected during 2011 were analyzed for dissolved chloride according to method EPA300.0 and for total dissolved solids (TDS) by method SM2540C.

4.2 POTENTIOMETRIC SURFACE AND GRADIENT

Fluid level measurements collected during 2011 are shown in TABLE I. Elevations of tops of casings are shown in feet above mean sea level (famsl). Elevations of the

potentiometric surface are also shown in famsl. The range of elevations on the potentiometric surface during the first semi-annual monitoring event in April was from 3856.27 famsl (TW-20) to 3859.16 famsl (TW-11). The map of elevations of the potentiometric surface during the first semi-annual monitoring event is shown in FIGURE 3. It indicates that the direction of flow of groundwater at that time was toward the Northeast. The magnitude of the gradient was 0.0042 ft./ft.

The range of elevations on the potentiometric surface during the second monitoring event on October 18 was from 3855.75 famsl (TW-10) to 3857.65 famsl (TW-11). The map of elevations of the potentiometric surface on October 17 and 18 is shown in FIGURE 4. This map indicates that the direction of flow of groundwater was also to the Northeast. Its magnitude was 0.0035 ft./ft.

Directions of the gradient on the potentiometric surface have remained consistently toward the Northeast during 2011 as they had since 2009. Magnitude of the gradients became slightly shallower—from 0.0042 ft./ft. to 0.0035 ft./ft. in April and October, respectively. Comparison of gauging data from the two monitoring events in October 2010 and October 2011 indicates that the potentiometric surface decreased in elevation in all wells that were measured during both monitoring events. The range of decline was 0.76 ft. to 1.71 ft. The average decline among those wells was 1.08 feet.

4.3 RESULTS OF ANALYSES OF DISSOLVED-PHASE CONTAMINANTS IN GROUNDWATER

Samples of groundwater were collected from wells TW-10, TW-13, TW-14, and RW-3 during monitoring events in both April and October 2011. A cumulative table of all available results of analyses of groundwater samples collected at the Buckeye Vacuum Field Unit Site is shown in TABLE II. Chemicals of Concern (COCs) are shown in columns across the top of the table. Appropriate standards are shown below the names of analytes. Analytical results for the first monitoring event, April 12, 2011, are shown in map form on FIGURE 5. Analytical results of the second monitoring event, in October 2011, have been compiled in TABLE II and shown in map form on FIGURE 6.

Trends of concentrations of chemicals of concern over time are shown in APPENDIX A. Copies of signed analytical reports and chains-of-custody are attached in APPENDIX B. Dissolved chloride was present in wells TW-10 and RW-3 in concentrations above the NMWQCC standard of 250 mg/L, during both monitoring events in 2011. The trend in TW-10 continued to be increasing during 2011, while that in RW-3 continued a decreasing trend during 2011. Dissolved chloride concentrations in TW-13 and TW-14 were below the NMWQCC standard during 2011. The trend in TW-13 was stable, while the trend in TW-14 was declining. Since dissolved chloride concentrations in TW-10 exceed the NMWQCC standard for chloride and data were not collected from TW-9 or TW-20 during 2011, delineation on the down-gradient side of chloride plume could not be demonstrated.

Total dissolved solids (TDS) were detected in concentrations exceeding the NMWQCC standard of 1000 mg/L in the samples collected from TW-10 and RW-3 during the first semi-annual monitoring event in April 2011; however, concentrations in both wells were below the standard during the second monitoring event; that is, both wells showed decreasing trends in 2011. Concentrations of TDS in TW-13 and TW-14 were below the standard in both monitoring events during 2011 and showed declining trends.

5.0 GROUNDWATER REMEDIATION AND PERFORMANCE

Concentrations of dissolved chloride in RW-3 remained above the NMWQCC standard; however, intermittent pumping of water from RW-3 to use in the waterflood operation in the Buckeye Vacuum Field Production Unit reduced the level in RW-3 to 392 mg/L in October 2011. That is the lowest level since 2007. Pumping from RW-3 during 2011 also reversed the increasing trend of total dissolved solids above the NMWQCC standard of 1000 mg/L to a decreasing trend below the standard. Monitor well TW-10 showed an increasing trend of dissolved chloride concentrations above the NMWQCC standard. TDS in TW-10 was above the standard in April 2011 but below the standard in October 2011. Both dissolved chloride and TDS in TW-13 and TW-14 remained below the NMWQCC standards during 2011.

6.0 PLANNED ACTIVITIES

Semi-annual gauging and sampling was conducted in April 2012 and will also be conducted in October of this year. TW-10, TW-13, TW-14, and RW-3 will be included in the semi-annual monitoring plan. TW-9 and TW-20 will be added to the monitoring program in light of the elevated concentrations of dissolved chloride and TDS in TW-10 during 2011. TW-9 and TW-20 will be monitored until TW-10 again provides downgrandient delineation for the contaminant plume. Monitoring will include measurements of fluid levels and collection of samples of groundwater. Dissolved chloride and total dissolved solids continue to be constituents of concern at the Buckeye Vacuum Field Unit Site, and samples will be analyzed for them according to analytical methods EPA300.0 and SM2540C, respectively.

Withdrawal of groundwater from RW-3 will continue for use in the water flood system of the Chevron Buckeye Vacuum Field Production Unit. Pump testing will be conducted in RW-3 to determine the extent to which groundwater removal can be increased to further reduce concentrations of dissolved chloride and TDS in RW-3 and the surrounding area.

Results of the two semi-annual groundwater monitoring events at the Buckeye Vacuum Field Unit Site during 2012 will be summarized in an annual report for submission to the NMOCD. The report will include tabulated data from gauging activities; tabulated results of chemical analyses; maps of groundwater gradients and maps of constituents of concern for each monitoring event; and recommendations to expedite the site toward closure. Activities conducted to determine the potential to increase the volume of groundwater pumped from RW-3 will also be reported.

7.0 SUMMARY OF FINDINGS

Based on activities conducted at the Buckeye Vacuum Field Unit Site in 2011, CRA presents the following summary of findings:

- Groundwater monitoring was conducted by CRA on a semi-annual basis in 2011. The first monitoring event of occurred on April 12. Fluid level measurements were collected from TW-9, TW-10, TW-11, TW-13, and TW-14, TW-15, TW-19, TW-20, and TW-23. Samples of groundwater were collected from TW-10, TW-13, TW-14, and RW-3. FIGURE 3 indicates that the direction of flow of groundwater during the April 2011 was toward the Northeast. The magnitude of the gradient was 0.0042 ft./ft.

- The second semi-annual event was conducted on October 17 and 18. Fluid levels and samples of groundwater were collected from monitor wells TW-10, TW-13, and TW-14. A sample of groundwater was also collected from RW-3. FIGURE 4 indicates that the direction of flow of groundwater was northeastward. The magnitude of the gradient was 0.0035 ft./ft.

- The elevations of the potentiometric surface fell in all monitor wells at the site that were gauged during both October 2010 and October 2011. The elevation of the potentiometric surface declined by an average of 1.08 feet during that period.

- Concentrations of dissolved chloride were above the NMWQCC standard of 250 mg/L in wells TW-10 and RW-3 during both monitoring events in 2011. The trend of chloride levels was decreasing in RW-3, while that in TW-10 was increasing. Levels of dissolved chloride in TW-13 and TW-14 were below the NMWQCC standard and had stable or decreasing trends.

- Concentrations of TDS exceeded the NMWQCC standard of 1000 mg/L in the samples collected from TW-10 and RW-3 during April 2011. Concentrations in both wells had decreased to levels below the standard by October 2011. TDS levels in TW-13 and TW-14 were below the standard throughout 2011 and showed declining trends.

- Since discovery of a release of high-chloride water from subsurface casing in oil production well VG SAU #58 in 1989, the area of impact of dissolved chloride and total dissolved solids in groundwater exceeding the NMWQCC standard continues to be reduced by pumping groundwater from RW-3.

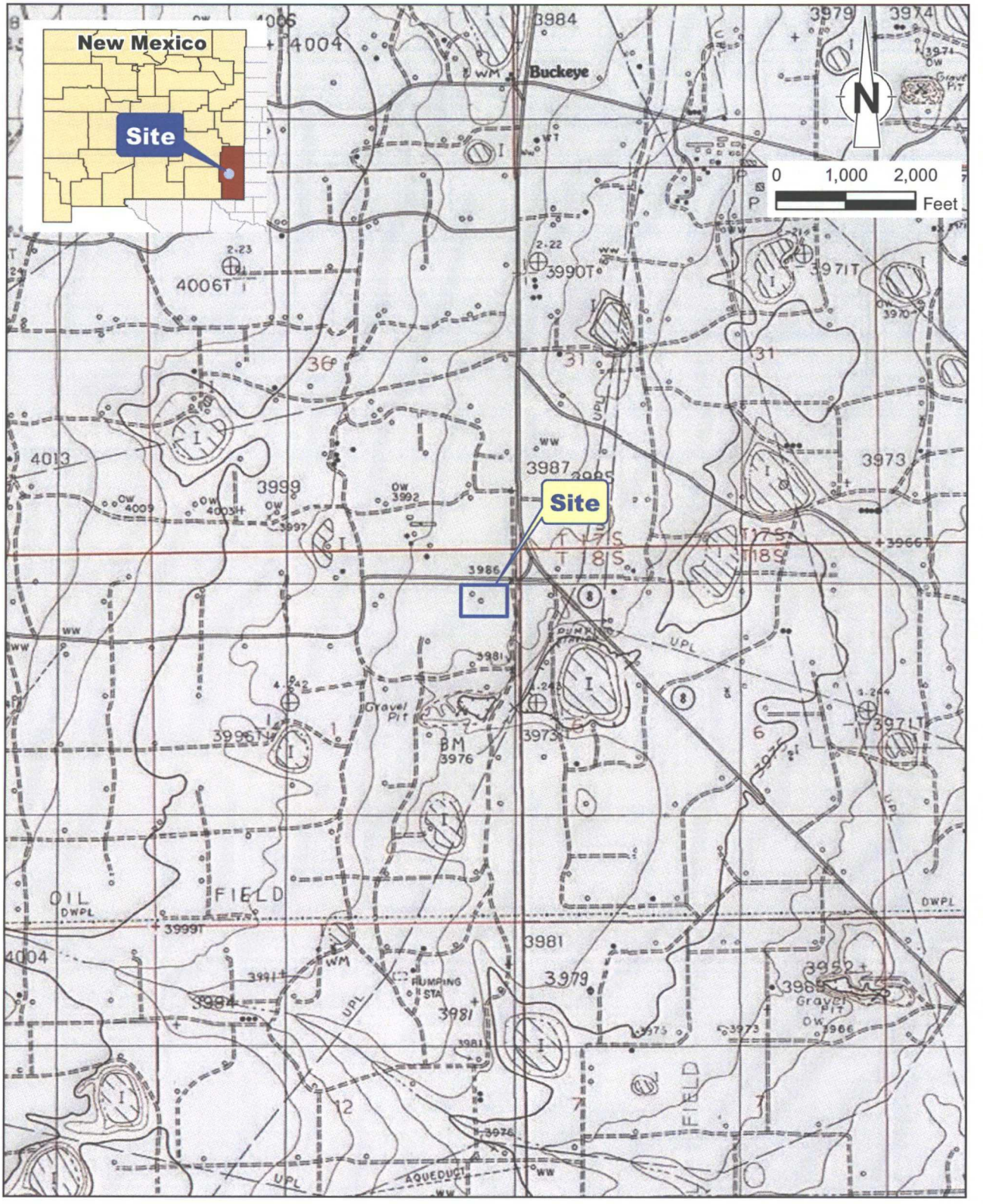
- Semi-annual monitoring for dissolved chloride and TDS will continue through 2012. Monitoring will include measurement of fluid levels and analyses of samples from TW-10, TW-13, and TW-14. Samples will be recovered from RW-3. Wells TW-9 and TW-20 will be added to the monitoring schedule in order to confirm current delineation with respect to NMWQCC standards on the down-gradient side of the contaminant plume.

- Removal of groundwater from RW-3 to further reduce the extent of the area impacted by dissolved chloride and TDS levels above NMWQCC standards will continue in 2012. Pump testing will be conducted RW-3 to determine the extent to which groundwater removal may be increased.

All of which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES, INC.

John P. Schnable
Project Manager

Thomas C. Larson
Senior Project Manager



RE: USGS 7.5 Minute Topographic Maps.

Figure 1
VICINITY MAP
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1, T18S-R34E, LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company, Houston, Texas

73015-2012(002)PR-BR001 5/8/2012

RE: 2011 NAIP Aerial Photograph

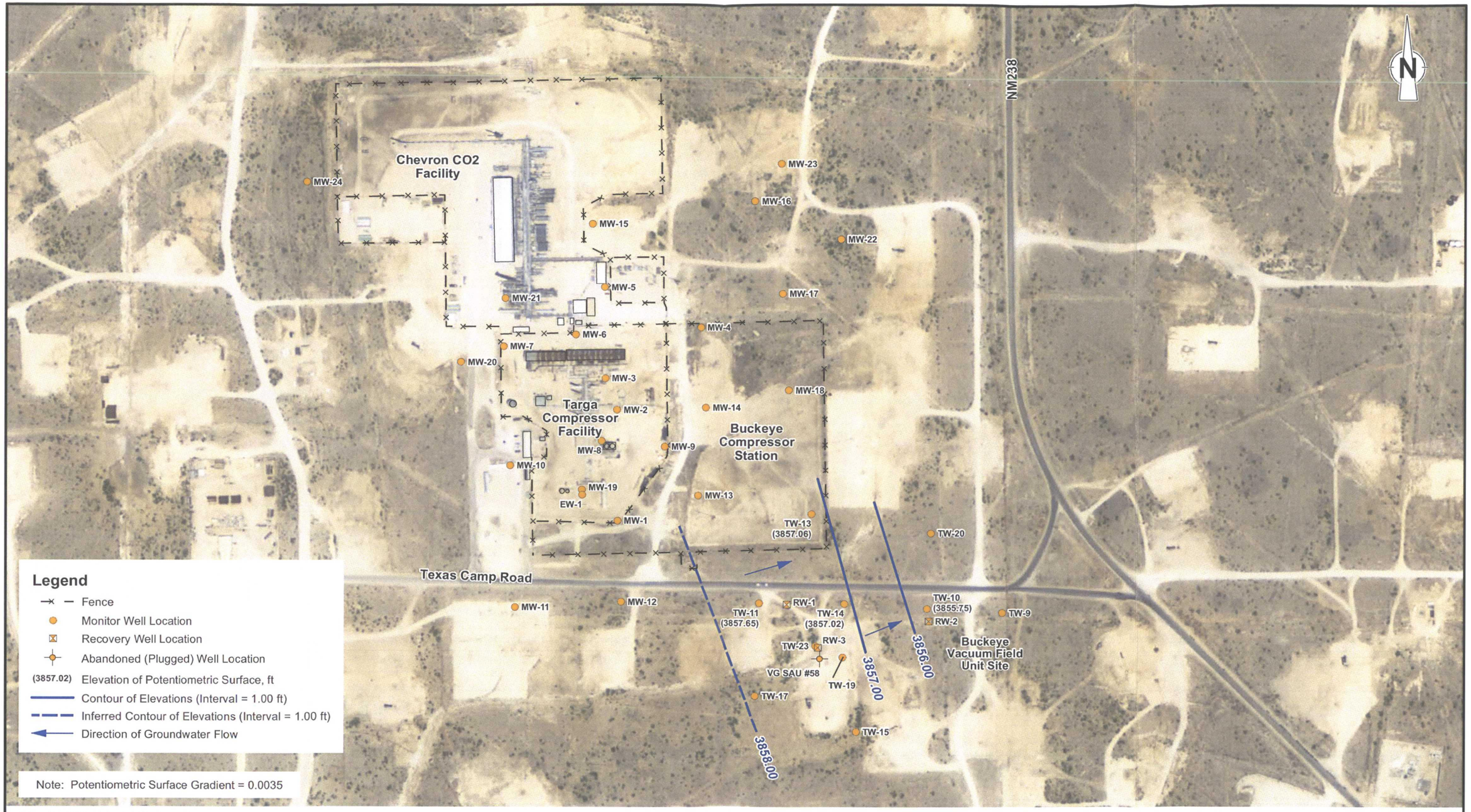
0 150 300
Feet

figure 2
SITE DETAILS MAP
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1, T18S-R34E, LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company, Houston, Texas

73015-2012(002)PR-BR002 7/26/2012

figure 3
MAP OF POTENTIOMETRIC SURFACE - APRIL 12, 2011
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1, T18S-R34E, LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company, Houston, Texas

73015-2012(002)PR-BR005 7/26/2012



RE: 2011 NAIP Aerial Photograph

figure 4
MAP OF POTENTIOMETRIC SURFACE - OCTOBER 17, 2011
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1, T18S-R34E, LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company, Houston, Texas

73015-2012(002)PR-BR006 9/6/2012

RE: 2011 NAIP Aerial Photograph

figure 5

DISTRIBUTION OF DISSOLVED CHLORIDE AND TOTAL DISSOLVED SOLIDS - APRIL 12, 2011
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1, T18S-R34E, LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company, Houston, Texas

73015-2012(002)PR-BR003 9/6/2012

RE: 2011 NAIP Aerial Photograph

figure 6

DISTRIBUTION OF DISSOLVED CHLORIDE AND TOTAL DISSOLVED SOLIDS - OCTOBER 18, 2011
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1, T18S-R34E, LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company, Houston, Texas

73015-2012(002)PR-BR004 7/26/2012

TABLE I

CUMULATIVE SUMMARRY OF FLUID LEVEL MEASUREMENTS
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Date Gauged*	*Elevation of TOC (famsl)*	*Depth To Water (fbtoc)*	*Elevation of Potentiometric Surface (famsl)*
TW-9	05/15/03	3988.69	129.01	3859.68
TW-9	11/18/03	3988.69	128.97	3859.72
TW-9	02/11/04	3988.69	128.62	3860.07
TW-9	05/27/04	3988.69	128.65	3860.04
TW-9	08/06/04	3988.69	128.64	3860.05
TW-9	03/03/05	3988.69	127.79	3860.90
TW-9	05/09/05	3988.69	128.67	3860.02
TW-9	11/01/05	3988.69	128.62	3860.07
TW-9	01/12/06	3988.69	129.05	3859.64
TW-9	04/03/06	3988.69	129.55	3859.14
TW-9	09/06/06	3988.69	129.20	3859.49
TW-9	10/03/06	3988.69	129.15	3859.54
TW-9	01/31/07	3988.69	126.39	3862.30
TW-9	04/23/07	3988.69	129.10	3859.59
TW-9	08/06/07	3988.69	128.98	3859.71
TW-9	10/02/07	3988.69	128.81	3859.88
TW-9	02/20/08	3988.69	128.92	3859.77
TW-9	05/21/08	3988.69	128.81	3859.88
TW-9	08/14/08	3988.69	129.58	3859.11
TW-9	10/09/08	3988.69	128.99	3859.70
TW-9	01/19/09	3988.69	130.05	3858.64
TW-9	04/09/09	3988.69	130.26	3858.43
TW-9	07/06/09	3988.69	130.36	3858.33
TW-9	09/28/09	3988.69	131.00	3857.69
TW-9	04/05/10	3988.69	131.10	3857.59
TW-9	10/04/10	3988.69	131.89	3856.80
TW-9	04/12/11	3988.69	132.28	3856.41
TW-10	05/15/03	3987.87	127.99	3859.88
TW-10	11/19/03	3987.87	128.11	3859.76
TW-10	02/11/04	3987.87	127.69	3860.18
TW-10	05/28/04	3987.87	127.66	3860.21
TW-10	08/06/04	3987.87	127.69	3860.18
TW-10	03/03/05	3987.87	126.80	3861.07
TW-10	05/09/05	3987.87	126.68	3861.19
TW-10	11/01/05	3987.87	127.54	3860.33
TW-10	04/03/06	3987.87	128.47	3859.40
TW-10	10/03/06	3987.87	128.17	3859.70
TW-10	04/23/07	3987.87	128.14	3859.73
TW-10	10/02/07	3987.87	127.86	3860.01
TW-10	05/21/08	3987.87	127.89	3859.98

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SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Date Gauged*	*Elevation of TOC (famsl)*	*Depth To Water (fbtoc)*	*Elevation of Potentiometric Surface (famsl)*
TW-10	10/09/08	3987.87	128.09	3859.78
TW-10	04/09/09	3987.87	129.02	3858.85
TW-10	09/28/09	3987.87	129.76	3858.11
TW-10	04/05/10	3987.87	129.92	3857.95
TW-10	10/04/10	3987.87	130.41	3857.46
TW-10	04/12/11	3987.87	130.95	3856.92
TW-10	10/17/11	3987.87	132.12	3855.75
TW-11	05/15/03	3989.11	128.97	3860.14
TW-11	11/19/03	3989.11	129.14	3859.97
TW-11	02/11/04	3989.11	128.67	3860.44
TW-11	05/28/04	3989.11	128.39	3860.72
TW-11	08/05/04	3989.11	128.42	3860.69
TW-11	03/03/05	3989.11	127.56	3861.55
TW-11	05/09/05	3989.11	127.41	3861.70
TW-11	11/01/05	3989.11	128.11	3861.00
TW-11	04/03/06	3989.11	128.97	3860.14
TW-11	10/03/06	3989.11	128.98	3860.13
TW-11	04/23/07	3989.11	128.94	3860.17
TW-11	10/02/07	3989.11	128.66	3860.45
TW-11	05/22/08	3989.11	128.69	3860.42
TW-11	10/09/08	3989.11	128.91	3860.20
TW-11	04/09/09	3989.11	129.48	3859.63
TW-11	09/28/09	3989.11	130.01	3859.10
TW-11	04/05/10	3989.11	130.27	3858.84
TW-11	10/04/10	3989.11	130.59	3858.52
TW-11	04/12/11	3989.11	129.95	3859.16
TW-11	10/18/11	3989.11	131.46	3857.65
TW-13	05/15/03	3988.73	128.85	3859.88
TW-13	11/18/03	3988.73	128.89	3859.84
TW-13	02/11/04	3988.73	128.67	3860.06
TW-13	05/27/04	3988.73	128.67	3860.06
TW-13	08/06/04	3988.73	128.66	3860.07
TW-13	03/03/05	3988.73	127.74	3860.99
TW-13	05/09/05	3988.73	127.68	3861.05
TW-13	11/01/05	3988.73	128.43	3860.30
TW-13	04/03/06	3988.73	129.31	3859.42
TW-13	10/03/06	3988.73	129.13	3859.60
TW-13	04/23/07	3988.73	129.00	3859.73
TW-13	10/02/07	3988.73	128.76	3859.97

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CUMULATIVE SUMMARRY OF FLUID LEVEL MEASUREMENTS
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Date Gauged*	*Elevation of TOC (famsl)*	*Depth To Water (fbtoc)*	*Elevation of Potentiometric Surface (famsl)*
TW-13	05/21/08	3988.73	128.86	3859.87
TW-13	10/09/08	3988.73	128.96	3859.77
TW-13	04/09/09	3988.73	129.70	3859.03
TW-13	09/28/09	3988.73	130.32	3858.41
TW-13	04/05/10	3988.73	130.56	3858.17
TW-13	10/04/10	3988.73	130.91	3857.82
TW-13	04/12/11	3988.73	131.45	3857.28
TW-13	10/17/11	3988.73	131.67	3857.06
TW-13	10/18/11	3988.73	131.57	3857.16
TW-14	05/15/03	3986.77	126.78	3859.99
TW-14	11/19/03	3986.77	127.28	3859.49
TW-14	02/11/04	3986.77	127.32	3859.45
TW-14	05/28/04	3986.77	126.44	3860.33
TW-14	08/05/04	3986.77	126.48	3860.29
TW-14	03/03/05	3986.77	125.55	3861.22
TW-14	05/09/05	3986.77	125.43	3861.34
TW-14	11/01/05	3986.77	126.24	3860.53
TW-14	04/03/06	3986.77	127.09	3859.68
TW-14	10/03/06	3986.77	127.05	3859.72
TW-14	04/23/07	3986.77	127.04	3859.73
TW-14	10/02/07	3986.77	126.67	3860.10
TW-14	05/22/08	3986.77	126.66	3860.11
TW-14	10/09/08	3986.77	126.98	3859.79
TW-14	04/09/09	3986.77	127.56	3859.21
TW-14	09/28/09	3986.77	128.22	3858.55
TW-14	04/05/10	3986.77	128.45	3858.32
TW-14	10/04/10	3986.77	128.77	3858.00
TW-14	04/12/11	3986.77	129.42	3857.35
TW-14	10/17/11	3986.77	129.75	3857.02
TW-15	05/15/03	3984.14	123.50	3860.64
TW-15	11/19/03	3984.14	123.76	3860.38
TW-15	02/11/04	3984.14	123.34	3860.80
TW-15	05/27/04	3984.14	123.06	3861.08
TW-15	08/05/04	3984.14	123.07	3861.07
TW-15	03/03/05	3984.14	122.18	3861.96
TW-15	05/09/05	3984.14	122.13	3862.01
TW-15	11/01/05	3984.14	122.68	3861.46
TW-15	01/12/06	3984.14	123.33	3860.81
TW-15	04/03/06	3984.14	123.65	3860.49

TABLE I

CUMULATIVE SUMMARRY OF FLUID LEVEL MEASUREMENTS
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Date Gauged*	*Elevation of TOC (famsl)*	*Depth To Water (fbtoc)*	*Elevation of Potentiometric Surface (famsl)*
TW-15	09/06/06	3984.14	123.61	3860.53
TW-15	10/03/06	3984.14	123.59	3860.55
TW-15	01/31/07	3984.14	123.33	3860.81
TW-15	04/23/07	3984.14	123.59	3860.55
TW-15	08/06/07	3984.14	123.58	3860.56
TW-15	10/02/07	3984.14	123.24	3860.90
TW-15	02/20/08	3984.14	123.40	3860.74
TW-15	05/21/08	3984.14	123.39	3860.75
TW-15	08/14/08	3984.14	123.77	3860.37
TW-15	10/09/08	3984.14	123.64	3860.50
TW-15	01/19/09	3984.14	124.03	3860.11
TW-15	04/09/09	3984.14	124.29	3859.85
TW-15	07/06/09	3984.14	124.28	3859.86
TW-15	09/28/09	3984.14	124.73	3859.41
TW-15	04/05/10	3984.14	125.08	3859.06
TW-15	10/04/10	3984.14	125.21	3858.93
TW-15	04/12/11	3984.14	125.70	3858.44
TW-17	05/15/03	3986.01	122.87	3863.14
TW-17	11/19/03	3986.01	125.64	3860.37
TW-17	02/11/04	3986.01	125.15	3860.86
TW-17	05/28/04	3986.01	124.89	3861.12
TW-17	08/05/04	3986.01	124.88	3861.13
TW-17	03/03/05	3986.01	124.06	3861.95
TW-17	05/09/05	3986.01	123.97	3862.04
TW-17	11/01/05	3986.01	124.50	3861.51
TW-17	04/03/06	3986.01	125.40	3860.61
TW-17	10/03/06	3986.01	125.45	3860.56
TW-17	04/23/07	3986.01	125.43	3860.58
TW-17	10/02/07	3986.01	125.19	3860.82
TW-17	05/22/08	3986.01	125.20	3860.81
TW-17	10/09/08	3986.01	125.48	3860.53
TW-17	04/09/09	3986.01	126.00	3860.01
TW-17	09/28/09	3986.01	126.51	3859.50
TW-17	04/05/10	3986.01	126.79	3859.22
TW-17	10/04/10	3986.01	126.92	3859.09
TW-19	05/15/03	3985.70	121.80	3863.90
TW-19	11/19/03	3985.70	126.25	3859.45
TW-19	02/11/04	3985.70	125.31	3860.39
TW-19	05/27/04	3985.70	125.11	3860.59

TABLE I

CUMULATIVE SUMMARRY OF FLUID LEVEL MEASUREMENTS
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Date Gauged*	*Elevation of TOC (famsl)*	*Depth To Water (fbtoc)*	*Elevation of Potentiometric Surface (famsl)*
TW-19	08/05/04	3985.70	125.14	3860.56
TW-19	03/03/05	3985.70	124.26	3861.44
TW-19	05/09/05	3985.70	124.02	3861.68
TW-19	11/01/05	3985.70	124.79	3860.91
TW-19	04/03/06	3985.70	125.66	3860.04
TW-19	10/02/06	3985.70	125.78	3859.92
TW-19	04/23/07	3985.70	126.25	3859.45
TW-19	10/02/07	3985.70	125.28	3860.42
TW-19	05/22/08	3985.70	125.34	3860.36
TW-19	10/09/08	3985.70	125.80	3859.90
TW-19	04/09/09	3985.70	126.24	3859.46
TW-19	09/28/09	3985.70	126.84	3858.86
TW-19	04/05/10	3985.70	127.09	3858.61
TW-19	10/04/10	3985.70	127.42	3858.28
TW-19	04/12/11	3985.70	127.90	3857.80
TW-20	05/15/03	3988.40	129.07	3859.33
TW-20	11/18/03	3988.40	128.93	3859.47
TW-20	02/11/04	3988.40	128.69	3859.71
TW-20	05/27/04	3988.40	128.69	3859.71
TW-20	08/06/04	3988.40	128.67	3859.73
TW-20	03/03/05	3988.40	127.79	3860.61
TW-20	05/09/05	3988.40	127.69	3860.71
TW-20	11/01/05	3988.40	128.74	3859.66
TW-20	04/03/06	3988.40	129.59	3858.81
TW-20	10/03/06	3988.40	129.20	3859.20
TW-20	04/23/07	3988.40	129.12	3859.28
TW-20	10/02/07	3988.40	128.84	3859.56
TW-20	05/21/08	3988.40	128.84	3859.56
TW-20	10/09/08	3988.40	128.98	3859.42
TW-20	04/09/09	3988.40	130.15	3858.25
TW-20	09/28/09	3988.40	130.97	3857.43
TW-20	04/05/10	3988.40	131.01	3857.39
TW-20	10/04/10	3988.40	131.66	3856.74
TW-20	04/12/11	3988.40	132.13	3856.27
TW-23	05/15/03	3984.58	124.42	3860.16
TW-23	11/19/03	3984.58	125.95	3858.63
TW-23	02/11/04	3984.58	124.16	3860.42
TW-23	05/27/04	3984.58	123.94	3860.64
TW-23	08/05/04	3984.58	124.03	3860.55

TABLE I

CUMULATIVE SUMMARRY OF FLUID LEVEL MEASUREMENTS
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Date Gauged*	*Elevation of TOC (famsl)*	*Depth To Water (fbtoc)*	*Elevation of Potentiometric Surface (famsl)*
TW-23	03/03/05	3984.58	123.10	3861.48
TW-23	05/09/05	3984.58	122.98	3861.60
TW-23	11/01/05	3984.58	123.71	3860.87
TW-23	01/12/06	3984.58	124.06	3860.52
TW-23	04/03/06	3984.58	124.52	3860.06
TW-23	09/06/06	3984.58	124.52	3860.06
TW-23	10/02/06	3984.58	124.81	3859.77
TW-23	01/31/07	3984.58	124.12	3860.46
TW-23	04/23/07	3984.58	126.02	3858.56
TW-23	08/06/07	3984.58	124.64	3859.94
TW-23	10/02/07	3984.58	124.20	3860.38
TW-23	02/20/08	3984.58	124.19	3860.39
TW-23	05/22/08	3984.58	124.25	3860.33
TW-23	08/14/08	3984.58	124.76	3859.82
TW-23	10/09/08	3984.58	124.85	3859.73
TW-23	01/19/09	3984.58	125.21	3859.37
TW-23	04/09/09	3984.58	125.09	3859.49
TW-23	07/06/09	3984.58	125.14	3859.44
TW-23	09/28/09	3984.58	125.67	3858.91
TW-23	04/05/10	3984.58	125.90	3858.68
TW-23	10/04/10	3984.58	126.14	3858.44
TW-23	04/12/11	3984.58	126.62	3857.96
RW-2	05/15/03	3987.04	Not gauged--pump in well	
RW-2	11/18/03	3987.04	Not gauged--pump in well	
RW-2	02/11/04	3987.04	Not gauged--pump in well	
RW-2	05/28/04	3987.04	126.82	3860.22
RW-2	08/06/04	3987.04	126.81	3860.23
RW-2	03/03/05	3987.04	126.90	3860.14
RW-2	05/09/05	3987.04	125.84	3861.20
RW-2	11/01/05	3987.04	NG	NG
RW-2	04/03/06	3987.04	127.61	3859.43
RW-2	10/03/06	3987.04	127.33	3859.71
RW-2	04/23/07	3987.04	127.40	3859.64
RW-2	10/02/07	3987.04	126.97	3860.07
RW-2	05/21/08	3987.04	127.02	3860.02
RW-2	10/09/08	3987.04	127.25	3859.79
RW-2	04/09/09	3987.04	128.25	3858.79
RW-2	09/28/09	3987.04	128.93	3858.11
RW-2	04/05/10	3987.04	129.06	3857.98
RW-2	10/04/10	3987.04	129.56	3857.48

TABLE I

CUMULATIVE SUMMARRY OF FLUID LEVEL MEASUREMENTS
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Date Gauged*	*Elevation of TOC (famsl)*	*Depth To Water (fbtoc)*	*Elevation of Potentiometric Surface (famsl)*
RW-3	05/15/03		Not gauged--pump in well	
RW-3	11/18/03		Not gauged--pump in well	
RW-3	02/11/04		Not gauged--pump in well	
RW-3	05/27/04	3984.18	123.50	3860.68
RW-3	08/06/04	3984.18	123.58	3860.60
RW-3	03/03/05	3984.18	122.67	3861.51
RW-3	05/09/05	3984.18	122.54	3861.64
RW-3	11/01/05	3984.18	126.72	3857.46
RW-3	04/03/06		Not gauged--pump in well	
RW-3	10/03/06		Not gauged--pump in well	
RW-3	05/22/08		Not gauged--pump in well	
RW-3	10/09/08		Not gauged--pump in well	
RW-3	04/09/08		Not gauged--pump in well	
RW-3	09/28/09		Not gauged--pump in well	
RW-3	04/05/10		Not gauged--pump in well	
RW-3	10/04/10		Not gauged--pump in well	
RW-3	04/12/11		Not gauged--pump in well	
RW-3	10/18/11		Not gauged--pump in well	

Notes:
1. TOC--top of casing
2. famsl--feet above mean sea level
3. fbtoc--feet below top of casing
4. NG--not gauged

TABLE II

CUMULATIVE SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Sample Date*	*Sample Depth (ft. below TOC)*	*Chloride (mg/L)*	*Total Dissolved Solids (mg/L)*
			NMWQCC Remediation Standards (mg/L)	
			250	*1,000*
TW-9	05/15/03		120	
TW-9	11/18/03		442	892
TW-9	02/11/04		420	972
TW-9	05/27/04		88.2	461
TW-9	08/06/04		49.0	385
TW-9	03/03/05		44.5	239
TW-9	05/09/05		53.7	378
TW-9	10/27/05		89.9	431
TW-9	01/12/06		49.6	325
TW-9	04/05/06		46.7	321
TW-9	10/02/06		54.5	319
TW-9	01/31/07		73.0	309
TW-9	04/24/07		58.8	324
TW-9	08/06/07		65.2	320
TW-9	10/03/07		54.6	322
TW-9	02/20/08		65.5	342
TW-9	05/21/08		72.5	331
TW-9	08/14/08		78.0	351
TW-9	10/09/08		71.5	371
TW-9	01/19/09		82.6	388
TW-9	04/13/09		76.7	376
TW-9	07/06/09		75.4	417
TW-9	10/01/09		75.4	356
TW-10	05/15/03		44.3	
TW-10	11/19/03		59.1	369
TW-10	02/11/04		52.9	372
TW-10	05/28/04		39.9	344
TW-10	08/06/04		45.4	354
TW-10	03/03/05		33.0	226
TW-10	10/27/05		71.0	372
TW-10	04/05/06		87.4	406
TW-10	10/03/06		66.6	375
TW-10	04/24/07		81.0	389
TW-10	10/03/07		85.6	385
TW-10	05/21/08		88.1	408
TW-10	10/09/08		91.1	456
TW-10	04/13/09		148	532
TW-10	10/01/09		158	622
TW-10	04/05/10		158	

TABLE II

CUMULATIVE SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Sample Date*	*Sample Depth (ft. below TOC)*	*Chloride (mg/L)*	*Total Dissolved Solids (mg/L)*
			NMWQCC Remediation Standards (mg/L)	
			250	*1,000*
TW-10	10/04/10		181	
TW-10	04/12/11		282	1070
TW-10	10/18/11	155.00	337	750
TW-11	05/15/03		35.4	
TW-11	11/19/03		25.3	307
TW-11	02/11/04		83.8	610
TW-11	05/28/04		27.0	274
TW-11	08/05/04		30.1	269
TW-11	03/03/05		28.4	174
TW-11	10/27/05		31.8	260
TW-11	04/05/06		34.8	269
TW-11	10/03/06		35.1	265
TW-11	04/24/07		42.3	285
TW-11	10/04/07		47.0	388
TW-11	05/22/08		39.3	256
TW-11	10/13/08		33.0	269
TW-11	04/14/09		49.3	270
TW-11	10/01/09		44.3	289
TW-13	05/15/03		39.0	
TW-13	11/18/03		64.3	560
TW-13	02/11/04		83.8	610
TW-13	05/27/04		84.5	625
TW-13	08/06/04		74.8	596
TW-13	03/03/05		90.0	502
TW-13	10/26/05		75.1	485
TW-13	04/06/06		60.3	429
TW-13	10/03/06		93.5	546
TW-13	04/25/07		140	921
TW-13	10/04/07		45.2	892
TW-13	05/21/08		47.1	614
TW-13	10/13/08		81.7	798
TW-13	04/14/09		129	1,000
TW-13	10/01/09		48.5	709
TW-13	04/05/10		92.6	
TW-13	10/04/10		54.7	
TW-13	04/12/11		94.5	976
TW-13	10/18/11	175.00	90.8	698

TABLE II

CUMULATIVE SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Sample Date*	*Sample Depth (ft. below TOC)*	*Chloride (mg/L)*	*Total Dissolved Solids (mg/L)*
			NMWQCC Remediation Standards (mg/L)	
			250	*1,000*
TW-14	05/15/03		65.0	
TW-14	11/19/03		25.4	368
TW-14	02/11/04		29.6	339
TW-14	05/28/04		30.3	346
TW-14	08/05/04		32.7	347
TW-14	03/03/05		87.9	340
TW-14	10/27/05		73.9	419
TW-14	04/05/06		71.1	421
TW-14	10/03/06		69.6	424
TW-14	04/24/07		94.6	444
TW-14	10/04/07		70.7	425
TW-14	05/22/08		85.2	421
TW-14	10/13/08		98.1	463
TW-14	04/14/09		192	600
TW-14	10/01/09		154	727
TW-14	04/05/10		93.8	
TW-14	10/04/10		73.2	
TW-14	04/12/11		65.7	642
TW-14	10/18/11	160.00	33.2	482
TW-15	05/15/03		88.6	
TW-15	11/19/03		561	1,132
TW-15	02/11/04		419	908
TW-15	05/27/04		93.4	439
TW-15	08/05/04		102	545
TW-15	03/03/05		189	577
TW-15	05/09/05		184	711
TW-15	10/27/05		155	569
TW-15	01/12/06		144	486
TW-15	04/05/06		125	557
TW-15	10/02/06		119	503
TW-15	01/31/07		159	480
TW-15	04/25/07		197	594
TW-15	08/06/07		154	502
TW-15	10/04/07		136	636
TW-15	02/20/08		139	502
TW-15	05/21/08		132	483
TW-15	08/14/08		119	498
TW-15	10/13/08		123	547
TW-15	01/19/09		108	477

TABLE II

CUMULATIVE SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Sample Date*	*Sample Depth (ft. below TOC)*	*Chloride (mg/L)*	*Total Dissolved Solids (mg/L)*
			NMWQCC Remediation Standards (mg/L)	
			250	*1,000*
TW-15	04/14/09		87.1	446
TW-15	07/06/09		66.5	432
TW-15	10/01/09		59.6	389
TW-17	05/15/03		31.9	
TW-17	11/19/03		26.7	295
TW-17	02/11/04		24.9	294
TW-17	05/28/04		26.7	302
TW-17	08/05/04		29.4	306
TW-17	03/03/05		178	565
TW-17	10/26/05		59.9	362
TW-17	04/05/06		36.1	294
TW-17	10/03/06		29.8	296
TW-17	04/24/07		32.9	311
TW-17	10/04/07		30.8	310
TW-17	05/22/08		31.2	281
TW-17	10/13/08		28.0	303
TW-17	04/14/09		36.8	304
TW-17	10/01/09		30.0	314
TW-17	04/05/10		27.9	
TW-17	10/04/10		16.7	
TW-19	05/15/03		35.4	
TW-19	11/19/03		28.3	325
TW-19	02/11/04		23.7	387
TW-19	05/27/04		33.6	287
TW-19	08/05/04		42.8	344
TW-19	03/03/05		54.2	224
TW-19	10/27/05		39.0	293
TW-19	04/06/06		40.5	308
TW-19	10/02/06		33.2	290
TW-19	04/24/07		37.3	287
TW-19	10/03/07		33.7	293
TW-19	05/22/08		33.5	275
TW-19	10/13/08		28.8	277
TW-19	04/13/09		27.8	278
TW-19	10/01/09		29.5	296
TW-20	05/15/03		35.4	
TW-20	11/18/03		26.5	328

TABLE II

CUMULATIVE SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Sample Date*	*Sample Depth (ft. below TOC)*	*Chloride (mg/L)*	*Total Dissolved Solids (mg/L)*
			NMWQCC Remediation Standards (mg/L)	
			250	*1,000*
TW-20	02/11/04		25.2	353
TW-20	05/27/04		27.1	316
TW-20	08/06/04		31.8	338
TW-20	03/03/05		25.3	232
TW-20	10/26/05		53.7	351
TW-20	04/06/06		34.3	329
TW-20	10/03/06		39.4	310
TW-20	04/24/07		38.2	324
TW-20	10/03/07		36.8	340
TW-20	05/21/08		41.7	315
TW-20	10/09/08		38.1	338
TW-20	04/13/09		43.3	330
TW-20	10/01/09		40.5	345
TW-23	05/15/03		1440	
TW-23	11/19/03		300	964
TW-23	02/11/04		117	603
TW-23	05/27/04		617	1,710
TW-23	08/05/04		919	2,000
TW-23	03/03/05		656	1,680
TW-23	05/09/05		835	2,680
TW-23	10/27/05		284	1,460
TW-23	01/12/06		272	1,090
TW-23	04/06/06		35.2	1,070
TW-23	10/02/06		253	1,070
TW-23	01/31/07		144	626
TW-23	04/25/07		346	1,260
TW-23	08/06/07		260	1,030
TW-23	10/03/07		228	1,110
TW-23	02/20/08		196	944
TW-23	05/22/08		317	1,300
TW-23	01/19/09		177	882
TW-23	04/14/09		53.7	456
TW-23	07/06/09		48.2	445
TW-23	10/01/09		42.3	462
RW-2	05/28/04		30.4	306
RW-2	08/06/04		34.6	354
RW-2	03/03/05		32.4	244
RW-2	10/27/05		264	600

TABLE II

CUMULATIVE SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

Monitoring Well ID	*Sample Date*	*Sample Depth (ft. below TOC)*	*Chloride (mg/L)*	*Total Dissolved Solids (mg/L)*
			NMWQCC Remediation Standards (mg/L)	
			250	*1,000*
RW-2	04/07/06		244	767
RW-2	10/03/06		49.8	325
RW-2	04/25/07		64.3	331
RW-2	10/03/07		58.5	346
RW-2	05/21/08		63.9	350
RW-2	10/09/08		77.0	371
RW-2	04/13/09		82.4	382
RW-2	10/01/09		240.0	691
RW-3	05/27/04		338	854
RW-3	08/06/04		700	1,620
RW-3	03/03/05		873	1,710
RW-3	10/27/05		298	844
RW-3	04/07/06		791	1,700
RW-3	10/02/06		1,060	1,930
RW-3	04/24/07		1,100	2,090
RW-3	10/03/07		321	902
RW-3	05/22/08		820	1,390
RW-3	10/14/08		847	1,630
RW-3	04/13/09		1,250	2,740
RW-3	10/01/09		1,320	2,850
RW-3	04/05/10		892	
RW-3	10/04/10		1,350	
RW-3	04/12/11		664	1,770
RW-3	10/18/11		392	848
Dup-1 (TW-10)	10/04/10		182	
Dup-1 (TW-11)	05/22/08		39.1	253
Dup-1 (TW-11)	10/13/08		39.3	284
Dup-100 (TW-14)	10/11/09		163	714
Dup-#1 (TW-14)	04/05/10		82.2	
Dup-#1 (TW-15)	04/14/09		95.2	450

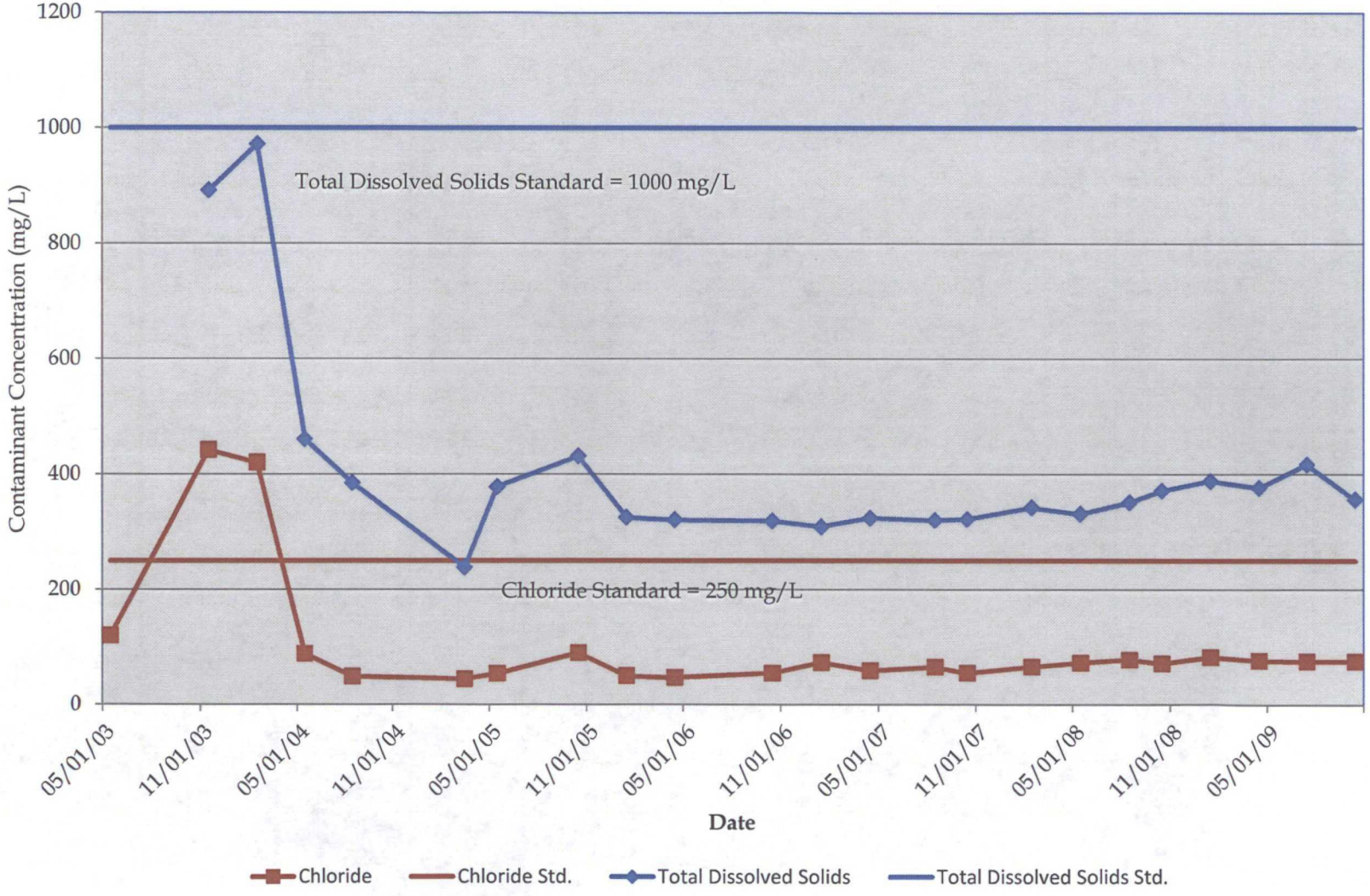
TABLE II

CUMULATIVE SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
BUCKEYE VACUUM FIELD UNIT SITE
SECTION 1-T18S-R34E, LEA COUNTY, NM

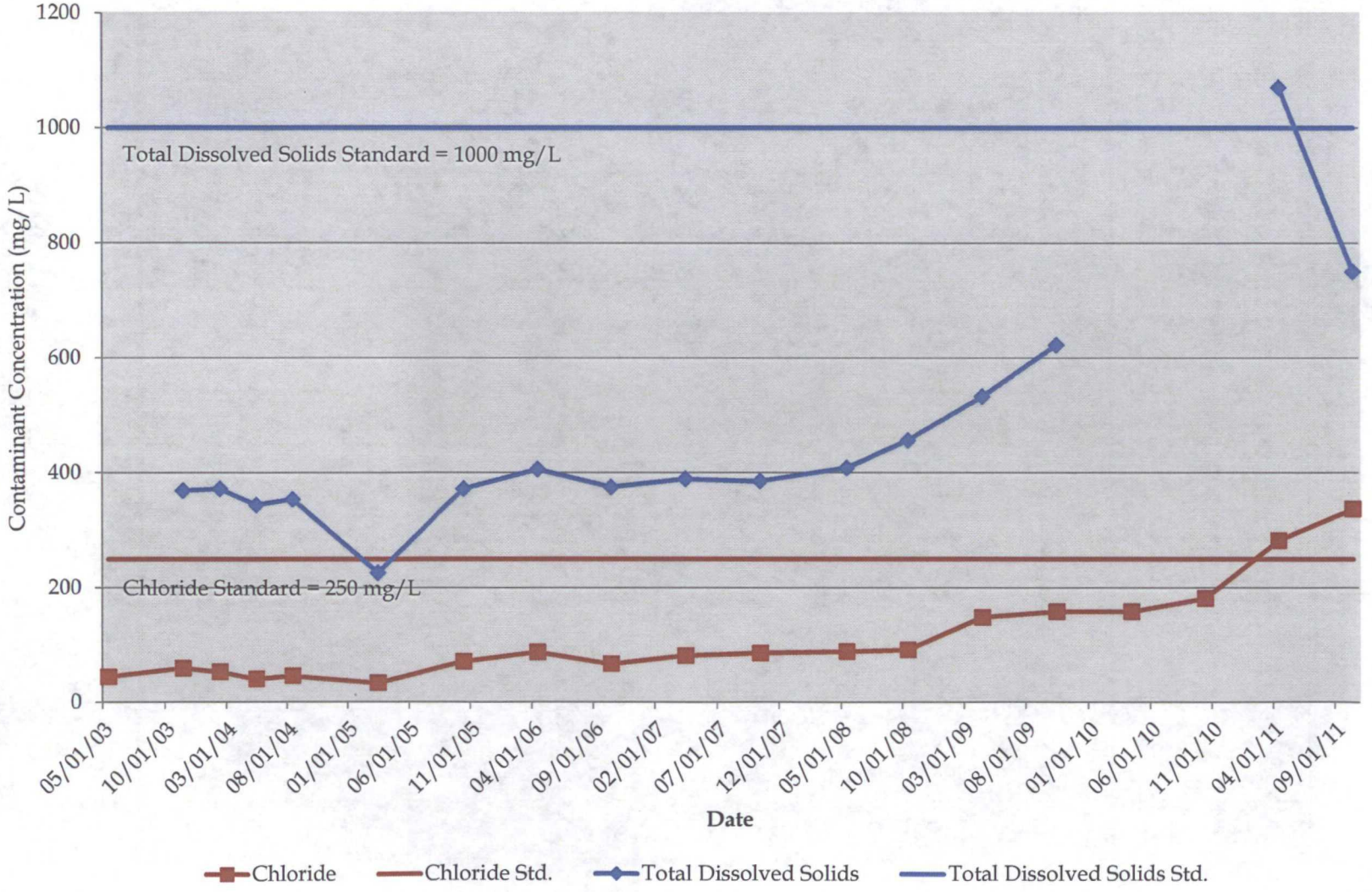
Monitoring Well ID	*Sample Date*	*Sample Depth (ft. below TOC)*	*Chloride (mg/L)*	*Total Dissolved Solids (mg/L)*
			NMWQCC Remediation Standards (mg/L)	
			250	*1,000*

NOTES:
1. TOC--top of casing
2. mg/L--milligrams per liter
3. NMWQCC--New Mexico Water Quality Control Commission
4. NA--Not analyzed
5. Cells shaded yellow indicates concentration that exceeds NMWQCC standards.

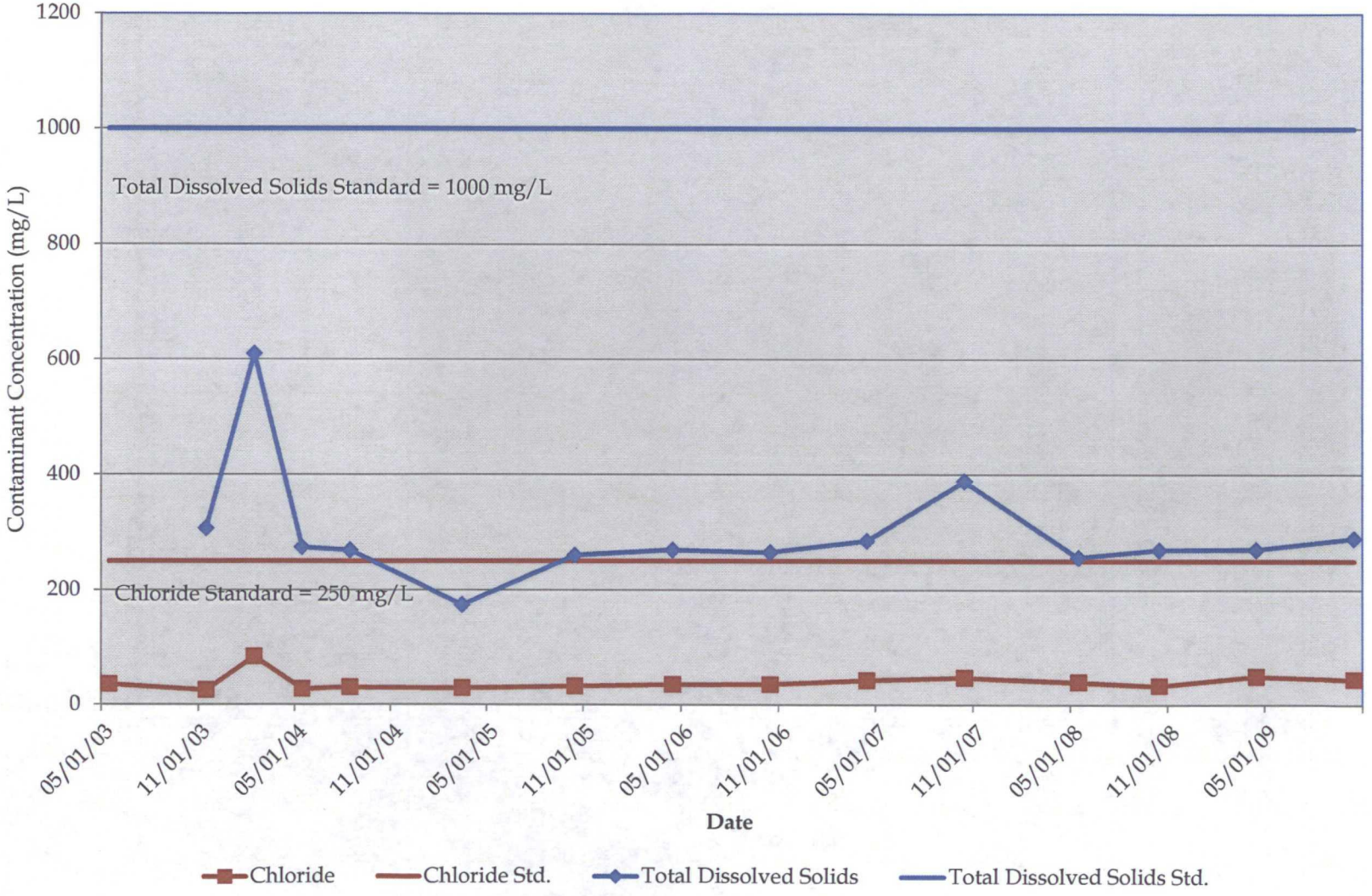
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-9



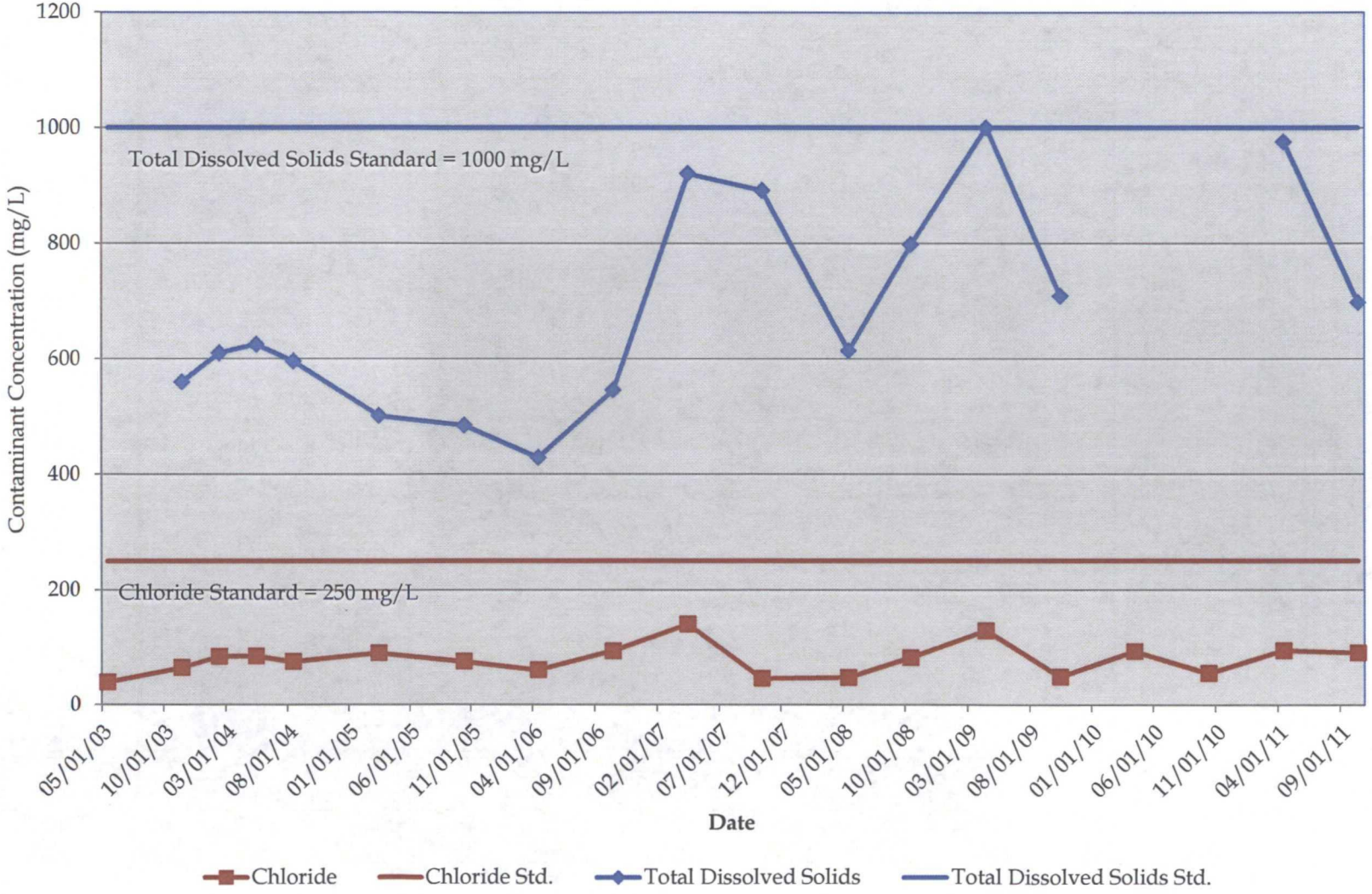
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-10



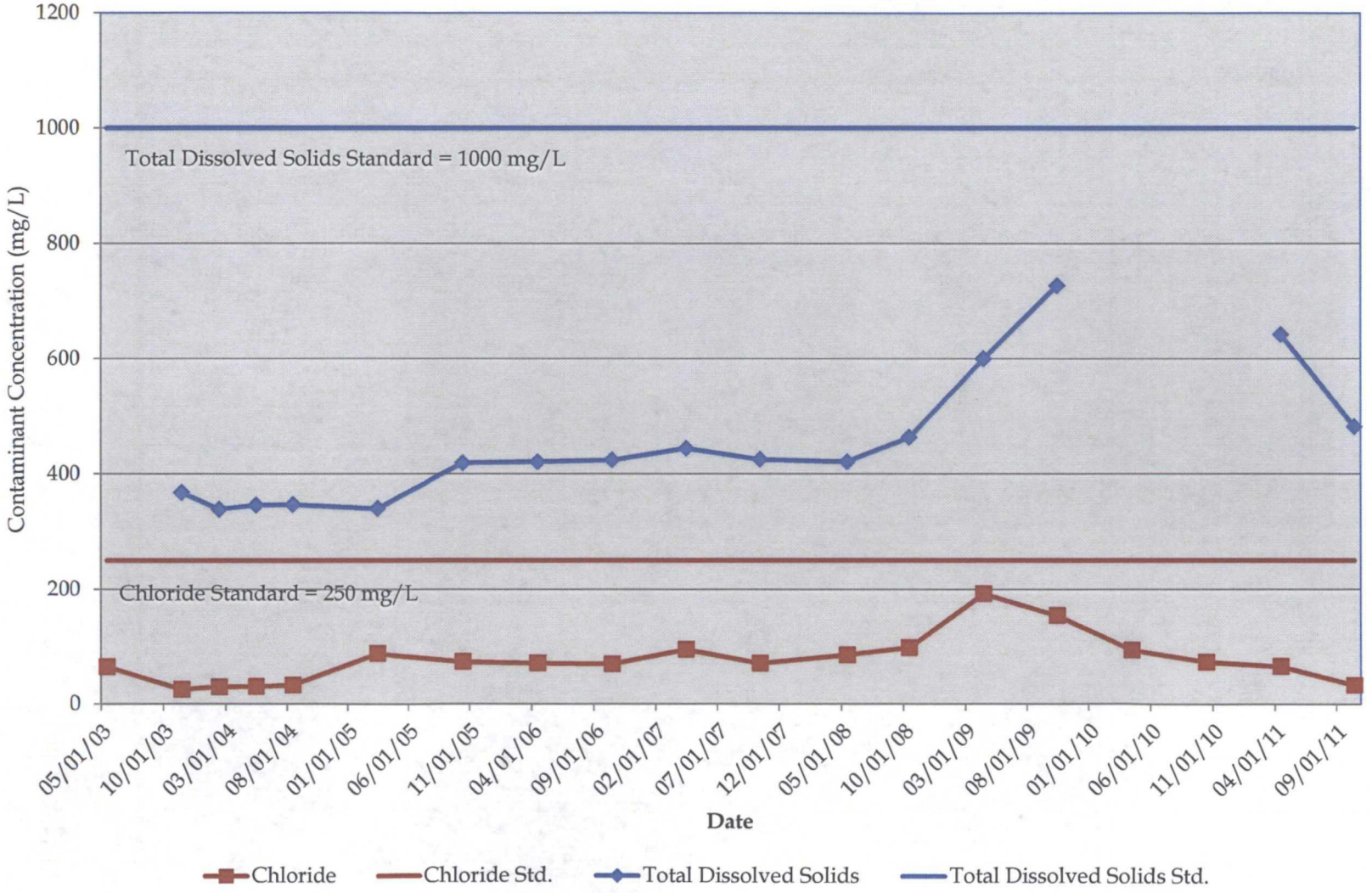
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-11



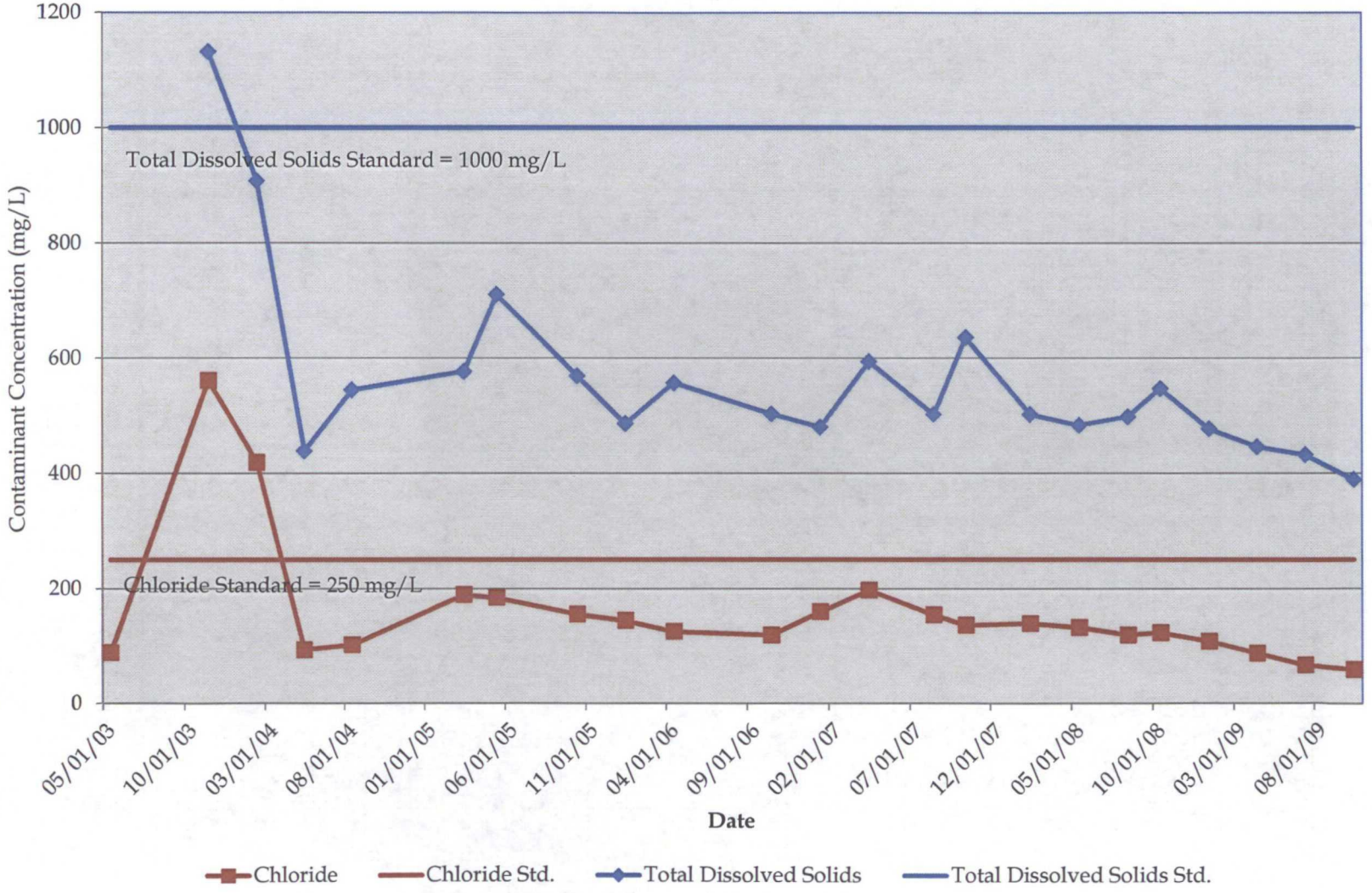
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-13



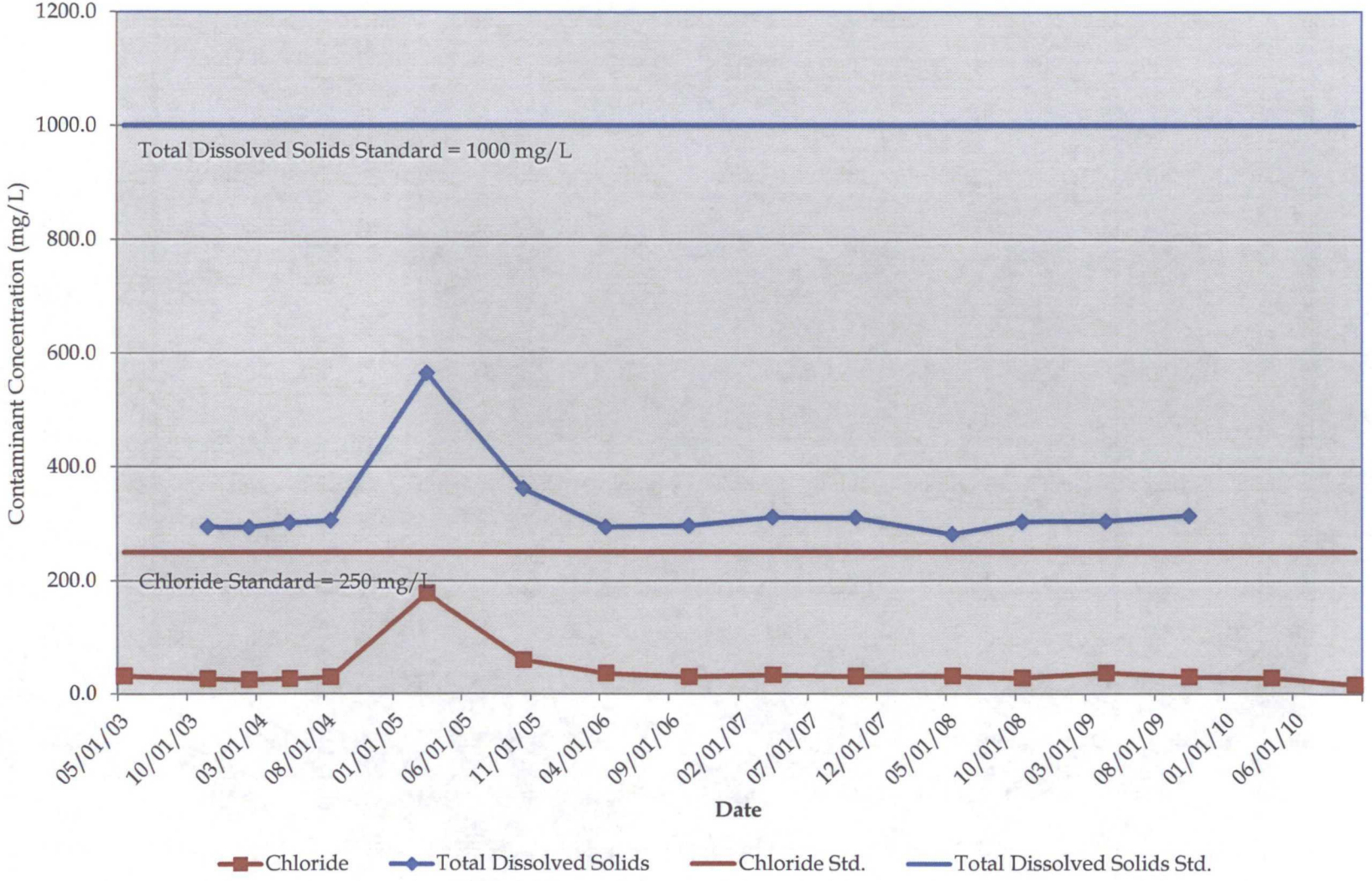
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-14



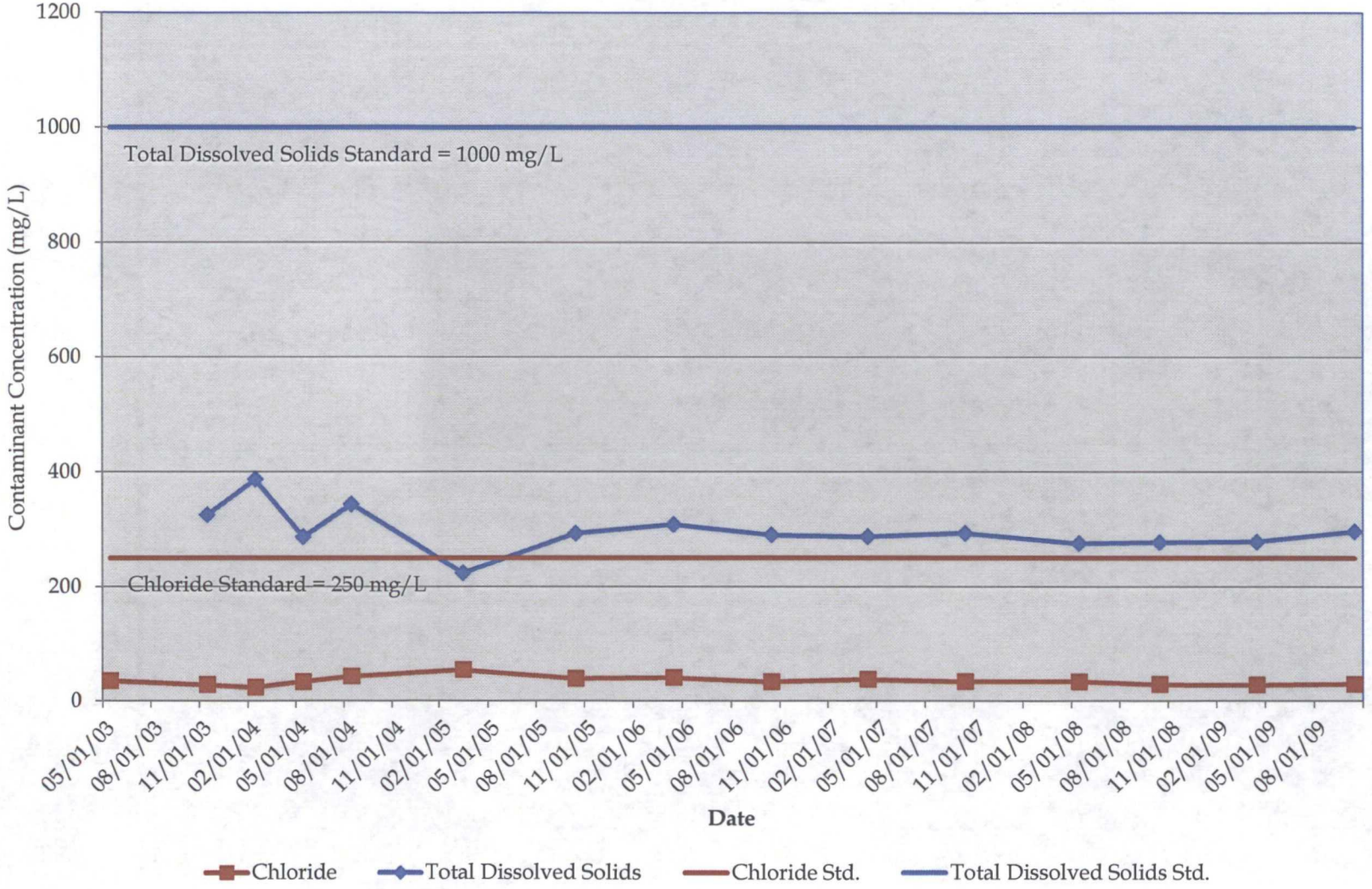
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-15



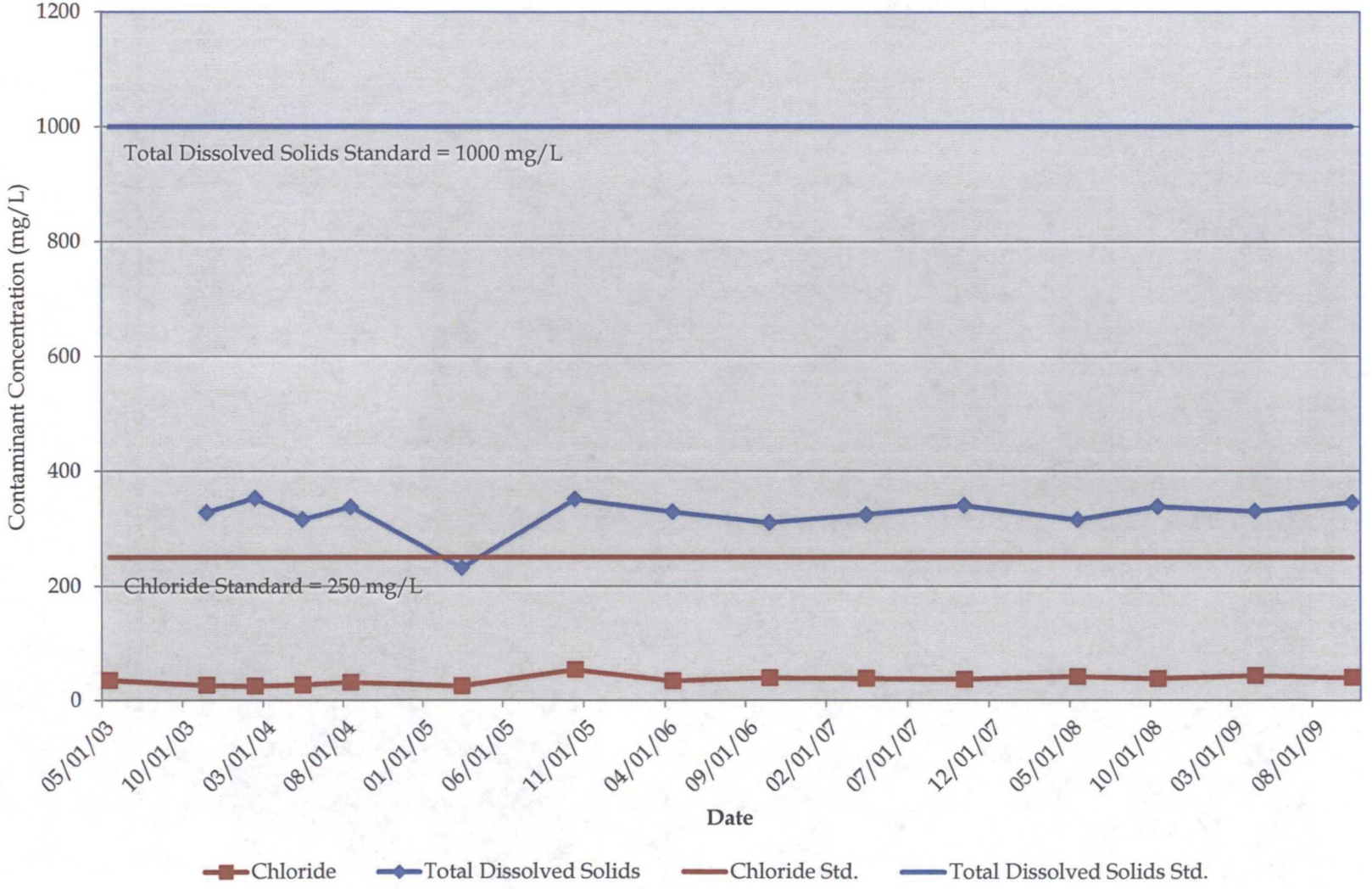
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-17



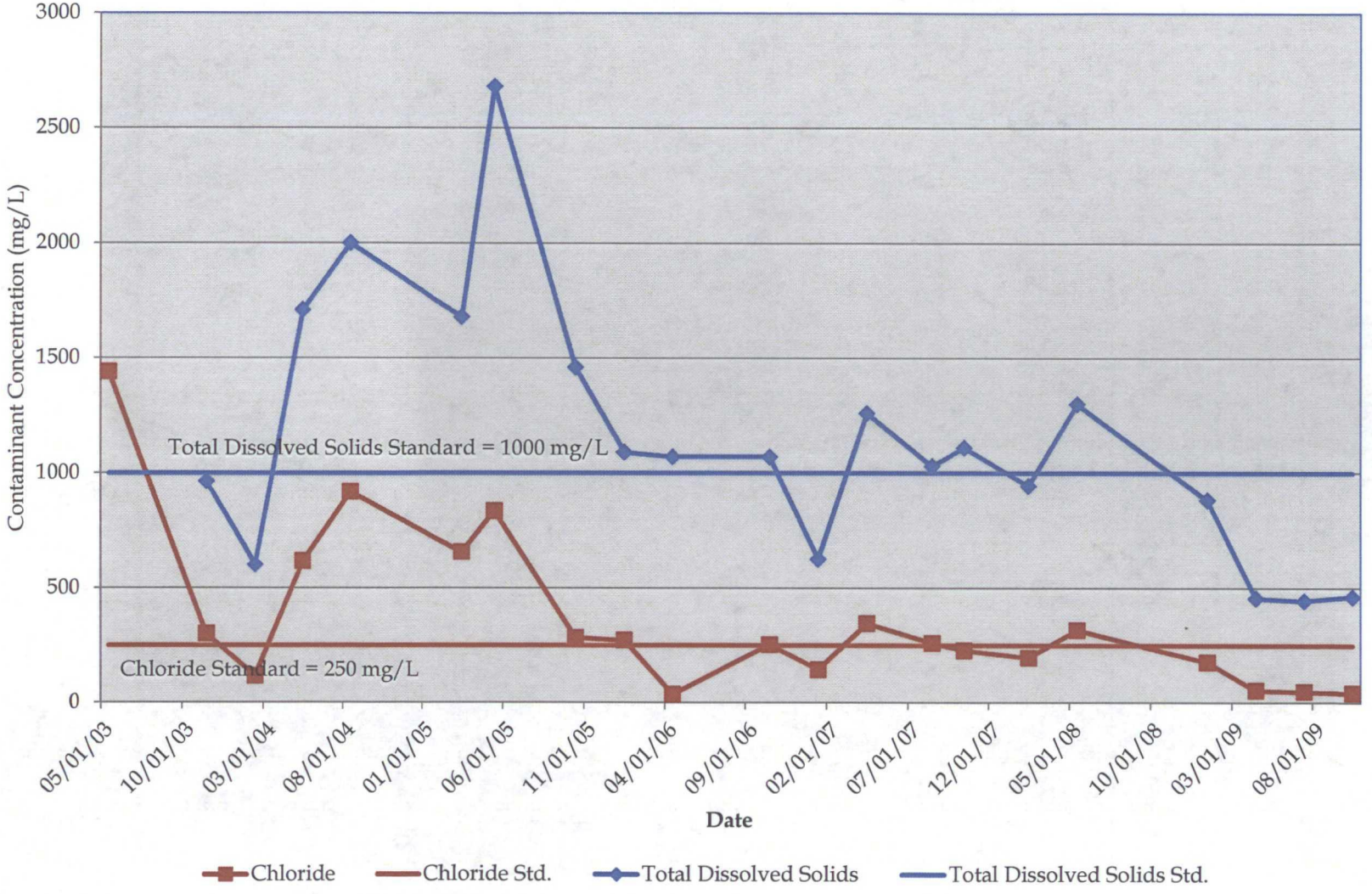
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-19



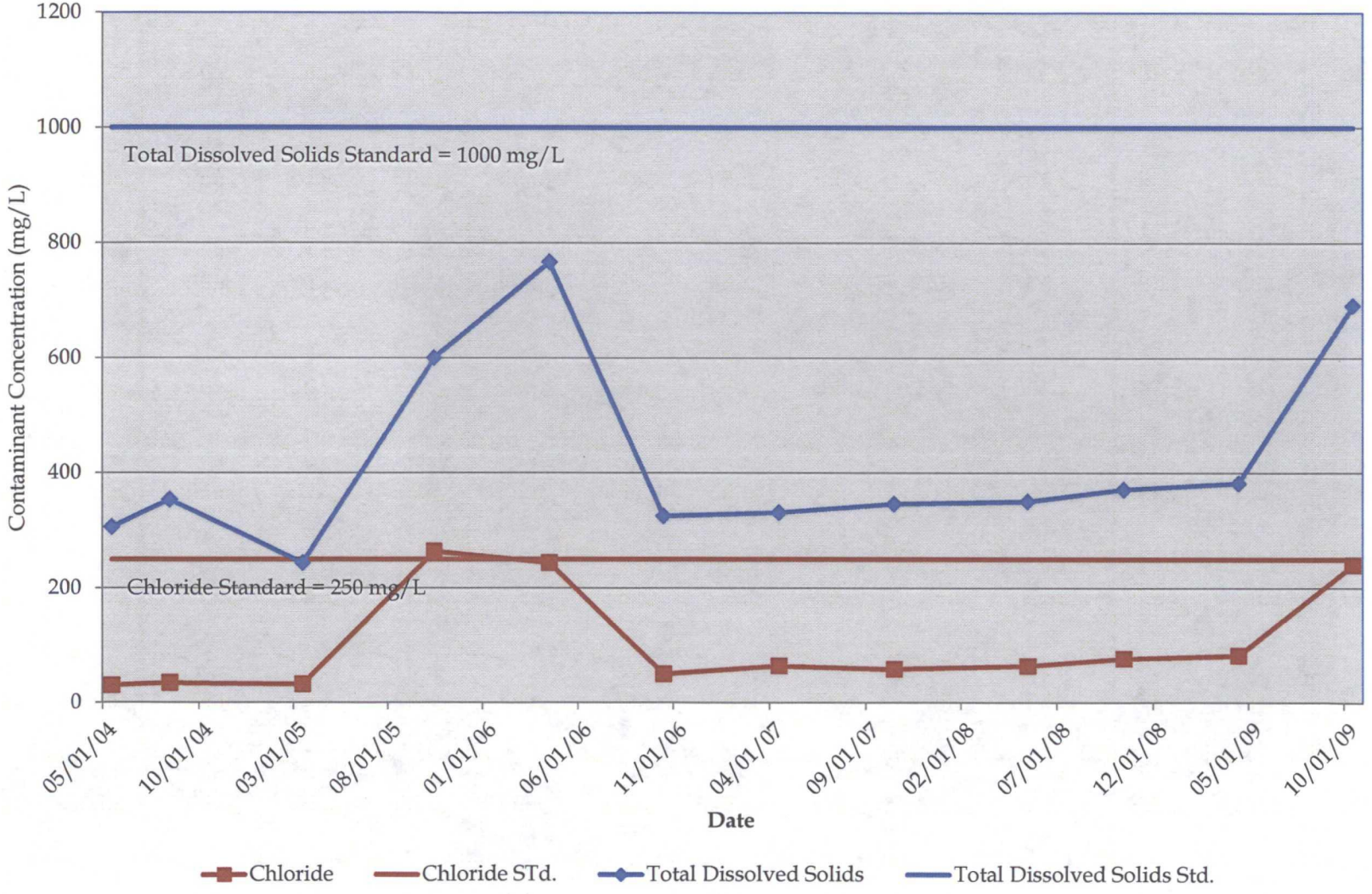
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-20



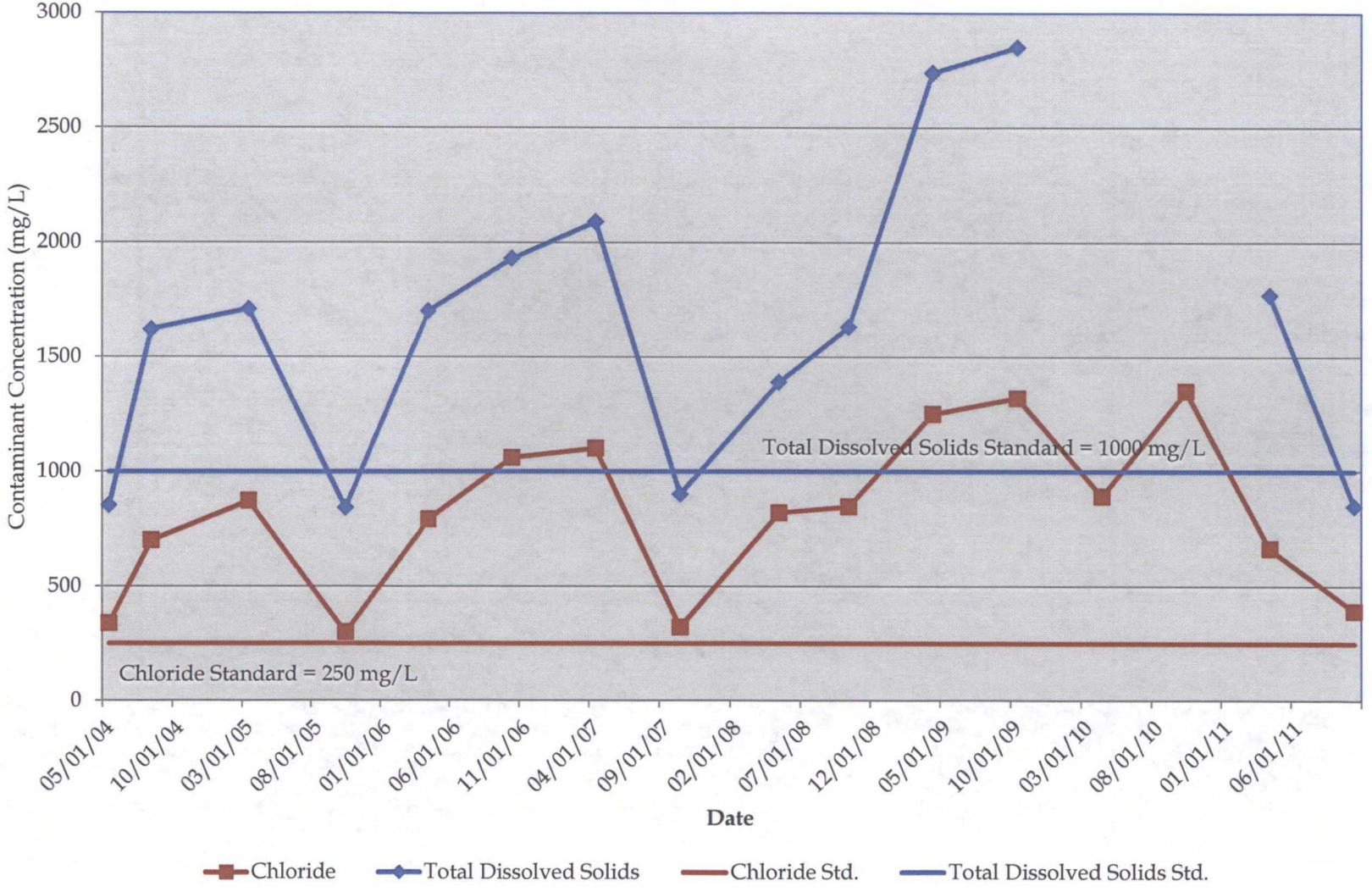
Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
TW-23



Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
RW-2



Chevron Environmental Management Company
Buckeye Vacuum Field Unit Site
Section 1-T18S-R34E, Lea County, NM
Dissolved Chloride and Total Dissolved Solids
RW-3



ALS Environmental

25-Apr-2011

John Schnable
Conestoga-Rovers & Associates
6320 Rothway, Suite 100
Houston, TX 77040

Tel: (713) 734-3090
Fax: (713) 734-3391

Re: Buckeye

Work Order: **1104502**

Dear John,

ALS Environmental received 4 samples on 15-Apr-2011 08:40 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

R. Kevin Given

Electronically approved by: R. Kevin Given

R. Kevin Given
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac

Certificate No: TX: T104704231-10-3

ALS Environmental

Date: 25-Apr-11

Client: Conestoga-Rovers & Associates
Project: Buckeye
Work Order: **1104502**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1104502-01	RW-3 041211	Water		4/12/2011 11:56	4/15/2011 08:40	☐
1104502-02	TW-1 041211	Water		4/12/2011 11:35	4/15/2011 08:40	☐
1104502-03	TW-13 041211	Water		4/12/2011 12:40	4/15/2011 08:40	☐
1104502-04	TW-14 041211	Water		4/12/2011 10:50	4/15/2011 08:40	☐

ALS Environmental

Date: *25-Apr-11*

Client: Conestoga-Rovers & Associates
Project: Buckeye
Sample ID: RW-3 041211
Collection Date: 4/12/2011 11:56 AM

Work Order: 1104502
Lab ID: 1104502-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS		Method: **E300**					Analyst: **TDW**
Chloride	**664**		**2.00**	**5.00**	**mg/L**	10	4/21/2011 19:45
Surr: Selenate (surr)	*96.7*			*85-115*	*%REC*	10	4/21/2011 19:45
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **JKP**
Total Dissolved Solids (Residue, Filterable)	**1,770**		**5.0**	**10.0**	**mg/L**	1	4/19/2011 13:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *25-Apr-11*

Client: Conestoga-Rovers & Associates
Project: Buckeye
Sample ID: TW-1 041211
Collection Date: 4/12/2011 11:35 AM

Work Order: 1104502
Lab ID: 1104502-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS		Method: **E300**					Analyst: **TDW**
Chloride	**282**		**2.00**	**5.00**	**mg/L**	10	4/21/2011 20:06
Surr: Selenate (surr)	*96.4*			*85-115*	*%REC*	10	4/21/2011 20:06
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **JKP**
Total Dissolved Solids (Residue, Filterable)	**1,070**		**5.0**	**10.0**	**mg/L**	1	4/18/2011 13:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *25-Apr-11*

Client: Conestoga-Rovers & Associates
Project: Buckeye
Sample ID: TW-13 041211
Collection Date: 4/12/2011 12:40 PM

Work Order: 1104502
Lab ID: 1104502-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS		Method: **E300**					Analyst: **TDW**
Chloride	**94.5**		**1.00**	**2.50**	**mg/L**	5	4/22/2011 16:28
Surr: Selenate (surr)	*85.8*			*85-115*	*%REC*	5	4/22/2011 16:28
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **JKP**
Total Dissolved Solids (Residue, Filterable)	**976**		**5.0**	**10.0**	**mg/L**	1	4/19/2011 13:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: *25-Apr-11*

Client: Conestoga-Rovers & Associates
Project: Buckeye
Sample ID: TW-14 041211
Collection Date: 4/12/2011 10:50 AM

Work Order: 1104502
Lab ID: 1104502-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS		Method: **E300**					Analyst: **TDW**
Chloride	**65.7**		**0.200**	**0.500**	mg/L	1	4/21/2011 22:12
Surr: Selenate (surr)	*97.3*			*85-115*	*%REC*	1	4/21/2011 22:12
TOTAL DISSOLVED SOLIDS		Method: **M2540C**					Analyst: **JKP**
Total Dissolved Solids (Residue, Filterable)	**642**		**5.0**	**10.0**	mg/L	1	4/18/2011 13:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 25-Apr-11

Client: Conestoga-Rovers & Associates

Work Order: 1104502

Project: Buckeye

QC BATCH REPORT

Batch ID: **R108523** Instrument ID **Balance1** Method: **M2540C**

MBLK Sample ID: **BLANK-R108523** Units: **mg/L** Analysis Date: **4/18/2011 01:10 PM**

Client ID: Run ID: **BALANCE1_110418H** SeqNo: **2352762** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	U	10								

LCS Sample ID: **LCS-R108523** Units: **mg/L** Analysis Date: **4/18/2011 01:10 PM**

Client ID: Run ID: **BALANCE1_110418H** SeqNo: **2352763** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	1088	10	1000	0	109	85-115	0			

DUP Sample ID: **1104385-02BDUP** Units: **mg/L** Analysis Date: **4/18/2011 01:10 PM**

Client ID: Run ID: **BALANCE1_110418H** SeqNo: **2352745** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	528	10	0	0	0	0-0	538	1.88	20	

DUP Sample ID: **1104399-01HDUPZ** Units: **mg/L** Analysis Date: **4/18/2011 01:10 PM**

Client ID: Run ID: **BALANCE1_110418H** SeqNo: **2352747** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	904	10	0	0	0	0-0	894	1.11	20	

The following samples were analyzed in this batch: 1104502-02A 1104502-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Conestoga-Rovers & Associates
Work Order: 1104502
Project: Buckeye

QC BATCH REPORT

Batch ID: **R108597** Instrument ID **Balance1** Method: **M2540C**

MBLK Sample ID: **BLANK-R108597** Units: **mg/L** Analysis Date: **4/19/2011 01:10 PM**
Client ID: Run ID: **BALANCE1_110419G** SeqNo: **2354653** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	U	10								

LCS Sample ID: **LCS-R108597** Units: **mg/L** Analysis Date: **4/19/2011 01:10 PM**
Client ID: Run ID: **BALANCE1_110419G** SeqNo: **2354654** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	1082	10	1000	0	108	85-115	0			

DUP Sample ID: **1104440-47EDUP** Units: **mg/L** Analysis Date: **4/19/2011 01:10 PM**
Client ID: Run ID: **BALANCE1_110419G** SeqNo: **2354633** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	3096	10	0	0	0	0-0	3112	0.515	20	

DUP Sample ID: **1104440-67D** Units: **mg/L** Analysis Date: **4/19/2011 01:10 PM**
Client ID: Run ID: **BALANCE1_110419G** SeqNo: **2354646** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Fil	2594	10	0	0	0	0-0	2544	1.95	20	

The following samples were analyzed in this batch: 1104502-01A 1104502-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Conestoga-Rovers & Associates
Work Order: 1104502
Project: Buckeye

QC BATCH REPORT

Batch ID: **R108670** Instrument ID **ICS3000** Method: **E300**

MBLK Sample ID: **WBLKW1-042111-R108670** Units: **mg/L** Analysis Date: **4/21/2011 01:04 PM**
Client ID: Run ID: **ICS3000_110421A** SeqNo: **2356296** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.50								
Surr: Selenate (surr)	*4.765*	0.10	*5*	0	*95.3*	*85-115*	0			

LCS Sample ID: **WLCSDW1-042111-R108670** Units: **mg/L** Analysis Date: **4/21/2011 01:46 PM**
Client ID: Run ID: **ICS3000_110421A** SeqNo: **2356297** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	21.41	0.50	20	0	107	90-110	0			
Surr: Selenate (surr)	*4.633*	0.10	*5*	0	*92.7*	*85-115*	0			

LCSD Sample ID: **WLCSDW1-042111-R108670** Units: **mg/L** Analysis Date: **4/21/2011 02:07 PM**
Client ID: Run ID: **ICS3000_110421A** SeqNo: **2356298** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	21.36	0.50	20	0	107	90-110	21.41	0.267	20	
Surr: Selenate (surr)	*4.757*	0.10	*5*	0	*95.1*	*85-115*	4.633	*2.64*	*20*	

MS Sample ID: **1104465-01AMS** Units: **mg/L** Analysis Date: **4/21/2011 04:14 PM**
Client ID: Run ID: **ICS3000_110421A** SeqNo: **2356364** Prep Date: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1654	25	500	1070	117	80-120	0			
Surr: Selenate (surr)	*243*	5.0	*250*	0	*97.2*	*85-115*	0			

MS Sample ID: **1104502-03AMS** Units: **mg/L** Analysis Date: **4/21/2011 08:48 PM**
Client ID: **TW-13 041211** Run ID: **ICS3000_110421A** SeqNo: **2357087** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	115.2	0.50	10	106.5	87.8	80-120	0			EO
Surr: Selenate (surr)	*5.02*	0.10	*5*	0	*100*	*85-115*	0			

MSD Sample ID: **1104465-01AMSD** Units: **mg/L** Analysis Date: **4/21/2011 04:35 PM**
Client ID: Run ID: **ICS3000_110421A** SeqNo: **2356394** Prep Date: DF: **50**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1654	25	500	1070	117	80-120	1654	0.00453	20	
Surr: Selenate (surr)	*243.4*	5.0	*250*	0	*97.4*	*85-115*	243	*0.183*	*20*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Conestoga-Rovers & Associates
Work Order: 1104502
Project: Buckeye

QC BATCH REPORT

Batch ID: **R108670** Instrument ID **ICS3000** Method: **E300**

MSD Sample ID: **1104502-03AMSD** Units: **mg/L** Analysis Date: **4/21/2011 09:51 PM**

Client ID: **TW-13 041211** Run ID: **ICS3000_110421A** SeqNo: **2357090** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	115.2	0.50	10	106.5	87.7	80-120	115.2	0.00868	20	EO
Surr: Selenate (surr)	*5.027*	0.10	*5*	0	*101*	*85-115*	5.02	*0.139*	*20*	

The following samples were analyzed in this batch: 1104502-01A 1104502-02A 1104502-03A 1104502-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Conestoga-Rovers & Associates
Work Order: 1104502
Project: Buckeye

QC BATCH REPORT

Batch ID: **R108749** Instrument ID **ICS2100** Method: **E300**

MBLK Sample ID: **WBLKW3-042211-R108749** Units: **mg/L** Analysis Date: **4/22/2011 12:36 PM**
Client ID: Run ID: **ICS2100_110422A** SeqNo: **2358331** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.441	0.50								J
Surr: Selenate (surr)	*4.348*	0.10	*5*	0	*87*	*85-115*	0			

LCS Sample ID: **WLCSW3-042211-R108749** Units: **mg/L** Analysis Date: **4/22/2011 12:50 PM**
Client ID: Run ID: **ICS2100_110422A** SeqNo: **2358332** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.19	0.50	20	0	96	90-110	0			
Surr: Selenate (surr)	*4.892*	0.10	*5*	0	*97.8*	*85-115*	0			

LCSD Sample ID: **WLCSDW3-042211-R108749** Units: **mg/L** Analysis Date: **4/22/2011 01:05 PM**
Client ID: Run ID: **ICS2100_110422A** SeqNo: **2358333** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.93	0.50	20	0	99.6	90-110	19.19	3.78	20	
Surr: Selenate (surr)	*4.294*	0.10	*5*	0	*85.9*	*85-115*	4.892	*13*	*20*	

MS Sample ID: **1104382-01GMS** Units: **mg/L** Analysis Date: **4/22/2011 03:30 PM**
Client ID: Run ID: **ICS2100_110422A** SeqNo: **2358343** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	71.54	0.50	10	56.84	147	80-120	0			SO
Surr: Selenate (surr)	*4.482*	0.10	*5*	0	*89.6*	*85-115*	0			

MSD Sample ID: **1104382-01GMSD** Units: **mg/L** Analysis Date: **4/22/2011 03:45 PM**
Client ID: Run ID: **ICS2100_110422A** SeqNo: **2358344** Prep Date: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	67.12	0.50	10	56.84	103	80-120	71.54	6.37	20	O
Surr: Selenate (surr)	*5.018*	0.10	*5*	0	*100*	*85-115*	4.482	*11.3*	*20*	

The following samples were analyzed in this batch: 1104502-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 25-Apr-11

Client: Conestoga-Rovers & Associates
Project: Buckeye
WorkOrder: 1104502

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Units Reported	Description
mg/L	Milligrams per Liter

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Chain of Custody Form

Page 1 of 1

COC ID: 34206

1104502

CRA-HOU: Conestoga-Rovers & Associates

Project: Buckeye

ALS Project Manager:

Customer Information		Project Information			
Purchase Order		Project Name	Buckeye	A	Anions (300) Cl
Work Order		Project Number	73015	B	TDS
Company Name	Conestoga-Rovers & Associates	Bill To Company	Conestoga-Rovers & Associates	C	
Send Report To	Patricia Lynch	Invoice Attn	Patricia Lynch	D	
Address	6320 Rothway Ste. 100	Address	6320 Rothway, Suite 100	E	
				F	
City/State/Zip	Houston, TX 77040	City/State/Zip	Houston, TX 77040	G	
Phone	(713) 734-3090	Phone	(713) 734-3090	H	
Fax	(713) 264-6138	Fax	(713) 734-3391	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	RW-3 041211	4-12-11	1156	W	N/A	1	X	X									
2	TW1 - 041211	4-12-11	1135	W	N/A	1	X	X									
3	TW-13 041211	4-12-11	1240	W	N/A	1	X	X									
4	TW-14 041211	4-12-11	1050	W	N/A	1	X	X									
5	TEMP	—	—														
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: J. PRIMERA

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) ☐ Std 10 WK Days ☑ 5 WK Days ☐ Other ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes: 5 Day TAT.
	4-14-11	1700	4/15/11 0840	
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID / Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	1761

QC Package: (Check One Box Below)
☑ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other / EDD

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Environmental

Sample Receipt Checklist

Client Name: **CRA-HOU** Date/Time Received: **15-Apr-11 08:40**

Work Order: **1104502** Received by: **PMG**

Checklist completed by Salvador A. Yanez (eSignature) 15-Apr-11 (Date) Reviewed by: R. Kevin Given (eSignature) 19-Apr-11 (Date)

Matrices: Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.2c	002	
Cooler(s)/Kit(s):	1761		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

1104502

ALS Environmental
10450 Stanaiff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Seal Broken By:

Date: 4/15/11

4-14-11 Time: 1800

Brice Haynes

Company: CRA

FedEx Tracking Number 875394691974

Sender's Name Phone

Company

Address

Dept/Floor/Suite/Room

City State ZIP

Your Internal Billing Reference

Analytical Report 430032

for

Conestoga Rovers & Associates

Project Manager: John Schnable

Buckeye Vacuum

073015

02-NOV-11

Collected By: Client

Celebrating 20 Years of commitment to excellence in Environmental Testing Services

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Utah (AALI1), West Virginia (362), Kentucky (85)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Miami (EPA Lab code: FL01152): Florida (E86678), Maryland (330)
Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

02-NOV-11

Project Manager: **John Schnable**
Conestoga Rovers & Associates
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No: **430032**
Buckeye Vacuum
Project Address: Buckeye

John Schnable:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 430032. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 430032 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron II
Odessa Laboratory Manager

Sample Cross Reference 430032

Conestoga Rovers & Associates, Midland, TX

Buckeye Vacuum

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
TW-13	W	10-18-11 11:47		430032-001
RW-3	W	10-18-11 12:45		430032-002
TW-14	W	10-18-11 12:10		430032-003
TW-10	W	10-18-11 12:30		430032-004

CASE NARRATIVE

Client Name: Conestoga Rovers & Associates
Project Name: Buckeye Vacuum

Project ID:	*073015*	*Report Date:*	*02-NOV-11*
Work Order Number:	*430032*	*Date Received:*	*10/21/2011*

Sample receipt non conformances and comments:
None

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 430032

Conestoga Rovers & Associates, Midland, TX

Project Name: Buckeye Vacuum

Project Id: 073015
Contact: John Schnable
Project Location: Buckeye

Date Received in Lab: Fri Oct-21-11 01:42 pm
Report Date: 02-NOV-11
Project Manager: Brent Barron II

Analysis Requested											
	Lab Id:	430032-001		430032-002		430032-003		430032-004			
	Field Id:	TW-13		RW-3		TW-14		TW-10			
	Depth:										
	Matrix:	GROUND WATER		GROUND WATER		GROUND WATER		GROUND WATER			
	Sampled:	Oct-18-11 11:47		Oct-18-11 12:45		Oct-18-11 12:10		Oct-18-11 12:30			
Anions by E300	***Extracted:***										
	Analyzed:	Oct-25-11 14:59		Oct-25-11 14:59		Oct-25-11 14:59		Oct-25-11 14:59			
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL		
Chloride		90.8	5.00	392	10.0	33.2	5.00	337	5.00		
TDS by SM2540C	***Extracted:***										
	Analyzed:	Oct-24-11 16:15		Oct-24-11 16:15		Oct-24-11 16:15		Oct-24-11 16:15			
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL		
Total dissolved solids		698	5.00	848	5.00	482	5.00	750	5.00		

Brent Barron II
Odessa Laboratory Manager

Final 1.000

XENCO Laboratories

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantiation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

* Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ Outside XENCO's scope of NELAC Accreditation. ^ NELAC or State program does not offer Accreditation at this time.

BS / BSD Recoveries

Project Name: Buckeye Vacuum

Work Order #: 430032 **Project ID:** 073015

Analyst: BRB **Date Prepared:** 10/25/2011 **Date Analyzed:** 10/25/2011

Lab Batch ID: 873144 **Sample:** 873144-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Anions by E300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<0.500	10.0	11.1	111	10.0	11.0	110	1	80-120	20	

Analyst: WRU **Date Prepared:** 10/24/2011 **Date Analyzed:** 10/24/2011

Lab Batch ID: 873669 **Sample:** 873669-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TDS by SM2540C Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Total dissolved solids	<5.00	1000	894	89	1000	920	92	3	80-120	30	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

XENCO Laboratories

Form 3 - MS Recoveries

Project Name: Buckeye Vacuum

Work Order #: 430032

Lab Batch #: 873144 **Project ID:** 073015

Date Analyzed: 10/25/2011 **Date Prepared:** 10/25/2011 **Analyst:** BRB

QC- Sample ID: 430032-001 S **Batch #:** 1 **Matrix:** Ground Water

Reporting Units: mg/L

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	90.8	100	195	104	80-120	

Lab Batch #: 873144

Date Analyzed: 10/25/2011 **Date Prepared:** 10/25/2011 **Analyst:** BRB

QC- Sample ID: 430045-005 S **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	214	100	324	110	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

XENCO Laboratories

Sample Duplicate Recovery

Project Name: Buckeye Vacuum

Work Order #: 430032

Lab Batch #: 873144 **Project ID:** 073015

Date Analyzed: 10/25/2011 14:59 **Date Prepared:** 10/25/2011 **Analyst:** BRB

QC- Sample ID: 430032-001 D **Batch #:** 1 **Matrix:** Ground Water

Reporting Units: mg/L

Anions by E300	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	90.8	90.4	0	20	

Lab Batch #: 873669

Date Analyzed: 10/24/2011 16:15 **Date Prepared:** 10/24/2011 **Analyst:** WRU

QC- Sample ID: 430032-001 D **Batch #:** 1 **Matrix:** Ground Water

Reporting Units: mg/L

TDS by SM2540C	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Total dissolved solids	698	670	4	30	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.
BRL - Below Reporting Limit

Xenco Laboratories

The Environmental Lab of Texas

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

12600 West I-20 East
Odessa, Texas 79765

Phone: 432-563-1800
Fax: 432-563-1713

Project Manager: John Schnable
Company Name: CRA
Company Address: 2135 S. Loop 250 W
City/State/Zip: Midland Tx 79703
Telephone No: 432-686-0086 Fax No: 686-0186
Sampler Signature: JP e-mail:

Project Name: Buckeye Vacuum
Project #: 073015
Project Loc: Buckeye
PO #: 4043096
Report Format: ☐ Standard ☐ TRRP ☐ NPDES

(lab use only)
ORDER #: 430032

LAB # (lab use only)	FIELD CODE	Beginning Depth	Ending Depth	Date Sampled	Time Sampled	Field Filtered	Total # of Containers	Preservation & # of Containers: Ice	HNO_3	HCl	H_2SO_4	NaOH	$Na_2S_2O_3$	None	Other (Specify)	Matrix: DW=Drinking Water SL=Sludge / GW=Groundwater S=Soil/Solid / NP=Non-Potable Specify Other	Analyze For: TCLP: TOTAL: TPH: 418.1 8015M 8015B	TPH: TX 1005 TX 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO_4, Alkalinity) Inc. C	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030 or BTEX 8260	RCI	N.O.R.M.	TDS EPA 160.1		RUSH TAT (Pre-Schedule) 24, 48, 72 hrs	Standard TAT
01	TW-13			10-18-11	1147		1	X						X		GW				X								X			
02	RW-3			10-18-11	1245		1	X						X		GW				X								X			
03	TW-14			10-18-11	1210		1	X						X		GW				X								X			
04	TW-10			10-18-11	1230		1	X						X		GW				X								X			
05	Temp																														

Special Instructions:

Relinquished by:	Date	Time	Received by:	Date	Time
	10-21-11	1342			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			A. Hernandez	10/21/11	13:42

Laboratory Comments:

Sample Containers Intact?	(Y)	N
VOCs Free of Headspace?	N/A	
Labels on container(s)	(Y)	N
Custody seals on container(s)	Y	(N)
Custody seals on cooler(s)	Y	(N)
Sample Hand Delivered	(Y)	N
by Sampler/Client Rep. ?	(Y)	N

by Courier? UPS DHL FedEx Lone Star

Temperature Upon Receipt: 2.0 °C

Final 1.000

XENCO Laboratories	XENCO Laboratories Atlanta, Boca Raton, Corpus Christi, Dallas Houston, Miami, Odessa, Philadelphia Phoenix, San Antonio, Tampa	Document Title: Sample Receipt Checklist Document No.: SYS-SRC Revision/Date: No. 01, 5/27/2010 Effective Date: 6/1/2010 Page 1 of 1

Prelogin / Nonconformance Report - Sample Log-In

Client: CRH

Date/Time: 10/21/11 13:42

Lab ID #: 430032

Initials: AH

Sample Receipt Checklist

1. Samples on ice?	Blue	(Water)	No	
2. Shipping container in good condition?	(Yes)	No	None	
3. Custody seals intact on shipping container (cooler) and bottles?	Yes	No	(N/A)	
4. Chain of Custody present?	(Yes)	No		
5. Sample instructions complete on chain of custody?	(Yes)	No		
6. Any missing / extra samples?	Yes	(No)		
7. Chain of custody signed when relinquished / received?	(Yes)	No		
8. Chain of custody agrees with sample label(s)?	(Yes)	No		
9. Container labels legible and intact?	(Yes)	No		
10. Sample matrix / properties agree with chain of custody?	(Yes)	No		
11. Samples in proper container / bottle?	(Yes)	No		
12. Samples properly preserved?	(Yes)	No	N/A	
13. Sample container intact?	(Yes)	No		
14. Sufficient sample amount for indicated test(s)?	(Yes)	No		
15. All samples received within sufficient hold time?	(Yes)	No		
16. Subcontract of sample(s)?	(Yes)	No	N/A	
17. VOC sample have zero head space?	Yes	No	(N/A)	

18. Cooler 1 No.		Cooler 2 No.		Cooler 3 No.		Cooler 4 No.		Cooler 5 No.	
lbs	2 °C	lbs	°C	lbs	°C	lbs	°C	lbs	°C

Nonconformance Documentation

Contact: _____ Contacted by: _____ Date/Time: _____

Regarding: _____

Corrective Action Taken: Sub TDS to Xenco Houston

Check all that apply:
- ☐ Cooling process has begun shortly after sampling event and out of temperature condition acceptable by NELAC 5.5.8.3.1.a.1.
- ☐ Initial and Backup Temperature confirm out of temperature conditions
- ☐ Client understands and would like to proceed with analysis