1227799

SGW-58242
Revision 0

[00829177H]

WMA C Quarterly January Through March 2014 Quarterly Groundwater Monitoring Report

RECEIVED
DEC 17 2014
EDMC

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

SGW-58242
Revision 0

WMA C Quarterly January Through March 2014 Quarterly Groundwater Monitoring Report

Date Published
December 2014

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352

APPROVED
By Lee Ann Snyder at 8:33 am, Dec 15, 2014

Release Approval Date

Approved for Public Release;
Further Dissemination Unlimited

TRADEMARK DISCLAIMER

Reference herein to any specific commercial product, process, or service by tradename, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy.

Printed in the United States of America

Contents

1 Purpose 1

2 Groundwater Flow and Rate 2

3 Quarterly Results Discussion 3

3.1 Field Parameters 3

3.2 Nitrate and Sulfate 4

3.2.1 Nitrate 4

3.2.2 Sulfate 5

3.3 Cyanide 5

3.4 Technetium-99 6

3.5 Uranium 6

3.6 Nickel 7

3.7 Low-Level Gamma 7

4 Conclusion 7

5 References 19

Appendices

A Waste Management Area C Groundwater Monitoring Well Attributes ..... A-i

B Low-Gradient Monitoring Network Water Table Measurements and Gradient and Azimuth Determinations ..... B-i

C Waste Management Area C Monitoring Network Water Table Measurements and Gradient and Azimuth Determinations ..... C-i

D Groundwater Analytical Data for Waste Management Area C, September 2013 ..... D-i

Figures

Figure 1 Waste Management Area C Monitoring Wells 9

Figure 2 Low Gradient Water Level Network for the Northwest Quarter of the 200 East Area 10

Figure 3 Flow Direction and Gradient Magnitude Determined from the Corrected Groundwater Levels at the 14-Well Low-Gradient Monitoring Network 11

Figure 4 Flow Direction and Gradient Magnitude Determined from the Corrected Groundwater Levels at the 6-Well Low-Gradient Monitoring Network 11

Figure 5 Recent Nitrate Results at Wells 299-E27-4, 299-E27-22, and 299-E27-25 12

Figure 6 Comparison of Nitrate Results at Wells 299-E27-21 and 299-E27-23 to Wells to the North and Northwest 12

Figure 7 Sulfate Results at WMA C Wells 13

Figure 8 Sulfate Trend Comparison at Wells 299-E27-10 and 299-E27-25 13

Figure 9 Cyanide Results at Wells 299-E27-7, 299-E27-23, and 299-E27-24 14

Figure 10 Interpretation of the 4 μg/L Cyanide Isopleth in the Upper 4 Meters and Lower 4 Meters of the Aquifer at Waste Management Area C and Cyanide Trend Results at Select Waste Management Area C Wells 15
Figure 11 Technetium-99 Results at WMA C Wells 17
Figure 12 Uranium Results at Wells 299-E27-14 and 299-E27-155 17
Figure 13 Filtered Nickel Results at WMA C Wells 18

Terms

AEA	*Atomic Energy Act of 1954*
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
DWS	drinking water standard
LLWMA	Low-Level Waste Management Area
RCRA	*Resource Conservation and Recovery Act of 1976*
WMA	Waste Management Area

This page intentionally left blank.

1 Purpose

This report provides the January through March 2014 quarterly monitoring results at the 241-C Tank Farm (also referred to as Single-Shell Tank Waste Management Area [WMA] C). This report meets two requirements at WMA C: requirements of 04-TPD-083, "Agreement on Content of Tank Waste Retrieval Work Plans," in which quarterly groundwater monitoring sample results are to be provided to the Washington State Department of Ecology during tank retrievals, and quarterly *Resource Conservation and Recovery Act of 1976* (RCRA) assessment requirements. Based on historical data at WMA C, tank retrieval activities have not impacted groundwater. However, WMA C has been determined to have impacted groundwater from historical releases and, as a consequence, is in a RCRA groundwater quality assessment program in accordance with WAC 173-303-400, "Dangerous Waste Regulations," "Interim Status Facility Standards," and, by reference, 40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart F, "Ground-Water Monitoring."

Tank retrievals at WMA C began November 18, 1998, as provided in HNF-5267, *Waste Retrieval Sluicing System Campaign Number 3 Solids Volume Transferred Calculation*. The retrievals were required to remove existing liquid supernate and sludge from the 16 underground storage tanks as defined in RPP-22393, *241-C-102, 241-C-104, 241-C-107, 241-C-108, and 241-C-112 Tanks Waste Retrieval Work Plan*. Other work plans, as provided in RPP-22393, direct retrieval requirements at the other 11 tanks in WMA C. Currently, retrieval has been completed or retrieved to the limit of the retrieval technology at 11 tanks and is ongoing at 4 tanks, with 1 tank remaining to be started, as provided in HNF-EP-0182, *Waste Tank Summary Report for Month Ending May 31, 2014*.

The 04-TPD-083 letter agreed to the quarterly analyses as tank retrieval activities were ongoing as provided in PNNL-13024, *RCRA Groundwater Monitoring Plan for Single-Shell Tank Waste Management Area C at the Hanford Site*. The agreed-upon analyses include RCRA and *Atomic Energy Act of 1954* (AEA) constituents from the following: anions, cyanide, metals, gross beta, technetium-99, total uranium, and low-level gamma scan.

The WMA C monitoring network has grown and the controlling documents have changed since retrieval began in 1998. Initially, the monitoring network consisted of five monitoring wells, which increased to nine in 2004 per PNNL-13024-ICN-4. An assessment program was initiated in July 2009 when a critical mean exceedance for specific conductance was verified in downgradient Well 299-E27-14 (Figure 1). During the initial assessment, the dangerous waste constituent cyanide was found in the downgradient WMA C monitoring wells but not in upgradient Well 299-E27-22. Other dangerous waste constituents potentially associated with WMA C have not been found in the groundwater. Because of the continued presence of cyanide downgradient of WMA C over several years, it was determined that past releases from WMA C had and continued to affect the groundwater. As a result, DOE/RL-2009-77, *Groundwater Quality Assessment Plan for the Single-Shell Tank Waste Management Area C*, was created and superseded PNNL-13024. DOE/RL-2009-77 required the addition of three monitoring wells (299-E27-24, 299-E27-25, and 299-E27-155) to the WMA C monitoring network. Wells 299-E27-24 and 299-E27-25 were installed in 2010. Well 299-E27-155, a 2008 *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) well, was added because of the presence of cyanide at this well in December 2009. Because DOE/RL-2009-77 was RCRA focused, the AEA constituents were not captured in this document. Thus, in October 2013, TPA-CN-578, *Tri-Party Agreement Change Notice Form: Groundwater Sampling and Analysis Plan for the 200-BP-5 Operable Unit, DOE/RL-2001-49 Rev. 1*, was finalized incorporating the AEA requirements (e.g., gross beta, technetium-99, total uranium, and low-level gamma scan) for all 12 WMA C monitoring wells. Table A-1 (Appendix A) provides the key attributes of the monitoring wells in the WMA C monitoring well network.

Groundwater monitoring objectives for CERCLA, RCRA, and AEA often differ slightly, and the contaminants monitored are not always the same. For RCRA regulated units, monitoring focuses on nonradioactive dangerous waste constituents. Radionuclides (source, special nuclear, and byproduct materials) may be monitored in some RCRA unit wells to support objectives of monitoring under AEA or CERCLA. Pursuant to RCRA, the source, special nuclear, and byproduct material component of radioactive mixed wastes are not regulated under RCRA and are regulated by the U.S. Department of Energy acting pursuant to its AEA authority. Therefore, while this report may be used to satisfy RCRA reporting requirements, inclusion of information on radionuclides in such context is for information only and may not be used to create conditions or other restrictions set forth in any RCRA permit.

2 Groundwater Flow and Rate

As discussed in Section 3 of SGW-54675, *WMA C October through December 2012 Quarterly Groundwater Monitoring Report*, various hydraulic parameters derived from past tests and ongoing evaluations have been applied in an effort to estimate a range of the groundwater flow rates beneath WMA C. Estimation of groundwater flow rates are required by 40 CFR 265.93(d)(7)(i) and 40 CFR 265.94(b)(1), "Recordkeeping and Reporting," because of the presence of the dangerous waste constituent cyanide. Hydraulic parameters used to estimate rates of groundwater flow at WMA C include effective porosity (n_e) and hydraulic conductivity values (K) developed from a variety of hydraulic tests and field observations. As discussed in SGW-54675, the effective porosity was established at 0.1, and the most appropriate hydraulic conductivity range is from 100 to 2,100 m/day (330 to 6,900 ft/day). The other hydraulic parameter, the hydraulic gradient (G) of the water table, has been based on current water level evaluations measured from a 14-well low-gradient monitoring network in the northwest corner of the 200 East Area over the past six quarters (Figure 2). The rationale for using this network for WMA C was established in SGW-54675 and SGW-54508, *WMA C September 2012 Quarterly Groundwater Monitoring Report*.

This quarter, another criterion was added to quanitify the groundwater measurements to be used for gradient and direction determinations. The criterion included evaluating the corrected groundwater levels at individual wells to a one standard deviation for the well network. Those wells exceeding the standard deviation were deleted from the network gradient and flow direction calculations. Table B-1 in Appendix B shows wells deleted from the network calculations. Using this new criterion provided a more reasonable month-to-month change of the groundwater gradient over the past year (Figure 3). At this time, it is uncertain why the gradient is highly variable at certain wells; however, the increased number of affected wells in the winter may indicate a relationship between well design and barometric response.

The measurements and gradient calculations associated with the 14-well low-gradient monitoring network from January through March 2014 are provided in Table B-1 (Appendix B). A discussion of the various statistical terms used in the gradient and flow direction analysis also is provided in Appendix B. The average groundwater gradient calculated from these measurements was approximately 7.85×10^{-6} m/m and will be used to calculate the range in groundwater flow rate at WMA C for this quarterly report. By comparison with last quarter, the magnitude of the groundwater gradient derived from the 14-well low-gradient monitoring network continued to decrease. The flow rate is used to provide the cyanide contaminant migration rate as required in 40 CFR 265.93(d)(7)(i), "Preparation, Evaluation, and Response."

As water levels in the 200 East Area continue to decline, the gradient and flow direction calculations associated with the regional 14-well low-gradient network are being compared to similar calculations being made at a more local 6-well network (299-E28-27, 299-E32-5, 299-E32-6, 299-E32-8, 299-E33-28, and 299-E33-34) located at the boundary of Low-Level Waste Management Area-1 (LLWMA-1) as depicted in Figure 2. This comparison is to determine if there may be variability between regional and

local networks. The 6-well network is a subset of the 14-well regional network as seen by comparing the wells in Tables B-1 and B-2 (Appendix B). As expected, when the size of the 14-well low-gradient network is reduced to the 6-well network, adjacent the 218-E-10 Burial Ground boundary, the hydraulic gradient measurements become statistically less reliable. For this reason, the 14-well low-gradient network is used to derive the gradient; however, even though the 6-well low-gradient network is not as statistically reliable, flow direction calculations usually provide good agreement with the observed migration of plumes in this area. This quarter, the flow direction was southeast in January and March and northeast in February (Figure 4). The p-value was highest for the month of February, indicating the least statistically reliable data.

Flow direction determinations for WMA C are derived from partially corrected water-level measurements made at selected WMA C wells. The partially corrected measurements collected at selected WMA C wells and the associated flow direction calculations are presented in Appendix C and shown in Figure 1. Water level measurements for the selected WMA C wells, which have been partially corrected, have not been corrected for barometric response, but plans have been made for these corrections in CY 2014. WMA C is a smaller well network, similar to the LLWMA-1 6-well network, and may not provide statistically significant gradient calculations. As a result, additional wells beyond the WMA C boundaries may be included in the low-gradient monitoring network for WMA C in the future. The additional wells are being corrected for barometric response, deviation from vertical, and precision surveyed to similar bench marks.

Using the hydraulic parameters discussed in the first paragraph of this section, estimates of the groundwater flow rate (V) beneath WMA C range between 0.001 and 0.165 m/day (0.026 and 0.54 ft/day) (3 to 60 m [9 to 197 ft] per year), based on the formula $V=(K*G)/n_e$ (Driscoll, 1986, *Groundwater and Wells*). This derived groundwater flow rate range has decreased from the October to December 2013 calculated flow rate, which ranged from 0.03 to 0.6 m/day (0.11 to 2.0 ft/day). The decrease in the derived flow rate is associated with a smaller gradient magnitude.

The groundwater gradient magnitude in the northwest corner of the 200 East Area has been shown to vary seasonally and the larger summer and fall gradients have been linked with the propagation of high Columbia River runoff levels (stages) in the later spring and early summer. The discharging high Columbia River level is propagated through the transmissive aquifer sediments deposited along the paleochannel aligned through the Gable Gap and into the 200 East Area, as depicted in Plate 10 of PNNL-12261, *Revised Hydrogeology for the Suprabasalt Aquifer System, 200-East Area and Vicinity, Hanford Site, Washington*. As the high river elevation head is propagated through the porous unconfined aquifer media, it also attenuates; thus, groundwater elevations in the 200 East Area do not reach the same elevations as seen in the high Columbia River stages. The lower winter and possibly early spring unconfined aquifer gradient magnitude in the northwest corner of the 200 East Area appears to reflect the lower Columbia River water levels of late summer and fall.

3 Quarterly Results Discussion

During March 2014, all 12 WMA C wells were successfully sampled as scheduled. The following subsections discuss the results for constituents analyzed per the 04-TPD-083 letter and DOE/RL-2009-77. Appendix D provides all 925 analytical results derived from the March 2014 sampling event at WMA C.

3.1 Field Parameters

The March pH measurements from WMA C monitoring wells ranged between 7.64 and 8.11.
The minimum pH was reported at Well 299-E27-155 and the maximum at Well 299-E27-13. In general, the wells screened across the upper part of the aquifer with short screen intervals (e.g., 299-E27-12, 299-E27-13, and 299-E27-15) had greater pH values, ranging from 7.8 to 8.11. The wells screened across

the bottom of the aquifer (e.g., 299-E27-24 and 299-E27-155) had the lowest pH values, ranging from 7.64 to 7.72. The wells with long screen intervals (e.g., extending approximately 9 m (30 ft) into the aquifer (Wells 299-E27-4, 299-E27-7, 299-E27-21, 299-E27-22, and 299-E27-23) had intermediate pH levels, ranging from 7.7 to 8.0. The lower pH levels within the deeper part of the aquifer are more reflective of the background geometric mean as reported in DOE/RL-96-61, *Hanford Site Background: Part 3, Groundwater Background.*

Specific conductance measurements in the 12 WMA C wells ranged between 371 and 980 µS/cm. The lowest value was observed at upgradient Well 299-E27-12, and the greatest specific conductance was observed at Well 299-E27-24. Elevated specific conductance was found in wells with elevated nitrate and sulfate concentrations. The specific conductance values observed were consistent with the calculated sum of the major anions and cations.

3.2 Nitrate and Sulfate

This section discusses results for nitrate and sulfate from the December 2013 sampling event. In the following subsection, nitrate concentrations are expressed in terms of the NO_3^- ion, as opposed to nitrogen in nitrate. For comparison purposes, the drinking water standard (DWS) of 10 mg/L for nitrogen in nitrate is approximately equal to 45 mg/L (45,000 µg/L) of nitrate as NO_3^-, using a molecular conversion of 4.43 times the nitrogen in nitrate concentration.

3.2.1 Nitrate

Nitrate exceeded 45,000 µg/L in three WMA C wells this quarter (299-E27-14, 299-E27-24, and 299-E27-25) (Appendix D). Two of the three wells above the DWS are south to southeast of WMA C (299-E27-14 and 299-E27-24). The source of elevated nitrate at Well 299-E27-25 may be related to unplanned releases associated with discharges to the 216-B-2 Ditches (DOE/RL-2011-118, *Hanford Site Groundwater Monitoring for 2011*, Section 3.4.1.7).

Of the four wells screened at the top of the aquifer (299-E27-12, 299-E27-13, 299-E27-14, and 299-E27-15), Well 299-E27-14 is the only well with nitrate concentrations exceeding 45,000 µg/L. The nitrate concentration at Well 299-E27-14 decreased significantly from December (88,500 compared to 110,000 µg/L). The other three wells screened across the top of the aquifer have the lowest nitrate concentrations at WMA C, ranging from 8,500 to 17,000 µg/L (Appendix D).

The two deepest wells near WMA C, 299-E27-24 and 299-E27-155, are screened at the bottom of the unconfined aquifer. Nitrate levels at Well 299-E27-24 have been stable, returning similar concentrations since being completed in December 2010. Over this period, the concentrations have ranged between 65,500 and 72,200 µg/L. In March 2014, the concentration was 69,100 µg/L. The concentration in Well 299-E27-155 has been decreasing since September 2012. The concentrations in this well have decreased from 51,000 to 24,000 µg/L. In March, the concentration rose to 25,000 µg/L.

The wells northwest, north, and northeast of WMA C (299-E27-4, 299-E27-22, and 299-E27-25), which have longer screen intervals than those screened near the top of the aquifer, continue to show mixed nitrate trends. Nitrate is trending down at Well 299-E27-4, but increasing at Well 299-E27-25 (Figure 5). At Well 299-E27-22, located between the other two wells, concentrations were trending down but increased in September and have remained nearly constant since (Figure 5). The nitrate concentration increase at 299-E27-25 appears to be associated with the migration of elevated nitrate from the north.

Nitrate concentrations at wells southeast and south of WMA C (299-E27-21 and 299-E27-23) continue to be more elevated relative to nitrate concentrations seen in wells north and northwest of WMA C (299-E27-4, 299-E27-12, 299-E27-13, 299-E27-15, and 299-E27-22) (Figure 6). However, nitrate concentrations at Well 299-E27-23 have decreased and are now similar to those in upgradient Well 299-E27-22.

3.2.2 Sulfate

The most significant sulfate concentrations at WMA C continue to be at Wells 299-E27-14, 299-E27-24, and 299-E27-25 (Figure 7). Results from these wells continue to exceed the secondary DWS of 250,00 µg/L. The remainder of the wells range from 52,000 to 184,000 µg/L.

The greatest sulfate concentrations downgradient of WMA C are at Wells 299-E27-14 and 299-E27-24. The sulfate and nitrate concentration trends at these two wells relative to those observed in upgradient wells continue to suggest a past release of contaminants containing elevated nitrate and sulfate to the groundwater from within WMA C. Well 299-E27-14 is screened across the upper part of the aquifer, and Well 299-E27-24 is screened across the bottom of the aquifer. Data from these wells suggest that these contaminants have migrated vertically through the aquifer. Concentrations at Well 299-E27-14 have continued to decrease since September 2012 (Figure 7). However, concentrations at Well 299-E27-24 have been stable, ranging between 287 and 304 µg/L since installation of this well. In March, the concentration was 299 µg/L.

Sulfate concentrations at Well 299-E27-25 had been slowly increasing since this well was installed and began being sampled as shown in Figure 7. As depicted in Figure 7, the concentrations rose from 227,000 µg/L to 292,000 µg/L. The March result at Well 299-E27-25 was 289 µg/L. The trend at Well 299-E27-25 appears to mimic the past trend at Well 299-E27-10, located near the 216-B-2 Ditches (Figure 8). The comparable sulfate trends between these wells and historical southward groundwater flow direction indicate that these wells are likely being impacted by past releases from the 216-B-2 Ditches (DOE/RL-2011-01, *Hanford Site Groundwater Monitoring Report for 2010*, Section 9.1.10.3).

3.3 Cyanide

The dangerous waste constituent cyanide was detected at four WMA C wells in March 2014. The wells with concentrations above the 4 µg/L detection limits were 299-E27-7, 299-E27-14, 299-E27-23, and 299-E27-24. The greatest concentration was at Well 299-E27-24 with 13.1 µg/L. The other wells ranged between 4.16 and 5.56 µg/L and results are flagged "B" (less than required detection limit, but greater than method detection limit). The cyanide result associated with these wells are significantly below the 200 µg/L DWS.

Cyanide was previously observed in the groundwater at WMA C at much greater concentrations than currently observed at Well 299-E27-24 (Figure 9). As discussed in DOE/RL-2009-77, the source may be related to past releases from WMA C. However, cyanide concentration levels observed at Well 299-E27-7 are not considered to be associated with tank retrieval activities because cyanide was first detected in this well in January 1999 and retrieval activities did not start at WMA C until November 18, 1998.

As required by 40 CFR 265.93(d)(7)(i) and 40 CFR 265.94(b)(1), a groundwater flow rate was derived from past hydraulic tests and ongoing groundwater gradient evaluations for determining the rate of migration of cyanide. Based on the discussion in Section 2, the current rate of cyanide migration is estimated to range between 0.001 and 0.165 m/day (0.026 and 0.54 ft/day). The flow direction over the past year has been predominantly southeast, ranging from 109 to 170° from north (Figure 10). During this quarter, the inferred groundwater flow direction ranged between 109 and 131° from north, as provided in Figure 1.

Also required by 40 CFR 265.93(d)(7)(i) and 40 CFR 265.94(b)(1) is a determination of the extent of cyanide contamination. Because concentrations are near detection limits at Well 299-E27-24, detectable levels of cyanide are not considered to be significantly farther southeast of this well, as depicted in Figure 10. A northerly extension of the elevated cyanide concentrations from Well 299-E27-24 is bounded by the nondetect groundwater results for cyanide at other wells surrounding WMA C. The depiction of cyanide extension to the southeast of Well 299-E27-24 in Figure 10 reflects an attempt to be consistent with recent cyanide concentrations and groundwater flow interpretations of a progressive shift from southwesterly to southerly to southeasterly near WMA C. A secondary area of elevated cyanide at depth to the southeast of Well 299-E27-155 is also inferred in Figure 10. Well 299-E27-155 is screened across the lower 10.7 m (35 ft) of the aquifer, and the aquifer at this well was measured at 16.8 m (55 ft) thick when installed in 2007. The greatest cyanide concentrations at this well were observed in the deepest discrete sample intervals during drilling. The inference at depth of a secondary area of slightly elevated concentrations of cyanide is uncertain but is inferred from previous observations of low levels of cyanide concentrations at Well 299-E27-155 and the lack of historically consistent cyanide concentrations in wells between this well and the west/southwest WMA C boundary. Two additional plumes of cyanide were interpreted around Wells 299-E27-7 and 299-E27-23 because of the detected levels at these wells in March 2014.

With the recent shift in groundwater flow direction near WMA C from a southwest to a more south and southeastly direction, a potential gap may have been created in the WMA C well network between Wells 299-E27-14 and 299-E27-7 for specific monitoring of cyanide. As a result of these groundwater flow changes, the network may need an additional well east of 299-E27-14 to fill this gap in monitoring.

3.4 Technetium-99

AEA samples for technetium-99 were collected and analyzed for all 12 WMA C wells in March. The activity levels exceeded the 900 pCi/L DWS in seven wells (299-E27-4, 299-E33-13, 299-E27-14, 299-E27-21, 299-E27-23, 299-E27-24, and 299-E27-155). A recent groundwater flow direction change has affected activity levels at these wells over the past two years. Concentrations at wells to the west of WMA C (299-E27-4, 299-E27-13, 299-E27-23, and 299-E27-155) have decreased by >60 percent (Figure 11). Wells to the south and southeast of WMA C (299-E27-14, 299-E27-21, and 299-E27-24) have increased by approximately 200 percent or greater. The activity level at four other WMA C wells (299-E27-12, 299-E27-15, 299-E27-22, and 299-E27-25) has never exceeded the DWS. These wells have been or are considered upgradient wells.

An assessment of the technetium-99 results with other contaminants was provided in SGW-56777, *WMA C October Through December 2013 Quarterly Groundwater Monitoring Report*. The outcome of the assessment indicates two or more technetium-99 laden sources have affected the groundwater at WMA C. The technetium-99-to-nitrate signature, used in the assessment, indicates that the technetium-99 near Well 299-E27-23 has migrated toward Well 299-E27-21. In addition, part of the technetium-99-to-nitrate signature recognized at Well 299-E27-23 has migrated to Well 299-E27-14. The migration of the technetium-99 plume appears to be consistent with the predominant southeast flow direction over the two plus years.

3.5 Uranium

AEA samples for uranium were collected and analyzed for all 12 WMA C wells in December and none of the results exceeded the 30 µg/L DWS. The uranium concentrations for all but four wells (299-E27-4, 299-E27-14, 299-E27-24, and 299-E27-155) were below regional background levels of ≤4 µg/L (DOE/RL-96-61).

The uranium concentration was greatest in Wells 299-E27-14 and 299-E27-155. Well 299-E27-155, located to the southwest of WMA C (Figure 1), had the greatest concentration (8.54 μg/L). This concentration was lower than the December 2013 concentration, which may indicate uranium is no longer increasing (Figure 12). Uranium at Well 299-E27-14 also had been increasing until late 2012 when concentrations leveled off (Figure 12). Since March 2011, uranium has been decreasing at Well 299-E27-14 (Figure 12). Uranium at the other two wells is just above background and less than 5 μg/L.

3.6 Nickel

Filtered nickel results at upgradient Wells 299-E27-15 and 299-E27-25 have ocassionally exceed 10 μg/L and are being assessed (Figure 13). Normally, low nickel concentrations are associated with corrosion of the well screen; however, in these wells, filtered chromium and iron have been low. A video of the well screen will be used to determine if the elevated nickel in these wells is associated with casing corrosion.

3.7 Low-Level Gamma

Samples for low-level gamma were collected and analyzed for all 12 WMA C wells in March. All of the results were below detection limits, except beryllium-7 at upgradient Well 299-E27-22. This was the first positive result at this well since the well was installed. Because the result is out of trend (one detection in 37 sample results), the result is a suspect false positive and a data review has been requested.

4 Conclusion

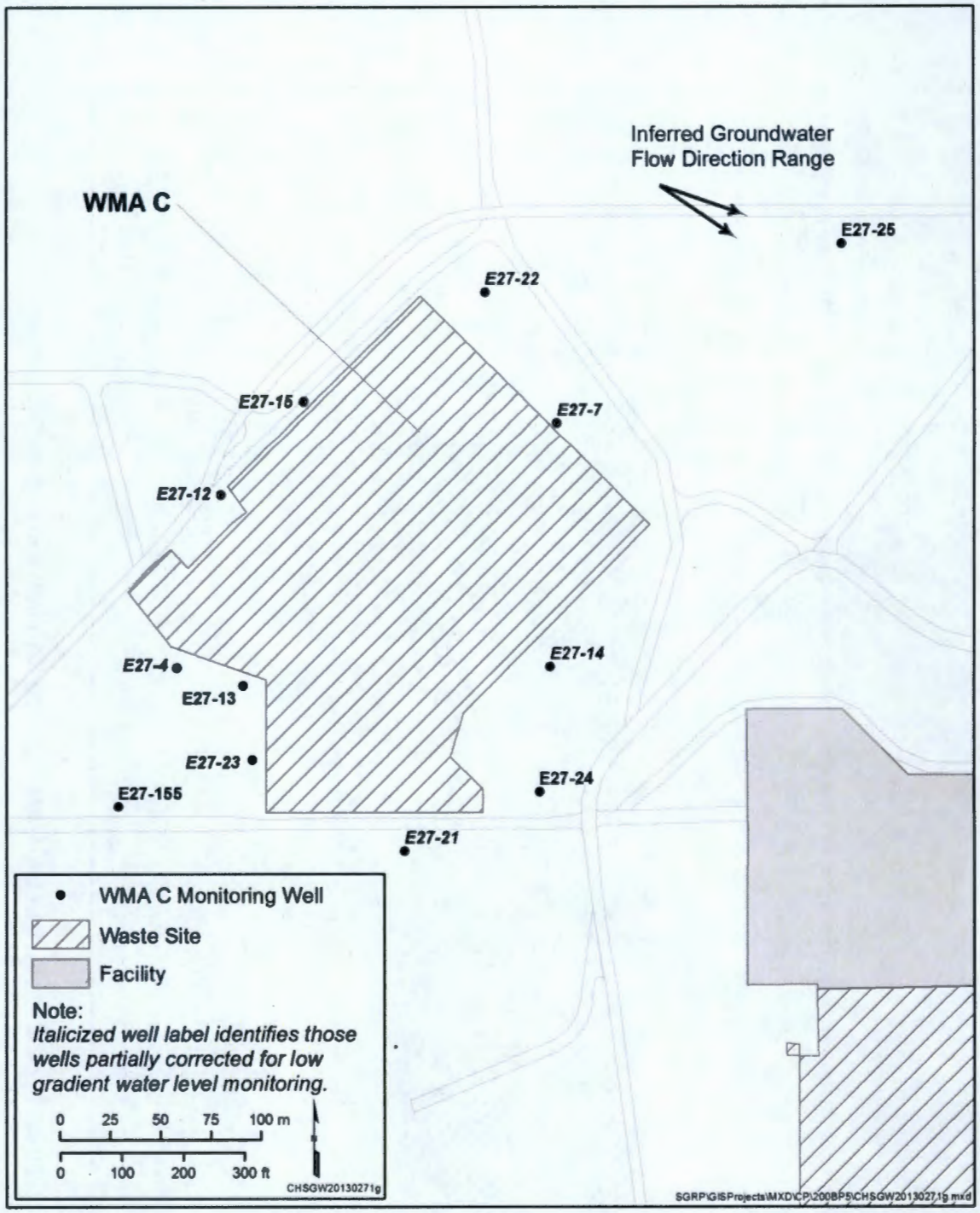
Because of the continued presence of cyanide, a dangerous waste constituent, above detection levels in wells at WMA C, the RCRA groundwater quality assessment program continues. The greatest measured cyanide concentrations was 13.1 μg/L and is much lower than the DWS of 200 μg/L.

As required by 40 CFR 265.93(d)(7)(i) and 40 CFR 265.94(b)(1), a groundwater flow rate was derived from past hydraulic tests and ongoing groundwater gradient evaluations for determining the rate of migration of cyanide. Based on the discussion in Section 2, the migration rate of cyanide during this quarter is estimated to range between 0.001 and 0.165 m/day (0.026 and 0.54 ft/day) in a southeast flow direction.

Also required by 40 CFR 265.93(d)(7)(i) and 40 CFR 265.94(b)(1), is a determination of the extent of cyanide contamination in groundwater. Because concentrations are near detection limits at Well 299-E27-24, detectable levels of cyanide are not considered to be significantly farther southwest of this well. A northerly extension of the elevated cyanide concentrations from Well 299-E27-24 is bounded by the nondetect groundwater results at other wells surrounding WMA C. The depiction of cyanide extension to the southeast of Well 299-E27-24 in Figure 10 reflects an attempt to be consistent with recent cyanide results and groundwater flow interpretations of a progressive shift from southwesterly to southeasterly in vicinity of WMA C. A secondary area of elevated cyanide at depth to the southeast of Well 299-E27-155 also is inferred in Figure 10. Well 299-E27-155 is screened across the lower 10.7 m (35 ft) of the aquifer, and the aquifer at this well was measured at 16.8 m (55 ft) thick when installed in 2007. The greatest cyanide concentrations were observed in the deepest discrete sample intervals during drilling.
The inference at depth of a secondary area of slightly elevated cyanide concentrations is uncertain but inferred from previous observations of low levels of cyanide concentrations at Well 299-E27-155 and the lack of consistent cyanide concentrations in wells between this well and the west/southwest WMA C boundary. Two additional plumes of cyanide were interpreted around Wells 299-E27-7 and 299-E27-23 because of the detected levels at these wells in March 2014.

Observations of elevated concentrations of nitrate, sulfate, and technetium-99 also appear to be associated with past releases from WMA C because these constituents are much higher in the downgradient wells compared to upgradient wells, and they exceed their respective groundwater DWSs.

Plans are underway to develop a low-gradient monitoring network in order to derive a more reliable gradient flow direction for WMA C. Currently, eight WMA C well casings have been evaluated with a gyroscope and precision surveyed; however, barometric response for each well is required to establish statistically significant determinations of the gradient and flow direction. Since it is uncertain whether the areal extent of the wells at WMA C is sufficient to derive a statistically significant gradient, additional wells outside the boundaries of WMA C are being included in the WMA C low-gradient monitoring network.



Note: The range in direction of the groundwater flow inferred by the arrow reflects the correlation of azimuth directions between WMA C and the 6-well LLWMA-1 networks from January through March 2014. The range in the azimuth direction was from 109 to 131° from north. These measurements were not corrected for barometric changes, but appear consistent with contaminant migration at WMA C. The northeast derived flow directions at both LLWMA-1 and WMA C were not considered credible at this time and, therefore, not included in the range.

Figure 1 Waste Management Area C Monitoring Wells

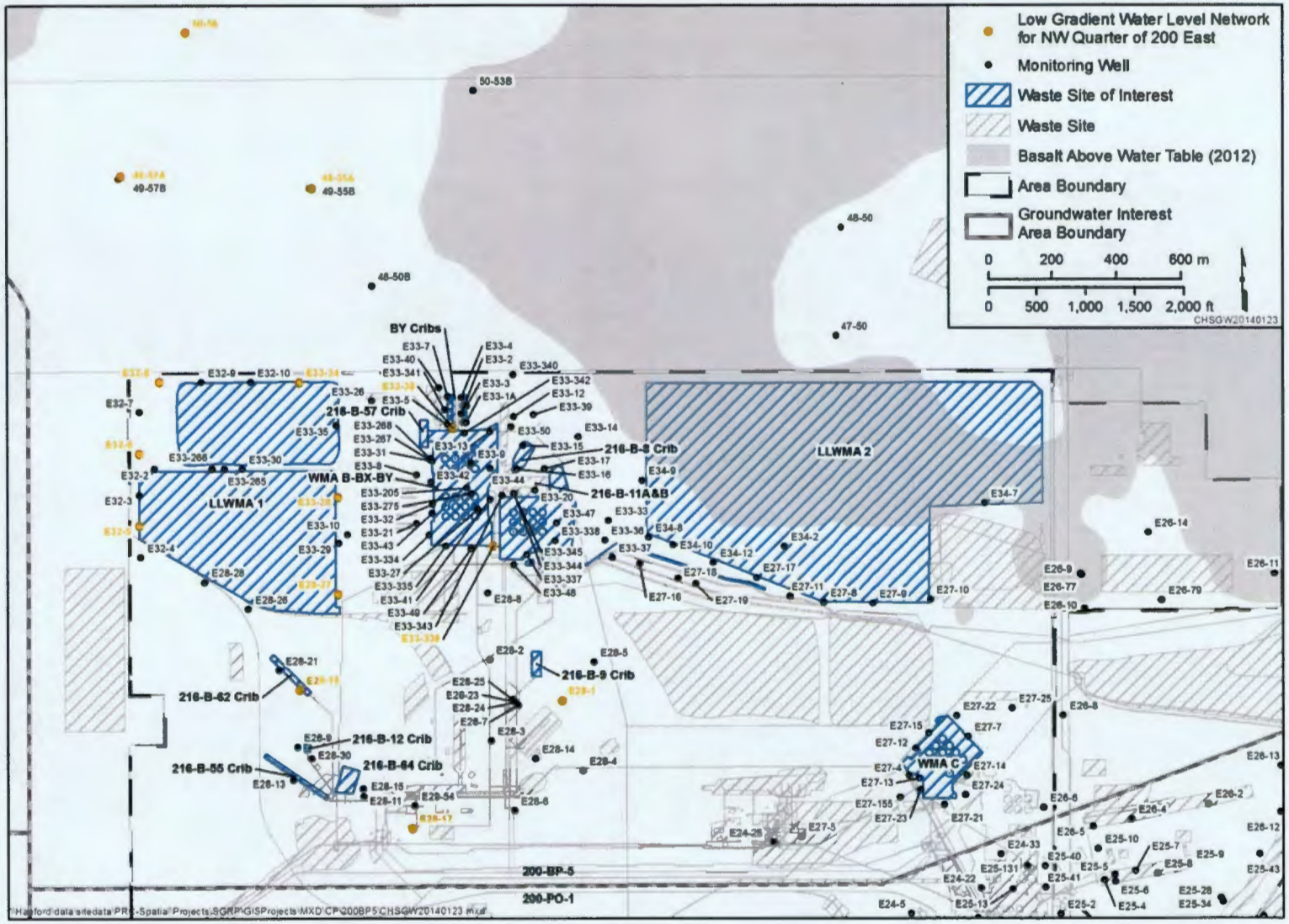


Figure 2 Low Gradient Water Level Network for the Northwest Quarter of the 200 East Area

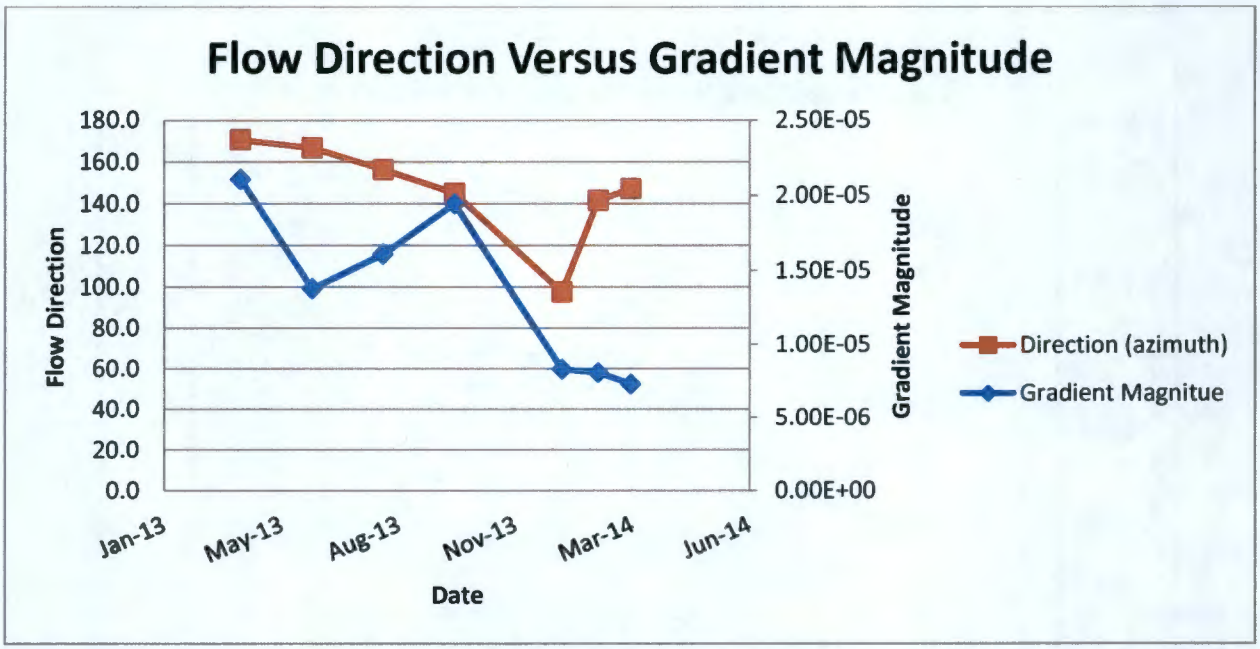


Figure 3 Flow Direction and Gradient Magnitude Determined from the Corrected Groundwater Levels at the 14-Well Low-Gradient Monitoring Network

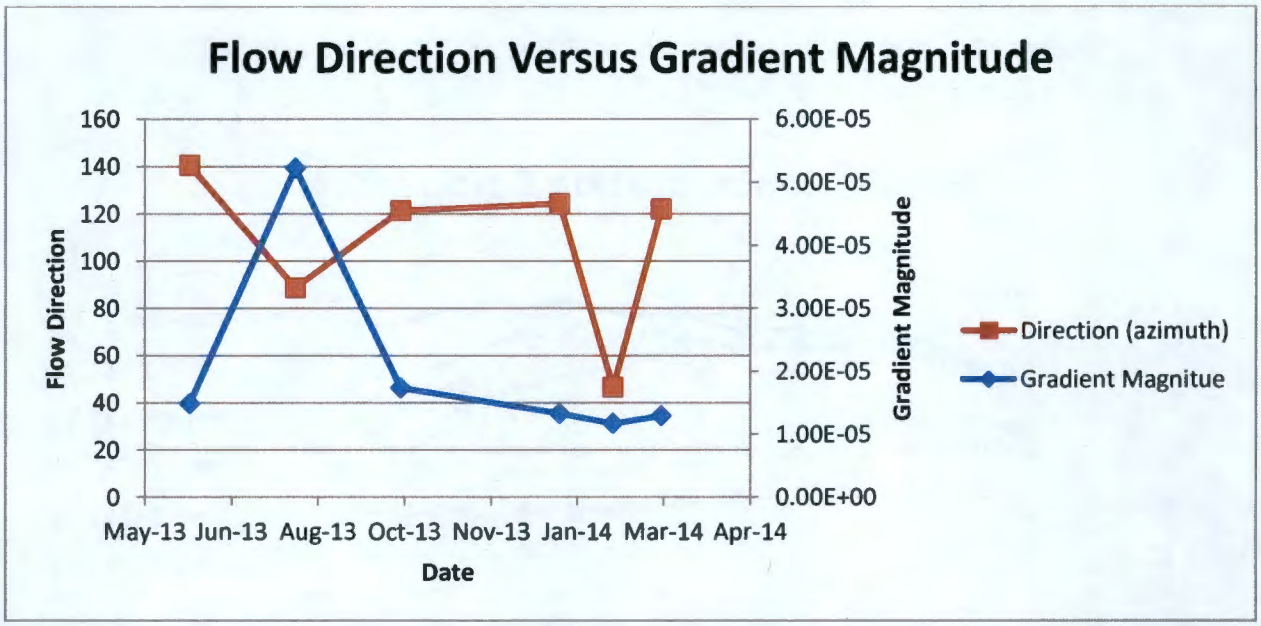


Figure 4 Flow Direction and Gradient Magnitude Determined from the Corrected Groundwater Levels at the 6-Well Low-Gradient Monitoring Network

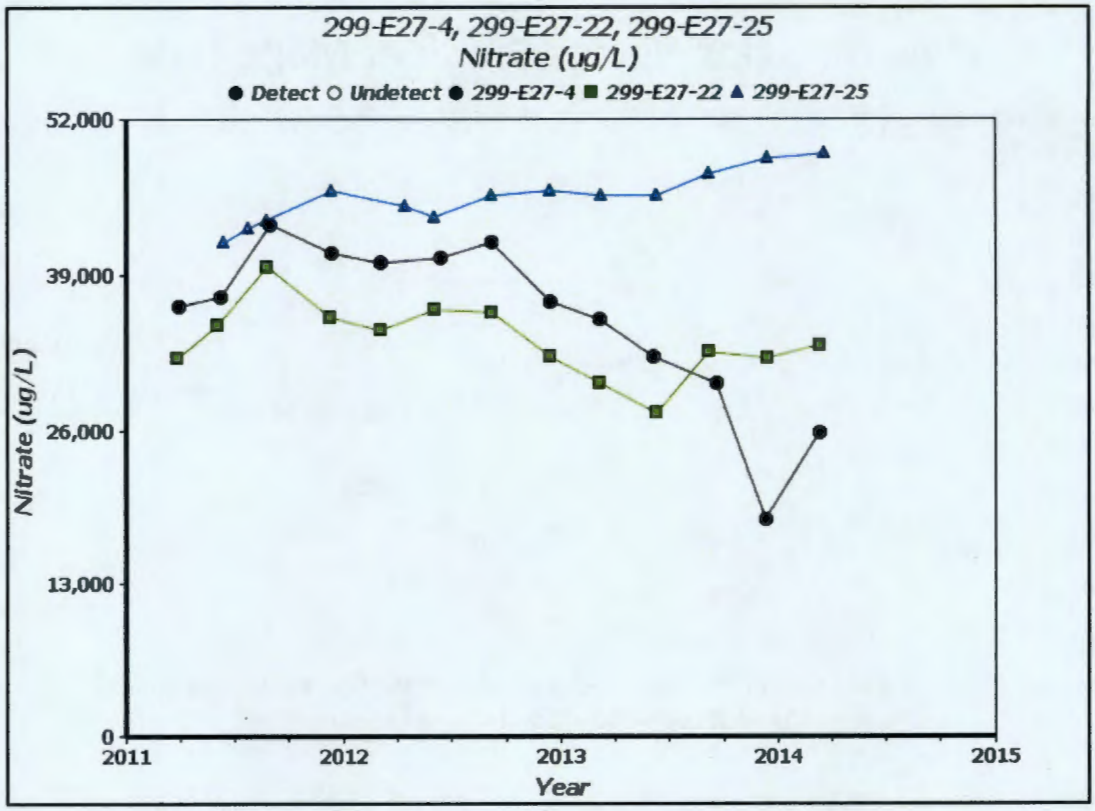


Figure 5 Recent Nitrate Results at Wells 299-E27-4, 299-E27-22, and 299-E27-25

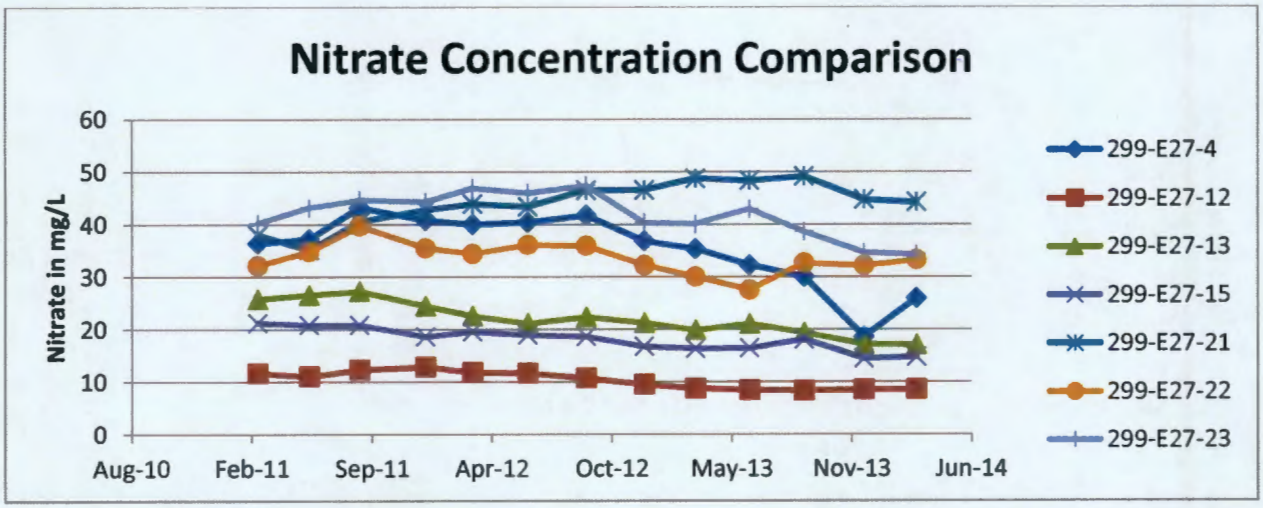


Figure 6 Comparison of Nitrate Results at Wells 299-E27-21 and 299-E27-23 to Wells to the North and Northwest

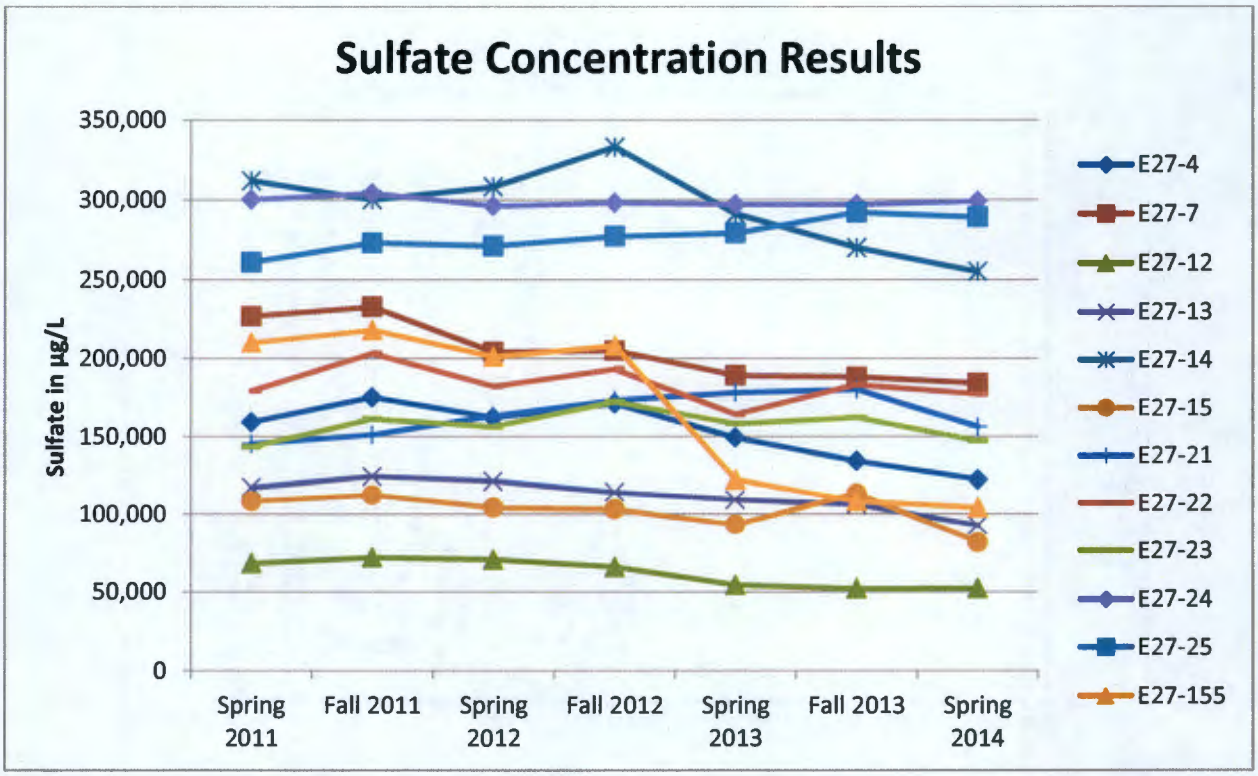


Figure 7 Sulfate Results at WMA C Wells

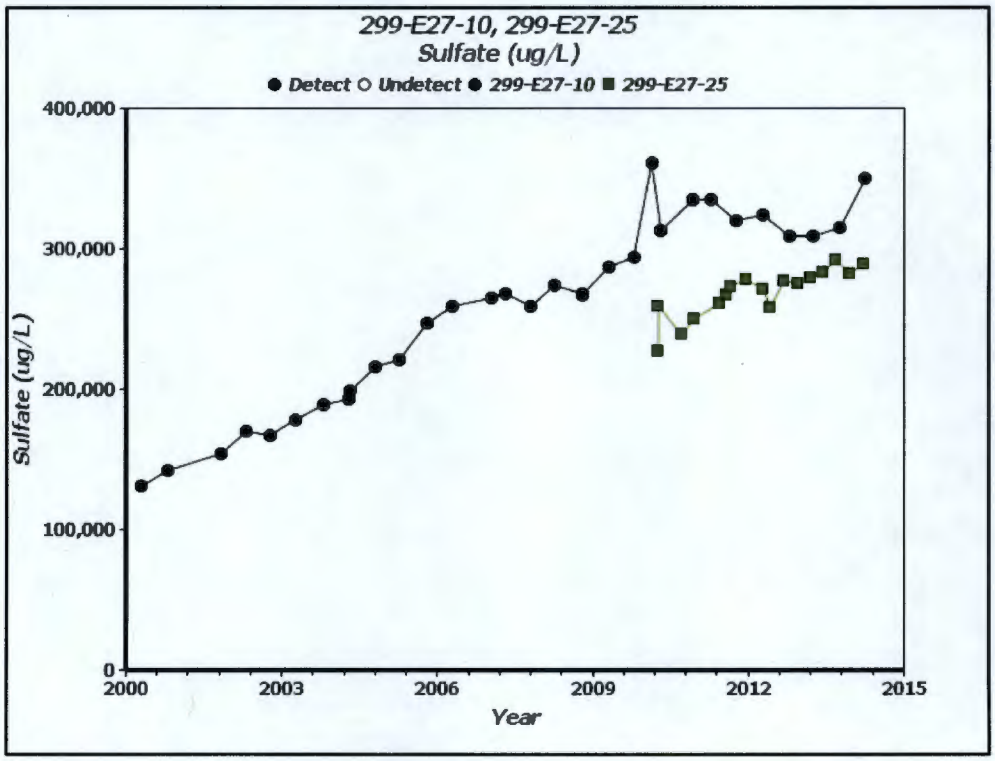


Figure 8 Sulfate Trend Comparison at Wells 299-E27-10 and 299-E27-25

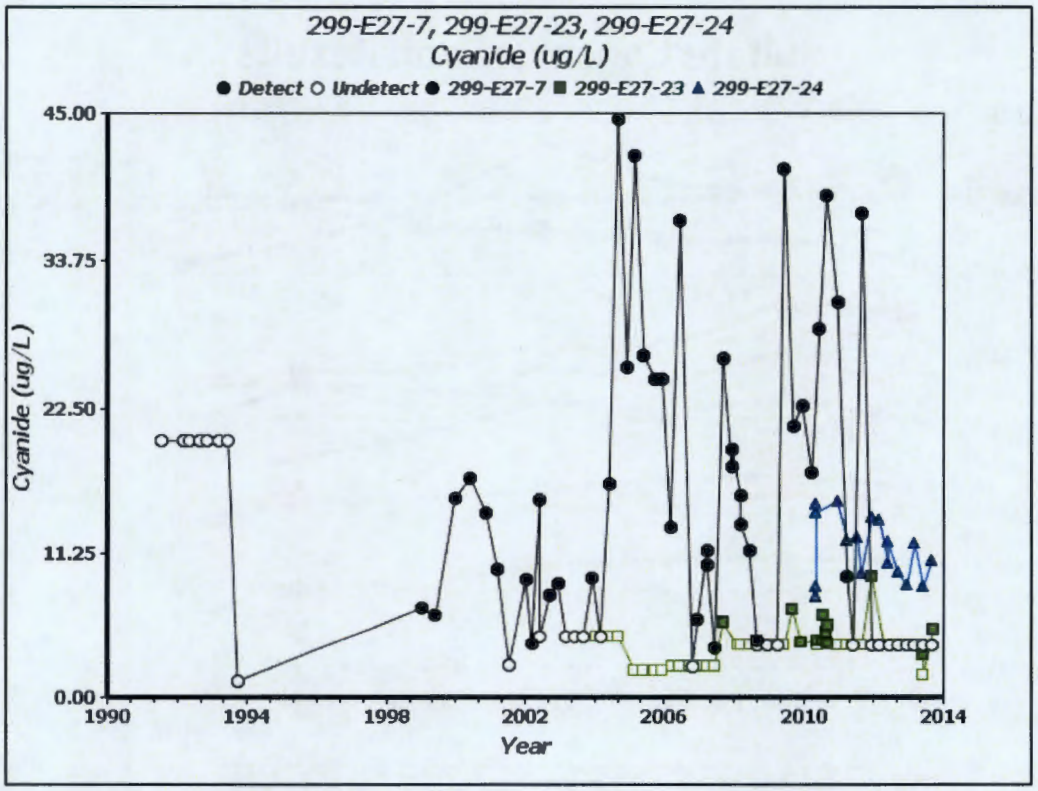


Figure 9 Cyanide Results at Wells 299-E27-7, 299-E27-23, and 299-E27-24

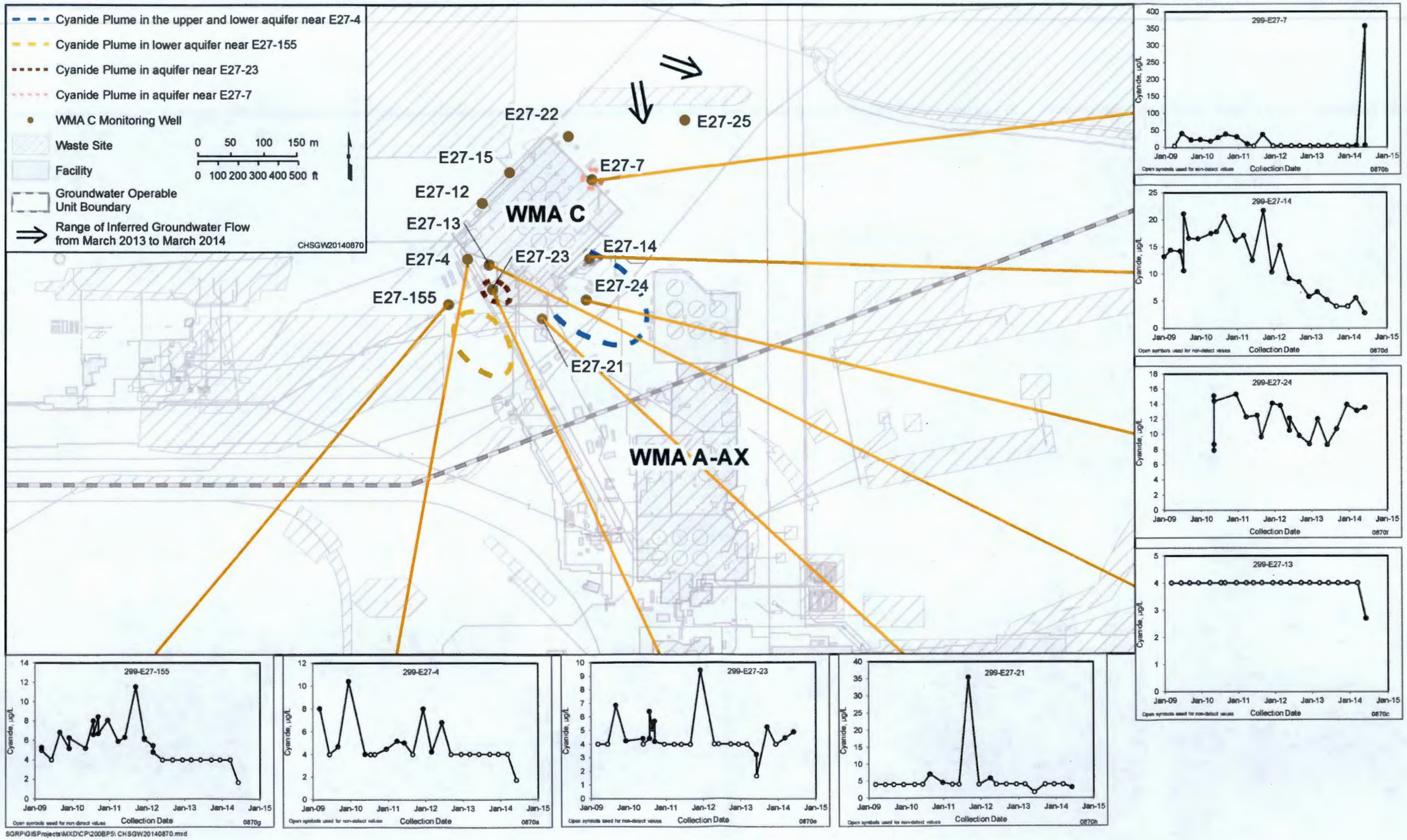


Figure 10 Interpretation of the 4 µg/L Cyanide Isopleth in the Upper 4 Meters and Lower 4 Meters of the Aquifer at Waste Management Area C and Cyanide Trend Results at Select Waste Management Area C Wells

This page intentionally left blank.

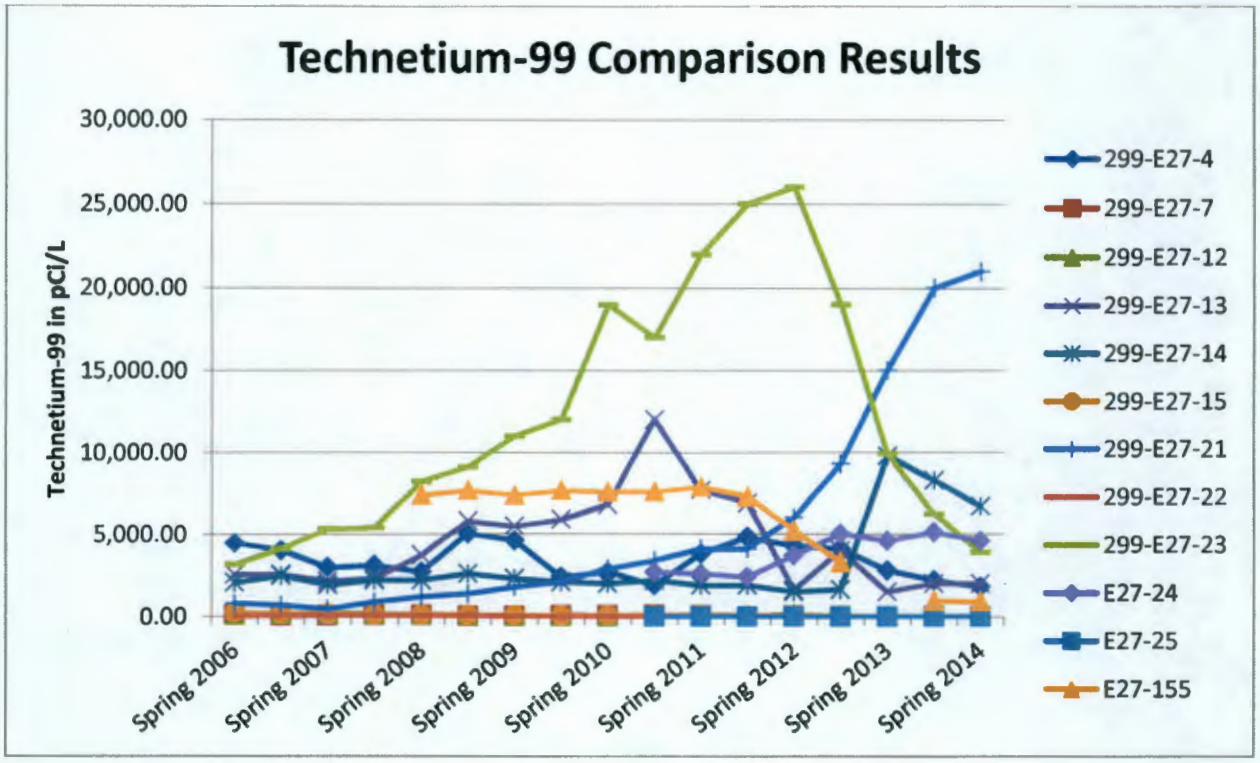


Figure 11 Technetium-99 Results at WMA C Wells

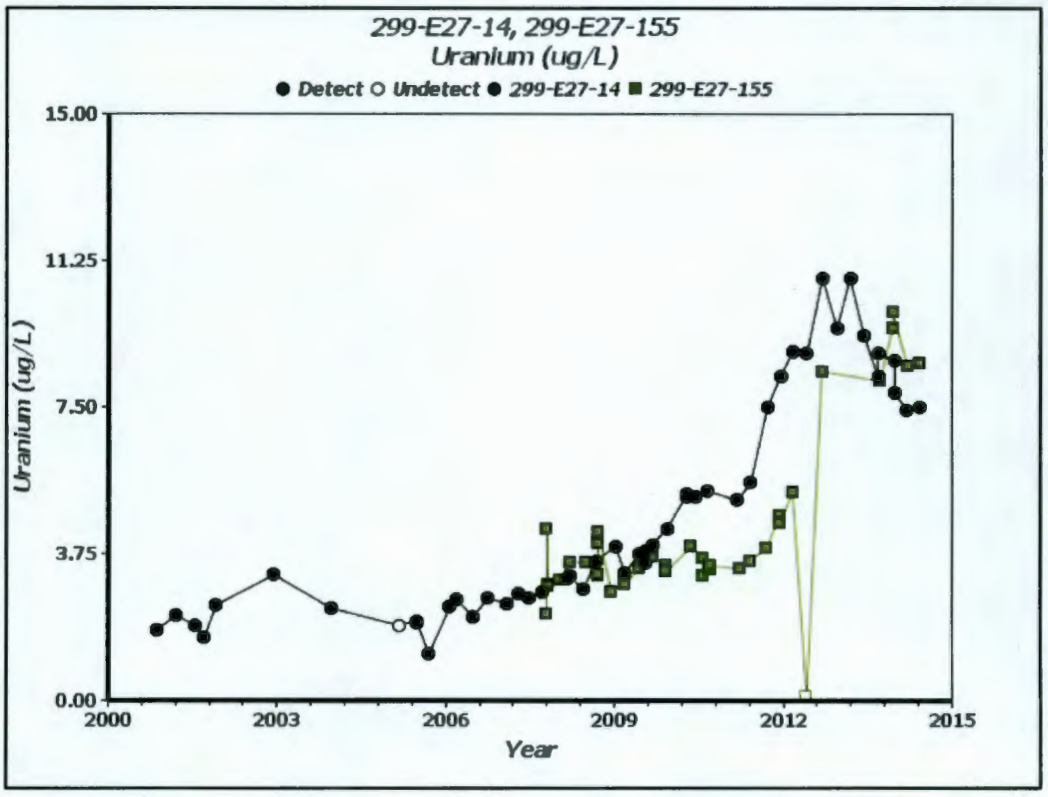


Figure 12 Uranium Results at Wells 299-E27-14 and 299-E27-155

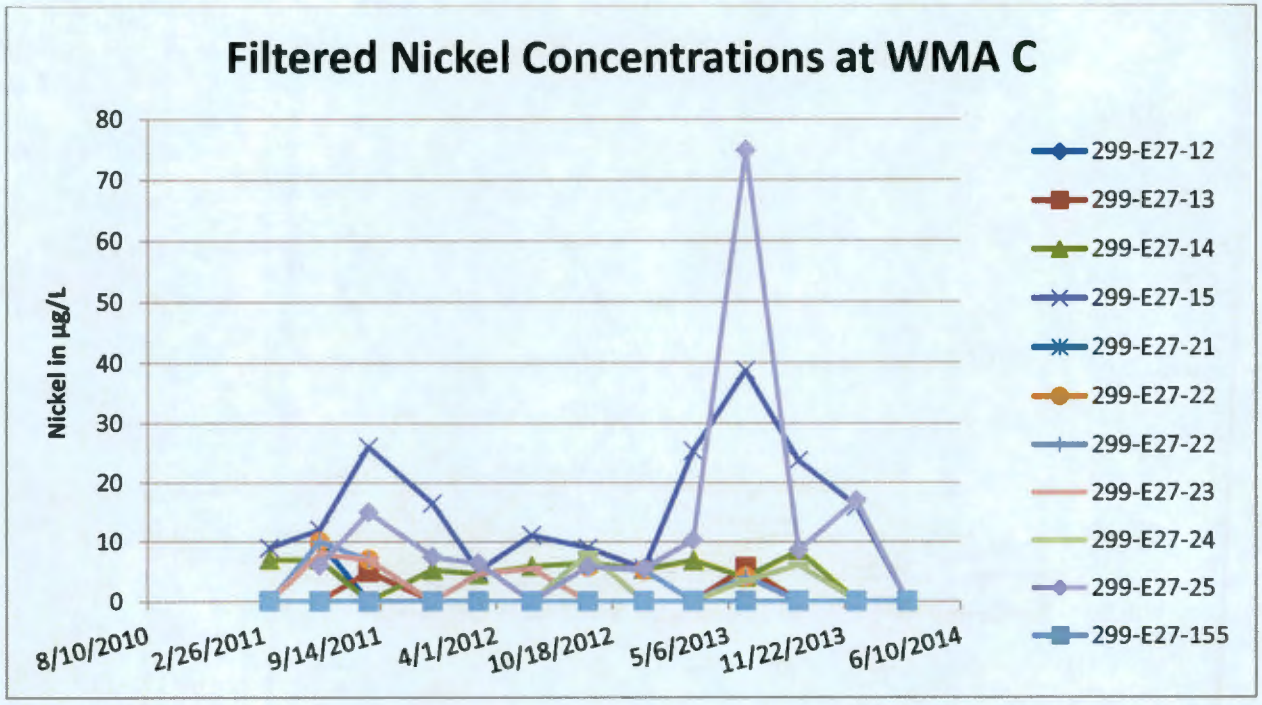


Figure 13 Filtered Nickel Results at WMA C Wells

5 References

04-TPD-083, 2004, "Agreement on Content of Tank Waste Retrieval Work Plans" (external letter to M.A. Wilson, Washington State Department of Ecology, from R.J. Shepens), U.S. Department of Energy, Office of River Protection, Richland, Washington, August 20. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=1212060215.

40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart F, "Ground-Water Monitoring," *Code of Federal Regulations*. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2010-title40-vol25/xml/CFR-2010-title40-vol25-part265-subpartF.xml.

40 CFR 265.93, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," "Preparation, Evaluation, and Response," *Code of Federal Regulations*. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2010-title40-vol25/xml/CFR-2010-title40-vol25-sec265-93.xml.

40 CFR 265.94, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," "Recordkeeping and Reporting," *Code of Federal Regulations*. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2012-title40-vol27/pdf/CFR-2012-title40-vol27-sec265-94.pdf.

Atomic Energy Act of 1954, as amended, 42 USC 2011, Pub. L. 83-703, 68 Stat. 919. Available at: http://epw.senate.gov/atomic54.pdf.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601, et seq., Pub. L. 107-377, December 31, 2002. Available at: http://epw.senate.gov/cercla.pdf.

DOE/RL-96-61, 1997, *Hanford Site Background: Part 3, Groundwater Background*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D197226378.

DOE/RL-2009-77, 2010, *Groundwater Quality Assessment Plan for the Single-Shell Tank Waste Management Area C*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0084330.

DOE/RL-2011-01, 2011, *Hanford Site Groundwater Monitoring Report for 2010*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://www.hanford.gov/c.cfm/sgrp/GWRep10/html/start10.htm.

DOE/RL-2011-118, 2012, *Hanford Site Groundwater Monitoring for 2011*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0091795.

Driscoll, Fletcher G., 1986, *Groundwater and Wells*, Second Edition, Johnson Division, St. Paul, Minnesota.

HNF-5267, 1999, *Waste Retrieval Sluicing System Campaign Number 3 Solids Volume Transferred Calculation*, Rev. 2, Lockheed Martin Hanford Corp., Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=1302141456.

HNF-EP-0182, 2014, *Waste Tank Summary Report for Month Ending October 31, 2013*, Rev. 307, Washington River Protection Solutions, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=1401161899.

PNNL-12261, 2000, *Revised Hydrogeology for the Suprabasalt Aquifer System, 200-East Area and Vicinity, Hanford Site, Washington*, Pacific Northwest National Laboratory, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0906180659.

PNNL-13024, 2001, *RCRA Groundwater Monitoring Plan for Single-Shell Tank Waste Management Area C at the Hanford Site*, Pacific Northwest National Laboratory, Richland, Washington. Available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-13024.PDF.

PNNL-13024-ICN-4, 2004, Interim Change Notice for RCRA Groundwater Monitoring Plan for Single-Shell Tank Waste Management Area C at the Hanford Site, Pacific Northwest National Laboratory, Richland, Washington. Available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-13024-ICN-4.pdf.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq. Available at: http://www.epa.gov/epawaste/inforesources/online/index.htm.

RPP-22393, 2004, *241-C-102, 241-C-104, 241-C-107, 241-C-108, and 241-C-112 Tanks Waste Retrieval Work Plan*, Rev. 1, CH2M HILL Hanford Group, Inc., Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D6223209.

SGW-54508, 2012, *WMA C September 2012 Quarterly Groundwater Monitoring Report*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0089297.

SGW-54675, 2013, *WMA C October through December 2012 Quarterly Groundwater Monitoring Report*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=1308060536.

SGW-56777, 2014, *WMA C October Through December 2013 Quarterly Groundwater Monitoring Report*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0085512.

TPA-CN-578, 2013, *Tri-Party Agreement Change Notice Form: Groundwater Sampling and Analysis Plan for the 200-BP-5 Operable Unit, DOE/RL-2001-49 Rev. 1*, dated August 13, U.S. Department of Energy, Richland Operations Office, and Washington State Department of Ecology, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=1310160532.

WAC 173-303-400, "Dangerous Waste Regulations," "Interim Status Facility Standards," *Washington Administrative Code*, Olympia, Washington. Available at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-400.

Appendix A

Waste Management Area C Groundwater Monitoring Well Attributes

This page intentionally left blank.

Table A-1. Waste Management Area C Groundwater Monitoring Well Attributes

Well Name	Construction Date	Screen Top (ft bgs)	Screen Bottom (ft bgs)	Water Level Date	Depth to Water (ft bgs)	Screened Water Column (ft)	Estimated Depth to Basalt (ft bgs)	Percentage of Screen in Aquifer
299-E27-4[TM]	2003	270.3	305.3	12/4/2013	271.1	32.6	321	68.5
299-E27-7[TM]	1982	241.0	281.0	12/4/2013	238.7	44.2	287	88.5
299-E27-12[T]	1989	246.5	267.6	12/4/2013	260.7	6.9	305	15.8
299-E27-13[T]	1989	253.6	274.7	12/10/2013	269.4	5.3	317	16.4
299-E27-14[T]	1989	245.8	266.8	12/4/2013	258.5	8.4	312	15.7
299-E27-15[T]	1989	238.0	259.0	12/4/2013	253.5	5.8	294	14.5
299-E27-155[B]	2007	380.4	345.4	12/10/2013	281.2	35.0	336*	61.4
299-E27-21[TM]	2003	271.4	306.4	12/4/2013	272.2	34.2	329	60.2
299-E27-22[TM]	2003	228.1	268.0	12/4/2013	231.1	36.9	268*	100
299-E27-23[TM]	2003	273.5	308.5	12/4/2013	274.4	34.1	328	63.6
299-E27-24[B]	2010	294.6	314.6	12/13/2013	265.26	20.0	315*	40.2
299-E27-25[T]	2010	209.14	229.16	12/13/2013	213.6	15.6	246*	48.2

* Actual depth is based on drilling depth to basalt.

bgs = below ground surface

B = screened across the bottom of the aquifer

T = screened across the top of the aquifer

TM = screened across the top and middle part of the aquifer

This page intentionally left blank.

Appendix B

Low-Gradient Monitoring Network Water Table Measurements and Gradient and Azimuth Determinations

This page intentionally left blank.

B1 Measurements and Water Table Gradient/Azimuth Determinations

Table B-1 provides a summary of information used to calculate water table gradients and azimuths for the groundwater table associated with the 14-well low-gradient network in the northwest corner of the 200 East Area. Yellow highlighted cells in the table are wells in which the corrected groundwater levels from a preceeding month to the month being evaluated were beyond one standard deviation of variability for the 14-well network. Removing the highlighted wells provided a more linear trend in month-to-month changes in the groundwater gradient magnitude and direction over the past year, as shown in Figure 3. Months not presented in Table B-1 were not provided because the data were not needed to show the linear relationship or because measurements at certain wells were not possible due to stop work issues.

Table B-2 provides a summary of the same information, using the same measurements, to calculate the water table gradient and azimuth of groundwater flow from a smaller areal footprint using only 6 of the 14 wells.

The upper part of each table shows the well name, date and time of groundwater measurement, and derived surface elevation of the groundwater. The groundwater elevation measurement incorporates precision surveys to the same benchmark for each well, correction for borehole deviation, and barometric response correction.

After these corrections have been applied, a least square regression of the plane to elevations associated with the well locations is completed to derive the gradient. The gradient, azimuth, R^2 ratio, and p-value are provided in the lower part of the table. Briefly, the R^2 ratio is the goodness of fit coefficient. Basically, it is the ratio of the sum of squares because of the regression to the total sum of squares. If the ratio of the two sums is close to 1, indicating unity, then the fit is considered good. Likewise, the p-value is the probability that the degree of an apparent spatially dependent trend observed in the data (or a trend of even greater degree) would occur solely by random chance. Thus, if the p-value is less than 0.05, the fitted trend surface is deemed statistically significant. Further details of this process calculation are provided in ECF-200E-12-0086, *Calculations in Support of the Low Hydraulic Gradient Evaluation Study for the 200 East Area Unconfined Aquifer*.

B2 References

ECF-200E-12-0086, 2013, *Calculations in Support of the Low Hydraulic Gradient Evaluation Study for the 200 East Area Unconfined Aquifer*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0087502.

NAVD88, 1988, *North American Vertical Datum of 1988*, National Geodetic Survey, Federal Geodetic Control Committee, Silver Spring, Maryland. Available at: http://www.ngs.noaa.gov/.

This page intentionally left blank.

Table B-1. Corrected 14-Well LLWMA-1 Measurements and Water Table Gradient/Azimuth Determinations

Well Name	April 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP	June 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP	Aug 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP	Oct 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction &	Jan 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP	Feb 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP	Mar 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP
299-E28-1	4/9/13 8:23	121.834	6/24/13 9:34 AM	121.818	8/5/13 9:28 AM	121.804	10/29/13 10:50 AM	121.788	1/27/14 9:47 AM	121.791	2/19/14 10:47 AM	121.766	3/24/14 9:55 AM	121.760
299-E28-17	4/9/13 8:06	121.803	6/24/13 9:13 AM	121.721	8/5/13 9:14 AM	121.791	10/29/13 11:07 AM	121.771	1/27/14 9:59 AM	121.754	2/19/14 10:30 AM	121.741	3/24/14 9:43 AM	121.751
299-E28-18	4/9/13 8:15	121.839	6/24/13 9:22 AM	121.825	8/5/13 9:01 AM	121.812	10/29/13 11:21 AM	121.803	1/27/14 10:06 AM	121.809	2/19/14 10:36 AM	121.772	3/24/14 10:04 AM	121.771
299-E28-27	4/9/13 9:51	121.835	6/24/13 9:58 AM	121.819	8/5/13 8:12 AM	121.803	10/29/13 12:57 PM	121.797	1/27/14 10:11 AM	121.802	2/19/14 10:41 AM	121.769	3/24/14 11:20 AM	121.763
299-E32-5	4/9/13 12:43	121.842	6/24/13 11:18 AM	121.827	8/5/13 8:37 AM	121.815	10/29/13 2:10 PM	121.807	1/27/14 10:55 AM	121.806	2/19/14 11:29 AM	121.770	3/24/14 10:19 AM	121.770
299-E32-6	4/9/13 12:20	121.846	6/24/13 11:24 AM	121.826	8/5/13 8:32 AM	121.817	10/29/13 1:59 PM	121.803	1/27/14 10:50 AM	121.803	2/19/14 11:25 AM	121.775	3/24/14 10:25 AM	121.767
299-E32-8	4/9/13 10:26	121.852	6/24/13 11:30 AM	121.834	8/5/13 8:27 AM	121.821	10/29/13 1:53 PM	121.836	1/27/14 10:46 AM	121.811	2/19/14 11:20 AM	121.783	3/24/14 10:28 AM	121.771
299-E33-28	4/9/13 9:39	121.839	6/24/13 9:51 AM	121.821	8/5/13 8:07 AM	121.811	10/29/13 1:37 PM	121.795	1/27/14 10:19 AM	121.799	2/19/14 11:11 AM	121.771	3/24/14 11:24 AM	121.762
299-E33-339	4/9/13 8:50	121.833	6/24/13 9:44 AM	121.817	8/5/13 8:44 AM	121.805	10/29/13 1:19 PM	121.792	1/27/14 10:25 AM	121.793	2/19/14 11:01 AM	121.771	3/24/14 11:32 AM	121.764
299-E33-34	4/9/13 10:11	121.836	6/24/13 11:36 AM	121.827	8/5/13 8:20 AM	121.809	10/29/13 1:45 PM	121.805	1/27/14 10:36 AM	121.798	2/19/14 11:15 AM	121.772	3/24/14 11:53 AM	121.766
299-E33-38	4/9/13 9:09	121.837	6/24/13 12:00 PM	121.825	8/5/13 7:42 AM	121.808	10/29/13 1:28 PM	121.793	1/27/14 10:30 AM	121.802	2/19/14 11:06 AM	121.772	3/24/14 11:46 AM	121.765
699-49-55A	4/9/13 11:00	121.885	6/24/13 11:09 AM	121.848	8/5/13 12:26 PM	121.834	10/29/13 12:28 PM	121.820	1/27/14 11:07 AM	121.809	2/19/14 12:30 PM	121.795	3/24/14 10:43 AM	121.780
699-49-57A	4/9/13 11:41	121.856	6/24/13 10:18 AM	121.839	8/5/13 12:19 PM	121.832	10/29/13 2:21 PM	121.825	1/27/14 11:02 AM	121.805	2/19/14 12:22 PM	121.789	3/24/14 10:38 AM	121.775
699-50-56	4/9/13 11:32	121.889	6/24/13 10:10 AM	121.872	8/5/13 12:10 PM	121.881	10/29/13 2:34 PM	121.881	1/27/14 11:11 AM	121.834	2/19/14 12:34 PM	121.821	3/24/14 10:47 AM	121.795
	Range (m):	0.086		0.151		0.090		0.110		0.080		0.080		0.044
	Gradient Magnitude (m/m):	2.11E-05		1.38E-05		1.61E-05		1.94E-05		8.27E-06		8.03E-06		7.25E-06
	Direction (azimuth):	170.6		166.7		156.3		145.0		97.5		141.5		147.1
	R^2:	0.79		0.74		0.82		0.83		0.48		0.70		0.58
	p-Value:	0.002		0.0022		0.0002		0.0003		0.0744		0.0485		0.0212
	Statistically Significant?:	Yes		Yes		Yes		Yes		No		Yes		Yes

Table B-2. Corrected 6-Well LLWMA-1 Measurements and Water Table Gradient/Azimuth Determinations

Well Name	June 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP Adjustment	July 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP Adjustment	August 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP Adjustment	October 2013 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP Adjustment	January 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP Adjustment	February 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP Adjustment	March 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP, Gyro Correction & BP Adjustment
299-E28-27	6/24/13 9:58 AM	121.819	7/24/13 9:25 AM	121.817	8/5/13 8:12 AM	121.803	10/29/13 12:57 PM	121.797	1/27/14 10:11 AM	121.802	2/19/14 10:41 AM	121.769	3/24/14 11:20 AM	121.763
299-E32-5	6/24/13 11:18 AM	121.827	7/24/13 9:33 AM	121.814	8/5/13 8:37 AM	121.815	10/29/13 2:10 PM	121.807	1/27/14 10:55 AM	121.806	2/19/14 11:29 AM	121.770	3/24/14 10:19 AM	121.770
299-E32-6	6/24/13 11:24 AM	121.826	7/24/13 9:37 AM	121.824	8/5/13 8:32 AM	121.817	10/29/13 1:59 PM	121.803	1/27/14 10:50 AM	121.803	2/19/14 11:25 AM	121.775	3/24/14 10:25 AM	121.767
299-E32-8	6/24/13 11:30 AM	121.834	7/24/13 10:20 AM	121.836	8/5/13 8:27 AM	121.821	10/29/13 1:53 PM	121.836	1/27/14 10:46 AM	121.811	2/19/14 11:20 AM	121.783	3/24/14 10:28 AM	121.771
299-E33-28	6/24/13 9:51 AM	121.821	7/24/13 9:18 AM	121.819	8/5/13 8:07 AM	121.811	10/29/13 1:37 PM	121.795	1/27/14 10:19 AM	121.799	2/19/14 11:11 AM	121.771	3/24/14 11:24 AM	121.762
299-E33-34	6/24/13 11:36 AM	121.826	7/24/13 10:25 AM	121.822	8/5/13 8:20 AM	121.809	10/29/13 1:45 PM	121.805	1/27/14 10:36 AM	121.798	2/19/14 11:15 AM	121.772	3/24/14 11:53 AM	121.766
Range (m):		0.015		0.022		0.018		0.041		0.013		0.014		0.009
Gradient Magnitude (m/m):		1.48E-05		5.22E-05		1.73E-05		1.32E-05		1.17E-05		1.29E-05		9.84E-06
Direction (azimuth):		140		88.6		121		124.3		46.4		121.9		108.5
R^2:		0.85		0.47		0.84		0.67		0.97		0.74		0.82
p-Value:		0.0568		0.3899		0.0655		0.3294		0.0262		0.2631		0.0775
Statistically Significant?:		No		No		No		No		Yes		No		No

Source: NAVD88, *North American Vertical Datum of 1988*.

BP = barometric pressure response correction

PST = Pacific Standard Time

RP = reference point

Appendix C

Waste Management Area C Monitoring Network Water Table Measurements and Gradient and Azimuth Determinations

This page intentionally left blank.

C1 WMA C Well Measurements and Water Table Gradient/Azimuth Determinations

Table C-1 provides a summary of information used to calculate water table gradients and azimuths of groundwater flow direction from measurements made in eight wells associated with the WMA C low-gradient monitoring network.

The upper part of the table shows the well name, date and time of groundwater measurement, and derived surface elevation of the groundwater. The groundwater elevation measurement incorporates precision survey to the same benchmark for each well and correction for borehole deviation.

After these corrections have been applied, a least square regression of the plane to elevations associated with the well locations is completed to derive the gradient. The gradient, azimuth, R^2 ratio, and p-value are provided in the lower part of the table. Briefly, the R^2 ratio is the goodness of fit coefficient. Basically, it is the ratio of the sum of squares because of the regression to the total sum of squares. If the ratio of the two sums is close to 1, indicating unity, then the fit is considered good. Likewise, the p-value is the probability that the degree of an apparent spatially dependent trend observed in the data (or a trend of even greater degree) would occur solely by random chance. Thus, if the p-value is less than 0.05, the fitted trend surface is deemed statistically significant. Further details of this process calculation are provided in ECF-200E-12-0086, *Calculations in Support of the Low Hydraulic Gradient Evaluation Study for the 200 East Area Unconfined Aquifer*. Note: the yellow highlighted measurements were removed because of elevated residual values associated with the statistical analysis. The highest residual values were removed one at a time and the statistical analysis repeated until the residual values of the remaining wells were ≤0.01. Removing the residual values lowered the p value from >0.5 to the value provided in Table C-1. The lower p value is considered more stastically reliable.

Table C-1. Partially Corrected WMA C Well Measurements and Water Table Gradient/Azimuth Determinations

Well Name	January 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP & Gyro Correction	February 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP & Gyro	March 2014 Measurement Date & Time (PST)	Hydraulic Head (m NAVD88) New RP & Gyro Correction
299-E27-12	1/8/14 11:42 AM	121.001	2/20/14 9:03 AM	120.979528	3/11/14 11:05 AM	120.949528
299-E27-14	1/8/14 11:24 AM	121.786	2/20/14 9:48 AM	121.759528	3/12/14 1:06 PM	121.779528
299-E27-15	1/8/14 11:46 AM	121.792	2/20/14 9:00 AM	121.770304	2/20/14 9:00 AM	121.770304
299-E27-21	1/8/14 11:20 AM	121.797	2/20/14 9:44 AM	121.768368	3/12/14 12:22 PM	121.783368
299-E27-22	1/8/14 11:52 AM	121.826	2/20/14 8:47 AM	121.80188	3/12/14 10:14 AM	121.80288
299-E27-23	1/8/14 11:30 AM	121.789	2/20/14 9:16 AM	121.76372	3/12/14 11:22 AM	121.77372
299-E27-4	1/8/14 11:34 AM	121.825	2/20/14 9:12 AM	121.805952	3/11/14 10:29 AM	121.782952
299-E27-7	1/8/14 11:59 AM	121.796	2/20/14 8:51 AM	121.76324	3/12/14 8:19 AM	121.75824
Range (m):		0.825		0.826		0.853
Gradient Magnitude (m/m):		2.20E-04		3.11E-04		8.23E-05
Direction (azimuth):		130.9		117.1		21.9
R^2:		0.65		0.89		0.66
p-Value:		0.2035		0.1089		0.2008
Statistically Significant?:		No		No		No

Source: NAVD88, *North American Vertical Datum of 1988.*

PST = Pacific Standard Time

RP = reference point

C2 References

ECF-200E-12-0086, 2013, *Calculations in Support of the Low Hydraulic Gradient Evaluation Study for the 200 East Area Unconfined Aquifer*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0087502.

NAVD88, 1988, *North American Vertical Datum of 1988*, National Geodetic Survey, Federal Geodetic Control Committee, Silver Spring, Maryland. Available at: http://www.ngs.noaa.gov/.

Appendix D

Groundwater Analytical Data for Waste Management Area C, December 2013

This page intentionally left blank.

Terms

DF	dilution factor
EQL	estimated quantitation limit
GC	gas chromatograph
GFAA	graphite-furnace atomic absorption
IDL	instrument detection limit
MDA	minimum detectable activity
MDL	method detection limit
MS	mass spectrometer
MSA	method of standard additions
NTU	nephelometric turbidity unit
PCB	polychlorinated biphenyl
PQL	practical quantitation limit
QC	quality control
RDL	required detection limit
TIC	tentatively identified compound

This page intentionally left blank.

The following are definitions of review qualifiers and laboratory qualifiers.

Notes:

The "Filtered" column indicates if the samples were (Y) or were not (N) filtered when they were collected in the field.

Review qualifiers:

A = Chain of custody problem.

F = The result is undergoing further review.

G = The result as undergone further review and is considered good.

H = The result exceeded hold time. When nitrate is flagged and no flag is seen for nitrite from the sample number, the initial analysis exceeded the calibration range for nitrate and the diluted analysis was rerun out of hold time. Generally, the result is acceptable as long as the sample was refrigerated prior to the rerun.

Y = The result as undergone further review and is considered suspect.

Lab qualifiers:

* INORGANICS – Duplicate analysis not within control limits.

\+ INORGANICS – Correlation coefficient for method of standard additions (MSA) is < 0.995.

\> WETCHEM – Result greater than quantifiable range or greater than upper limit of the analysis range.

A ORGANICS – Valid for tentatively identified compounds (TICs) only: the TIC is a suspected aldol-condensation product.

B INORGANICS and WETCHEM – The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the instrument detection limit/method detection limit (IDL/MDL) (as appropriate).

B flag (INORGANIC and WETCHEM) – [analyte] ≥ MDL

< Estimated Quantitation Limit (EQL)

= 5 times or 10 times the MDL

ORGANICS – The analyte was detected in both the associated quality control (QC) blank and in the sample.

RADIONUCLIDES – The associated QC sample blank has a result >= 2 times the minimum detectable activity (MDA) and, after corrections, result is >= MDA for this sample.

C INORGANICS/WETCHEM – The analyte was detected in both the sample and the associated QC blank, and the sample concentration was <= 5 times the blank concentration.

ORGANICS (PESTICIDE only) – The identification of a pesticide confirmed by gas chromatograph/mass spectrometer (GC/MS).

D ALL – Analyte was reported at a secondary dilution factor (DF), typically DF>1 (i.e., the primary preparation required dilution to either bring the analyte within the calibration range or to minimize interference). Required for organics/wetchem if the sample was diluted.

E INORGANICS – Reported value is estimated because of interference.

ORGANICS – Concentration exceeds the calibration range of the GC/MS.

J ORGANICS – Estimated value; (1) constituent detected at a level less than the Required Detection Limit (RDL) or Practical Quantitation Limit (PQL) and greater than or equal to the MDL, (2) estimated concentration for TICs.

M INORGANICS – Duplicate precision criteria not met.

N ALL (except GC/MS based analysis) – Spike and/or spike duplicate sample recovery is outside control limits.

ORGANICS (GC/MS only) – Presumptive evidence of compound based on mass spectral library search.

P ORGANICS (polychlorinated biphenyl [PCB] only) – Aroclor target analyte with greater than 25 percent difference between column analyses.

Q ORGANICS (Dioxins and PCB-congeners only) – Estimated maximum concentration. Used if one of the qualitative identification criteria is not met (e.g., Cl isotopic ratios outside theoretical range).

S INORGANICS – Reported value determined by MSA.

T ORGANICS (GC/MS only) – Spike and/or spike duplicate sample recovery is outside control limits.

U ALL – Analyzed for but not detected above limiting criteria. Limiting criteria may be any of the following: value reported < 0; value reported < counting error; value reported < total analytical error; value_rptd <=contract MDL/IDL/MDA/PQL. Note – When another qualifier accompanies a "U" qualifier, the result is always considered nondetected. The qualifier combinations :UJ" and "UL" indicate that the result was nondetected, but the detection limit (i.e., value reported in the VALUE_RPTD or MIN_DETECTABLE_ACTIVITY [rad analysis only] fields was estimated.

W INORGANICS – Post-digestion spike recovery for Graphite-furnace atomic absorption (GFAA) out of control limit. Sample absorbency < 50 percent of spike absorbency.

X ALL – The result-specific translation of this qualifier code is provided in the hardcopy data report and/or case narrative. Additional result-specific translation information may also be found in the RESULT_COMMENT field for this record.

Y Same as X if more than one flag is required.

Z Same as X and Y if more than two flags are required.

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-12	B2VYC0	3/11/2014	N	Alkalinity	110000	ug/L		
299-E27-12	B2VYC0	3/11/2014	N	Antimony	20	ug/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Antimony	20	ug/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Antimony-125	3.5	pCi/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Arsenic	25	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Arsenic	25	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Barium	36.4	ug/L		
299-E27-12	B2VYC2	3/11/2014	Y	Barium	36.2	ug/L		
299-E27-12	B2VYC0	3/11/2014	N	Beryllium	2	ug/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Beryllium	2	ug/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Beryllium-7	-13	pCi/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Bicarbonate	110000	ug/L		
299-E27-12	B2VYC2	3/11/2014	Y	Cadmium	4	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Cadmium	4	ug/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Calcium	44900	ug/L		
299-E27-12	B2VYC0	3/11/2014	N	Calcium	44700	ug/L	N	
299-E27-12	B2VYC0	3/11/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Cesium-134	-12	pCi/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Cesium-137	-1.6	pCi/L	U	
299-E27-12	B2VYC1	3/11/2014	N	Chloride	11300	ug/L	D	
299-E27-12	B2VYC2	3/11/2014	Y	Chromium	5	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Chromium	5	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Cobalt	4	ug/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Cobalt	4	ug/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Cobalt-60	-1.2	pCi/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-12	B2VYC2	3/11/2014	Y	Copper	4	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Copper	4	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Cyanide	4	ug/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Europium-152	-17	pCi/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Europium-154	12	pCi/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Europium-155	2.6	pCi/L	U	
299-E27-12	B2VYC1	3/11/2014	N	Fluoride	168	ug/L	BD	
299-E27-12	B2W0W1	3/11/2014	N	Gross beta	11	pCi/L		
299-E27-12	B2VYC0	3/11/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Iron	41.2	ug/L	B	
299-E27-12	B2VYC2	3/11/2014	Y	Iron	40	ug/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Magnesium	12800	ug/L		
299-E27-12	B2VYC0	3/11/2014	N	Magnesium	12900	ug/L		
299-E27-12	B2VYC0	3/11/2014	N	Manganese	4	ug/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Manganese	4	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Nickel	10	ug/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Nickel	10	ug/L	U	
299-E27-12	B2VYC1	3/11/2014	N	Nitrate	8500	ug/L	D	
299-E27-12	B2VYC1	3/11/2014	N	Nitrite	131	ug/L	UD	
299-E27-12	B2VYC0	3/11/2014	N	Potassium	6090	ug/L		
299-E27-12	B2VYC2	3/11/2014	Y	Potassium	6120	ug/L		
299-E27-12	B2W0W1	3/11/2014	N	Potassium-40	-80	pCi/L	U	
299-E27-12	B2W0W1	3/11/2014	N	Ruthenium-106	14	pCi/L	U	
299-E27-12	B2VYC2	3/11/2014	Y	Silver	5	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Silver	5	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-12	B2VYC2	3/11/2014	Y	Sodium	12700	ug/L		
299-E27-12	B2VYC0	3/11/2014	N	Sodium	13200	ug/L		
299-E27-12	B2W210	3/11/2014	N	Specific Conductance	371	uS/cm		
299-E27-12	B2W209	3/11/2014	N	Specific Conductance	371	uS/cm		
299-E27-12	B2W208	3/11/2014	N	Specific Conductance	371	uS/cm		
299-E27-12	B2VYB9	3/11/2014	N	Specific Conductance	371	uS/cm		
299-E27-12	B2VYC0	3/11/2014	N	Strontium	228	ug/L		
299-E27-12	B2VYC2	3/11/2014	Y	Strontium	218	ug/L		
299-E27-12	B2VYC1	3/11/2014	N	Sulfate	52000	ug/L	D	
299-E27-12	B2W0W1	3/11/2014	N	Technetium-99	9	pCi/L		
299-E27-12	B2VYB9	3/11/2014	N	Temperature	17.7	Deg C		
299-E27-12	B2W208	3/11/2014	N	Temperature	17.7	Deg C		
299-E27-12	B2W210	3/11/2014	N	Temperature	17.7	Deg C		
299-E27-12	B2W209	3/11/2014	N	Temperature	17.7	Deg C		
299-E27-12	B2W210	3/11/2014	N	Turbidity	1.85	NTU		
299-E27-12	B2W208	3/11/2014	N	Turbidity	1.38	NTU		
299-E27-12	B2W209	3/11/2014	N	Turbidity	1.65	NTU		
299-E27-12	B2VYB9	3/11/2014	N	Turbidity	2.29	NTU		
299-E27-12	B2W0W1	3/11/2014	N	Uranium	3.19	ug/L	D	
299-E27-12	B2VYC0	3/11/2014	N	Vanadium	19.6	ug/L	B	
299-E27-12	B2VYC2	3/11/2014	Y	Vanadium	19.2	ug/L	B	
299-E27-12	B2VYC2	3/11/2014	Y	Zinc	5	ug/L	U	
299-E27-12	B2VYC0	3/11/2014	N	Zinc	5.78	ug/L	B	
299-E27-12	B2W209	3/11/2014	N	pH Measurement	8.05	unitless		
299-E27-12	B2W208	3/11/2014	N	pH Measurement	8.04	unitless		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-12	B2W210	3/11/2014	N	pH Measurement	8.07	unitless		
299-E27-12	B2VYB9	3/11/2014	N	pH Measurement	8.02	unitless		
299-E27-13	B2VYC4	3/19/2014	N	Alkalinity	100000	ug/L		
299-E27-13	B2VYC6	3/19/2014	Y	Antimony	20	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Antimony	20	ug/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Antimony-125	-8.8	pCi/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Arsenic	25	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Arsenic	25	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Barium	36.5	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Barium	38.8	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Beryllium	2	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Beryllium	2	ug/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Beryllium-7	8.6	pCi/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Bicarbonate	100000	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Cadmium	4	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Cadmium	4	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Calcium	54000	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Calcium	57500	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Cesium-134	-0.82	pCi/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Cesium-137	-0.014	pCi/L	U	
299-E27-13	B2VYC5	3/19/2014	N	Chloride	17500	ug/L	D	
299-E27-13	B2VYC6	3/19/2014	Y	Chromium	5	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Chromium	9.23	ug/L	B	
299-E27-13	B2VYC6	3/19/2014	Y	Cobalt	4	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-13	B2VYC4	3/19/2014	N	Cobalt	4	ug/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Cobalt-60	0.81	pCi/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Copper	4	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Copper	4	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Cyanide	4	ug/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Europium-152	-1.4	pCi/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Europium-154	-8	pCi/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Europium-155	3.9	pCi/L	U	
299-E27-13	B2VYC5	3/19/2014	N	Fluoride	159	ug/L	BDN	
299-E27-13	B2W0W2	3/19/2014	N	Gross beta	1300	pCi/L		Q
299-E27-13	B2VYC4	3/19/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Iron	59.3	ug/L		
299-E27-13	B2VYC6	3/19/2014	Y	Iron	40	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Magnesium	15500	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Magnesium	16400	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Manganese	4	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Manganese	4	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Nickel	10	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Nickel	10	ug/L	U	
299-E27-13	B2VYC5	3/19/2014	N	Nitrate	17000	ug/L	D	
299-E27-13	B2VYC5	3/19/2014	N	Nitrite	131	ug/L	UD	
299-E27-13	B2VYC6	3/19/2014	Y	Potassium	7030	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Potassium	7350	ug/L		
299-E27-13	B2W0W2	3/19/2014	N	Potassium-40	-72	pCi/L	U	
299-E27-13	B2W0W2	3/19/2014	N	Ruthenium-106	-9.7	pCi/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-13	B2VYC4	3/19/2014	N	Silver	5	ug/L	U	
299-E27-13	B2VYC6	3/19/2014	Y	Silver	5	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Sodium	13800	ug/L		
299-E27-13	B2VYC6	3/19/2014	Y	Sodium	13000	ug/L		
299-E27-13	B2W212	3/19/2014	N	Specific Conductance	476	uS/cm		
299-E27-13	B2W211	3/19/2014	N	Specific Conductance	478	uS/cm		
299-E27-13	B2VYC3	3/19/2014	N	Specific Conductance	478	uS/cm		
299-E27-13	B2W213	3/19/2014	N	Specific Conductance	475	uS/cm		
299-E27-13	B2VYC6	3/19/2014	Y	Strontium	275	ug/L		
299-E27-13	B2VYC4	3/19/2014	N	Strontium	290	ug/L		
299-E27-13	B2VYC5	3/19/2014	N	Sulfate	92500	ug/L	D	
299-E27-13	B2W0W2	3/19/2014	N	Technetium-99	2000	pCi/L		
299-E27-13	B2W211	3/19/2014	N	Temperature	18	Deg C		
299-E27-13	B2W212	3/19/2014	N	Temperature	18	Deg C		
299-E27-13	B2VYC3	3/19/2014	N	Temperature	18.1	Deg C		
299-E27-13	B2W213	3/19/2014	N	Temperature	18	Deg C		
299-E27-13	B2W211	3/19/2014	N	Turbidity	2.08	NTU		
299-E27-13	B2W212	3/19/2014	N	Turbidity	2.06	NTU		
299-E27-13	B2W213	3/19/2014	N	Turbidity	3.17	NTU		
299-E27-13	B2VYC3	3/19/2014	N	Turbidity	3.09	NTU		
299-E27-13	B2W0W2	3/19/2014	N	Uranium	3.05	ug/L	D	
299-E27-13	B2VYC6	3/19/2014	Y	Vanadium	18.4	ug/L	B	
299-E27-13	B2VYC4	3/19/2014	N	Vanadium	19.4	ug/L	B	
299-E27-13	B2VYC6	3/19/2014	Y	Zinc	5	ug/L	U	
299-E27-13	B2VYC4	3/19/2014	N	Zinc	5	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-13	B2W213	3/19/2014	N	pH Measurement	8.1	unitless		
299-E27-13	B2W212	3/19/2014	N	pH Measurement	8.11	unitless		
299-E27-13	B2W211	3/19/2014	N	pH Measurement	8.12	unitless		
299-E27-13	B2VYC3	3/19/2014	N	pH Measurement	8.12	unitless		
299-E27-14	B2VYC7	3/12/2014	N	Alkalinity	86000	ug/L		Q
299-E27-14	B2VYC7	3/12/2014	N	Antimony	20	ug/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Antimony	20	ug/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Antimony-125	9.3	pCi/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Arsenic	25	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Arsenic	25	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Barium	75.4	ug/L		
299-E27-14	B2VYC9	3/12/2014	Y	Barium	77.3	ug/L		
299-E27-14	B2VYC7	3/12/2014	N	Beryllium	2	ug/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Beryllium	2	ug/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Beryllium-7	11	pCi/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Bicarbonate	86000	ug/L		Q
299-E27-14	B2VYC9	3/12/2014	Y	Cadmium	4	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Cadmium	4	ug/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Calcium	119000	ug/L		
299-E27-14	B2VYC7	3/12/2014	N	Calcium	115000	ug/L		
299-E27-14	B2VYC7	3/12/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Cesium-134	-2.7	pCi/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Cesium-137	2.1	pCi/L	U	
299-E27-14	B2VYC8	3/12/2014	N	Chloride	35900	ug/L	D	
299-E27-14	B2VYC7	3/12/2014	N	Chromium	12.8	ug/L		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-14	B2VYC9	3/12/2014	Y	Chromium	7.94	ug/L	B	
299-E27-14	B2VYC9	3/12/2014	Y	Cobalt	4	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Cobalt	4	ug/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Cobalt-60	1.6	pCi/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Copper	4	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Copper	4	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Cyanide	5.56	ug/L	B	
299-E27-14	B2W0W3	3/12/2014	N	Dissolved oxygen	8470	ug/L		
299-E27-14	B2W207	3/12/2014	N	Dissolved oxygen	8450	ug/L		
299-E27-14	B2W205	3/12/2014	N	Dissolved oxygen	8460	ug/L		
299-E27-14	B2W206	3/12/2014	N	Dissolved oxygen	8470	ug/L		
299-E27-14	B2W0W4	3/12/2014	N	Europium-152	-2.3	pCi/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Europium-154	7.5	pCi/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Europium-155	6.7	pCi/L	U	
299-E27-14	B2VYC8	3/12/2014	N	Fluoride	137	ug/L	BD	
299-E27-14	B2W0W4	3/12/2014	N	Gross beta	4400	pCi/L		
299-E27-14	B2VYC7	3/12/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Iron	40	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Iron	83.8	ug/L		
299-E27-14	B2VYC9	3/12/2014	Y	Magnesium	34600	ug/L		
299-E27-14	B2VYC7	3/12/2014	N	Magnesium	33400	ug/L		
299-E27-14	B2VYC9	3/12/2014	Y	Manganese	4	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Manganese	4	ug/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Nickel	10	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Nickel	10	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-14	B2VYC8	3/12/2014	N	Nitrate	88500	ug/L	D	
299-E27-14	B2VYC8	3/12/2014	N	Nitrite	131	ug/L	UD	
299-E27-14	B2VYC7	3/12/2014	N	Potassium	9080	ug/L		
299-E27-14	B2VYC9	3/12/2014	Y	Potassium	9200	ug/L		
299-E27-14	B2W0W4	3/12/2014	N	Potassium-40	24	pCi/L	U	
299-E27-14	B2W0W4	3/12/2014	N	Ruthenium-106	-36	pCi/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Silver	5	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Silver	5	ug/L	U	
299-E27-14	B2VYC9	3/12/2014	Y	Sodium	23800	ug/L		
299-E27-14	B2VYC7	3/12/2014	N	Sodium	23200	ug/L		
299-E27-14	B2W206	3/12/2014	N	Specific Conductance	889	uS/cm		
299-E27-14	B2W205	3/12/2014	N	Specific Conductance	892	uS/cm		
299-E27-14	B2W207	3/12/2014	N	Specific Conductance	884	uS/cm		
299-E27-14	B2W0W3	3/12/2014	N	Specific Conductance	901	uS/cm		
299-E27-14	B2VYC9	3/12/2014	Y	Strontium	559	ug/L		
299-E27-14	B2VYC7	3/12/2014	N	Strontium	546	ug/L		
299-E27-14	B2VYC8	3/12/2014	N	Sulfate	255000	ug/L	D	
299-E27-14	B2W0W4	3/12/2014	N	Technetium-99	6700	pCi/L		
299-E27-14	B2W0W3	3/12/2014	N	Temperature	18.6	Deg C		
299-E27-14	B2W205	3/12/2014	N	Temperature	18.7	Deg C		
299-E27-14	B2W206	3/12/2014	N	Temperature	18.7	Deg C		
299-E27-14	B2W207	3/12/2014	N	Temperature	18.7	Deg C		
299-E27-14	B2W206	3/12/2014	N	Turbidity	2.63	NTU		
299-E27-14	B2W207	3/12/2014	N	Turbidity	2.87	NTU		
299-E27-14	B2W0W3	3/12/2014	N	Turbidity	4.92	NTU		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-14	B2W205	3/12/2014	N	Turbidity	3.32	NTU		
299-E27-14	B2W0W4	3/12/2014	N	Uranium	7.41	ug/L	D	
299-E27-14	B2VYC9	3/12/2014	Y	Vanadium	18.9	ug/L	B	
299-E27-14	B2VYC7	3/12/2014	N	Vanadium	19	ug/L	B	
299-E27-14	B2VYC9	3/12/2014	Y	Zinc	5	ug/L	U	
299-E27-14	B2VYC7	3/12/2014	N	Zinc	8.32	ug/L	B	
299-E27-14	B2W207	3/12/2014	N	pH Measurement	7.84	unitless		
299-E27-14	B2W205	3/12/2014	N	pH Measurement	7.79	unitless		
299-E27-14	B2W0W3	3/12/2014	N	pH Measurement	7.77	unitless		
299-E27-14	B2W206	3/12/2014	N	pH Measurement	7.82	unitless		
299-E27-15	B2VYD0	3/19/2014	N	Alkalinity	100000	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Antimony	20	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Antimony	20	ug/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Antimony-125	0.55	pCi/L	U	
299-E27-15	B2VYD2	3/19/2014	Y	Arsenic	25	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Arsenic	25	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Barium	35.3	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Barium	35	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Beryllium	2	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Beryllium	2	ug/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Beryllium-7	25	pCi/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Bicarbonate	100000	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Cadmium	4	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Cadmium	4	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Calcium	50000	ug/L		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-15	B2VYD2	3/19/2014	Y	Calcium	49900	ug/L		
299-E27-15	B2VYD0	3/19/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Cesium-134	2.5	pCi/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Cesium-137	1.8	pCi/L	U	
299-E27-15	B2VYD1	3/19/2014	N	Chloride	15600	ug/L	D	
299-E27-15	B2VYD0	3/19/2014	N	Chromium	11.3	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Chromium	5	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Cobalt	4	ug/L	U	
299-E27-15	B2VYD2	3/19/2014	Y	Cobalt	4	ug/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Cobalt-60	-1	pCi/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Copper	4	ug/L	U	
299-E27-15	B2VYD2	3/19/2014	Y	Copper	4	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Cyanide	4	ug/L	U	
299-E27-15	B2W0W5	3/19/2014	N	Dissolved oxygen	8650	ug/L		
299-E27-15	B2W204	3/19/2014	N	Dissolved oxygen	8660	ug/L		
299-E27-15	B2W203	3/19/2014	N	Dissolved oxygen	8660	ug/L		
299-E27-15	B2W202	3/19/2014	N	Dissolved oxygen	8680	ug/L		
299-E27-15	B2W0W6	3/19/2014	N	Europium-152	0.32	pCi/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Europium-154	11	pCi/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Europium-155	-0.87	pCi/L	U	
299-E27-15	B2VYD1	3/19/2014	N	Fluoride	142	ug/L	BD	
299-E27-15	B2W0W6	3/19/2014	N	Gross beta	17	pCi/L		Q
299-E27-15	B2VYD0	3/19/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-15	B2VYD2	3/19/2014	Y	Iron	40	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Iron	40	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-15	B2VYD0	3/19/2014	N	Magnesium	15500	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Magnesium	15300	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Manganese	4	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Manganese	4	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Nickel	19.9	ug/L	B	
299-E27-15	B2VYD2	3/19/2014	Y	Nickel	14.9	ug/L	B	
299-E27-15	B2VYD1	3/19/2014	N	Nitrate	14700	ug/L	D	
299-E27-15	B2VYD1	3/19/2014	N	Nitrite	131	ug/L	UD	
299-E27-15	B2W0W5	3/19/2014	N	Oxidation Reduction Potential	253.8	mV		
299-E27-15	B2W202	3/19/2014	N	Oxidation Reduction Potential	254.1	mV		
299-E27-15	B2W203	3/19/2014	N	Oxidation Reduction Potential	254.5	mV		
299-E27-15	B2W204	3/19/2014	N	Oxidation Reduction Potential	254.6	mV		
299-E27-15	B2VYD0	3/19/2014	N	Potassium	7020	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Potassium	6960	ug/L		
299-E27-15	B2W0W6	3/19/2014	N	Potassium-40	-41	pCi/L	U	
299-E27-15	B2W0W6	3/19/2014	N	Ruthenium-106	-6.3	pCi/L	U	
299-E27-15	B2VYD2	3/19/2014	Y	Silver	5	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Silver	5	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Sodium	14800	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Sodium	14700	ug/L		
299-E27-15	B2W202	3/19/2014	N	Specific Conductance	441	uS/cm		
299-E27-15	B2W204	3/19/2014	N	Specific Conductance	441	uS/cm		
299-E27-15	B2W203	3/19/2014	N	Specific Conductance	441	uS/cm		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-15	B2W0W5	3/19/2014	N	Specific Conductance	442	uS/cm		
299-E27-15	B2VYD0	3/19/2014	N	Strontium	265	ug/L		
299-E27-15	B2VYD2	3/19/2014	Y	Strontium	262	ug/L		
299-E27-15	B2VYD1	3/19/2014	N	Sulfate	81200	ug/L	D	
299-E27-15	B2W0W6	3/19/2014	N	Technetium-99	12	pCi/L		
299-E27-15	B2W203	3/19/2014	N	Temperature	18.7	Deg C		
299-E27-15	B2W204	3/19/2014	N	Temperature	18.7	Deg C		
299-E27-15	B2W0W5	3/19/2014	N	Temperature	18.7	Deg C		
299-E27-15	B2W202	3/19/2014	N	Temperature	18.7	Deg C		
299-E27-15	B2W204	3/19/2014	N	Turbidity	1.74	NTU		
299-E27-15	B2W0W5	3/19/2014	N	Turbidity	1.79	NTU		
299-E27-15	B2W202	3/19/2014	N	Turbidity	1.72	NTU		
299-E27-15	B2W203	3/19/2014	N	Turbidity	1.66	NTU		
299-E27-15	B2W0W6	3/19/2014	N	Uranium	2.98	ug/L	D	
299-E27-15	B2VYD2	3/19/2014	Y	Vanadium	16.7	ug/L	B	
299-E27-15	B2VYD0	3/19/2014	N	Vanadium	17	ug/L	B	
299-E27-15	B2VYD2	3/19/2014	Y	Zinc	5	ug/L	U	
299-E27-15	B2VYD0	3/19/2014	N	Zinc	5	ug/L	U	
299-E27-15	B2W204	3/19/2014	N	pH Measurement	8.09	unitless		
299-E27-15	B2W203	3/19/2014	N	pH Measurement	8.09	unitless		
299-E27-15	B2W0W5	3/19/2014	N	pH Measurement	8.11	unitless		
299-E27-15	B2W202	3/19/2014	N	pH Measurement	8.1	unitless		
299-E27-155	B2VYD4	3/19/2014	N	Alkalinity	190000	ug/L		
299-E27-155	B2VYD4	3/19/2014	N	Antimony	20	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Antimony	20	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-155	B2W0W9	3/19/2014	N	Antimony-125	-5	pCi/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Arsenic	25	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Arsenic	25	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Barium	54	ug/L		
299-E27-155	B2VYD8	3/19/2014	Y	Barium	57.6	ug/L		
299-E27-155	B2VYD8	3/19/2014	Y	Beryllium	2	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Beryllium	2	ug/L	U	
299-E27-155	B2W0W9	3/19/2014	N	Beryllium-7	18	pCi/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Bicarbonate	190000	ug/L		
299-E27-155	B2VYD4	3/19/2014	N	Cadmium	4	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Cadmium	4	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Calcium	79500	ug/L		
299-E27-155	B2VYD8	3/19/2014	Y	Calcium	84900	ug/L		
299-E27-155	B2VYD4	3/19/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-155	B2W0W9	3/19/2014	N	Cesium-134	9.2	pCi/L	U	
299-E27-155	B2W0W9	3/19/2014	N	Cesium-137	1.4	pCi/L	U	
299-E27-155	B2VYD6	3/19/2014	N	Chloride	20700	ug/L	D	
299-E27-155	B2VYD8	3/19/2014	Y	Chromium	5	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Chromium	5	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Cobalt	4	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Cobalt	4	ug/L	U	
299-E27-155	B2W0W9	3/19/2014	N	Cobalt-60	-3.3	pCi/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Copper	4	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Copper	4	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Cyanide	4	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-155	B2W0W9	3/19/2014	N	Europium-152	6.8	pCi/L	U	
299-E27-155	B2W0W9	3/19/2014	N	Europium-154	-15	pCi/L	U	
299-E27-155	B2W0W9	3/19/2014	N	Europium-155	1.6	pCi/L	U	
299-E27-155	B2VYD6	3/19/2014	N	Fluoride	105	ug/L	BDN	
299-E27-155	B2W0W9	3/19/2014	N	Gross beta	690	pCi/L		Q
299-E27-155	B2VYD4	3/19/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Iron	40	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Iron	40	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Magnesium	24100	ug/L		
299-E27-155	B2VYD8	3/19/2014	Y	Magnesium	25500	ug/L		
299-E27-155	B2VYD4	3/19/2014	N	Manganese	4	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Manganese	4	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Nickel	10	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Nickel	10	ug/L	U	
299-E27-155	B2VYD6	3/19/2014	N	Nitrate	25300	ug/L	D	
299-E27-155	B2VYD6	3/19/2014	N	Nitrite	131	ug/L	UD	
299-E27-155	B2VYD4	3/19/2014	N	Potassium	9080	ug/L		
299-E27-155	B2VYD8	3/19/2014	Y	Potassium	9670	ug/L		
299-E27-155	B2W0W9	3/19/2014	N	Potassium-40	-110	pCi/L	U	
299-E27-155	B2W0W9	3/19/2014	N	Ruthenium-106	23	pCi/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Silver	5	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Silver	5	ug/L	U	
299-E27-155	B2VYD4	3/19/2014	N	Sodium	26900	ug/L		
299-E27-155	B2VYD8	3/19/2014	Y	Sodium	28500	ug/L		
299-E27-155	B2W0W7	3/19/2014	N	Specific Conductance	681	uS/cm		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-155	B2VYD4	3/19/2014	N	Strontium	410	ug/L		
299-E27-155	B2VYD8	3/19/2014	Y	Strontium	442	ug/L		
299-E27-155	B2VYD6	3/19/2014	N	Sulfate	104000	ug/L	D	
299-E27-155	B2W0W9	3/19/2014	N	Technetium-99	930	pCi/L		
299-E27-155	B2W0W7	3/19/2014	N	Temperature	19.2	Deg C		
299-E27-155	B2W0W7	3/19/2014	N	Turbidity	0.71	NTU		
299-E27-155	B2W0W9	3/19/2014	N	Uranium	8.54	ug/L	D	
299-E27-155	B2VYD8	3/19/2014	Y	Vanadium	15.9	ug/L	B	
299-E27-155	B2VYD4	3/19/2014	N	Vanadium	15.2	ug/L	B	
299-E27-155	B2VYD4	3/19/2014	N	Zinc	5	ug/L	U	
299-E27-155	B2VYD8	3/19/2014	Y	Zinc	5	ug/L	U	
299-E27-155	B2W0W7	3/19/2014	N	pH Measurement	7.64	unitless		
299-E27-21	B2VYF0	3/12/2014	N	Alkalinity	93000	ug/L		Q
299-E27-21	B2VYD9	3/12/2014	N	Alkalinity	93000	ug/L		Q
299-E27-21	B2VYF4	3/12/2014	Y	Antimony	20	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Antimony	20	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Antimony	20	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Antimony	20	ug/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Antimony-125	-9.6	pCi/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Antimony-125	-8.1	pCi/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Barium	47.4	ug/L		
299-E27-21	B2VYF0	3/12/2014	N	Barium	63.5	ug/L		Q
299-E27-21	B2VYF4	3/12/2014	Y	Barium	47.5	ug/L		
299-E27-21	B2VYF0	3/12/2014	N	Beryllium	2	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Beryllium	2	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-21	B2VYD9	3/12/2014	N	Beryllium	2	ug/L	U	
299-E27-21	B2VYF4	3/12/2014	Y	Beryllium	2	ug/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Beryllium-7	-7.7	pCi/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Beryllium-7	-16	pCi/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Bicarbonate	93000	ug/L		Q
299-E27-21	B2VYF0	3/12/2014	N	Bicarbonate	93000	ug/L		Q
299-E27-21	B2VYD9	3/12/2014	N	Cadmium	4	ug/L	U	
299-E27-21	B2VYF4	3/12/2014	Y	Cadmium	4	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Cadmium	4	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Cadmium	4	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Calcium	65600	ug/L	N	
299-E27-21	B2VYF4	3/12/2014	Y	Calcium	80300	ug/L	N	
299-E27-21	B2VYD9	3/12/2014	N	Calcium	79600	ug/L	N	
299-E27-21	B2VYF3	3/12/2014	Y	Calcium	81700	ug/L	N	
299-E27-21	B2VYD9	3/12/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Cesium-134	-7.7	pCi/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Cesium-134	6.9	pCi/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Cesium-137	-0.4	pCi/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Cesium-137	-5.1	pCi/L	U	
299-E27-21	B2VYF2	3/12/2014	N	Chloride	22700	ug/L	D	
299-E27-21	B2VYF1	3/12/2014	N	Chloride	22500	ug/L	D	
299-E27-21	B2VYF4	3/12/2014	Y	Chromium	7.55	ug/L	B	
299-E27-21	B2VYD9	3/12/2014	N	Chromium	8.93	ug/L	B	
299-E27-21	B2VYF3	3/12/2014	Y	Chromium	7.4	ug/L	B	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-21	B2VYF0	3/12/2014	N	Chromium	5	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Cobalt	4	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Cobalt	4	ug/L	U	
299-E27-21	B2VYF4	3/12/2014	Y	Cobalt	4	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Cobalt	4	ug/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Cobalt-60	0.13	pCi/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Cobalt-60	2	pCi/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Copper	4	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Copper	4	ug/L	U	
299-E27-21	B2VYF4	3/12/2014	Y	Copper	4	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Copper	4	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Cyanide	4	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Cyanide	4	ug/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Europium-152	8.4	pCi/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Europium-152	-2.4	pCi/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Europium-154	-10	pCi/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Europium-154	-5.6	pCi/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Europium-155	-4.3	pCi/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Europium-155	-2.1	pCi/L	U	
299-E27-21	B2VYF2	3/12/2014	N	Fluoride	146	ug/L	BD	
299-E27-21	B2VYF1	3/12/2014	N	Fluoride	142	ug/L	BD	
299-E27-21	B2W0X1	3/12/2014	N	Gross beta	14000	pCi/L		
299-E27-21	B2W0X2	3/12/2014	N	Gross beta	14000	pCi/L		
299-E27-21	B2VYF0	3/12/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Hydroxylion	1000	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-21	B2VYF0	3/12/2014	N	Iron	74.2	ug/L		
299-E27-21	B2VYD9	3/12/2014	N	Iron	40	ug/L	U	
299-E27-21	B2VYF4	3/12/2014	Y	Iron	40	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Iron	40	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Magnesium	23900	ug/L		
299-E27-21	B2VYF3	3/12/2014	Y	Magnesium	23500	ug/L		
299-E27-21	B2VYD9	3/12/2014	N	Magnesium	22800	ug/L		
299-E27-21	B2VYF4	3/12/2014	Y	Magnesium	23200	ug/L		
299-E27-21	B2VYF4	3/12/2014	Y	Manganese	4	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Manganese	4	ug/L	U	Q
299-E27-21	B2VYF3	3/12/2014	Y	Manganese	4	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Manganese	137	ug/L		Q
299-E27-21	B2VYF4	3/12/2014	Y	Nickel	10	ug/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Nickel	10	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Nickel	10	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Nickel	10	ug/L	U	
299-E27-21	B2VYF2	3/12/2014	N	Nitrate	44200	ug/L	D	
299-E27-21	B2VYF1	3/12/2014	N	Nitrate	43700	ug/L	D	
299-E27-21	B2VYF2	3/12/2014	N	Nitrite	131	ug/L	UD	
299-E27-21	B2VYF1	3/12/2014	N	Nitrite	131	ug/L	UD	
299-E27-21	B2VYF3	3/12/2014	Y	Potassium	7790	ug/L		
299-E27-21	B2VYF0	3/12/2014	N	Potassium	5110	ug/L		Q
299-E27-21	B2VYF4	3/12/2014	Y	Potassium	7690	ug/L		
299-E27-21	B2VYD9	3/12/2014	N	Potassium	7590	ug/L		Q
299-E27-21	B2W0X2	3/12/2014	N	Potassium-40	56	pCi/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-21	B2W0X1	3/12/2014	N	Potassium-40	5.8	pCi/L	U	
299-E27-21	B2W0X1	3/12/2014	N	Ruthenium-106	-31	pCi/L	U	
299-E27-21	B2W0X2	3/12/2014	N	Ruthenium-106	19	pCi/L	U	
299-E27-21	B2VYF0	3/12/2014	N	Silver	5	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Silver	5	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Silver	5	ug/L	U	
299-E27-21	B2VYF4	3/12/2014	Y	Silver	5	ug/L	U	
299-E27-21	B2VYF3	3/12/2014	Y	Sodium	19300	ug/L		
299-E27-21	B2VYD9	3/12/2014	N	Sodium	18800	ug/L		
299-E27-21	B2VYF4	3/12/2014	Y	Sodium	18800	ug/L		
299-E27-21	B2VYF0	3/12/2014	N	Sodium	18400	ug/L		
299-E27-21	B2W0X0	3/12/2014	N	Specific Conductance	628	uS/cm		
299-E27-21	B2VYD9	3/12/2014	N	Strontium	392	ug/L		Q
299-E27-21	B2VYF0	3/12/2014	N	Strontium	285	ug/L		Q
299-E27-21	B2VYF3	3/12/2014	Y	Strontium	403	ug/L		
299-E27-21	B2VYF4	3/12/2014	Y	Strontium	395	ug/L		
299-E27-21	B2VYF1	3/12/2014	N	Sulfate	155000	ug/L	D	
299-E27-21	B2VYF2	3/12/2014	N	Sulfate	156000	ug/L	D	
299-E27-21	B2W0X2	3/12/2014	N	Technetium-99	21000	pCi/L		
299-E27-21	B2W0X1	3/12/2014	N	Technetium-99	20000	pCi/L		
299-E27-21	B2W0X0	3/12/2014	N	Temperature	18.5	Deg C		
299-E27-21	B2W0X0	3/12/2014	N	Turbidity	0.67	NTU		
299-E27-21	B2W0X2	3/12/2014	N	Uranium	2.84	ug/L	D	
299-E27-21	B2W0X1	3/12/2014	N	Uranium	2.88	ug/L	D	
299-E27-21	B2VYF3	3/12/2014	Y	Vanadium	19.3	ug/L	B	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-21	B2VYD9	3/12/2014	N	Vanadium	19.1	ug/L	B	
299-E27-21	B2VYF0	3/12/2014	N	Vanadium	5	ug/L	U	
299-E27-21	B2VYF4	3/12/2014	Y	Vanadium	18.9	ug/L	B	
299-E27-21	B2VYF0	3/12/2014	N	Zinc	94.8	ug/L		Q
299-E27-21	B2VYF4	3/12/2014	Y	Zinc	5	ug/L	U	
299-E27-21	B2VYD9	3/12/2014	N	Zinc	5	ug/L	U	Q
299-E27-21	B2VYF3	3/12/2014	Y	Zinc	5	ug/L	U	
299-E27-21	B2W0X0	3/12/2014	N	pH Measurement	7.7	unitless		
299-E27-22	B2VYF5	3/12/2014	N	Alkalinity	89000	ug/L		Q
299-E27-22	B2VYF5	3/12/2014	N	Antimony	20	ug/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Antimony	20	ug/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Antimony-125	-23	pCi/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Arsenic	25	ug/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Arsenic	25	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Barium	54.3	ug/L		
299-E27-22	B2VYF6	3/12/2014	Y	Barium	54	ug/L		
299-E27-22	B2VYF6	3/12/2014	Y	Beryllium	2	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Beryllium	2	ug/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Beryllium-7	140	pCi/L		F
299-E27-22	B2VYF5	3/12/2014	N	Bicarbonate	89000	ug/L		Q
299-E27-22	B2VYF6	3/12/2014	Y	Cadmium	4	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Cadmium	4	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Calcium	88400	ug/L	N	
299-E27-22	B2VYF6	3/12/2014	Y	Calcium	88200	ug/L	N	
299-E27-22	B2VYF5	3/12/2014	N	Carbonate alkalinity	1000	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-22	B2W0X4	3/12/2014	N	Cesium-134	16	pCi/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Cesium-137	4.3	pCi/L	U	
299-E27-22	B2W1Y1	3/12/2014	N	Chloride	34100	ug/L	D	
299-E27-22	B2VYF6	3/12/2014	Y	Chromium	5	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Chromium	7.19	ug/L	B	
299-E27-22	B2VYF6	3/12/2014	Y	Cobalt	4	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Cobalt	4	ug/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Cobalt-60	-1.4	pCi/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Copper	4	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Copper	4	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Cyanide	4	ug/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Europium-152	-6.7	pCi/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Europium-154	-6	pCi/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Europium-155	0.044	pCi/L	U	
299-E27-22	B2W1Y1	3/12/2014	N	Fluoride	128	ug/L	BD	
299-E27-22	B2W0X4	3/12/2014	N	Gross beta	17	pCi/L		
299-E27-22	B2VYF5	3/12/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Iron	40	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Iron	40	ug/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Magnesium	24800	ug/L		
299-E27-22	B2VYF5	3/12/2014	N	Magnesium	24600	ug/L		
299-E27-22	B2VYF6	3/12/2014	Y	Manganese	4	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Manganese	4	ug/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Nickel	10	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Nickel	10	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-22	B2W1Y1	3/12/2014	N	Nitrate	33200	ug/L	D	
299-E27-22	B2W1Y1	3/12/2014	N	Nitrite	131	ug/L	UD	
299-E27-22	B2VYF5	3/12/2014	N	Potassium	8030	ug/L		
299-E27-22	B2VYF6	3/12/2014	Y	Potassium	8000	ug/L		
299-E27-22	B2W0X4	3/12/2014	N	Potassium-40	-190	pCi/L	U	
299-E27-22	B2W0X4	3/12/2014	N	Ruthenium-106	-3.8	pCi/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Silver	5	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Silver	5	ug/L	U	
299-E27-22	B2VYF6	3/12/2014	Y	Sodium	17800	ug/L		
299-E27-22	B2VYF5	3/12/2014	N	Sodium	17600	ug/L		
299-E27-22	B2W0X3	3/12/2014	N	Specific Conductance	676	uS/cm		
299-E27-22	B2VYF6	3/12/2014	Y	Strontium	456	ug/L		
299-E27-22	B2VYF5	3/12/2014	N	Strontium	451	ug/L		
299-E27-22	B2W1Y1	3/12/2014	N	Sulfate	177000	ug/L	D	
299-E27-22	B2W0X4	3/12/2014	N	Technetium-99	12	pCi/L		
299-E27-22	B2W0X3	3/12/2014	N	Temperature	18.2	Deg C		
299-E27-22	B2W0X3	3/12/2014	N	Turbidity	1.07	NTU		
299-E27-22	B2W0X4	3/12/2014	N	Uranium	3.56	ug/L	D	
299-E27-22	B2VYF5	3/12/2014	N	Vanadium	16.1	ug/L	B	
299-E27-22	B2VYF6	3/12/2014	Y	Vanadium	16.2	ug/L	B	
299-E27-22	B2VYF6	3/12/2014	Y	Zinc	5	ug/L	U	
299-E27-22	B2VYF5	3/12/2014	N	Zinc	5	ug/L	U	
299-E27-22	B2W0X3	3/12/2014	N	pH Measurement	7.95	unitless		
299-E27-23	B2VYF7	3/12/2014	N	Alkalinity	97000	ug/L		Q
299-E27-23	B2VYF9	3/12/2014	Y	Antimony	20	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-23	B2VYF7	3/12/2014	N	Antimony	20	ug/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Antimony-125	-5.8	pCi/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Arsenic	25	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Arsenic	25	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Barium	50.3	ug/L		
299-E27-23	B2VYF9	3/12/2014	Y	Barium	50.6	ug/L		
299-E27-23	B2VYF7	3/12/2014	N	Beryllium	2	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Beryllium	2	ug/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Beryllium-7	-42	pCi/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Bicarbonate	97000	ug/L		Q
299-E27-23	B2VYF7	3/12/2014	N	Cadmium	4	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Cadmium	4	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Calcium	79200	ug/L	N	
299-E27-23	B2VYF7	3/12/2014	N	Calcium	78100	ug/L	N	
299-E27-23	B2VYF7	3/12/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Cesium-134	-0.051	pCi/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Cesium-137	-10	pCi/L	U	
299-E27-23	B2VYF8	3/12/2014	N	Chloride	23700	ug/L	D	
299-E27-23	B2VYF7	3/12/2014	N	Chromium	5	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Chromium	5	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Cobalt	4	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Cobalt	4	ug/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Cobalt-60	6.7	pCi/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Copper	4	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Copper	4	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-23	B2VYF7	3/12/2014	N	Cyanide	4.46	ug/L	B	
299-E27-23	B2W0X6	3/12/2014	N	Europium-152	13	pCi/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Europium-154	-4.6	pCi/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Europium-155	47	pCi/L	U	
299-E27-23	B2VYF8	3/12/2014	N	Fluoride	151	ug/L	BD	
299-E27-23	B2W0X6	3/12/2014	N	Gross beta	2400	pCi/L		
299-E27-23	B2VYF7	3/12/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Iron	40	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Iron	40	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Magnesium	22700	ug/L		
299-E27-23	B2VYF7	3/12/2014	N	Magnesium	22300	ug/L		
299-E27-23	B2VYF9	3/12/2014	Y	Manganese	4	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Manganese	4	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Nickel	10	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Nickel	10	ug/L	U	
299-E27-23	B2VYF8	3/12/2014	N	Nitrate	34200	ug/L	D	
299-E27-23	B2VYF8	3/12/2014	N	Nitrite	131	ug/L	UD	
299-E27-23	B2VYF9	3/12/2014	Y	Potassium	7770	ug/L		
299-E27-23	B2VYF7	3/12/2014	N	Potassium	7700	ug/L		
299-E27-23	B2W0X6	3/12/2014	N	Potassium-40	-340	pCi/L	U	
299-E27-23	B2W0X6	3/12/2014	N	Ruthenium-106	67	pCi/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Silver	5	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Silver	5	ug/L	U	
299-E27-23	B2VYF9	3/12/2014	Y	Sodium	16500	ug/L		
299-E27-23	B2VYF7	3/12/2014	N	Sodium	16200	ug/L		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-23	B2W0X5	3/12/2014	N	Specific Conductance	604	uS/cm		
299-E27-23	B2W1Y2	3/12/2014	N	Specific Conductance	606	uS/cm		
299-E27-23	B2W1Y3	3/12/2014	N	Specific Conductance	607	uS/cm		
299-E27-23	B2W1Y4	3/12/2014	N	Specific Conductance	607	uS/cm		
299-E27-23	B2VYF9	3/12/2014	Y	Strontium	391	ug/L		
299-E27-23	B2VYF7	3/12/2014	N	Strontium	384	ug/L		
299-E27-23	B2VYF8	3/12/2014	N	Sulfate	147000	ug/L	D	
299-E27-23	B2W0X6	3/12/2014	N	Technetium-99	3900	pCi/L		
299-E27-23	B2W0X5	3/12/2014	N	Temperature	18.8	Deg C		
299-E27-23	B2W1Y2	3/12/2014	N	Temperature	18.9	Deg C		
299-E27-23	B2W1Y3	3/12/2014	N	Temperature	18.9	Deg C		
299-E27-23	B2W1Y4	3/12/2014	N	Temperature	18.9	Deg C		
299-E27-23	B2W0X5	3/12/2014	N	Turbidity	0.6	NTU		
299-E27-23	B2W1Y2	3/12/2014	N	Turbidity	0.49	NTU		
299-E27-23	B2W1Y3	3/12/2014	N	Turbidity	0.66	NTU		
299-E27-23	B2W1Y4	3/12/2014	N	Turbidity	0.4	NTU		
299-E27-23	B2W0X6	3/12/2014	N	Uranium	4.05	ug/L	D	
299-E27-23	B2VYF9	3/12/2014	Y	Vanadium	18.9	ug/L	B	
299-E27-23	B2VYF7	3/12/2014	N	Vanadium	18.2	ug/L	B	
299-E27-23	B2VYF9	3/12/2014	Y	Zinc	5	ug/L	U	
299-E27-23	B2VYF7	3/12/2014	N	Zinc	5	ug/L	U	
299-E27-23	B2W1Y4	3/12/2014	N	pH Measurement	7.81	unitless		
299-E27-23	B2W0X5	3/12/2014	N	pH Measurement	7.73	unitless		
299-E27-23	B2W1Y3	3/12/2014	N	pH Measurement	7.78	unitless		
299-E27-23	B2W1Y2	3/12/2014	N	pH Measurement	7.76	unitless		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-24	B2VYH0	3/19/2014	N	Alkalinity	84000	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Antimony	20	ug/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Antimony	20	ug/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Antimony-125	1	pCi/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Arsenic	25	ug/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Arsenic	25	ug/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Barium	74	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Barium	72.1	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Beryllium	2	ug/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Beryllium	2	ug/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Beryllium-7	2.1	pCi/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Bicarbonate	84000	ug/L		
299-E27-24	B2VYH2	3/19/2014	Y	Cadmium	4	ug/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Cadmium	4	ug/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Calcium	118000	ug/L		
299-E27-24	B2VYH2	3/19/2014	Y	Calcium	121000	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Cesium-134	-2.1	pCi/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Cesium-137	3.8	pCi/L	U	
299-E27-24	B2VYH1	3/19/2014	N	Chloride	41400	ug/L	D	
299-E27-24	B2VYH0	3/19/2014	N	Chromium	16.6	ug/L		
299-E27-24	B2VYH2	3/19/2014	Y	Chromium	9.64	ug/L	B	
299-E27-24	B2VYH2	3/19/2014	Y	Cobalt	4	ug/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Cobalt	4	ug/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Cobalt-60	1.5	pCi/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-24	B2VYH0	3/19/2014	N	Copper	4	ug/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Copper	4	ug/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Cyanide	13.1	ug/L	B	
299-E27-24	B2W0X8	3/19/2014	N	Europium-152	0.87	pCi/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Europium-154	-15	pCi/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Europium-155	-11	pCi/L	U	
299-E27-24	B2VYH1	3/19/2014	N	Fluoride	116	ug/L	BDN	
299-E27-24	B2W0X8	3/19/2014	N	Gross beta	3300	pCi/L		Q
299-E27-24	B2VYH0	3/19/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Iron	40	ug/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Iron	68.1	ug/L		
299-E27-24	B2VYH2	3/19/2014	Y	Magnesium	34800	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Magnesium	33900	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Manganese	4	ug/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Manganese	4	ug/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Nickel	10	ug/L	U	
299-E27-24	B2VYH0	3/19/2014	N	Nickel	10	ug/L	U	
299-E27-24	B2VYH1	3/19/2014	N	Nitrate	69100	ug/L	D	
299-E27-24	B2VYH1	3/19/2014	N	Nitrite	131	ug/L	UD	
299-E27-24	B2VYH0	3/19/2014	N	Potassium	10300	ug/L		
299-E27-24	B2VYH2	3/19/2014	Y	Potassium	10100	ug/L		
299-E27-24	B2W0X8	3/19/2014	N	Potassium-40	-110	pCi/L	U	
299-E27-24	B2W0X8	3/19/2014	N	Ruthenium-106	-1.8	pCi/L	U	
299-E27-24	B2VYH2	3/19/2014	Y	Silver	5.24	ug/L	B	
299-E27-24	B2VYH0	3/19/2014	N	Silver	5.24	ug/L	B	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-24	B2VYH2	3/19/2014	Y	Sodium	24800	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Sodium	24300	ug/L		
299-E27-24	B2W0X7	3/19/2014	N	Specific Conductance	980	uS/cm		
299-E27-24	B2VYH2	3/19/2014	Y	Strontium	594	ug/L		
299-E27-24	B2VYH0	3/19/2014	N	Strontium	586	ug/L		
299-E27-24	B2VYH1	3/19/2014	N	Sulfate	299000	ug/L	D	
299-E27-24	B2W0X8	3/19/2014	N	Technetium-99	4600	pCi/L		
299-E27-24	B2W0X7	3/19/2014	N	Temperature	18.5	Deg C		
299-E27-24	B2W0X7	3/19/2014	N	Turbidity	1.22	NTU		
299-E27-24	B2W0X8	3/19/2014	N	Uranium	4.97	ug/L	D	
299-E27-24	B2VYH0	3/19/2014	N	Vanadium	14.5	ug/L	B	
299-E27-24	B2VYH2	3/19/2014	Y	Vanadium	14.5	ug/L	B	
299-E27-24	B2VYH2	3/19/2014	Y	Zinc	6.75	ug/L	B	
299-E27-24	B2VYH0	3/19/2014	N	Zinc	15.9	ug/L		
299-E27-24	B2W0X7	3/19/2014	N	pH Measurement	7.72	unitless		
299-E27-25	B2VYH3	3/19/2014	N	Alkalinity	78000	ug/L		
299-E27-25	B2VYH3	3/19/2014	N	Antimony	20	ug/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Antimony	20	ug/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Antimony-125	-7.8	pCi/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Arsenic	25	ug/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Arsenic	25	ug/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Barium	62	ug/L		
299-E27-25	B2VYH3	3/19/2014	N	Barium	61.2	ug/L		
299-E27-25	B2VYH5	3/19/2014	Y	Beryllium	2	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Beryllium	2	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-25	B2W0Y0	3/19/2014	N	Beryllium-7	39	pCi/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Bicarbonate	78000	ug/L		
299-E27-25	B2VYH5	3/19/2014	Y	Cadmium	4	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Cadmium	4	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Calcium	124000	ug/L		
299-E27-25	B2VYH5	3/19/2014	Y	Calcium	129000	ug/L		
299-E27-25	B2VYH3	3/19/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Cesium-134	-10	pCi/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Cesium-137	-5.5	pCi/L	U	
299-E27-25	B2VYH4	3/19/2014	N	Chloride	60500	ug/L	D	
299-E27-25	B2VYH5	3/19/2014	Y	Chromium	5	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Chromium	11.2	ug/L		
299-E27-25	B2VYH3	3/19/2014	N	Cobalt	4	ug/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Cobalt	4	ug/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Cobalt-60	2.3	pCi/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Copper	4	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Copper	4	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Cyanide	4	ug/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Europium-152	-3.1	pCi/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Europium-154	-6.7	pCi/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Europium-155	11	pCi/L	U	
299-E27-25	B2VYH4	3/19/2014	N	Fluoride	102	ug/L	BD	
299-E27-25	B2W0Y0	3/19/2014	N	Gross beta	14	pCi/L		Q
299-E27-25	B2VYH3	3/19/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Iron	40	ug/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-25	B2VYH3	3/19/2014	N	Iron	46	ug/L	B	
299-E27-25	B2VYH5	3/19/2014	Y	Magnesium	36200	ug/L		
299-E27-25	B2VYH3	3/19/2014	N	Magnesium	34400	ug/L		
299-E27-25	B2VYH5	3/19/2014	Y	Manganese	4	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Manganese	4	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Nickel	10	ug/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Nickel	10	ug/L	U	
299-E27-25	B2VYH4	3/19/2014	N	Nitrate	49100	ug/L	D	
299-E27-25	B2VYH4	3/19/2014	N	Nitrite	131	ug/L	UD	
299-E27-25	B2VYH3	3/19/2014	N	Potassium	9890	ug/L		
299-E27-25	B2VYH5	3/19/2014	Y	Potassium	10300	ug/L		
299-E27-25	B2W0Y0	3/19/2014	N	Potassium-40	-27	pCi/L	U	
299-E27-25	B2W0Y0	3/19/2014	N	Ruthenium-106	35	pCi/L	U	
299-E27-25	B2VYH5	3/19/2014	Y	Silver	5.8	ug/L	B	
299-E27-25	B2VYH3	3/19/2014	N	Silver	5.42	ug/L	B	
299-E27-25	B2VYH3	3/19/2014	N	Sodium	18600	ug/L		
299-E27-25	B2VYH5	3/19/2014	Y	Sodium	19300	ug/L		
299-E27-25	B2W1Y6	3/19/2014	N	Specific Conductance	974	uS/cm		
299-E27-25	B2W1Y7	3/19/2014	N	Specific Conductance	974	uS/cm		
299-E27-25	B2W0X9	3/19/2014	N	Specific Conductance	974	uS/cm		
299-E27-25	B2W1Y5	3/19/2014	N	Specific Conductance	973	uS/cm		
299-E27-25	B2VYH3	3/19/2014	N	Strontium	585	ug/L		
299-E27-25	B2VYH5	3/19/2014	Y	Strontium	611	ug/L		
299-E27-25	B2VYH4	3/19/2014	N	Sulfate	289000	ug/L	D	
299-E27-25	B2W0Y0	3/19/2014	N	Technetium-99	2.6	pCi/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-25	B2W1Y5	3/19/2014	N	Temperature	18.4	Deg C		
299-E27-25	B2W0X9	3/19/2014	N	Temperature	18.4	Deg C		
299-E27-25	B2W1Y6	3/19/2014	N	Temperature	18.5	Deg C		
299-E27-25	B2W1Y7	3/19/2014	N	Temperature	18.5	Deg C		
299-E27-25	B2W1Y6	3/19/2014	N	Turbidity	1.2	NTU		
299-E27-25	B2W1Y7	3/19/2014	N	Turbidity	1.02	NTU		
299-E27-25	B2W0X9	3/19/2014	N	Turbidity	1.07	NTU		
299-E27-25	B2W1Y5	3/19/2014	N	Turbidity	1.21	NTU		
299-E27-25	B2W0Y0	3/19/2014	N	Uranium	3.19	ug/L	D	
299-E27-25	B2VYH5	3/19/2014	Y	Vanadium	13.9	ug/L	B	
299-E27-25	B2VYH3	3/19/2014	N	Vanadium	14.7	ug/L	B	
299-E27-25	B2VYH5	3/19/2014	Y	Zinc	5	ug/L	U	
299-E27-25	B2VYH3	3/19/2014	N	Zinc	5	ug/L	U	
299-E27-25	B2W0X9	3/19/2014	N	pH Measurement	7.81	unitless		
299-E27-25	B2W1Y7	3/19/2014	N	pH Measurement	7.81	unitless		
299-E27-25	B2W1Y6	3/19/2014	N	pH Measurement	7.81	unitless		
299-E27-25	B2W1Y5	3/19/2014	N	pH Measurement	7.81	unitless		
299-E27-4	B2VYH6	3/11/2014	N	Alkalinity	110000	ug/L		
299-E27-4	B2VYH8	3/11/2014	Y	Antimony	20	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Antimony	20	ug/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Antimony-125	5.1	pCi/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Arsenic	25	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Arsenic	25	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Barium	50.2	ug/L		
299-E27-4	B2VYH6	3/11/2014	N	Barium	48.2	ug/L		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-4	B2VYH8	3/11/2014	Y	Beryllium	2	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Beryllium	2	ug/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Beryllium-7	15	pCi/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Bicarbonate	110000	ug/L		
299-E27-4	B2VYH6	3/11/2014	N	Cadmium	4	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Cadmium	4	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Calcium	74200	ug/L		
299-E27-4	B2VYH6	3/11/2014	N	Calcium	72300	ug/L		
299-E27-4	B2VYH6	3/11/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Cesium-134	-3.8	pCi/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Cesium-137	-2.4	pCi/L	U	
299-E27-4	B2VYH7	3/11/2014	N	Chloride	22100	ug/L	D	
299-E27-4	B2VYH6	3/11/2014	N	Chromium	7.29	ug/L	B	
299-E27-4	B2VYH8	3/11/2014	Y	Chromium	5	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Cobalt	4	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Cobalt	4	ug/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Cobalt-60	1.9	pCi/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Copper	4	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Copper	4	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Cyanide	4	ug/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Europium-152	16	pCi/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Europium-154	5.4	pCi/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Europium-155	4.6	pCi/L	U	
299-E27-4	B2VYH7	3/11/2014	N	Fluoride	154	ug/L	BD	
299-E27-4	B2W0Y2	3/11/2014	N	Gross beta	1100	pCi/L		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-4	B2VYH6	3/11/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Iron	40	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Iron	40	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Magnesium	20500	ug/L		
299-E27-4	B2VYH8	3/11/2014	Y	Magnesium	21100	ug/L		
299-E27-4	B2VYH6	3/11/2014	N	Manganese	4	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Manganese	4	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Nickel	10	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Nickel	10	ug/L	U	
299-E27-4	B2VYH7	3/11/2014	N	Nitrate	25900	ug/L	D	
299-E27-4	B2VYH7	3/11/2014	N	Nitrite	131	ug/L	UD	
299-E27-4	B2VYH8	3/11/2014	Y	Potassium	7660	ug/L		
299-E27-4	B2VYH6	3/11/2014	N	Potassium	7470	ug/L		
299-E27-4	B2W0Y2	3/11/2014	N	Potassium-40	-120	pCi/L	U	
299-E27-4	B2W0Y2	3/11/2014	N	Ruthenium-106	3.3	pCi/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Silver	5	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Silver	5	ug/L	U	
299-E27-4	B2VYH6	3/11/2014	N	Sodium	15800	ug/L		
299-E27-4	B2VYH8	3/11/2014	Y	Sodium	16200	ug/L		
299-E27-4	B2W0Y1	3/11/2014	N	Specific Conductance	557	uS/cm		
299-E27-4	B2VYH6	3/11/2014	N	Strontium	356	ug/L		
299-E27-4	B2VYH8	3/11/2014	Y	Strontium	365	ug/L		
299-E27-4	B2VYH7	3/11/2014	N	Sulfate	122000	ug/L	D	
299-E27-4	B2W0Y2	3/11/2014	N	Technetium-99	1800	pCi/L		
299-E27-4	B2W0Y1	3/11/2014	N	Temperature	19.5	Deg C		

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-4	B2W0Y1	3/11/2014	N	Turbidity	0.41	NTU		
299-E27-4	B2W0Y2	3/11/2014	N	Uranium	4.45	ug/L	D	
299-E27-4	B2VYH8	3/11/2014	Y	Vanadium	17.7	ug/L	B	
299-E27-4	B2VYH6	3/11/2014	N	Vanadium	17.1	ug/L	B	
299-E27-4	B2VYH6	3/11/2014	N	Zinc	5	ug/L	U	
299-E27-4	B2VYH8	3/11/2014	Y	Zinc	5	ug/L	U	
299-E27-4	B2W0Y1	3/11/2014	N	pH Measurement	7.87	unitless		
299-E27-7	B2VYJ0	3/12/2014	N	Alkalinity	89000	ug/L		Q
299-E27-7	B2VYJ4	3/12/2014	Y	Antimony	20	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Antimony	20	ug/L	U	
299-E27-7	B2W0Y5	3/12/2014	N	Antimony-125	-15	pCi/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Arsenic	25	ug/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Arsenic	25	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Barium	50.5	ug/L		
299-E27-7	B2VYJ4	3/12/2014	Y	Barium	51.5	ug/L		
299-E27-7	B2VYJ0	3/12/2014	N	Beryllium	2	ug/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Beryllium	2	ug/L	U	
299-E27-7	B2W0Y5	3/12/2014	N	Beryllium-7	-18	pCi/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Bicarbonate	89000	ug/L		Q
299-E27-7	B2VYJ0	3/12/2014	N	Cadmium	4	ug/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Cadmium	4	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Calcium	83800	ug/L	N	
299-E27-7	B2VYJ4	3/12/2014	Y	Calcium	90200	ug/L	N	
299-E27-7	B2VYJ0	3/12/2014	N	Carbonate alkalinity	1000	ug/L	U	
299-E27-7	B2W0Y5	3/12/2014	N	Cesium-134	-44	pCi/L	U	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-7	B2W0Y5	3/12/2014	N	Cesium-137	3.1	pCi/L	U	
299-E27-7	B2VYJ2	3/12/2014	N	Chloride	33600	ug/L	D	
299-E27-7	B2VYJ0	3/12/2014	N	Chromium	5.96	ug/L	B	
299-E27-7	B2VYJ4	3/12/2014	Y	Chromium	5	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Cobalt	4	ug/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Cobalt	4	ug/L	U	
299-E27-7	B2W0Y5	3/12/2014	N	Cobalt-60	-0.61	pCi/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Copper	4	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Copper	4	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Cyanide	4.16	ug/L	B	
299-E27-7	B2W0Y5	3/12/2014	N	Europium-152	2.3	pCi/L	U	
299-E27-7	B2W0Y5	3/12/2014	N	Europium-154	-4.8	pCi/L	U	
299-E27-7	B2W0Y5	3/12/2014	N	Europium-155	10	pCi/L	U	
299-E27-7	B2VYJ2	3/12/2014	N	Fluoride	142	ug/L	BD	
299-E27-7	B2W0Y5	3/12/2014	N	Gross beta	22	pCi/L		
299-E27-7	B2VYJ0	3/12/2014	N	Hydroxylion	1000	ug/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Iron	40	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Iron	375	ug/L		
299-E27-7	B2VYJ4	3/12/2014	Y	Magnesium	25700	ug/L		
299-E27-7	B2VYJ0	3/12/2014	N	Magnesium	23700	ug/L		
299-E27-7	B2VYJ4	3/12/2014	Y	Manganese	4	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Manganese	6.07	ug/L		
299-E27-7	B2VYJ0	3/12/2014	N	Nickel	10	ug/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Nickel	10	ug/L	U	
299-E27-7	B2VYJ2	3/12/2014	N	Nitrate	32600	ug/L	D	

Table D-1. March 2014 Sample Results

Well Name	Sample Number	Sample Date	Filtered Flag	Standard Constituent Long Name	Standard Value Reported	Standard Analytical Units Reported	Lab Qualifier	Review Qualifier
299-E27-7	B2VYJ2	3/12/2014	N	Nitrite	131	ug/L	UD	
299-E27-7	B2VYJ4	3/12/2014	Y	Potassium	8250	ug/L		
299-E27-7	B2VYJ0	3/12/2014	N	Potassium	8260	ug/L		
299-E27-7	B2W0Y5	3/12/2014	N	Potassium-40	-58	pCi/L	U	
299-E27-7	B2W0Y5	3/12/2014	N	Ruthenium-106	-32	pCi/L	U	
299-E27-7	B2VYJ4	3/12/2014	Y	Silver	5	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Silver	5	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Sodium	15900	ug/L		
299-E27-7	B2VYJ4	3/12/2014	Y	Sodium	17100	ug/L		
299-E27-7	B2W0Y3	3/12/2014	N	Specific Conductance	680	uS/cm		
299-E27-7	B2VYJ4	3/12/2014	Y	Strontium	482	ug/L		
299-E27-7	B2VYJ0	3/12/2014	N	Strontium	437	ug/L		
299-E27-7	B2VYJ2	3/12/2014	N	Sulfate	184000	ug/L	D	
299-E27-7	B2W0Y5	3/12/2014	N	Technetium-99	17	pCi/L		
299-E27-7	B2W0Y3	3/12/2014	N	Temperature	18.5	Deg C		
299-E27-7	B2W0Y3	3/12/2014	N	Turbidity	2.75	NTU		
299-E27-7	B2W0Y5	3/12/2014	N	Uranium	3.19	ug/L	D	
299-E27-7	B2VYJ0	3/12/2014	N	Vanadium	14.5	ug/L	B	
299-E27-7	B2VYJ4	3/12/2014	Y	Vanadium	14.7	ug/L	B	
299-E27-7	B2VYJ4	3/12/2014	Y	Zinc	5	ug/L	U	
299-E27-7	B2VYJ0	3/12/2014	N	Zinc	5	ug/L	U	
299-E27-7	B2W0Y3	3/12/2014	N	pH Measurement	8	unitless		

This page intentionally left blank.

Distribution

U.S. Department of Energy, Richland Operations Office – Electronic Distribution	
R.D. Hildebrand (4 copies/16 CDs)	A6-38
J.G. Morse	A5-11
U.S. Department of Energy, Office of River Protection – Electronic Distribution	
J.F. Grindstaff	H6-60
C.J. Kemp	H6-60
Washington River Protection Solutions LLC – Electronic Distribution ONLY	
M.V. Bergeron	H6-13
S.J. Eberlein	H6-13
R.E. Fox	S7-83
J.G. Field	S7-90
D.R. Glaser	H6-13
J.J. Luke	H6-14
A.R. Olander	S7-90
J.S. Schofield	R2-53
CH2M HILL Plateau Remediation Company – Electronic Distribution ONLY	
W.R. Faught	R3-50
G.S. Thomas	R3-50
R.H. Engelman	H8-45
Administrative Record – Electronic Distribution	
H.M. Childers (1 copy)	H6-08
Document Clearance - Electronic Distribution	H6-08

This page intentionally left blank.