LMS/RFO/RFN/S09046

2012 Verification Monitoring Report for the Old and New Rifle, Colorado, Processing Sites

June 2012

U.S. DEPARTMENT OF ENERGY | Legacy Management

This page intentionally left blank

LMS/RFO-RFN/S09046

2012 Verification Monitoring Report for the Old and New Rifle, Colorado, Processing Sites

June 2012

This page intentionally left blank

Contents

Abbreviations iii
1.0 Introduction 1
1.1 Compliance Strategy 1
1.2 Site Status 1
1.3 Land Use, Water Use, and ICs 5
2.0 Site Conditions 7
2.1 Hydrogeology 7
2.2 Groundwater Quality 8
3.0 Monitoring Program 9
3.1 Monitoring Network 9
3.2 Results of the Monitoring Program 10
3.2.1 Old Rifle Site 10
3.2.1.1 Surface Water 10
3.2.1.2 Groundwater 10
3.2.1.3 Isotopic Data 26
3.2.1.4 ICs Monitoring 28
3.2.2 New Rifle Site 28
3.2.2.1 Surface Water 28
3.2.2.2 Groundwater 29
3.2.2.3 Institutional Controls Monitoring 34
3.2.3 Mann-Kendall Test for Trend for New Rifle 34
4.0 Results and Conclusions 35
5.0 References 37

Figures

Figure 1. LM Monitoring Locations and Site Boundary for the Old Rifle, Colorado, Processing Site 2
Figure 2. LM Monitoring Locations for the New Rifle, Colorado, Processing Site 3
Figure 3. Location of the New Rifle Mill Site and Institutional Controls Boundary 4
Figure 4. Selenium in Water, June 2011 Results at the Old Rifle Site 11
Figure 5. Selenium in Water, November 2011 Results at the Old Rifle Site 12
Figure 6. Uranium in Water, June 2011 Results at the Old Rifle Site 13
Figure 7. Uranium in Water, November 2011 Results at the Old Rifle Site 14
Figure 8. Vanadium in Water, June 2011 Results at the Old Rifle Site 15
Figure 9. Vanadium in Water, November 2011 Results at the Old Rifle Site 16
Figure 10. Molybdenum in Water, Latest Results from June/August 2011 at the New Rifle Site 18
Figure 11. Molybdenum in Water, Latest Results from November 2011 at the New Rifle Site 19
Figure 12. Nitrate in Water, Latest Results from June/August 2011 at the New Rifle Site 20
Figure 13. Nitrate in Water, Latest Results from November 2011 at the New Rifle Site 21
Figure 14. Uranium in Water, Latest Results from June/August 2011 at the New Rifle Site 22
Figure 15. Uranium in Water, Latest Results from November 2011 at the New Rifle Site 23
Figure 16. Vanadium in Water, Latest Results from June/August 2011 at the New Rifle Site 24
Figure 17. Vanadium in Water, November 2011 at the New Rifle Site 25

Tables

Table 1. Historical Groundwater Chemistry for Old and New Rifle Site COCs 8
Table 2. Summary of GCAP Monitoring Requirements for the Old Rifle Site 9
Table 3. Summary of GCAP Monitoring Requirements for the New Rifle Site 10
Table 4. Post-Surface-Remediation Groundwater Monitoring Results for the Old Rifle Site 17
Table 5. Uranium Isotopic Analyses for June 2011 Sampling Event 27
Table 6. Mean Concentrations in Groundwater—1998–1999: combined June 2011 and November 2011 for the New Rifle Site 31
Table 7. Range of Concentrations in Groundwater—1998–1999; combined June 2011 and November 2011 for the New Rifle Site 31

Appendixes

Appendix A−1 Time-Concentration Plots for Wells at the Old Rifle Site
Appendix A−2 Time-Concentration Plots for Wells at the New Rifle Site
Appendix A–3 New Rifle Ponds
Appendix B Application of the Mann-Kendall Test to the New Rifle Monitoring Data
Appendix C Groundwater and Surface Water Monitoring Results for CY 2011

Abbreviations

CDPHE	Colorado Department of Public Health and Environment
CFR	*Code of Federal Regulations*
COC	contaminant of concern
CY	calendar year
DOE	U.S. Department of Energy
ft	feet
FY	fiscal year
GCAP	Ground Water Compliance Action Plan
IC	institutional control
IFRC	Integrated Field Research Challenge
MCL	maximum concentration limit
mg/L	milligram per liter
NRC	U.S. Nuclear Regulatory Commission
SOWP	Site Observational Work Plan
UAR	uranium activity ratio
UMTRCA	Uranium Mill Tailings Radiation Control Act
VMR	Verification Monitoring Report
VSP	Visual Sample Plan
Williams	Williams Production RMT Company

This page intentionally left blank

1.0 Introduction

This Verification Monitoring Report (VMR) presents and interprets groundwater monitoring data collected at the Old and New Rifle, Colorado, Title I Uranium Mill Tailings Radiation Control Act (UMTRCA) sites (Figure 1 and Figure 2). These sites are located near the City of Rifle in Garfield County of western Colorado. Detailed information for the Old and New Rifle sites and water quality data through 1998 and 1999 are in the final Site Observational Work Plans (SOWPs) (DOE 1999a and 1999b) for the sites. Groundwater monitoring has been conducted at least annually since completion of the SOWPs and reported annually in VMRs since 2006. This VMR presents data collected and information on activities conducted during calendar year (CY) 2011.

1.1 Compliance Strategy

Based on groundwater modeling results presented in the SOWPs, the proposed compliance strategy for both the Old and New Rifle sites is natural flushing, although strategies at both sites are being reexamined. The compliance strategies also require continued groundwater and surface water monitoring along with institutional controls (ICs) that restrict access to contaminated groundwater (DOE 1999b, DOE 2001). Additionally, the U.S. Department of Energy (DOE) and the State of Colorado constructed an alternate domestic water supply system in 2003 to service users near and downgradient of the New Rifle site. In 2009, an environmental covenant was established to prohibit domestic livestock from using the gravel pit ponds. These compliance strategies are protective of human health and the environment.

1.2 Site Status

The Old Rifle SOWP (DOE 1999a) and Ground Water Compliance Action Plan (GCAP) (DOE 2001) are complete and have received concurrence from the U.S. Nuclear Regulatory Commission (NRC) and the Colorado Department of Public Health and Environment (CDPHE). The conditions of the natural flushing compliance strategy are to maintain ICs over the site and conduct a monitoring program until concentrations of contaminants of concern (COCs) decrease to acceptable levels. Because the natural flushing compliance strategy has not been performing as expected, the GCAP has been revised and a different compliance strategy selected; the revised GCAP has been submitted to NRC and CDPHE for comment. The City of Rifle currently owns the Old Rifle site.

The New Rifle SOWP (DOE 1999b) was submitted to DOE and CDPHE; modeling indicated that most COCs at the site would naturally flush to Title 40 *Code of Federal Regulations* (CFR) Part 192 maximum concentration limits (MCLs) for groundwater within 100 years. An environmental assessment completed for groundwater compliance at the site proposed natural flushing for all COCs. A GCAP for the site has been drafted, but it has not yet been submitted to the regulatory agencies. The conditions of the natural flushing compliance strategy are to maintain ICs over the site and downgradient areas (Figure 3) and continue a monitoring program until concentrations of COCs decrease to acceptable levels. The City of Rifle owns the New Rifle site. The annual verification monitoring described in the GCAPs for these sites is currently being implemented.

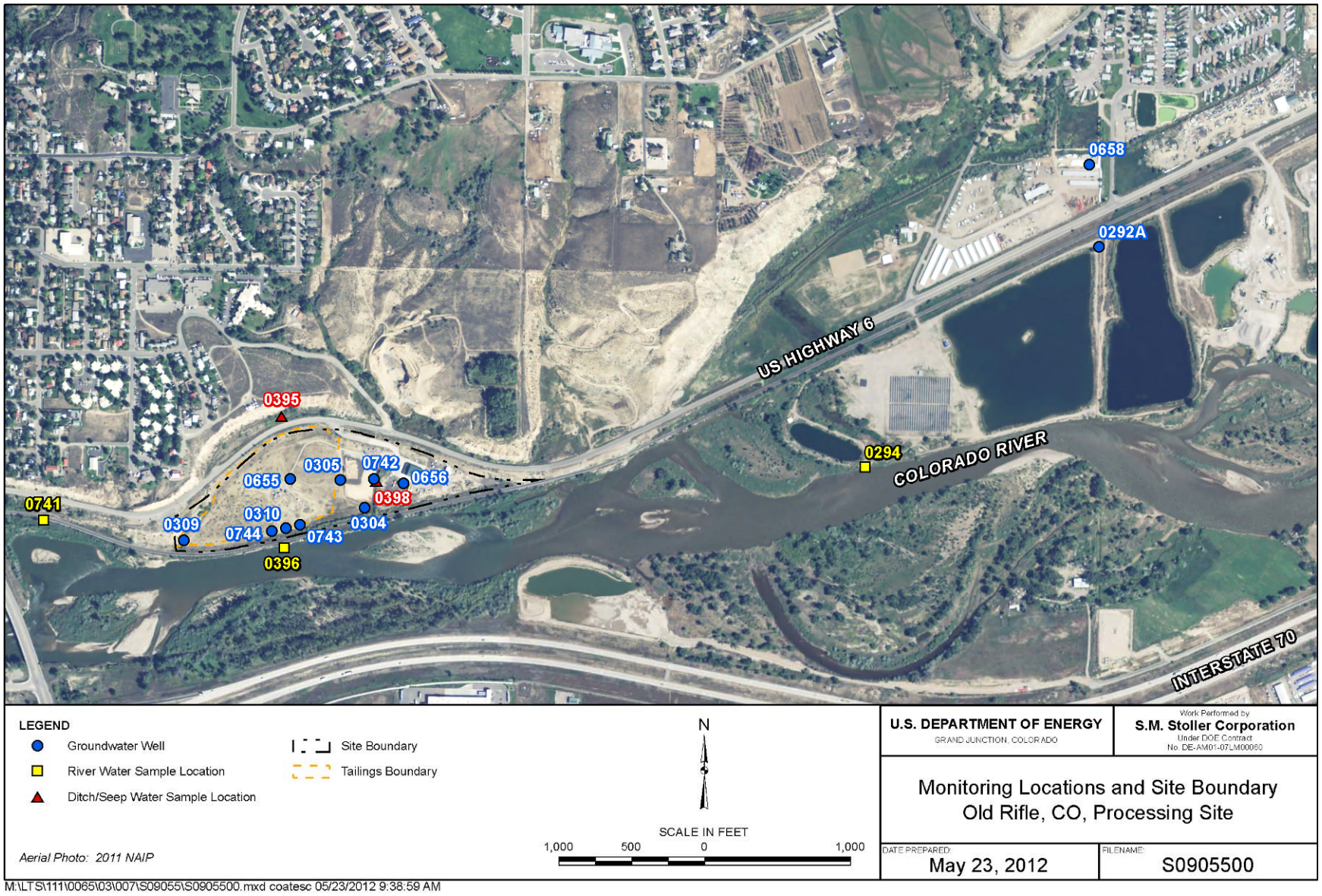


Figure 1. LM Monitoring Locations and Site Boundary for the Old Rifle, Colorado, Processing Site

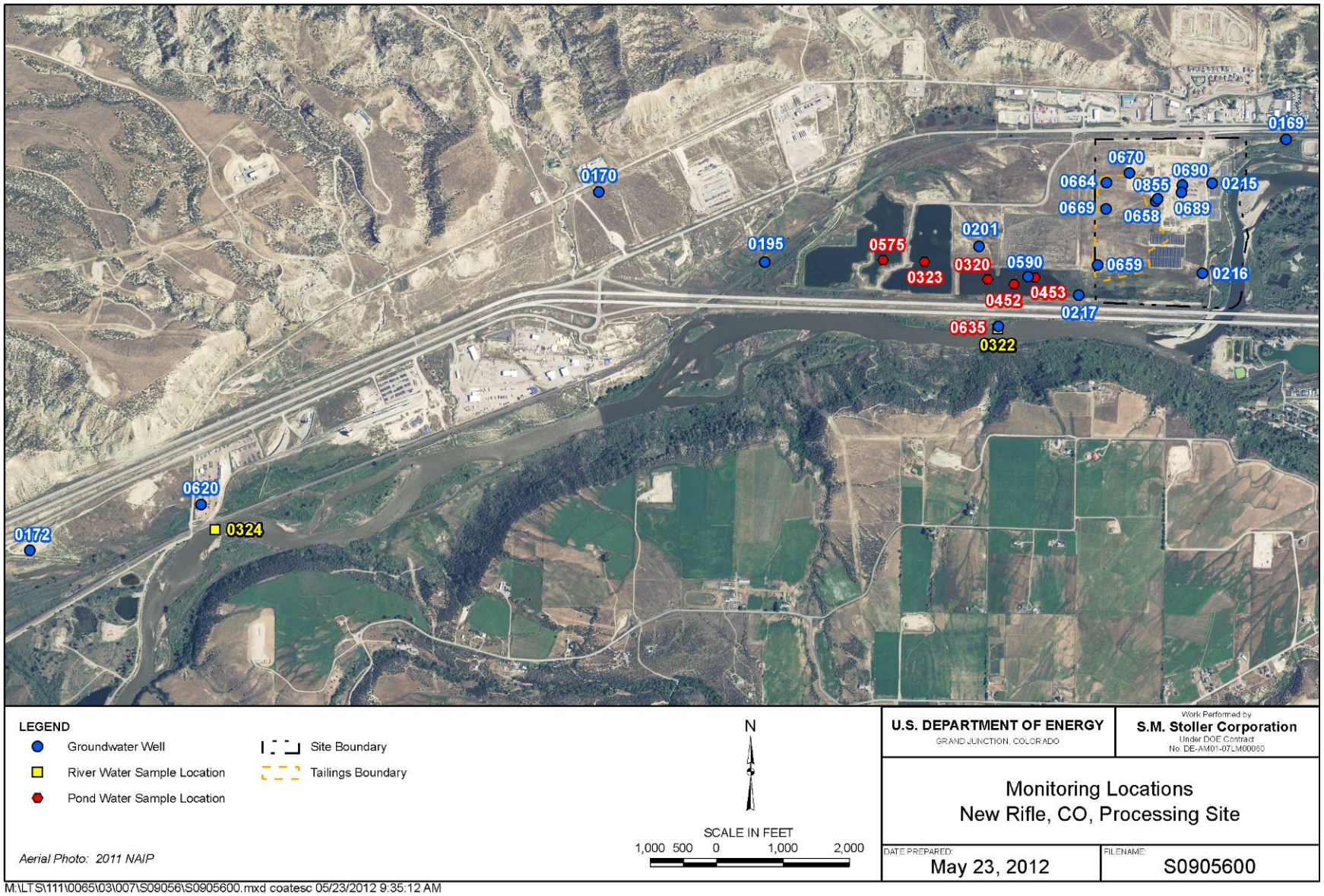


Figure 2. LM Monitoring Locations for the New Rifle, Colorado, Processing Site

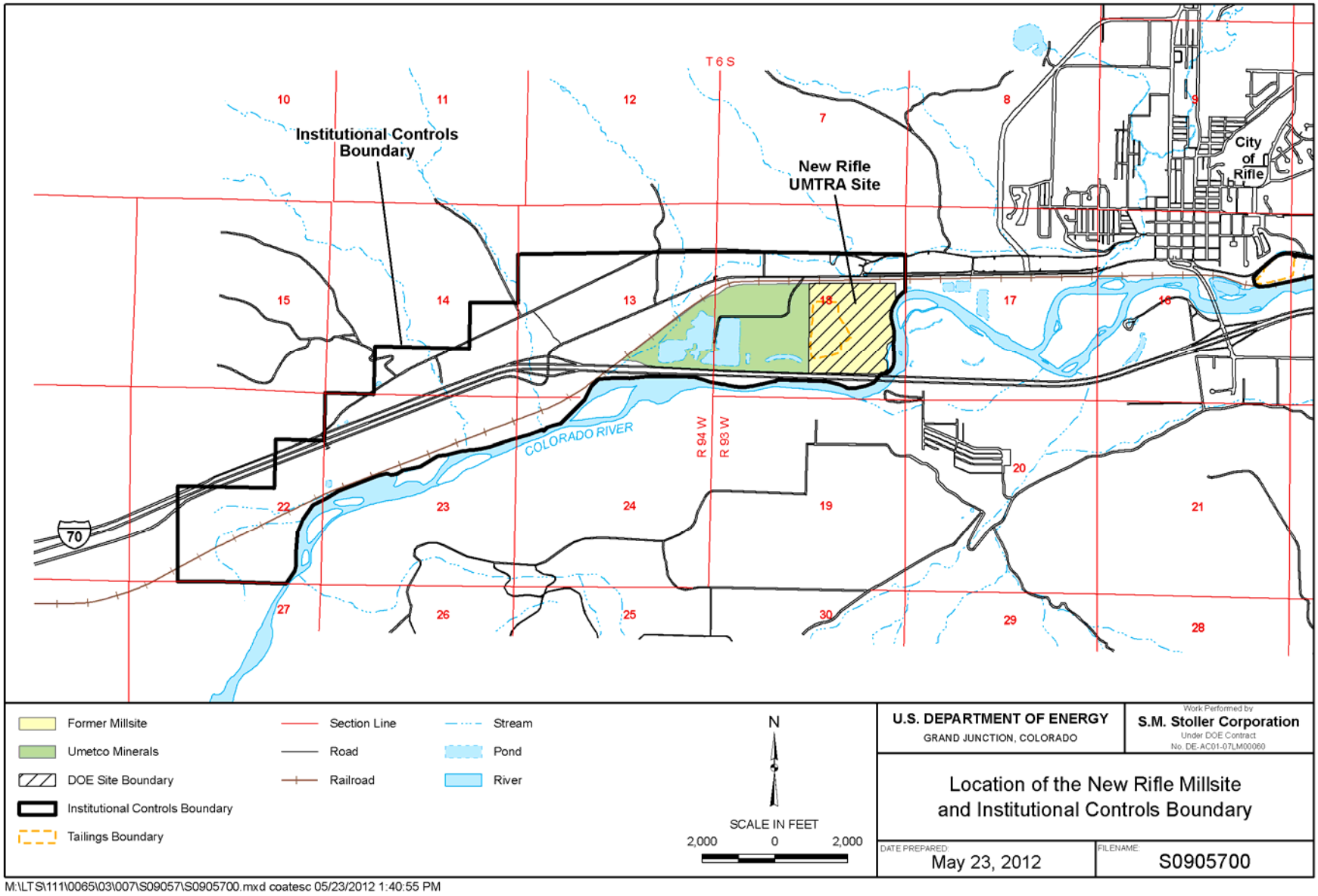


Figure 3. Location of the New Rifle Mill Site and Institutional Controls Boundary

1.3 Land Use, Water Use, and ICs

The City of Rifle acquired the former Old Rifle processing site from the State of Colorado in 2000. The City uses the site for an operations and maintenance and recycling facility. The site has also been established as an Integrated Field Research Challenge (IFRC) site through DOE's Office of Science. Experiments have been conducted at the Old Rifle site since 2006 to better understand the behavior of uranium in the alluvial aquifer. All groundwater contamination is contained within IC boundaries except for groundwater that discharges into the Colorado River.

The former New Rifle processing site was transferred from the State of Colorado to the City of Rifle in 2004. The site currently contains a wastewater treatment plant, a composting facility, and the Colorado State University experimental station for producing biofuels. Dow Chemical (which acquired Umetco Minerals Corporation) owns the adjacent downgradient property (Figure 3). Other private parties own parcels farther downgradient of the site.

Historically, domestic wells downgradient of the New Rifle site were used for drinking water. However, these wells are no longer in use, and drinking water for these locations is supplied by the City via the alternate water supply system funded by DOE and the State. The Roaring Fork gravel pit (now owned by Dow Chemical) ceased operation in 2003, and the ponds have since filled with groundwater and equilibrated with the local water table. The banks of the ponds have been contoured and seeded. No immediate plans are in place for this property although the City would like to acquire it for future development.

ICs prevent improper use of the groundwater while remediation is in progress. Aside from government ownership of the former mill site properties, the quitclaim deeds for the properties state "Grantee covenants (ii) not to use groundwater from the site for any purpose, and not to construct wells or any means of exposing groundwater to the surface unless prior written approval for such use is given by the Grantor and the DOE." This restriction was recorded with the deeds, will be binding upon future landowners, and is enforceable by the State.

In 2001, the State of Colorado passed into law Senate Bill 01-145 (effective July 1, 2001), which creates enforceable covenants that can be used to place environmental restrictions on properties. These covenants run with the land until a request is made to modify or terminate the covenants. Covenant ID HMCOV00001 was placed on the New Rifle site on October 8, 2001, and prevents potable use of groundwater. Covenant ID HMCOV00006 was placed on the Old Rifle property on October 29, 2002, and prohibits drilling of alluvial aquifer wells and earthmoving activities without CDPHE approval (http://www.cdphe.state.co.us/hm/covenant/index.htm). It also requires the use of radon vent systems for any habitable structures.

A special zoning ordinance passed by the City of Rifle in 2008 sets forth procedures and restrictions governing development of these City-owned properties. Restrictions already outlined in the quitclaim deed and environmental covenants, and requirements for both soil and groundwater materials handling plans, were codified.

In 2009, covenant ID HMCOV00073 between CDPHE and Umetco Minerals Corporation (and parent company Dow Chemical) was signed for the parcel of land that is downgradient of the mill site and that contains the large Roaring Fork gravel ponds. It prohibits any wells from being drilled on the property, prohibits livestock from using the ponds, disallows interference with DOE monitor wells, and grants DOE access to these wells.

The City ordinance for the New Rifle site extends downgradient from the site to the city limit and requires that property owners obtain their potable water from the municipal water supply system. A Garfield County zoning ordinance extends from the Rifle city limit to the downgradient extent of the IC area shown in Figure 3. It gives property owners the option of obtaining potable water from the municipal water supply system or using an alternative, approved domestic water supply. In the past, DOE supplied reverse-osmosis units to residents with domestic wells completed in the alluvial aquifer. Since that time, those wells were replaced with City water taps. No private domestic wells are in use or being sampled at this time.

2.0 Site Conditions

2.1 Hydrogeology

The Old Rifle former processing site is 0.3 mile southeast of the city of Rifle, in a floodplain on the north side of the Colorado River (Figure 1). Groundwater is unconfined in the uppermost aquifer, which consists of river alluvium and the upper weathered surface of the Tertiary Wasatch Formation. The uppermost aquifer is 5 to 25 feet (ft) thick; saturation occurs from 5 to 10 ft below ground surface. The uppermost aquifer is composed of poorly sorted sediments that range from clay-sized material, to cobbles, to occasional boulders. Groundwater in the alluvial aquifer generally flows to the west-southwest. Hydraulic conductivity estimates for the alluvial aquifer range from 100 to 125 ft per day (DOE 1999a); estimates for the weathered Wasatch are about 0.02 ft per day (DOE 1999a).

Recharge to the alluvial aquifer is from an unlined irrigation return ditch that flows across the middle of the site, subsurface inflow from north of Highways 6 & 24, and precipitation. The Colorado River and the alluvial aquifer probably interact, but the monitoring network is insufficient to fully characterize their relationship. Groundwater discharge is mainly to the Colorado River. At the Old Rifle site, alluvium pinches out against bedrock outcrops at the downgradient end of the site. The alluvial aquifer at the Old Rifle site has no hydraulic connection to the alluvial aquifer at the New Rifle site.

The Old Rifle SOWP (DOE 1999a) provides additional data regarding the hydrogeology of the Old Rifle site and the site conceptual model. Results of subsequent IFRC studies have shown that the conceptual model for the site is much more complex than envisioned at the time the SOWP was completed. A recent report summarizes the results of the IFRC studies and presents a revised conceptual model for the site (DOE 2011).

The New Rifle former processing site is about 1.5 miles west of the city of Rifle and is also situated on the north floodplain of the Colorado River (Figure 2). As with the Old Rifle site, the uppermost aquifer consists of poorly sorted river alluvium and the weathered surface of the Wasatch Formation. Hydraulic conductivities for the alluvial aquifer range from 53 to 275 ft per day with an average of 114 ft per day (DOE 1999b). Alluvium is thickest along the western and southern portions of the site and is continuous for at least 4 miles downgradient of the site. Recharge is from ephemeral streams from the north, precipitation, and inflow from the Colorado River along the east side of the site (DOE 1999b). Groundwater discharge is primarily to the Colorado River; groundwater also discharges to other surface water features (wetland area, gravel ponds).

At one time, Roaring Fork Resources operated a gravel mine on the property adjacent to and downgradient of the New Rifle site. Water was pumped from an active onsite mining pit, where excavation was occurring, to another onsite pit for storage and infiltration. (These pits have been referred to previously as the "Roaring Fork ponds.") During Roaring Fork Resources' period of operation, the pumping affected groundwater flow downgradient of the New Rifle site, creating both a cone of depression in and a groundwater mound on the alluvial aquifer water table (DOE 1999b). Operation of the gravel mine ceased in early 2003, and natural alluvial groundwater flow conditions have been reestablished, though the effects of the ponds on contaminant distribution persist today. Over time, and with the progression of natural flushing, these effects have become less pronounced.

2.2 Groundwater Quality

Alluvial groundwater in background locations near the Rifle sites has concentrations of selenium and uranium that are above MCLs (DOE 1995b). Sulfate levels in background locations have also been relatively high, far exceeding the secondary drinking water standard of 250 milligrams per liter (mg/L) (non-enforceable; based on aesthetic considerations). However, it has been demonstrated that site-related activities contributed to contamination of the groundwater in the uppermost aquifer beneath the Old Rifle site and beneath and downgradient of the New Rifle site.

Table 1 presents historical data for COCs in groundwater at both sites before surface remediation was completed. A comparison of historical data with benchmarks indicates that criteria were exceeded for a number of COCs. The New Rifle site had a greater number of contaminants and much higher contaminant concentrations than the Old Rifle site.

Table 1. Historical Groundwater Chemistry for Old and New Rifle Site COCs

COC (all units mg/L)	Benchmark	Old Rifle Site		New Rifle Site	
		Historical Range[a] Aug. 1990−Aug. 1994	Median[a]	Historical Range[a] Aug. 1990−Aug. 1994	Median[a]
Ammonia as NH_4[b]	NA	NA	NA	506−1,750	1,030
Arsenic	0.05[c]	NA	NA	0.97−1.3	1.1
Molybdenum	0.10[c]	NA	NA	2.3−3.7	2.9
Nitrate + Nitrite as Nitrogen	10[c]	NA	NA	124−251	177
Selenium	0.041[d]	0.007–0.085	0.072	<0.002−0.3	<0.05
Uranium	0.067[d]	1.6–2.1	1.8	0.24−0.37	0.29
Vanadium	NA	0.5–0.75	0.55	0.59−2.8	1.3

[a] Ranges and median values are from the Baseline Risk Assessment (DOE 1995a), Table 3.1 (pre-remedial action).
[b] No longer considered a COC; included to understand nitrate behavior.
[c] U.S. Environmental Protection Agency groundwater standards for sites (40 CFR 192).
[d] Maximum background value, cleanup goal.
NA = not applicable

During surface remediation, mill tailings and other residual radioactive materials (RRM) were removed. Surface remediation was completed by 1996, and tailings were stabilized in an engineered repository about 6 miles north of Rifle. RRM were removed down to and, in some cases, just below the groundwater surface. Clean gravel and soil were used to fill the excavations, and the surface was given 6 inches of topsoil and sown with seed mixtures.

Subsequent characterization completed at the New Rifle site as part of a pilot study for the removal of vanadium from the groundwater (DOE 2000) indicated that some residual soil contamination remains at that site below the water table. Analyses showed elevated concentrations of vanadium; several samples also showed residual concentrations of molybdenum, uranium, and arsenic. Most of these soils are associated with the location of a former disposal pond and, to a lesser extent, a former tailings pile. From 2008 through 2010, the City of Rifle conducted activities within and to the east of these known contaminated soils during construction of the waste water treatment facility.

3.0 Monitoring Program

3.1 Monitoring Network

Table 2 lists the sampling locations that constitute the routine monitoring network at the Old Rifle processing site. The network consists of nine monitoring wells (six onsite wells and three background wells) and five surface water locations (Figure 1). Although not part of the routine site monitoring requirements, wells installed in November 2011 to fill gaps in some areas (especially for the Office of Science's ongoing research) were sampled. They are RFO-0742, RFO-0743, and RFO-0744 three-port continuous multichannel tubing wells completed at approximately 10 ft, 14 ft, and 18 ft below ground surface. Analyses of water from the isolated completions provide insight into the vertical distribution of contamination at the site. Several other wells in the plume area, which the Rifle IFRC scientists use and which have not been affected by biogeochemical studies, were also sampled. They are LQ-109, LQ-107, LQ-108, and B-04. Additional seep locations north of the site were sampled in June to provide additional evidence of uranium contributions from upgradient groundwater. The seep locations are RFO-0387, RFO-0388, RFO-0389, and RFO-0394. Selenium, uranium, and vanadium were analyzed from these locations. Results are provided in Appendix C and shown on spot plots.

Table 2. Summary of GCAP Monitoring Requirements for the Old Rifle Site

Location	Monitoring Purpose	Analytes	Frequency
RFO-0305, RFO-0655	Center of plume[a]; west side of ditch	Selenium, uranium, vanadium	Semiannually
RFO-0656	Center of plume; east side of ditch	Selenium, uranium, vanadium	Semiannually
RFO-0304, RFO-0309, RFO-0310	Farthest downgradient location; leading edge of plume	Selenium, uranium, vanadium	Semiannually
RFO-0292A, RFO-0658, RFN-0169	Background groundwater quality; upgradient monitoring well	Selenium, uranium, vanadium	Semiannually
RFO-0395, RFO-0398	Monitor surface water recharging aquifer; seep and onsite ditch	Selenium, uranium, vanadium	Semiannually
RFO-0294 (to replace RFO-0598), RFO-0396, RFO-0741	Monitor effects of site on river; surface water; upgradient of, adjacent to, and downgradient of site on Colorado River	Selenium, uranium, vanadium	Semiannually

[a] Based on uranium.

Table 3 lists the monitoring requirements for the New Rifle site described in the draft GCAP. The monitoring network currently consists of 16 monitoring wells at various locations and seven surface water sampling sites (Figure 2). Although not required by the GCAP, wells RFN-0689 and RFN-0690 were installed in the vicinity of the Colorado State University biofuels experimental facility (Figure 2) and were sampled and analyzed for site COCs as well as herbicides in November 2010 to determine if operation of the facility is having any effect on the groundwater (see sampling results in Appendix C). These wells were not sampled during the reporting period for this VMR, but they will be sampled again in fiscal year (FY) 2012 and will likely be included in the monitoring network for the next several years or for as long as Colorado State University maintains the experimental plots. The two Old Rifle background wells (RFO-0658 and RFO-0292A) and well RFN-0169 serve as background wells for the New Rifle site. The analytes monitored vary with the sample location. Monitoring was conducted twice for the New Rifle site in CY 2011.

Table 3. Summary of GCAP Monitoring Requirements for the New Rifle Site

Location	Monitoring Purpose	Analytes	Frequency
RFN-0170, RFN-0172, RFN-0620	Monitor middle and leading edge of molybdenum, uranium, and nitrate plumes	Molybdenum, uranium, nitrate	Semiannually
RFN-0195, RFN-0201, RFN-0215, RFN-0216, RFN-0217, RFN-0590, RFN-0635, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, RFN-0855	Monitor flushing in main body of plumes	Molybdenum, nitrate, uranium	
RFN-0320, RFN-0322, RFN-0323, RFN-0324, RFN-0452, RFN-0453, RFN-0575	Monitor surface water to determine impact of groundwater discharge to surface water and ecological receptors	Molybdenum, nitrate, uranium, vanadium	
RFN-0215, RFN-0216, RFN-0217, RFN-0590, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, RFN-0855	Monitor flushing in main body of plumes	Vanadium	

3.2 Results of the Monitoring Program

3.2.1 Old Rifle Site

3.2.1.1 Surface Water

Results of CY 2011 surface water monitoring in the Colorado River (locations RFO-0294, RFO-0396, and RFO-0741) indicate that the water quality of the river adjacent to and downgradient of the Old Rifle site is indistinguishable from background water quality. This confirms the calculations included in the SOWP (DOE 1999a) demonstrating that groundwater discharged to the river would immediately undergo rapid mixing with river water. The two sampling events of the site ditch at RFO-0398 showed uranium levels of 0.014 mg/L and 0.015 mg/L; a one-time sampling of upgradient seeps RFO-0395, RFO-0387, RFO-0388, and RFO-0394, which serve as sources of recharge to the alluvial aquifer, indicates that measurable amounts of uranium (0.030, 0.033, 0.042, and 0.008 mg/L, respectively) are present in that water. Appendix C includes surface water results for this VMR monitoring period.

3.2.1.2 Groundwater

Appendix C includes groundwater monitoring results for CY 2011. Figure 4 through Figure 9 present spot plots showing the distribution of COCs in groundwater at the Old Rifle site. Appendix A presents time-concentration graphs for wells sampled at both the Old and New Rifle sites. Table 4 presents statistics for monitoring results for the Old Rifle site for two periods—(1) 1998 and 1999, shortly after the completion of surface remediation, and (2) the most recent monitoring results, from June through August 2011 and from November 2011. A comparison of these two groups of data shows the progress natural flushing has made since the surface cleanup ended.

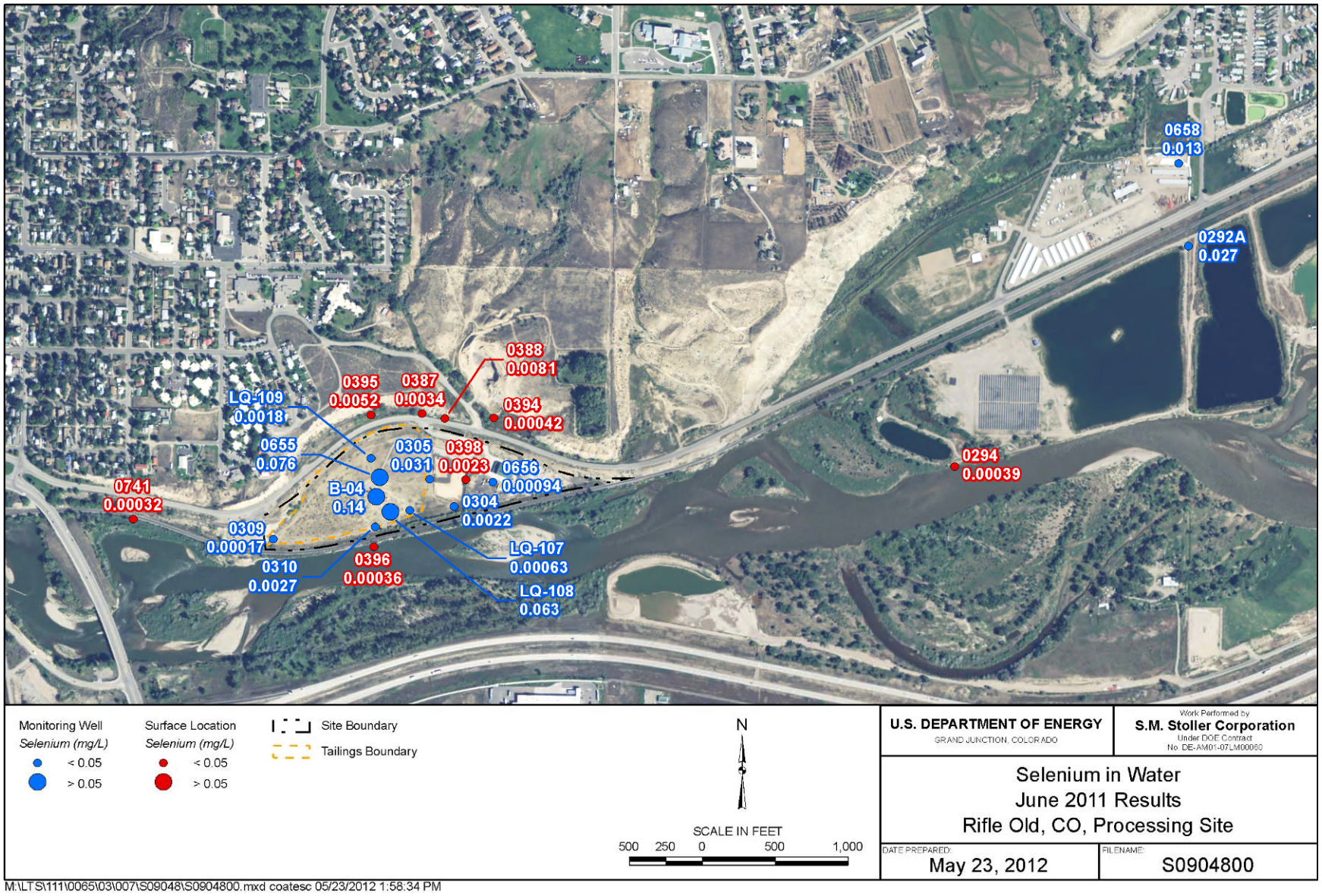


Figure 4. Selenium in Water, June 2011 Results at the Old Rifle Site

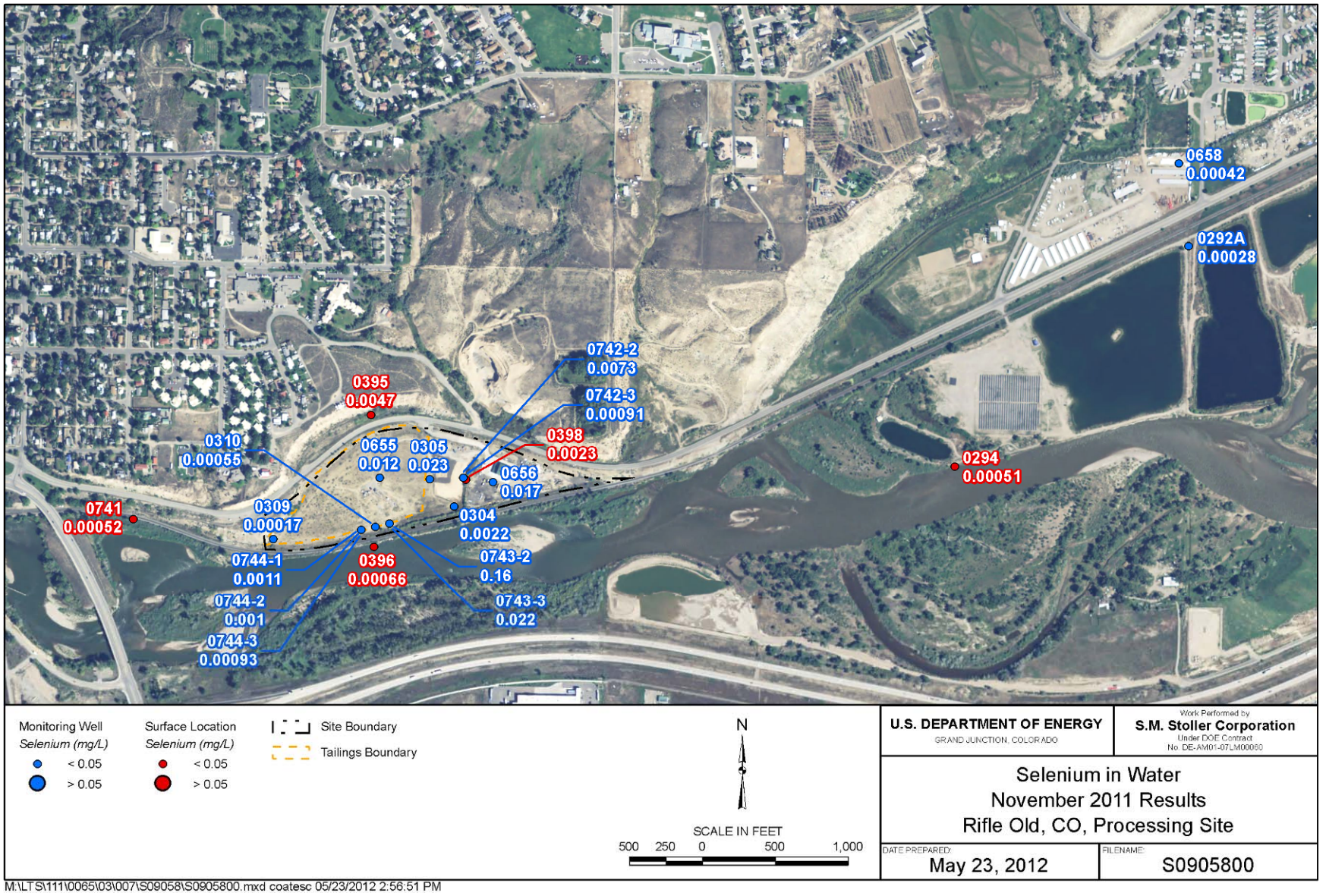


Figure 5. Selenium in Water, November 2011 Results at the Old Rifle Site

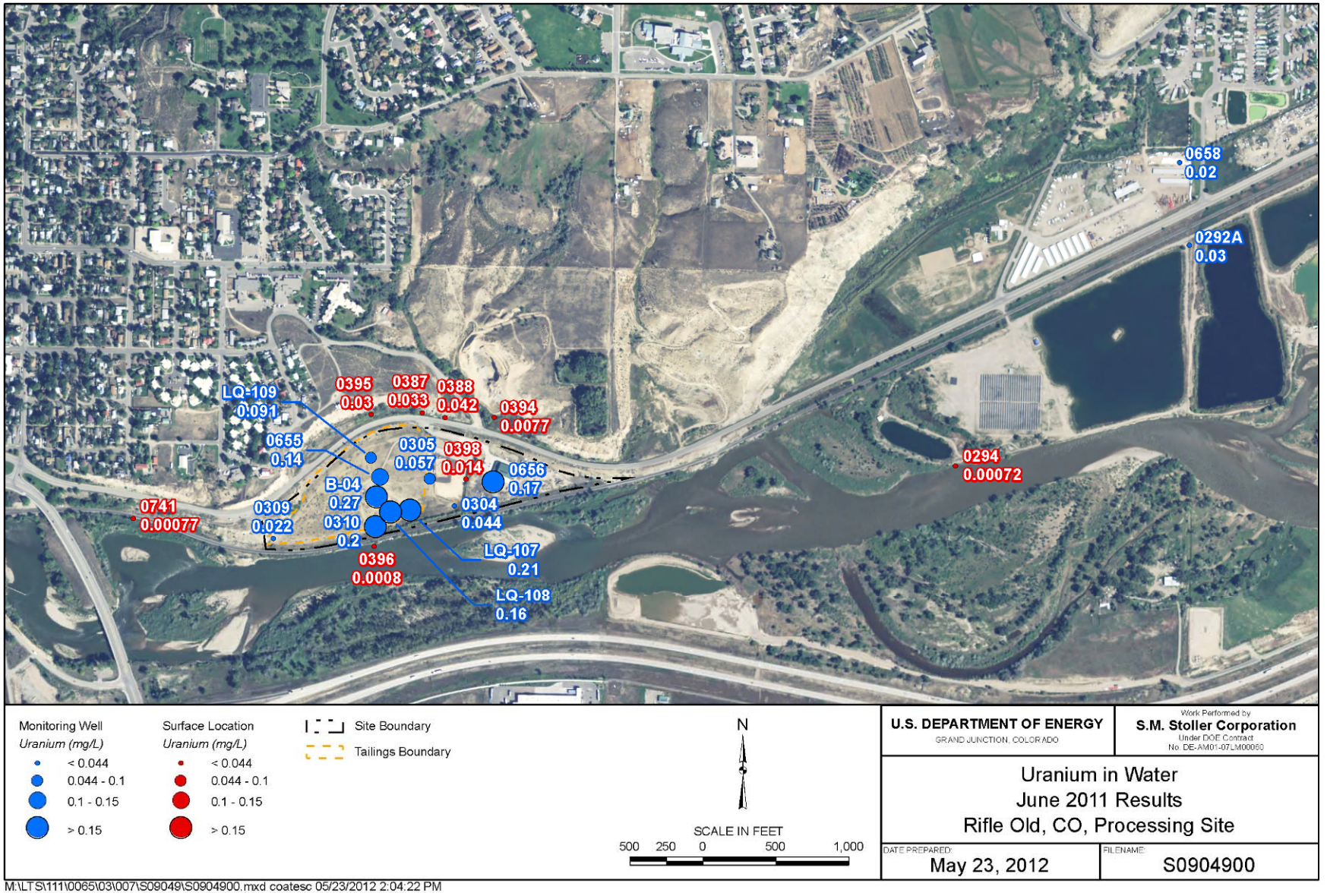


Figure 6. Uranium in Water, June 2011 Results at the Old Rifle Site

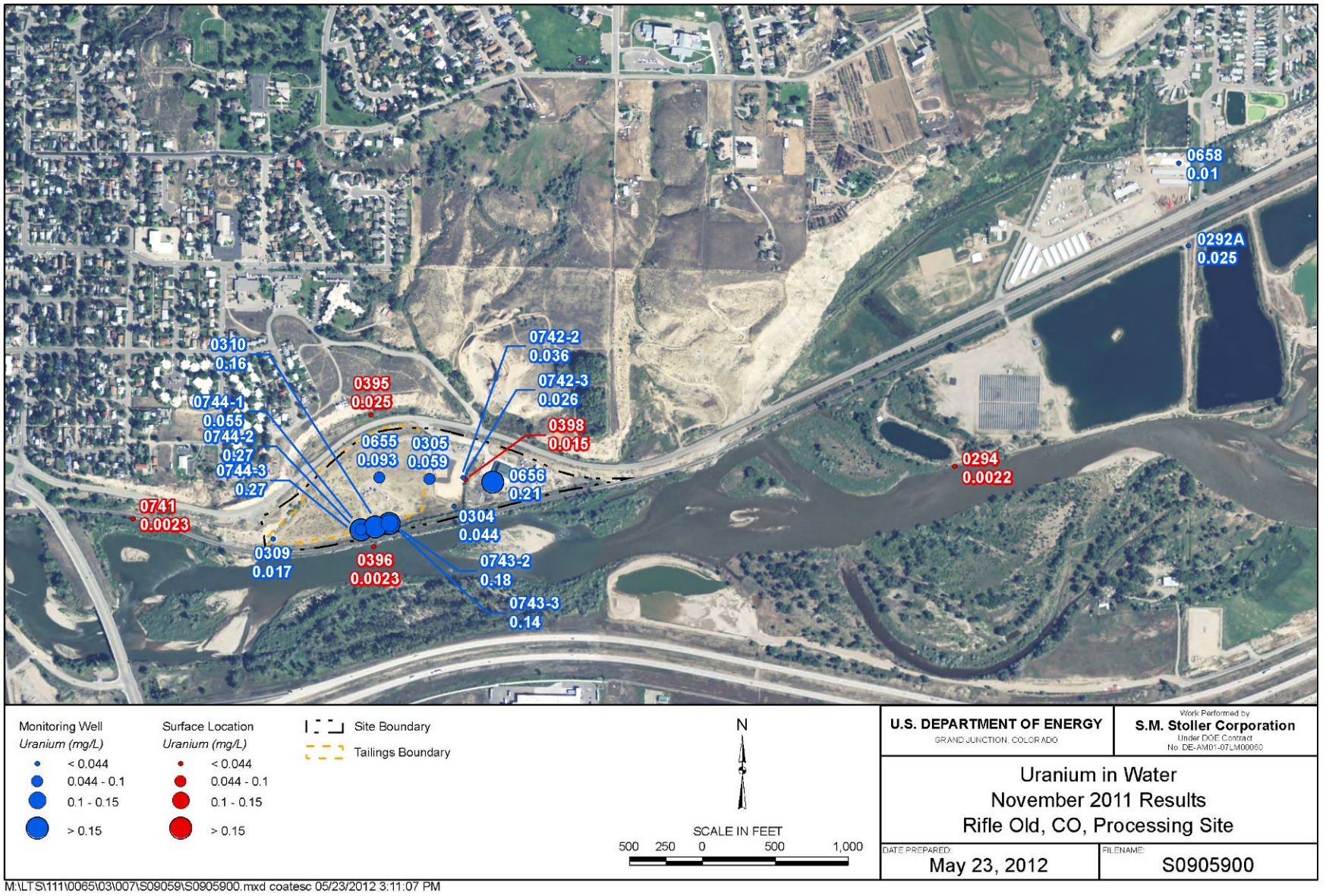


Figure 7. Uranium in Water, November 2011 Results at the Old Rifle Site

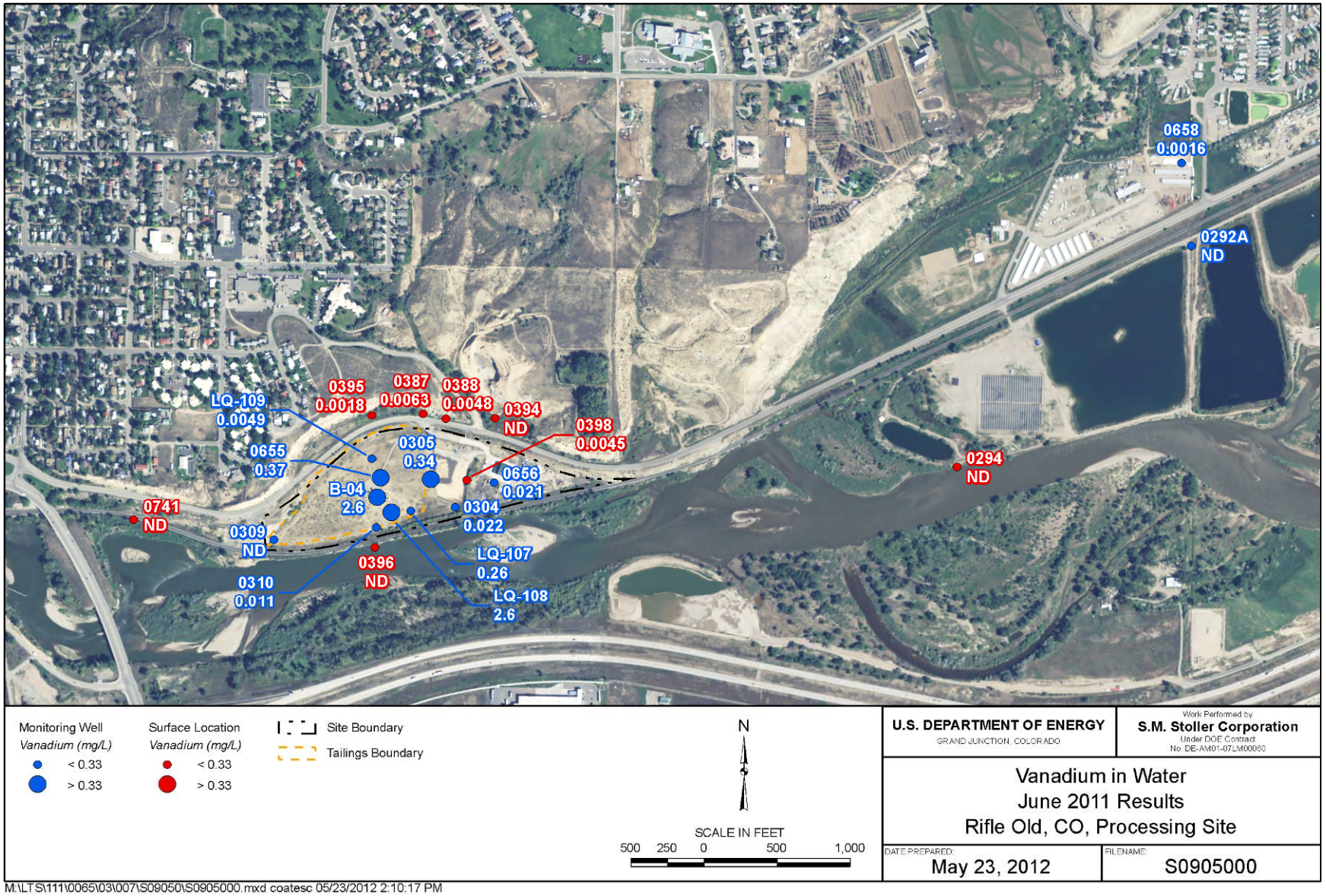


Figure 8. Vanadium in Water, June 2011 Results at the Old Rifle Site

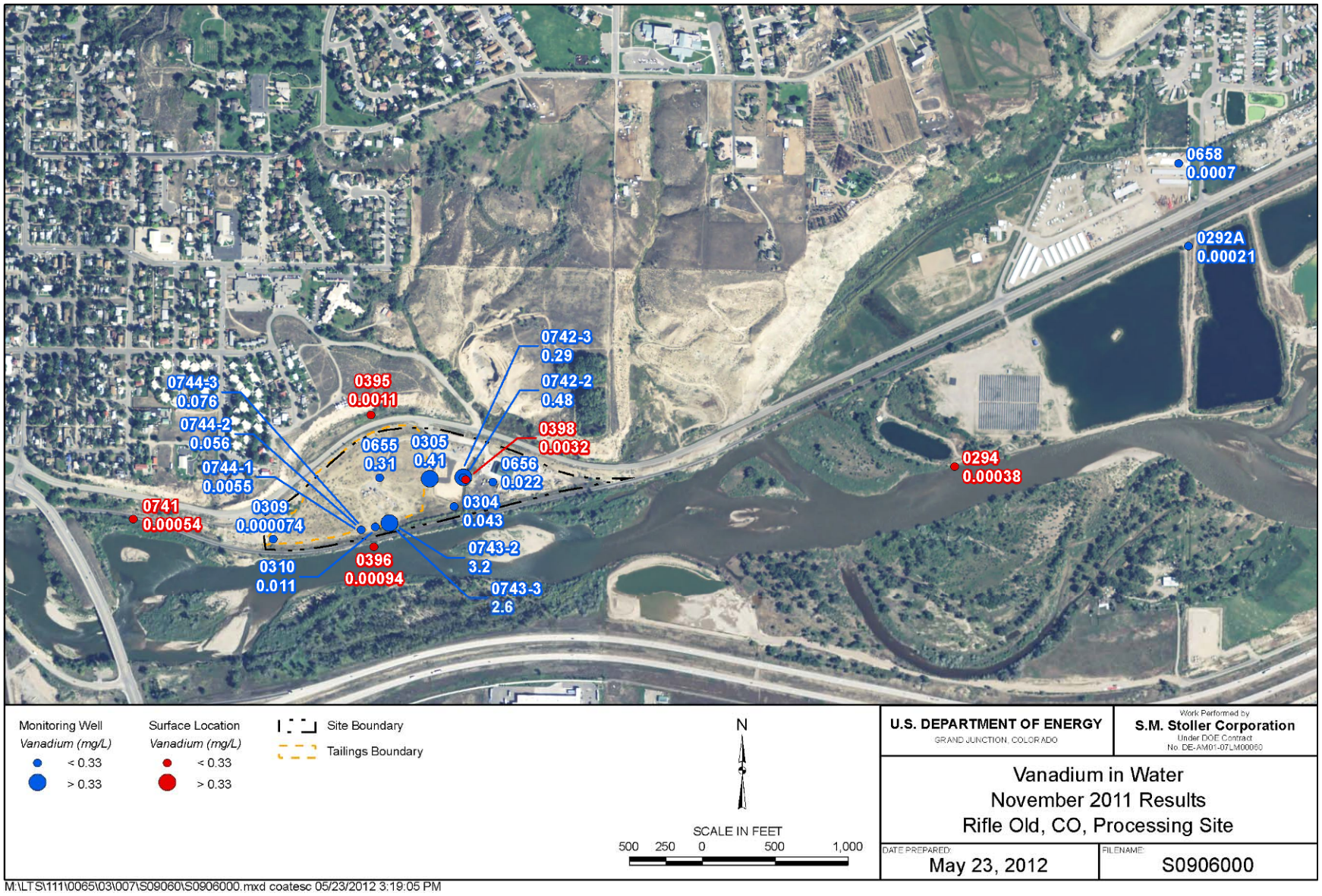


Figure 9. Vanadium in Water, November 2011 Results at the Old Rifle Site

Table 4. Post-Surface-Remediation Groundwater Monitoring Results for the Old Rifle Site

	Benchmark	Range 1998–1999	Mean 1998–1999	Range June 2011 and Nov 2011	Mean June 2011 and Nov 2011
Selenium	0.05[a]	<0.0001–0.122	0.023	0.00017–0.076	0.014
Uranium	0.044[b]	0.0268–0.270	0.0997	0.017–0.210	0.106
Vanadium	0.33[c]	<0.0006–0.799	0.2337	0.00007–0.410	0.141

Data are for wells RFO-0304, RFO-0305, RFO-0309, RFO-0310, RFO-0655, and RFO-0656.
[a] U.S. Environmental Protection Agency Safe Drinking Water Act standard and approved alternate concentration limit
[b] U.S. Environmental Protection Agency UMTRCA groundwater standard (40 CFR 192)
[c] Risk-based concentration

Spot plots in Figure 4 through Figure 17 indicate that elevated uranium concentrations persist across the site, while selenium and vanadium are somewhat more localized. The more limited distribution of and greater decreases in concentrations of vanadium and selenium, when compared to uranium, can likely be attributed to adsorption onto or precipitation within aquifer solids. Attenuation through immobilization rather than true flushing of the aquifer is probably the cause for decreases in these COCs.

By contrast, uranium tends to be a highly mobile constituent and was expected to easily be flushed from site groundwater in solution. The model in the SOWP predicted that flushing of uranium would achieve MCLs within a 10-year period (DOE 1999b). The fact that uranium concentrations have not decreased significantly at the site may indicate that the inventory of uranium in the aquifer system was underestimated, that groundwater is not moving through the subsurface as rapidly as previously thought, or that the behavior of uranium in aquifer materials is more complicated than expected.

Selenium

In 2008 and 2009, the selenium concentrations for all wells were below the old maximum background level observed at the time (0.036 mg/L). In June 2010, the concentration in well RFO-0655 increased to 0.064 mg/L, nearly double the background level, and in June 2011, it increased further, to 0.076 mg/L. Since then, the selenium concentration has fallen back to 0.012 mg/L (the concentration observed in November 2011). Wells B-04 and LQ-108 also had higher concentrations of selenium during the June 2011 sampling event, but they were not sampled again in November. Overall, the average concentration for required wells for the site is below the more recent maximum background concentration of 0.041 mg/L (observed in April 2010). The November sampling of multiple completion well RFN-0742-2 showed a value of 0.16 mg/L at about 14 ft below ground surface, but at about 18 ft below ground surface, the value was lower (0.022 mg/L).

Uranium

Uranium persists at the site. Uranium concentrations at most sampling locations continued to exceed the uranium MCL during CY 2011. The current average concentration of uranium is slightly higher than it was shortly after completion of surface remediation (Table 4). Time-concentration plots are ambiguous with respect to the attenuation of uranium. Portions of plots for some wells show increases, while others show decreases; plots for other wells appear to fluctuate around almost level concentrations.

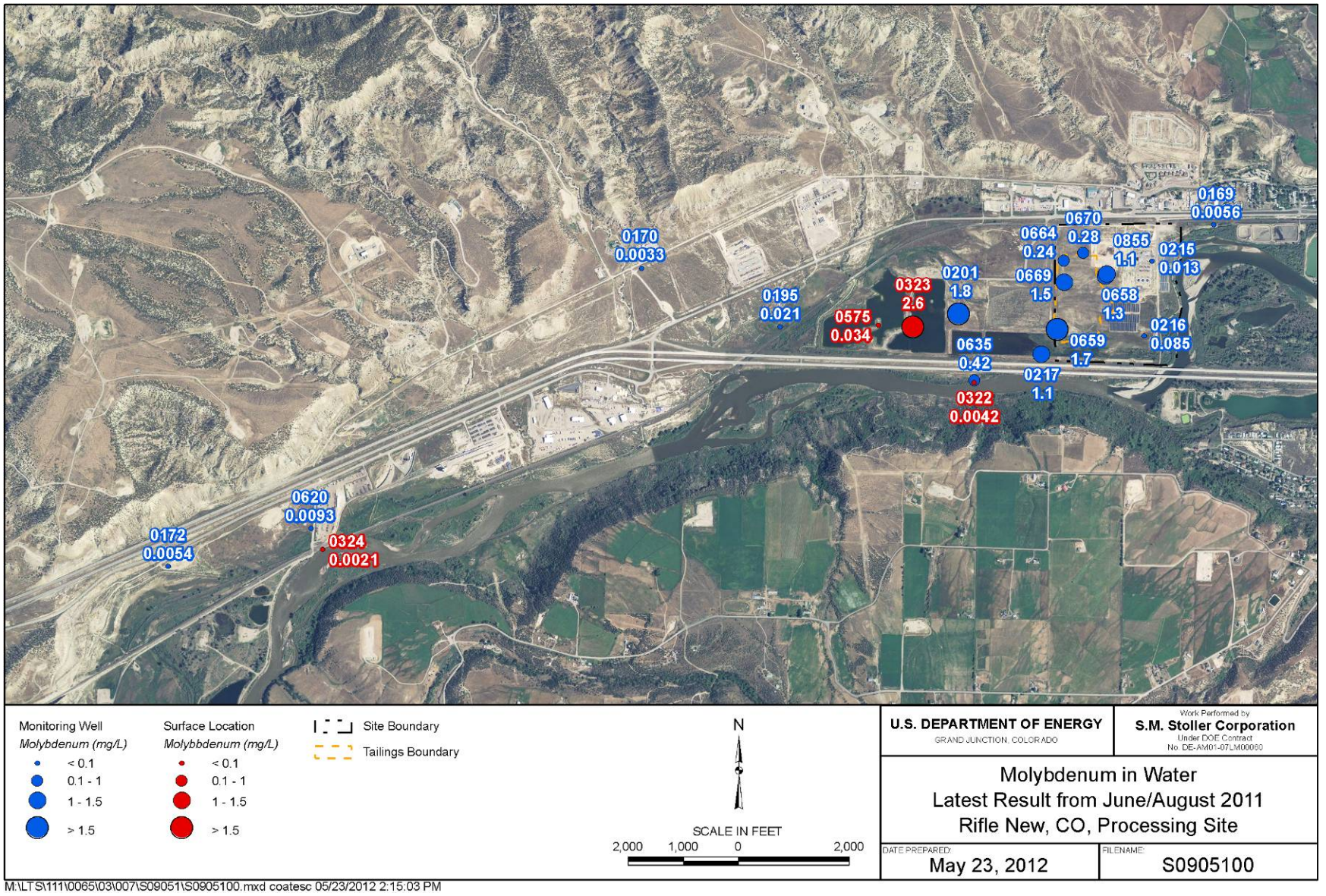


Figure 10. Molybdenum in Water, Latest Results from June/August 2011 at the New Rifle Site

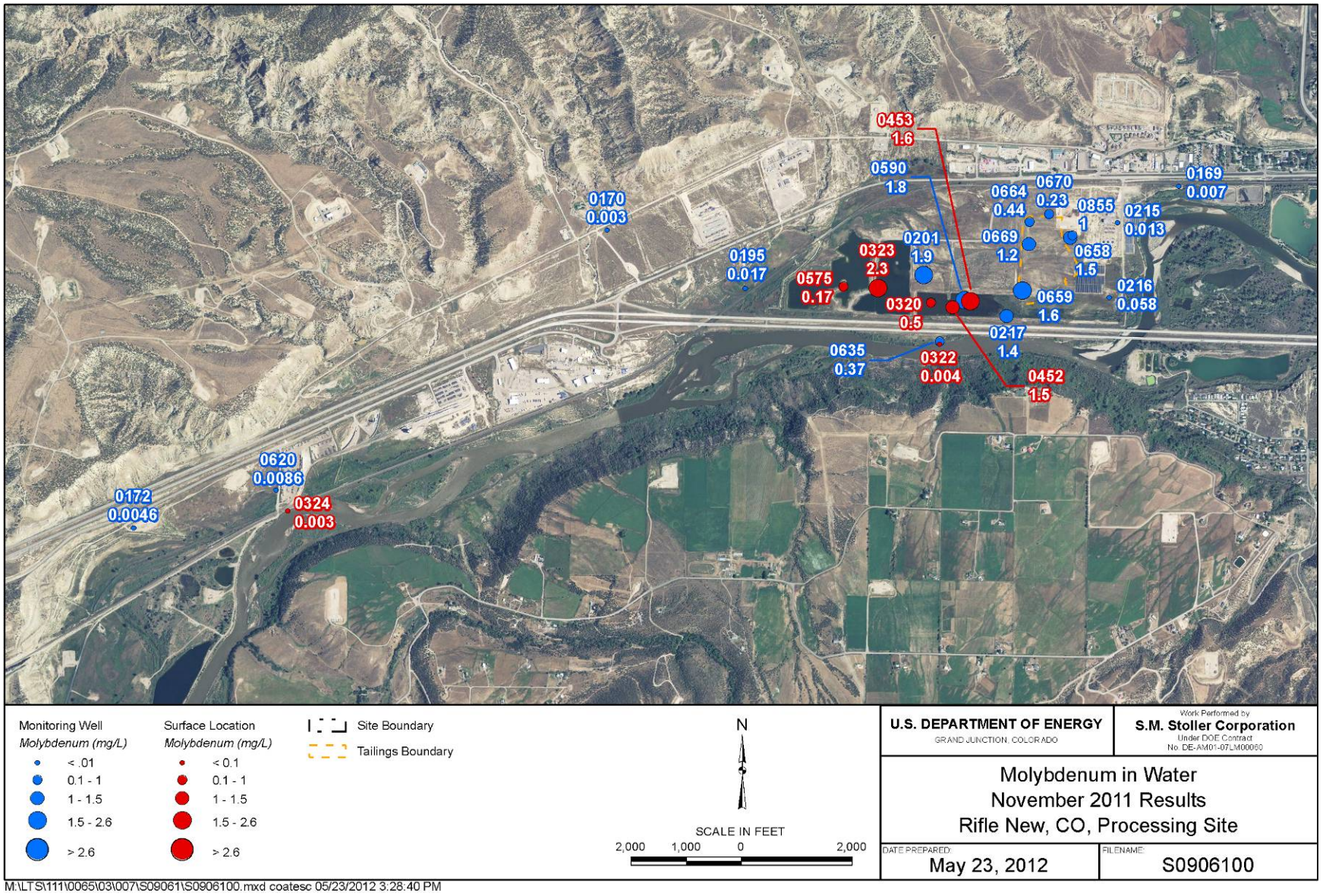


Figure 11. Molybdenum in Water, Latest Results from November 2011 at the New Rifle Site

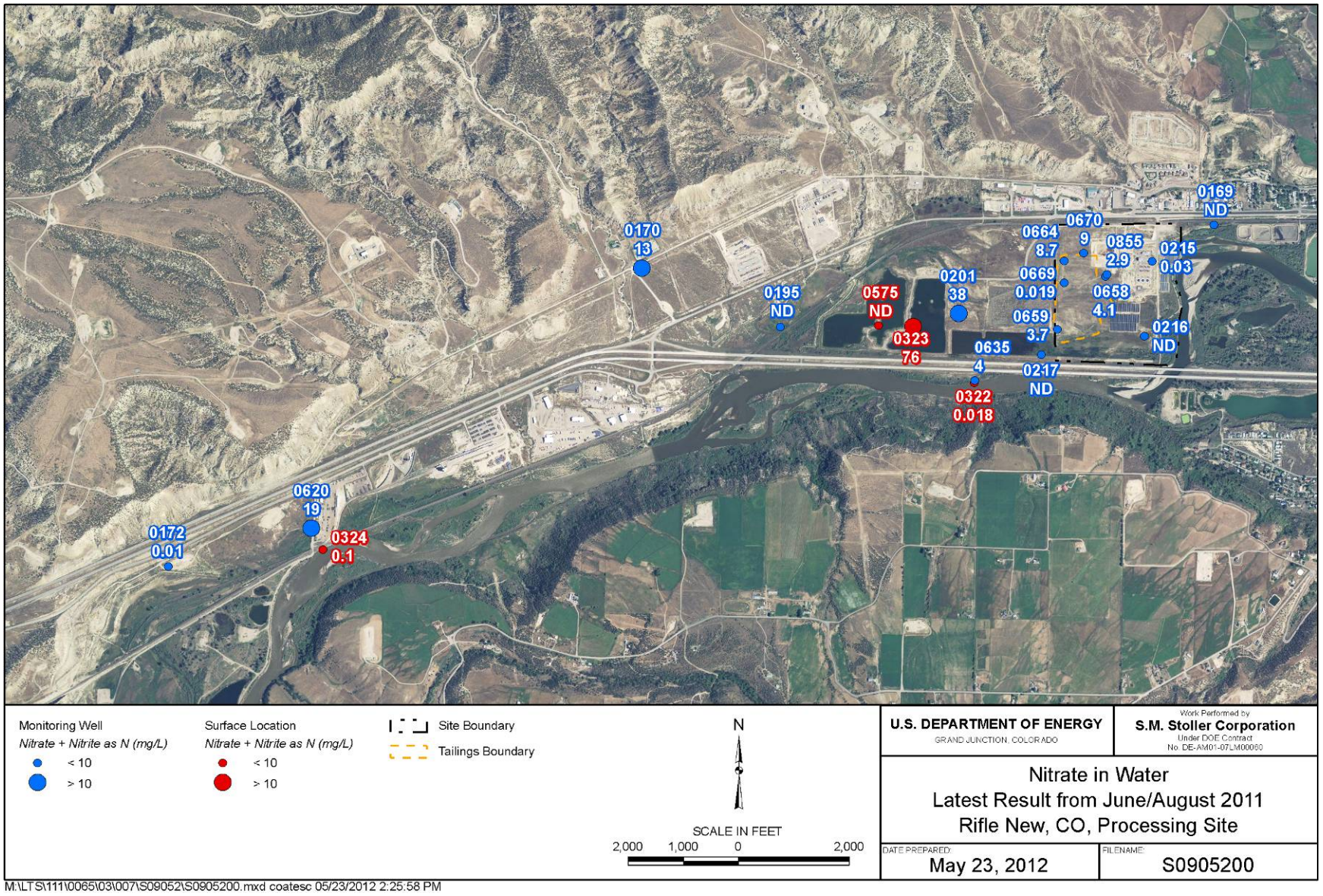


Figure 12. Nitrate in Water, Latest Results from June/August 2011 at the New Rifle Site

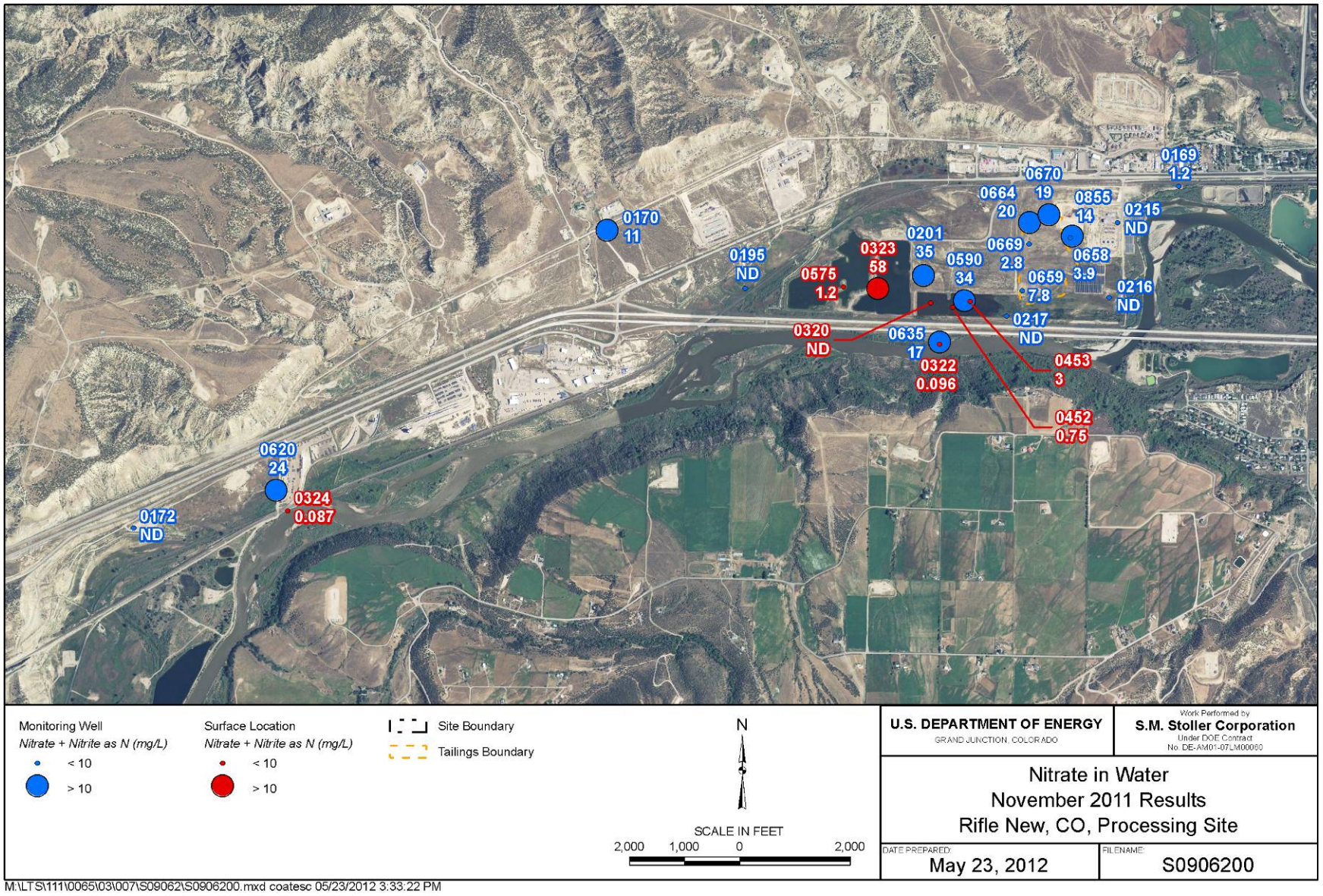


Figure 13. Nitrate in Water, Latest Results from November 2011 at the New Rifle Site

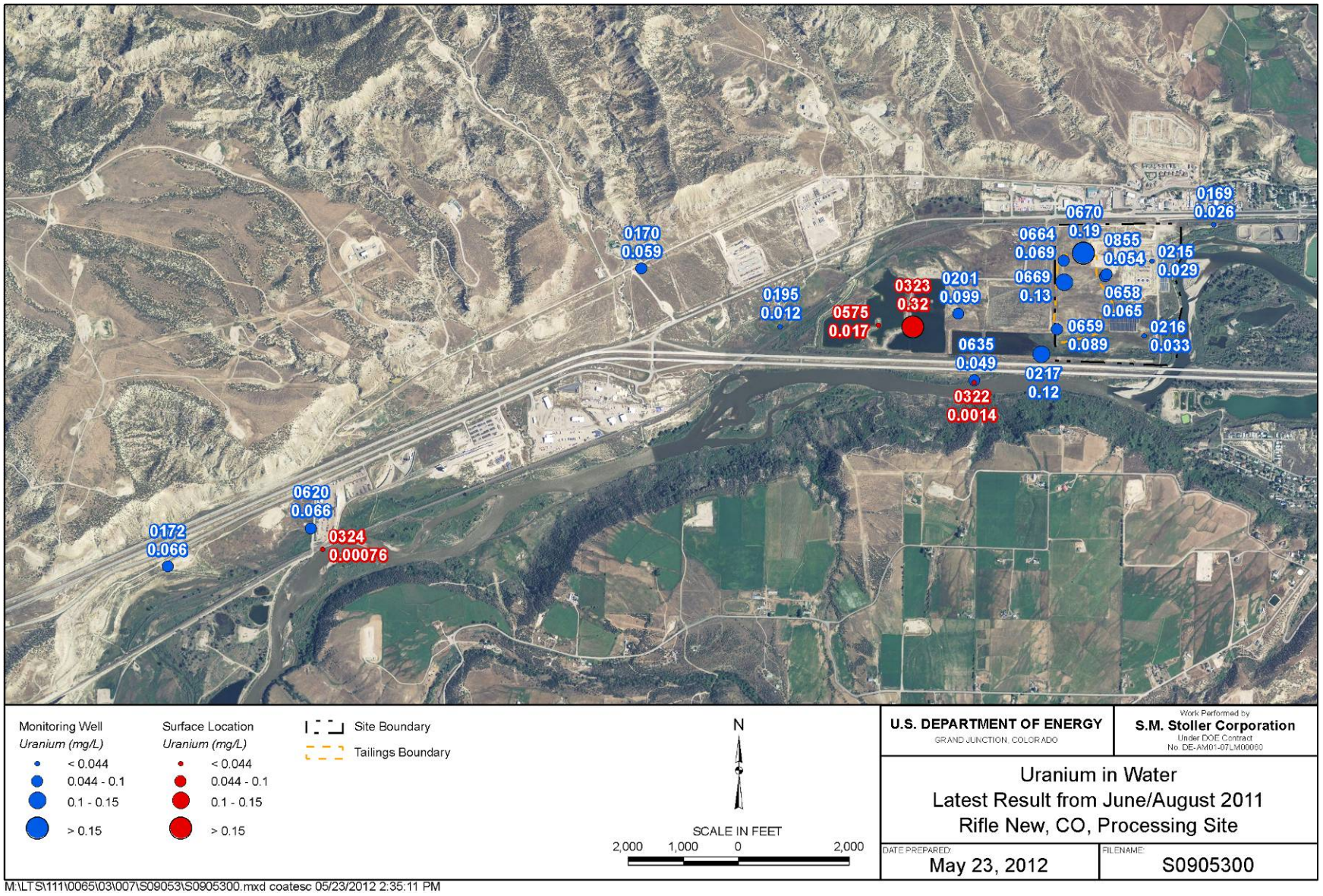


Figure 14. Uranium in Water, Latest Results from June/August 2011 at the New Rifle Site

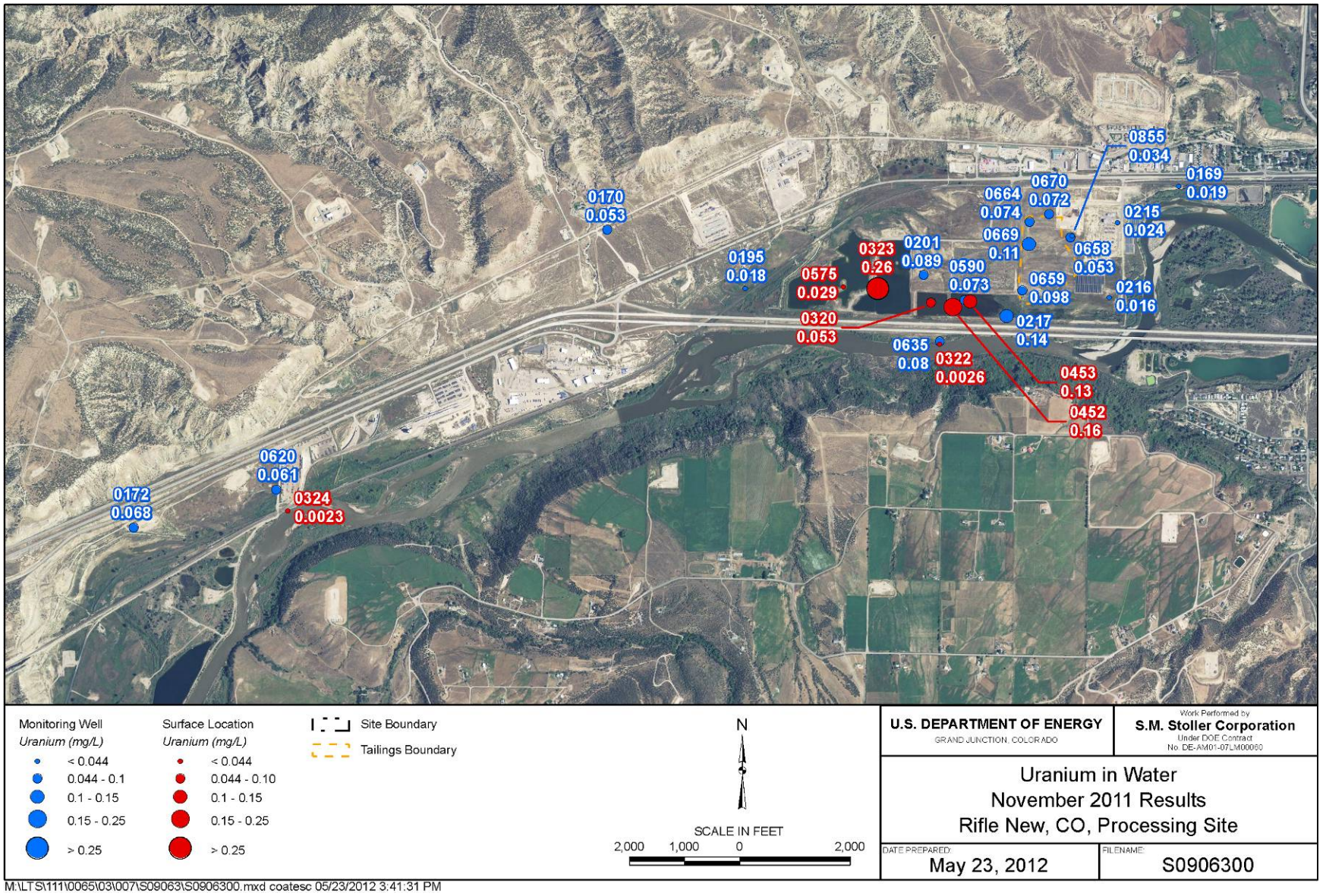


Figure 15. Uranium in Water, Latest Results from November 2011 at the New Rifle Site

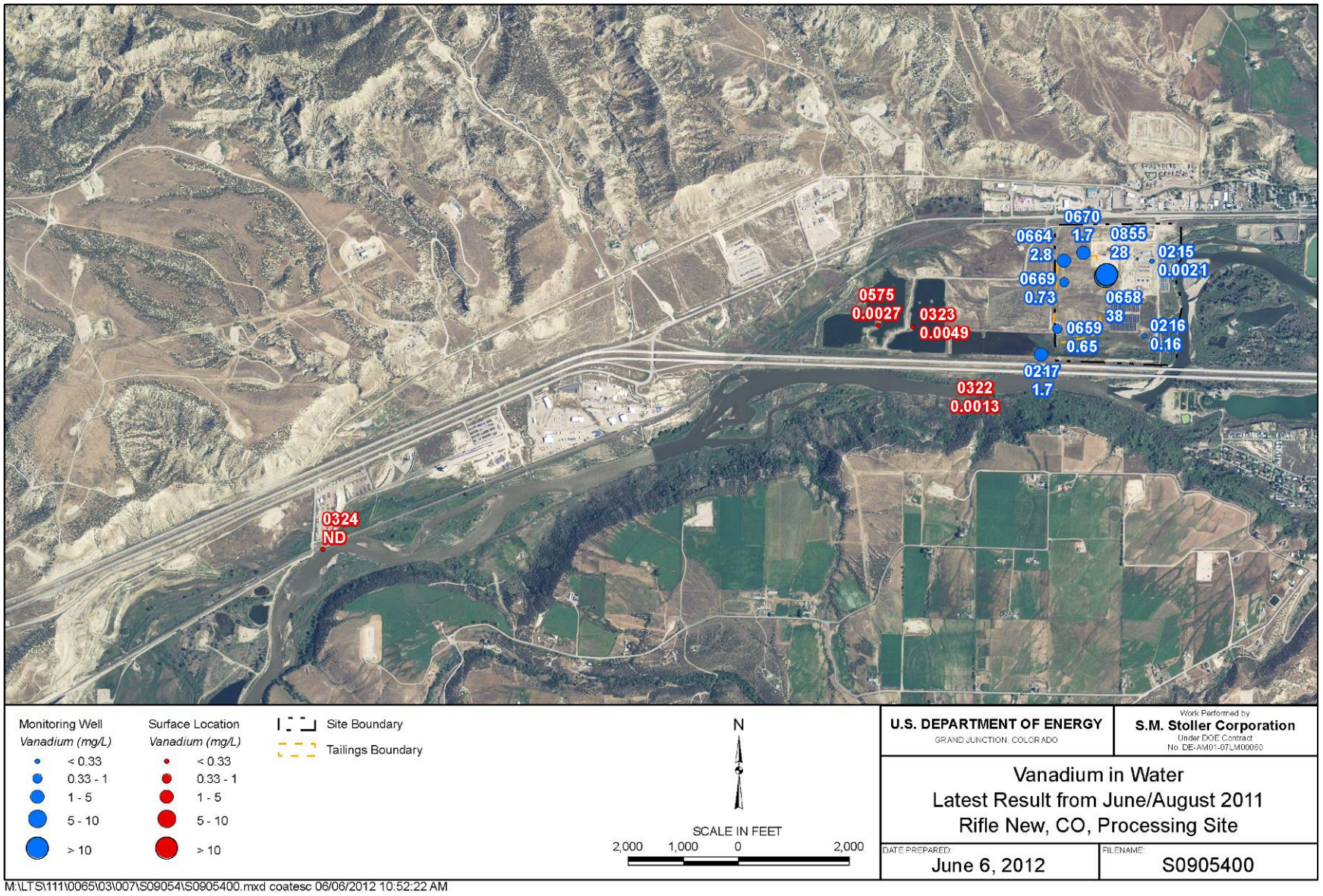


Figure 16. Vanadium in Water, Latest Results from June/August 2011 at the New Rifle Site

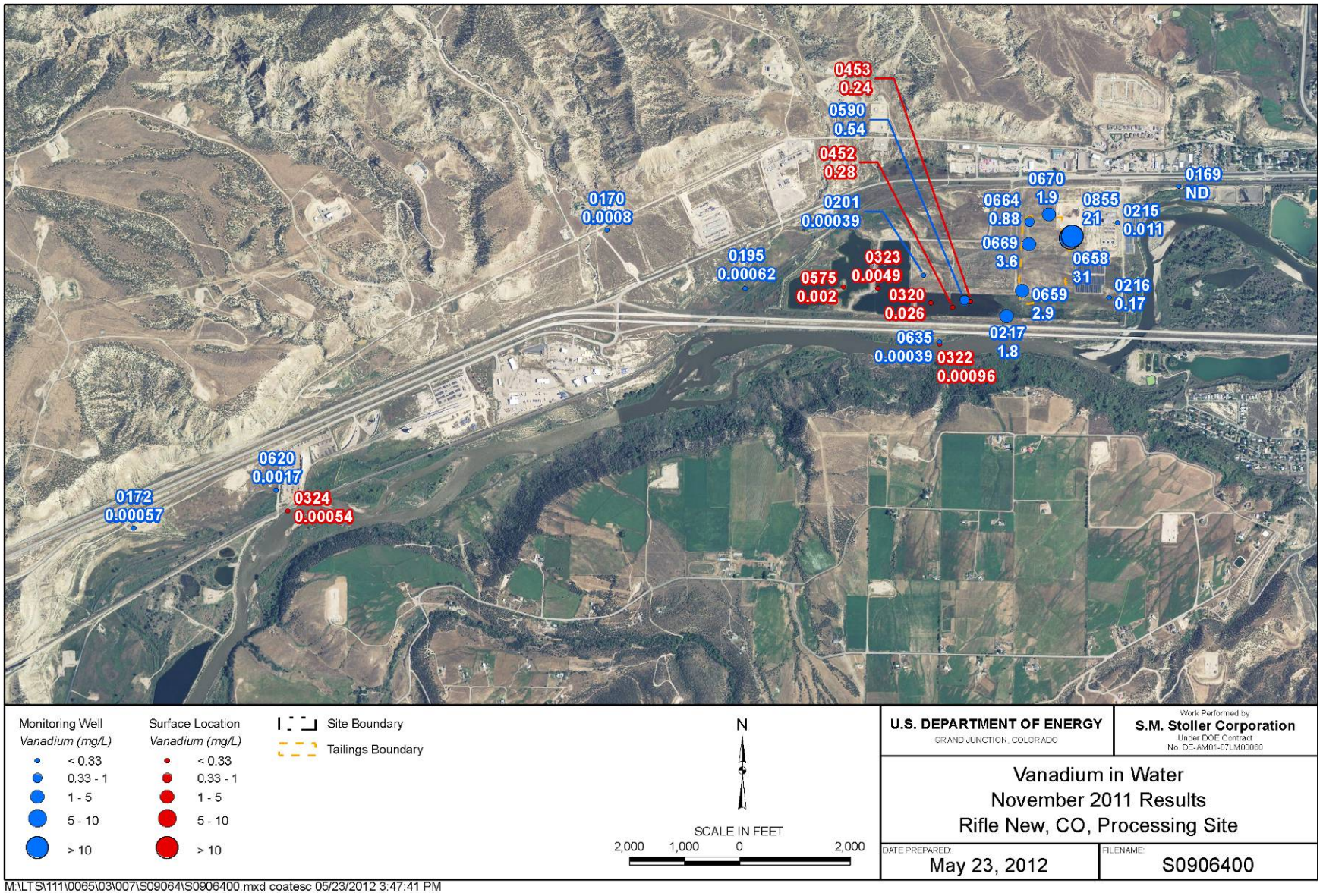


Figure 17. Vanadium in Water, November 2011 at the New Rifle Site

Sampling of additional Rifle IFRC wells in June 2011 showed concentrations similar to LM wells in the plume area. Well RFN-656, on the east side of the site, has shown increasing concentrations since 2003 and increased by 0.05 mg/L in 2010. The reason for this increase is not clear. Uranium concentrations from multiple completion wells are shown on the November 2011 spot plots. Uppermost sample ports were dry for RFN-0743 and RFN-0744, but the general trend was higher concentrations in the middle completion at about 14 ft below ground surface. This would correspond to the upper part of the saturated zone. Of course, the lack of information from two of the three upper zones compromises this observation.

Uranium monitoring should continue until conclusions can be reached regarding the applicability of the natural flushing compliance strategy. At that time, a change in the monitoring approach may be recommended.

Vanadium

Data in Table 4 indicate that, currently, the average concentration of vanadium in Old Rifle alluvial groundwater is below the benchmark value of 0.33 mg/L. Two locations (RFO-0305 and RFO-0655) exceeded this value in CY 2011. Vanadium in samples from well RFO-0305 has increased after a sharp decline to below the benchmark value in June 2010, and remained slightly above the benchmark value in CY 2011. The concentrations of vanadium in RFO-0655 and RFO-0305 are still below the maximum values observed in both wells in 2000. Rifle IFRC wells sampled in June 2011 that are located in the vanadium plume show higher concentrations than do other LM wells. Vanadium analyses from multiple completion wells show vertical values higher in middle completions for two well sets without an upper value, but highest concentrations in the uppermost completion for the well set with all three ports sampled.

3.2.1.3 Isotopic Data

Three sets of isotopic ratios were used to try to distinguish mill site contamination from naturally occurring groundwater chemistry. Only results of the uranium ratio data suggest a different source of uranium for the mill site compared to background groundwater. Results of other data were equivocal.

U-234/U-238 Ratios

The activity concentration ratios for the radioactive isotopes U-234 and U-238, shown in Table 5, suggest that they can be used to distinguish mill-related uranium contamination from background uranium levels. In general, uranium in groundwater that appears to have resulted from former milling operations tends to exhibit U-234/U-238 ratios (uranium activity ratios [UARs]) that approximate unity, whereas the ratios associated with natural background processes tend to exceed 1.3 (Zielinski 1997).

Table 5. Uranium Isotopic Analyses for June 2011 Sampling Event

Location	Onsite or Offsite	Surface Water or Groundwater	Uranium Mass Concentration (mg/L)	U-234 Activity Concentration (pCi/L)	U-238 Activity Concentration (pCi/L)	Uranium Activity Ratio	Presumed Source (Natural or Mill-Related)
0304	On	Groundwater	0.44	15.7	13.8	1.14	Mill-Related
0310	On	Groundwater	0.2	70.5	65.6	1.07	Mill-Related
LQ-107	On	Groundwater	0.21	68.9	66.4	1.04	Mill-Related
LQ-109	On	Groundwater	0.091	34	29.9	1.14	Mill-Related
0387	Off	Surface Water (Seep)	0.033	14.1	10.1	1.40	Natural
0388	Off	Surface Water (Seep)	0.042	18.1	13.1	1.38	Natural
0394	Off	Surface Water (Seep)	0.0077	3.04	2.2	1.38	Natural
0395	On	Surface Water (Seep)	0.03	12.4	8.97	1.38	Natural

pCi/L = picocuries/gram

As previously discussed in the report *Review of the Natural Flushing Groundwater Remedy at the Old Rifle Legacy Management Site, Rifle, Colorado* (DOE 2011), data collected from the Old Rifle site in 2010 pointed to the presence of both site-related ($1 \leq UAR \leq 1.1$) and naturally occurring uranium in groundwater (UAR >1.3). This phenomenon was observed again in June 2011, when four onsite wells known to be associated with site-related contamination (0304, 0310, LQ-107, and LQ-109) exhibited UARs between 1.04 and 1.14. Onsite wells 0304 and LQ-109 each had a UAR of 1.14 in June 2011, suggesting that they might contain both background and mill-related uranium. LQ-109 is about 200 ft south of Highway 6 on the west half of the site; well 0304 is about 50 ft west of the north-south trending, onsite ditch and just north of the railroad, in a location that has probably been subjected to both mill-related contamination and seepage losses of surface ditch water. In contrast, four surface water samples collected in June 2011 just north of Highway 6 and upgradient of mill-associated contamination showed UARs ranging from 1.38 to 1.40. Of note, surface location RFN-0394 is seep water from below the two City lagoons. The City treats Colorado River water for municipal drinking water, and excess river water is pumped into the lagoons. Therefore, water from this location probably reflects the chemistry of the Colorado River.

Deuterium/Hydrogen Ratios

Ratios of the stable isotope deuterium (H-2 or D) and hydrogen (H-1) in water molecules, as reported in delta units (δ) of parts per thousand or per mil, do not appear to provide a mechanism for distinguishing site-related contamination from background contamination. In June 2011, δD values on and near the site ranged from -119.08 to -112.3 per mil. However, there is no pattern to the observed values. Both high and low ratios occur just north of Highway 6 as well as onsite.

Sulfur Isotope Ratios

Like the deuterium data, the June 2011 sulfur isotopic data showed no apparent trends occurring with the concentration ratios of the stable isotopes S-34 and S-32 in sulfate. The reported ratios

for the four surface water sampling locations (0387, 0388, 0394, and 0395) just north of Highway 60, as reported in delta units (δS-34), ranged from -10.38 to +3.61. The comparable range for onsite locations (0304, 0310, LQ-107, and LQ-109) is from -7.06 to -3.5. These values indicate significant overlap between offsite and onsite samples, and no strong inference regarding source water can be made.

3.2.1.4 ICs Monitoring

ICs for the site were discussed in Section 1.3. Not only is groundwater monitored at the site, but so is the effectiveness of ICs. Changes in land use are noted during regular groundwater sampling events and recorded in trip reports. Scientists are present at the Old Rifle site for much of the year because of the ongoing IFRC studies, especially from May until November. DOE will also note activities at the Old Rifle processing site during the annual inspection of the disposal site. A record of the City's activities will also be received from the City manager as a requirement in Ordinance 9 Series 2008 (d8), the Uranium Mill Tailings Remedial Action Overlay Zone District. This information will be added to the VMR for next year as it becomes available.

3.2.2 New Rifle Site

3.2.2.1 Surface Water

Appendix C includes surface water monitoring results for CY 2011. Two surface water locations at the New Rifle site (locations RFN-0322 and RFN-0324) represent Colorado River water. At the other five surface locations, three samples were collected from the wetland area ponds, and two samples were collected from the former Roaring Fork gravel ponds. These can be seen in the spot plots (Figures 10–17) and in time-concentration graphs in Appendix A−2. Concentrations of molybdenum, nitrate, and uranium are above MCLs for some locations. No human health risk exists from this contamination because ICs overlap on these areas. Although ammonia is not a COC because it dropped below values of concern for human health (calculated as 155 mg/L as N for inhalation in a closed structure; DOE 1999b), it was kept as an analyte for comparison with nitrate. Ammonia does remain above concentrations generally found to be acceptable for aquatic life. For a representative surface water pH of about 8, the acute ambient water quality criteria for ammonia (salmonids absent) is 8.4 mg/L as N (EPA 1999).

The ecological risks for these four constituents in ponds located in the wetland area (sample locations RFN-0320, RFN-0452, and RFN-0453) are not considered high because the ponds evaporate periodically and are therefore available for only occasional exposures. The large gravel pit ponds represented by locations RFN-0323 and RFN-0575 are essentially permanent features (though the eastern pond may experience significant water losses during dry periods). The eastern pond contains COCs and ammonia in excess of MCLs or ecological risk concentrations, respectively, but the western pond has acceptable values (although molybdenum and uranium showed slight increases during the November 2011 sample round).

Time-concentration plots for most constituents in pond waters do not show any pronounced trends and it appears that the likelihood of natural attenuation reducing the concentrations to acceptable levels in the near future is poor. The exception to this is for nitrate and ammonia, which show consistent downward trends. The lack of attenuation in pond waters is likely caused,

in part, by evaporation of pond waters, which tends to increase concentrations of dissolved constituents. This is evidenced by the fact that some pond water concentrations are higher than the same constituents in groundwater from nearby wells as shown on the spot plots (e.g., uranium in Figure 15).

3.2.2.2 Groundwater

Groundwater beneath the New Rifle site was contaminated by former vanadium- and uranium-ore-processing operations that were ongoing from 1958 through 1972, from lignite ash processing from 1964 to 1967, and from vanadium processing (which did not produce tailings but may have produced milling solutions) from 1973 to 1984. Site field investigations have shown that the alluvial aquifer is the only aquifer affected by the former milling operations.

COCs previously identified in the alluvial aquifer at concentrations that exceed the 40 CFR 192 groundwater standards are arsenic, molybdenum, nitrate, selenium, and uranium. Fluoride levels have exceeded the Safe Drinking Water Act standard of 4 mg/L. Concentrations of ammonia, manganese, and vanadium have exceeded risk-based concentrations deemed acceptable for groundwater that is used for domestic purposes in a residential setting (DOE 1999b). Based on discussions with CDPHE, fluoride and manganese are of little concern at the site and were eliminated from the monitoring program. Ammonia, arsenic, and selenium have declined below levels of concern for the most part, though analysis for these constituents has continued to a limited degree. Elevated concentrations of these constituents persist mainly in the vicinity of the former raffinate ponds (near wells RFN-0855 and RFN-0658) where contaminated soil is known to exist.

Most of the following discussion focuses on the more widespread or persistent COCs—molybdenum, nitrate, uranium, and vanadium. Appendix C includes groundwater monitoring results for CY 2011. The most conspicuous feature in time-concentration plots of groundwater monitoring data for the last several years is a pronounced spike in concentrations of molybdenum, selenium, and vanadium in samples collected from well RFN-0855 (see graphs in Appendix A−2). Concentrations of vanadium in samples from this well were more than an order of magnitude higher than in samples from other wells. This difference was attributed to mobilization of contaminants due to dewatering and excavation activities being conducted by the City of Rifle in association with construction of the City's wastewater treatment facility. Since that spike, concentrations of molybdenum and vanadium in well RFN-0855 have decreased significantly; vanadium concentrations in samples from well RFN-0658 exceeded those of RFN-0855 for the last four rounds of sampling. Other onsite wells displayed increases of certain constituents (e.g., uranium in RFN-0216 and RFN-0670; molybdenum in well RFN-0216). However, in CY 2011, the time-concentration plots for most wells showed decreases, and the concentrations now fall within their normal ranges again. Uranium concentrations for wells RFN-201, RFN-217, RFN-590, and RFN-0635 vary mostly between 0.05 and 0.15 mg/L. While some plots appear to shown an overall declining trend (e.g., molybdenum and uranium for RFN-0195, RFN-0658, and RFN-0635), others appear to be on the rise (e.g., uranium for RFN-0217) and most show no particular trend.

Figures 10 through 17 present spot plots showing the distribution of COCs monitored in New Rifle alluvial groundwater and surface water. In general, the contaminant plumes for the less mobile COCs (such as vanadium) are restricted in areal extent and are still concentrated around

the former mill site. Plumes for constituents that are more mobile (nitrate, molybdenum, and uranium) are more extensive. To evaluate the progress of natural flushing at the New Rifle site, monitoring wells were assigned to one of three groupings—onsite, adjacent to site, or downgradient—for the purposes of computing statistics for analytical results.

Onsite wells are those within the site boundary. As noted, residual soil contamination does exist at the New Rifle site below the water table. This contamination is most likely to affect groundwater in direct contact with those soils (i.e., onsite wells) by serving as a persistent source of contamination to groundwater. Although onsite wells are all grouped together for the purpose of computing groundwater statistics and comparing the results to historical trends, three subgroups of onsite wells were recognized in previous VMRs based on patterns of time-concentration plots for the wells (Appendix A includes time-concentration plots). These patterns were interpreted as being related to the wells' location and proximity to former source areas as discussed below.

Wells RFN-0169, RFN-0215, and RFN-216 are adjacent to the Colorado River and upgradient of the main source of site groundwater contamination—the former raffinate ponds and tailings pile. Concentrations of most COCs in these wells are generally low and have had limited variability over the past 10 years. A notable exception is well RFN-216, which, in 2008, showed spikes in molybdenum, uranium, and vanadium concentrations that remained elevated in 2009 but subsequently declined. Groundwater concentrations is this area were likely influenced by the groundwater pumping that the City of Rifle conducted during the construction of infrastructure for the wastewater treatment plant.

Locations RFN-0658, RFN-0659, and RFN-0855 are in the footprint of the former raffinate ponds and tailings pile. Soil sampling conducted during the pilot study for vanadium at the site indicated that residual contamination exists in these areas and may have local influence on groundwater quality. These locations are characterized by time-concentration plots with the highest concentrations of most COCs and the greatest degree of variability over time. For the most part, these wells exhibit no clear trends, except to decrease after the groundwater returns to normal elevations. Adsorption/desorption reactions between groundwater and soils probably occur in this area, and groundwater concentrations are likely sensitive to fluctuations in the water table. As noted above, due to the City's activities, concentrations for a number of COCs in well RFN-0855 increased sharply (for example, vanadium increased from 14 mg/L in 2007, before dewatering began, to 1,600 mg/L in 2009) but declined again in 2010 to levels below that of well RFN-0658, a trend that continued in 2011. Future monitoring results will be evaluated to determine whether this contaminant "slug" affects concentrations in downgradient wells.

The remaining onsite wells—RFN-0669, RFN-0664, and RFN-0670—are outside of the residual contamination area. Trends shown in time-concentration plots for these locations are more similar to those for offsite locations. They show some variability but are typically decreasing (with some exceptions), but uranium and molybdenum remain MCLs.

Contamination in offsite wells is attributed solely to the downgradient migration of dissolved contaminants in groundwater and not from direct contact with a primary residual source. The wells downgradient of the New Rifle site were split into two groups according to their location relative to the Roaring Fork gravel ponds. As described previously, the ponds affected groundwater flow direction during pumping operations, thus hydraulically separating those two

groups of wells to some extent. Additionally, activities associated with wetland construction were more likely to influence the water quality of the wells adjacent to the site than that of the wells farther downgradient. These differences have lessened over time. Table 6 and Table 7 provide statistics for the three main groups of wells. Table 6 provides water quality benchmarks, for comparison. The historical data provided in Table 1 are based on the combined results of data from wells on and adjacent to the site. Appendix A includes time-concentration plots for molybdenum, nitrate, uranium, and vanadium in the New Rifle wells.

Table 6. Mean Concentrations in Groundwater—1998–1999: combined June 2011 and November 2011 for the New Rifle Site

Contaminant (all units mg/L)	Benchmark	Onsite[a]		Adjacent to Site[b]		Downgradient[c]	
		1998–1999 mean	June 2011 and November 2011 mean	1998–1999 mean	June 2011 and November 2011 mean	1998–1999 mean	June 2011 and November 2011 mean
Molybdenum	0.1[d]	2.50	0.766	1.928	1.311	0.037	0.007
Nitrate + Nitrite as Nitrogen	10[d]	13.8	5.999	51.9	15.003	16.6	11.17
Uranium	0.067[e]	0.101	0.072	0.097	0.093	0.0744	0.064
Vanadium	NA	5.68	8.344	0.037	0.808	<0.0001	NA

[a] Includes wells RFN-0215, RFN-216, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, and RFN-0855 (not all wells were sampled for all analytes).
[b] Includes wells RFN-0201, RFN-0217, RFN-0590, and RFN-0635 (only wells RFN-0217 and RFN-0590 were sampled for vanadium).
[c] Includes wells RFN-0170, RFN-0172, RFN-0195, and RFN-620.
[d] U.S. Environmental Protection Agency UMTRCA groundwater standard (40 CFR 192).
[e] Maximum background value, cleanup goal.
NA = not applicable

Table 7. Range of Concentrations in Groundwater—1998–1999; combined June 2011 and November 2011 for the New Rifle Site

Contaminant (all units mg/L)	Onsite[a]		Adjacent to Site[b]		Downgradient[c]	
	1998–1999 range	June 2011 and November 2011 range	1998–1999 range	June 2011 and November 2011 range	1998–1999 range	June 2011 and November 2011 range
Molybdenum	0.0237–6.84	0.013–1.70	0.61–3.15	0.42–1.90	0.0041–0.231	0.0030–0.0093
Nitrate + Nitrite as Nitrogen	<0.003–83.1	0.01–20.0	0.089–188	0.01-38.0	0.012–85.2	0.010–25.0
Uranium	0.0103–0.284	0.016–0.190	0.0837–0.120	0.049–0.140	0.050–0.177	0.053–0.069
Vanadium	<0.001–25.3	0.002–38.0	<0.001–2.69	0.0004–1.80	0.00065–0.0018	NA

[a] Includes wells RFN-0215, RFN-0216, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, and RFN-0855 (not all wells were sampled for all analytes).
[b] Includes wells RFN-0201, RFN-0217, RFN-0590, and RFN-0635
[c] Includes wells RFN-0170, RFN-0172, RFN-0195, and RFN-0620.
NA = not applicable

It should be noted here that it is unclear whether site-related contamination is or has ever been present at well locations RFN-0170, -0620, or -0172. These locations have been included as part of the downgradient "plume" solely on the basis of the fact that uranium values have exceeded the UMTRCA groundwater standard. However, the uranium concentrations observed at those

locations have been in the same range as those reported in background (maximum observed at 0.067 mg/L, Table 6). Uranium in those wells does not display any clear increasing or decreasing trends (unlike location RFN-0195, which shows a steady decline in uranium concentrations). No other site-related constituents have been elevated in these wells. The apparent decreases over time in mean concentrations and ranges for the downgradient wells reported in Tables 6 and 7, respectively, is due exclusively to significant decreases in concentrations at location RFN-0195.

During CY 2011, DOE worked with CDPHE and the State of Colorado Oil & Gas Conversation Commission to perform special monitoring of wells RFN-0172 and RFN-0620. Williams Production RMT Company (Williams) has gas wells in clusters FWT 33-22 and FWT 342-22 located near wells RFN-0172 and RFN-0620, respectively. Benzene-toluene- ethylbenzene-xylene was found to be slightly elevated in RFN-0172. According to the Williams representative, this was due to petroleum residue in the mud pit, which has since undergone remediation to alleviate the problem. In Williams' well cluster, FWT 342-22, methane was leaking up along the well annulus into the surrounding groundwater. To date, no evidence of this methane has been found in nearby well RFN-0620. DOE will continue to conduct special monitoring in these two wells to test for changes in metals chemistry that could be caused by the influence of organics associated with the gas drilling.

DOE also installed wells RFN-689 and RFN-690 to monitor for possible traces of pesticides or herbicides that may be used on biofuel plants being grown in an experimental plot southwest of the Rifle wastewater treatment facility. This work is sponsored by the Colorado State University Western Colorado Research Center in Fruita, Colorado. Groundwater samples were collected before the planting began, and analyses were performed for a suite of organic constituents. This supplied a background data set for the site. No additional analyses were collected during CY 2011, but wells will be sampled for pesticides and herbicides in June 2012 to detect any organic constituents that the experimental plot has introduced into the groundwater.

Molybdenum

Molybdenum has been one of the most widespread COCs due to its high mobility. It remains elevated in onsite and downgradient wells. Well RFN-0855 spiked at an all-time high observation of 18 mg/L in 2009, but the concentration decreased significantly in June 2010 to 1.8 mg/L and further decreased in November 2011 to 1.0 mg/L. Mean concentrations for all groups of wells have declined over time. Molybdenum in the portion of the plume downgradient of the former gravel ponds appears to have dissipated. However, the relatively high concentrations recently observed onsite suggest that molybdenum may move downgradient and recontaminate these areas.

The highest concentrations of molybdenum were found in surface water location RFN-0323, the easternmost gravel pit pond. They were 2.6 mg/L in June 2011 and 2.3 mg/L in November 2011. Concentrations in the westernmost gravel pit pond at location RFN-0575 were dramatically lower; they were 0.034 mg/L in June and 0.17 mg/L in November. Surface water locations RFN-0320, RFN -0452, and RFN-0453 in the wetland area were also high. They were not sampled during the June/August event because the water remained high due a record runoff in the Colorado River. For the November event, these locations recorded 0.5 mg/L, 1.5 mg/L, and 1.6 mg/L, respectively. These values have decreased since 2010 for all pond locations except RFN-0575, which increased slightly during 2011.

Nitrate

The highest concentrations of nitrate are immediately downgradient of the site, though the standard is exceeded as far downgradient as location RFN-0620. The source of much of the nitrate is likely the degradation of ammonia. Trends (or lack thereof) probably depend more on ammonia behavior than on natural flushing processes. Despite some increases of nitrate in individual wells because of ammonia degradation (e.g., RFN-0590), mean concentrations for all well groups have declined over time. It appears that—with declines in ammonia to low levels—nitrate's behavior has become less erratic, and its concentrations are leveling out.

The highest concentrations of nitrate were recorded in surface water location RFN-0323, the easternmost gravel pit pond. The June 2011 value was 76 mg/L, and the November 2011 concentration was 58 mg/L. These concentrations have been decreasing steadily since 2008 and generally decreasing since 2003.

Uranium

Uranium persists throughout the plume. The standard is exceeded as far downgradient as well RFN-0172. However, all locations downgradient of the former gravel ponds are below the maximum background concentration of 0.067 mg/L, and, as discussed above, it is not clear whether uranium in these downgradient areas is site-related or ambient contamination. Time-concentration plots for these downgradient wells show no clear trend except for RFN-0195, which has decreased continuously since 2005. Time-concentration plots for a number of the wells upgradient of the former gravel ponds show no well-defined trend (e.g., RFN-0659, RFN-0590, RFN-0664, and RFN-0670) but fluctuate over a fairly narrow concentration range. Mean concentrations in wells adjacent to the site are the same as they were more than 10 years ago. This distribution may reflect the disturbance caused by operation of the gravel ponds.

All surface pond concentrations exceeded the MCL except the large westernmost gravel pit pond with sample location RFN-0575, which has been below the MCL of 0.044 mg/L since 2005. The highest concentrations were in RFN-0323 at 0.32 mg/L in June 2011 and 0.27 mg/L in November 2011. Overall, uranium concentrations in the ponds have shown no decrease since 2000, when most analytical records began, except for RFN-0575, which has a longer record and shows a general decrease since sampling began in 1991.

Vanadium

In 2009, vanadium spiked to the highest concentration ever observed in well RFN-0855 (1,600 mg/L) in association with the City of Rifle's construction work and especially the dewatering of the area around RFN-0855. The concentration in RFN-0855 dropped back to 41 mg/L in November 2010 and, most recently, to 21 mg/L in November 2011. The vanadium concentration in adjacent well RFN-0658 (a shallow well only 5.4 ft deep) was 52 mg/L for a high in 2010 and has since fallen to 31 mg/L in November 2011. Elevated concentrations are observed only onsite and immediately downgradient of the site, as has been the case in past years.

The highest vanadium concentrations in surface water occurs in the wetland pond location RNF-0452 at 0.28 mg/L. Vanadium concentrations in the large gravel pit pond locations farther west are in the 0.002 mg/L to 0.004 mg/L range.

3.2.2.3 Institutional Controls Monitoring

During regular groundwater sampling events, changes in land use at and downgradient of the New Rifle site was observed and recorded in trip reports. During CY 2011, DOE was in communication with property owners and various users of City-owned property regarding, among other topics, potential construction. These discussions included meetings with the City of Rifle; Williams Exploration and Production; the Western Colorado Research Center; Cacaloco, a composting operation; and Nelson Environmental Engineering personnel. The discussions covered the impacts that the parties' activities may have on the site groundwater geochemistry.

DOE will also note activities at the Old Rifle processing site during the annual inspection of the disposal site. A record of the City's activities will also be received from the city manager as a requirement in Ordinance 9 Series 2008 (d8) (the Uranium Mill Tailings Remedial Action Overlay Zone District). This information will be added to this VMR as it becomes available.

3.2.3 Mann-Kendall Test for Trend for New Rifle

Another method of data evaluation is the nonparametric Mann-Kendall test for trend (Gilbert 1987). The test does not require any particular data distribution and will accommodate missing values and data reported as less than the detection limit. Essentially, it analyzes a series of data by subtracting the values of data collected earlier from those of later data. The method results in a test statistic that is a positive or negative (indicating an increasing or decreasing trend) and is used to estimate the probability that the trend is real. Appendix D-1 of the New Rifle GCAP (DOE 2006) describes the Mann-Kendall test for trend.

As a preliminary analysis, several wells from the New Rifle site were selected for application of the Mann-Kendall test based on their locations with respect to the uranium and molybdenum plumes. The test was applied to uranium and molybdenum concentrations because these COCs are the most widespread and the most mobile. Additionally, they are not affected by geochemical transformation processes, as are ammonia and nitrate. Wells RFN-0664 and RFN-0669 are from two onsite locations near the original plume source areas (raffinate ponds and tailings piles). Well RFN-0201 is immediately downgradient of the site and upgradient of the Roaring Fork ponds; well RFN-0195 is immediately downgradient of the ponds. Appendix B includes the results of applying the Mann-Kendall test statistic to uranium and molybdenum values for these wells.

Onsite well RFN-0664 shows a strongly decreasing trend (at the 95 percent confidence level) for uranium and molybdenum. Onsite well RFN-0669 shows a strongly decreasing trend for molybdenum (at the 95 percent confidence level) and a lesser downward trend (at the 90 percent confidence level) for uranium. Downgradient wells RFN-0201 and RFN-0195 show strongly decreasing trends for uranium and molybdenum (at the 95 percent confidence level). These results suggest that natural flushing for these two COCs is progressing at these locations and that the main portions of the uranium and molybdenum plumes are moving offsite into the adjacent downgradient area.

4.0 Results and Conclusions

Concentrations of vanadium at the Old Rifle site continue to decrease; selenium concentrations, which had been declining, increased during 2010 and into 2011. Uranium concentrations do not display any consistent trends and have not declined as the modeling results in the SOWP predicted. The modeling results indicated that uranium would meet its groundwater standard across the site within 10 years; this has not been achieved. All wells except RFO-0309 exceed the uranium MCL of 0.044 mg/L. Isotopic ratio data suggest that a naturally occurring and continuing source of uranium exists to the north of the site and may influence site groundwater quality. The vanadium benchmark of 0.33 mg/L is currently exceeded at one well; no wells currently exceed the selenium benchmark of 0.05 mg/L. Selenium and vanadium compliance goals have been met based on the site-wide averages. Time-concentrations plots in Appendix A–1 indicate that these two COCs, uranium and vanadium, have been relatively stable in Old Rifle wells for the last few years of monitoring.

As expected with natural flushing, contaminant plumes for a number of COCs associated with the New Rifle site have been decreasing in general and moving downgradient over time. The only significant COCs in terms of concentration and distribution are molybdenum, nitrate, uranium, and vanadium. The highest concentrations over the last few years of nitrate and uranium were found downgradient of the site. Nitrate concentrations, which had been increasing in response to ammonia degradation, have generally been declining since 2007. The uranium standard was exceeded over the entire extent of the alluvial aquifer, although it is not clear if all contamination is site-related, especially in the far western wells. Concentrations appear to be nearly constant for most downgradient wells; an exception is RFN-0195, which has decreased steadily from 0.17 mg/L in 2005 to 0.018 in 2011. The highest concentrations of molybdenum and vanadium were still found onsite. Significant fluctuations in molybdenum, vanadium, and uranium were noted in several onsite wells over the last few sampling rounds, due to the City of Rifle's dewatering activities on the eastern part of the site. These fluctuations appear to be stabilizing with the cessation of dewatering.

With the number of variables that can affect the distribution of contaminants in the alluvial aquifer at New Rifle, it is probably too early to determine the effectiveness of natural flushing at the site. However, data collected for the site indicate that some COCs are flushing, even if trends do not exactly match predictions. Generally speaking, groundwater contamination is decreasing. Some individual wells may display increasing concentrations for certain COCs, but this is to be expected as the plume centers migrate downgradient away from the site. On the basis of combined spatial and temporal data, plume centers for nitrate and uranium appear to have already moved offsite, but they remain within the IC boundary and continue to dissipate downgradient. Highest concentrations of molybdenum are both onsite and in the ponds. The portions of the molybdenum and uranium plumes downgradient of the former gravel ponds seem to have dissipated; however, elevated upgradient concentrations could eventually recontaminate these areas as they move downgradient. Arsenic and selenium have little mobility and will probably remain confined to site groundwater. Vanadium, also relatively immobile, has migrated offsite, but only to a very limited degree.

Neither the Old Rifle site's nor the New Rifle site's groundwater discharge is affecting surface water quality of the Colorado River. ICs are effectively preventing inappropriate use of groundwater. Presently, the selected compliance strategies at both sites appear to be adequately protective. However, because the natural flushing of uranium in groundwater at the Old Rifle

processing site is not decreasing as modeling predicted, DOE, in consultation with CDPHE, has prepared a revised GCAP. Additionally, because some COCs at the New Rifle processing site are consistently appearing in concentrations above MCLs in downgradient gravel pit ponds, the GCAP for New Rifle will be reevaluated in FY 2013.

5.0 References

40 CFR 192. "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," *Code of Federal Regulations,* July 1, 2007.

DOE (U.S. Department of Energy), 1995a. *Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Rifle, Colorado*, DOE/AL/62350-179, Rev. 1, August.

DOE (U.S. Department of Energy), 1995b. *Private Well/Spring Position Paper, Rifle, Colorado Sites*, DOE/AL/62350-190, Rev. 0, May.

DOE (U.S. Department of Energy), 1999a. *Final Site Observational Work Plan for the Old Rifle, Colorado, UMTRA Project Site*, GJO-99-214-TAR, March.

DOE (U.S. Department of Energy), 1999b. *Final Site Observational Work Plan for the New Rifle, Colorado, UMTRA Project Site*, GJO-99-112-TAR, Rev. 1, November.

DOE (U.S. Department of Energy), 2000. *Draft Work Plan for Vanadium Pilot Study, New Rifle UMTRA Site, Rifle, Colorado*, GWRFL10.6.4, July.

DOE (U.S. Department of Energy), 2001. *Ground Water Compliance Action Plan for the Old Rifle, Colorado, UMTRA Project Site*, GJO-2000-177-TAR, December.

DOE (U.S. Department of Energy), 2006. *Draft Ground Water Compliance Action Plan for the New Rifle, Colorado, Processing Site*, DOE-LM/GJ1211-2006, December.

DOE (U.S. Department of Energy), 2011. *Review of the Natural Flushing Groundwater Remedy at the Old Rifle Legacy Management Site, Rifle, Colorado,* Draft, LMS/RFO/S07263, July.

EPA (U.S. Environmental Protection Agency), 1999. *1999 Update of Ambient Water Quality Criteria for Ammonia*, EPA-822-R-99-014, December.

Gilbert, R.O., 1987. *Statistical Methods for Environmental Pollution Monitoring,* Van Nostrand Reinhold Company, New York.

Hollander, M., and D.A. Wolfe, 1973. *Nonparametric Statistical Methods*, Wiley, New York.

This page intentionally left blank

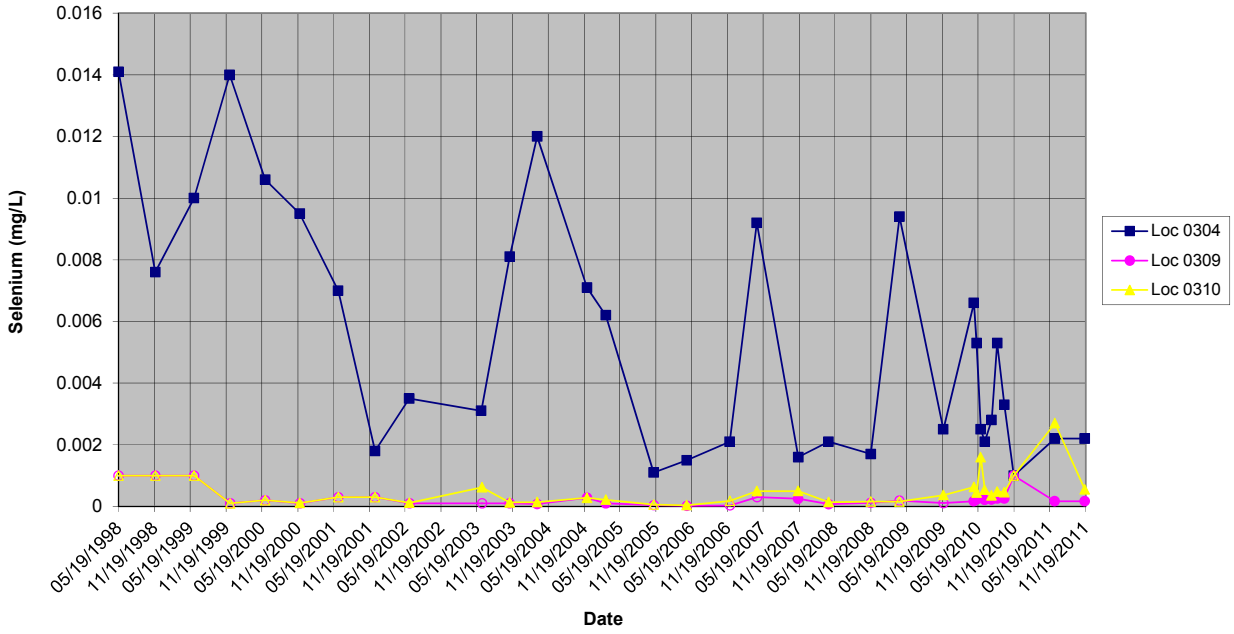
Appendix A−1

Time-Concentration Plots for Wells at the Old Rifle Site

This page intentionally left blank

Rifle Old Processing Site (RFO01)

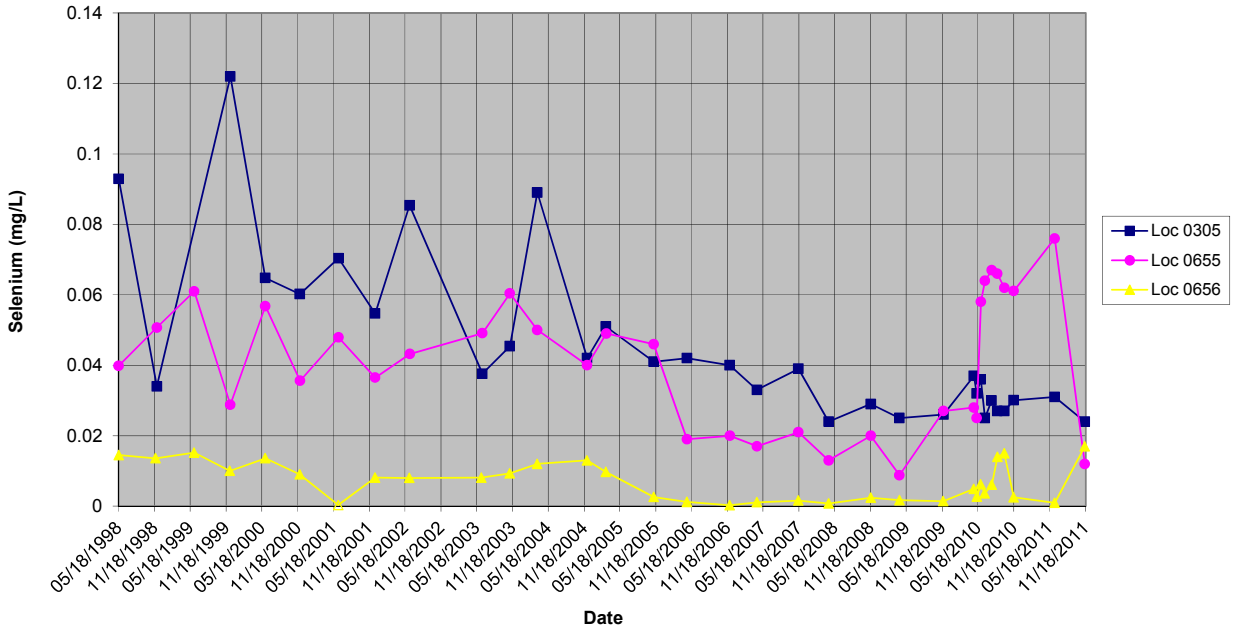
Selenium Concentration



Note: A hollow symbol denotes an analytical result below the detection limit.

Rifle Old Processing Site (RFO01)

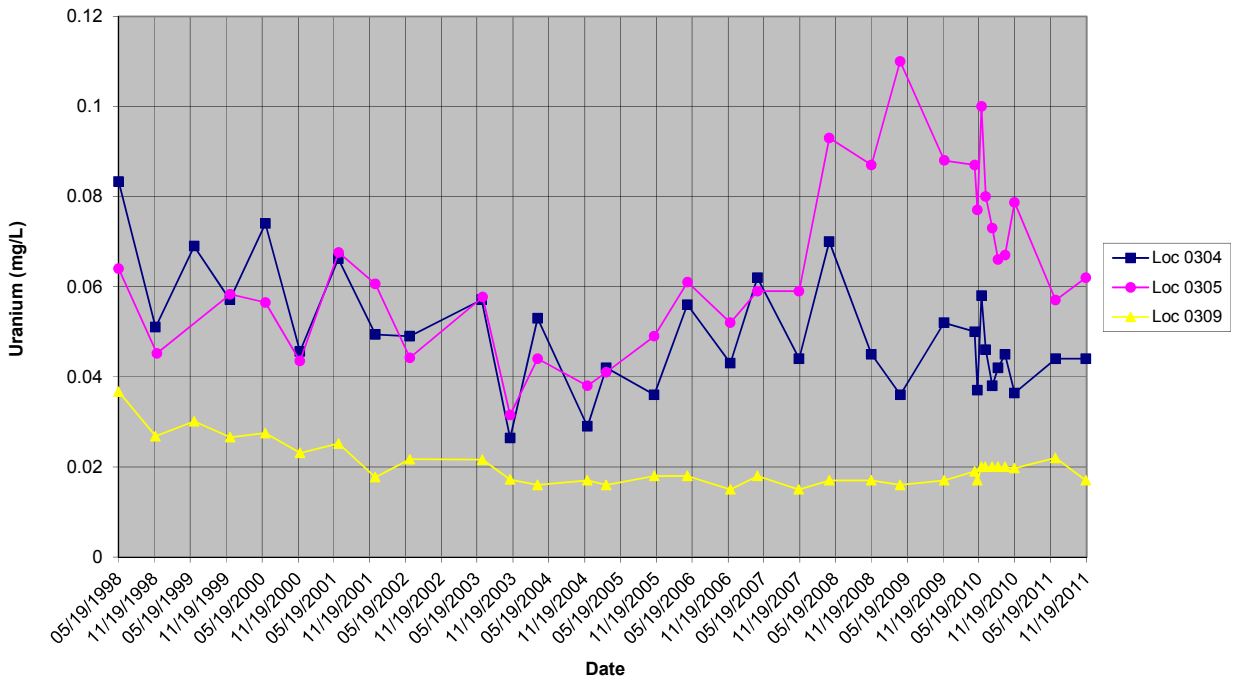
Selenium Concentration



Note: A hollow symbol denotes an analytical result below the detection limit.

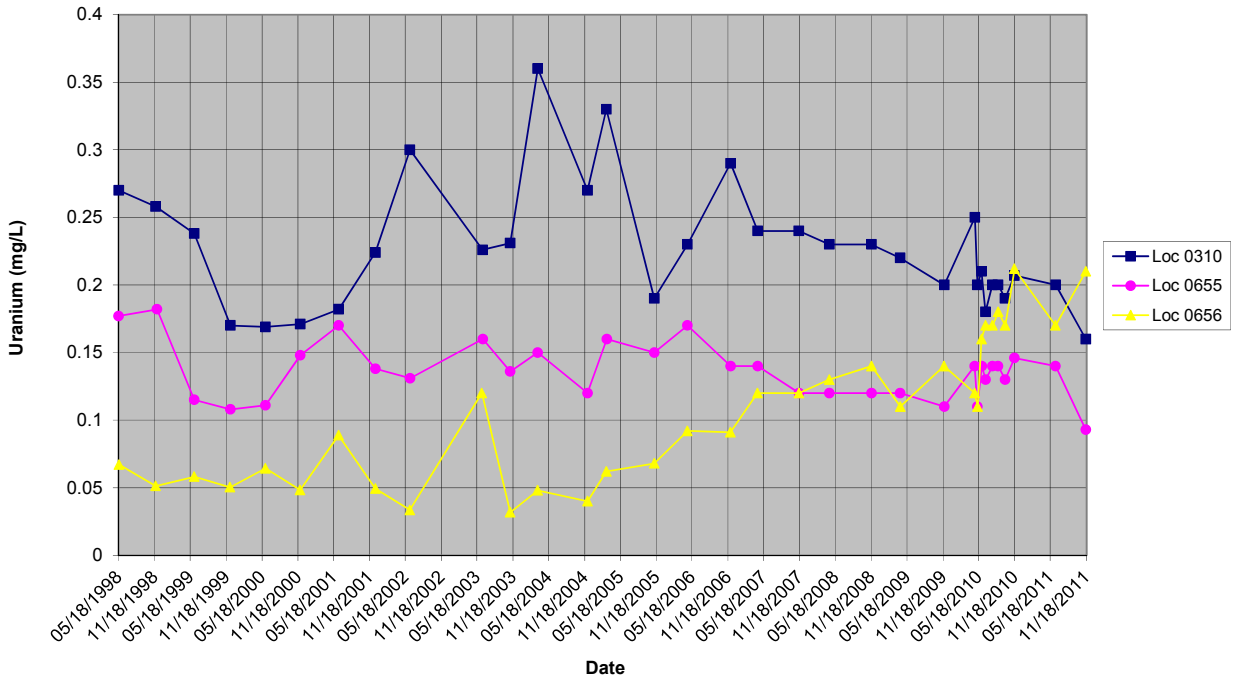
Rifle Old Processing Site (RFO01)

Uranium Concentration



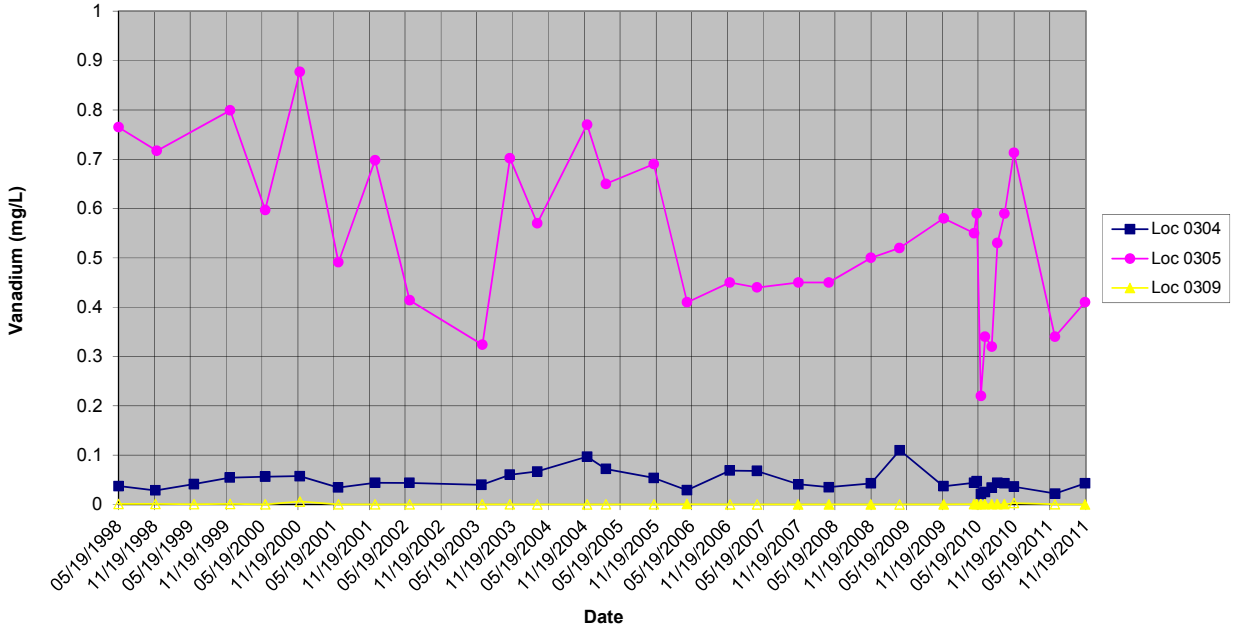
Rifle Old Processing Site (RFO01)

Uranium Concentration



Rifle Old Processing Site (RFO01)

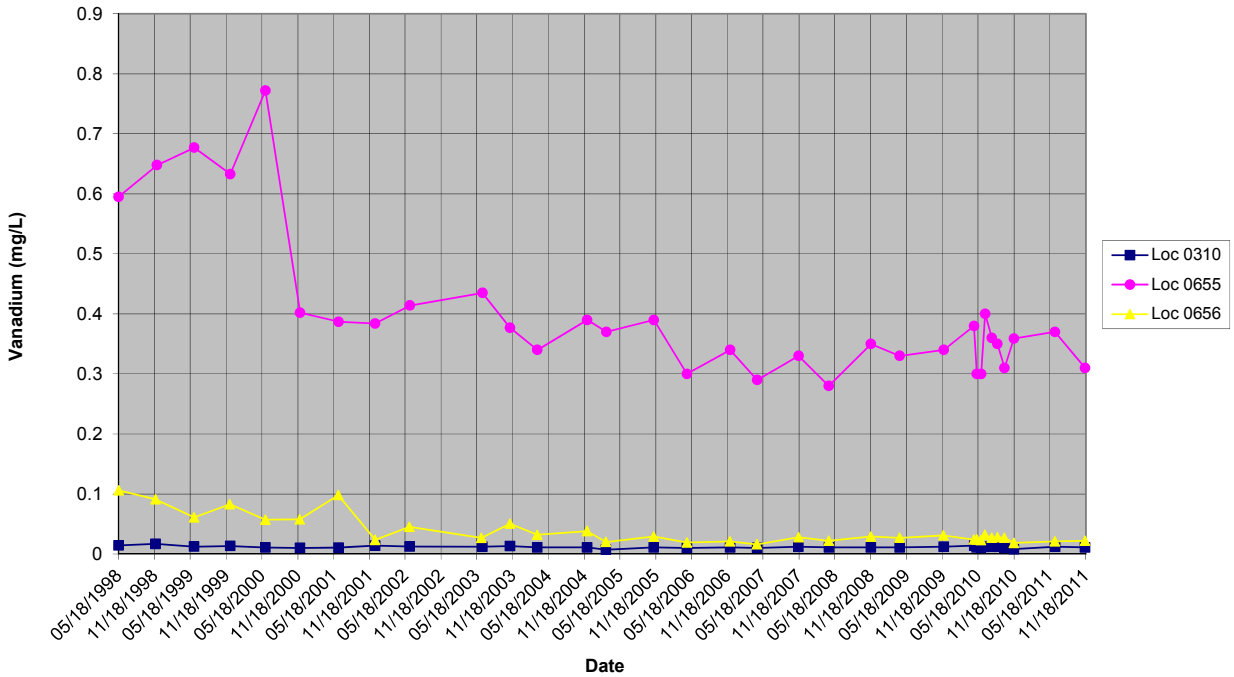
Vanadium Concentration



Note: A hollow symbol denotes an analytical result below the detection limit.

Rifle Old Processing Site (RFO01)

Vanadium Concentration



This page intentionally left blank

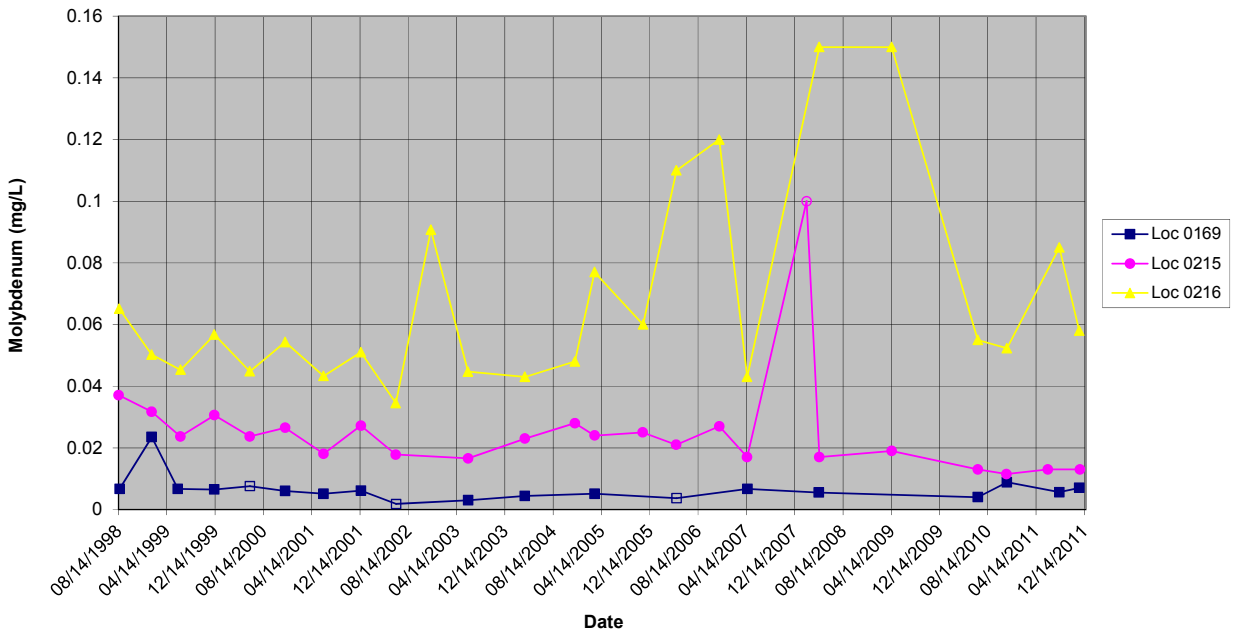
Appendix A−2

Time-Concentration Plots for Wells at the New Rifle Site

This page intentionally left blank

Rifle New Processing Site (RFN01)

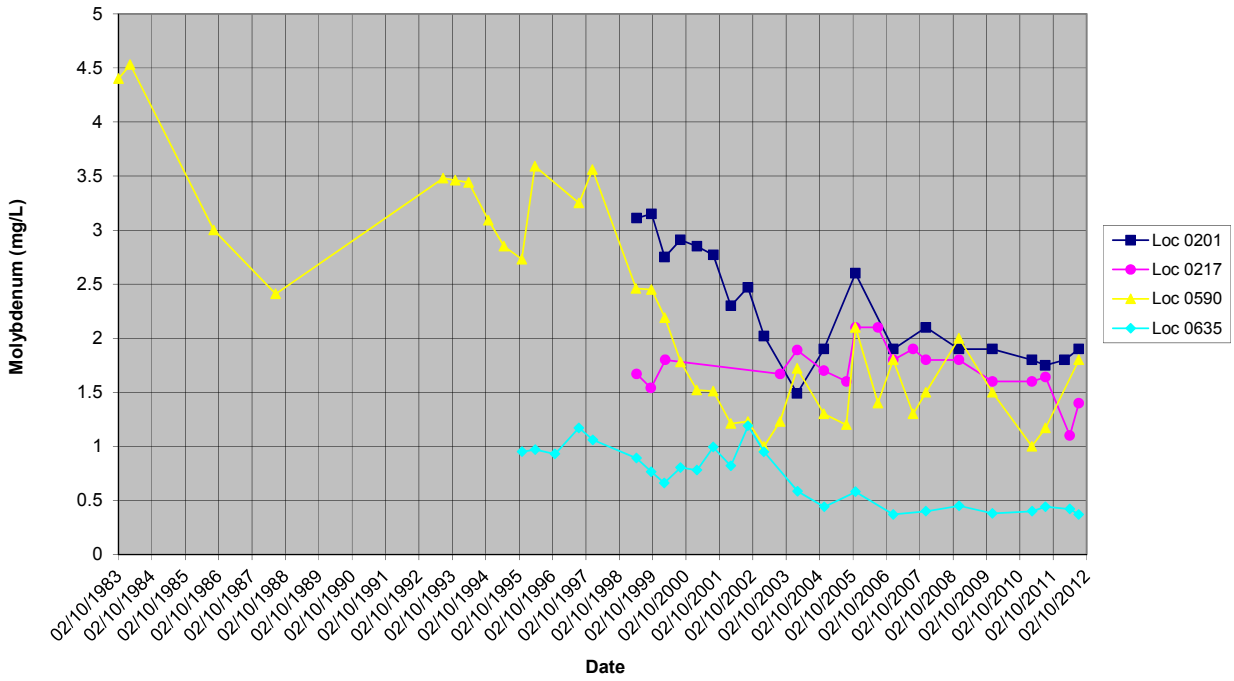
Molybdenum Concentration



Note: A hollow symbol denotes an analytical result below the detection limit.

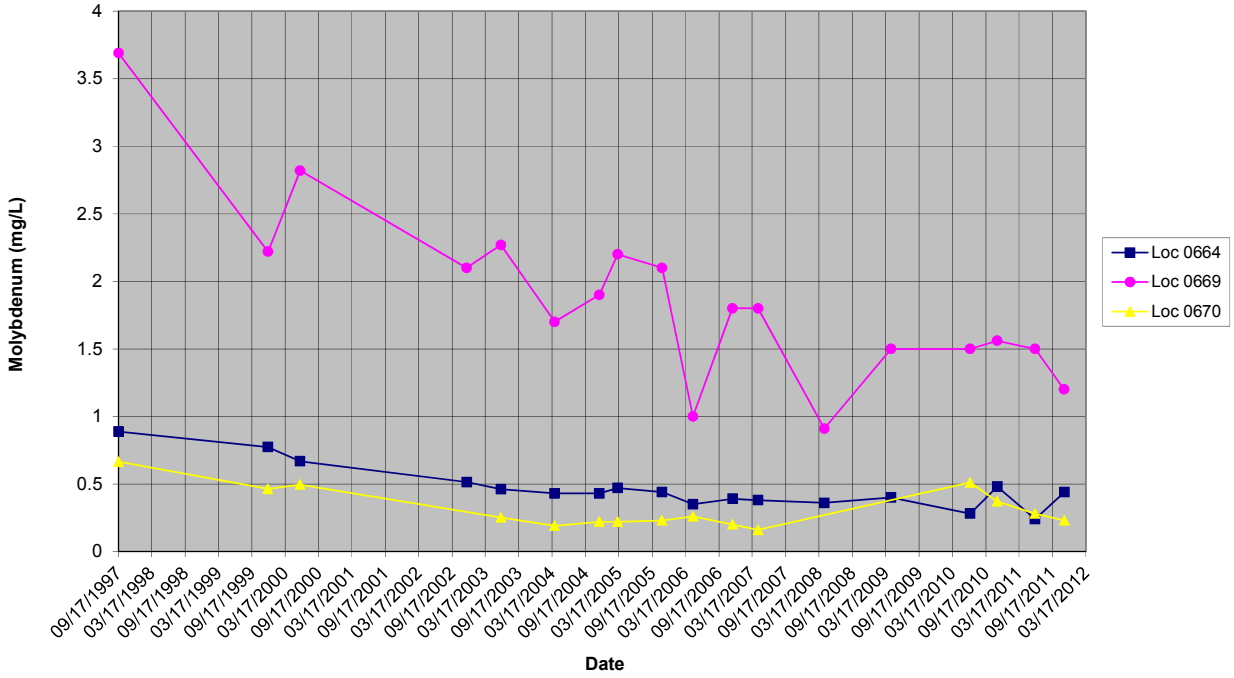
Rifle New Processing Site (RFN01)

Molybdenum Concentration



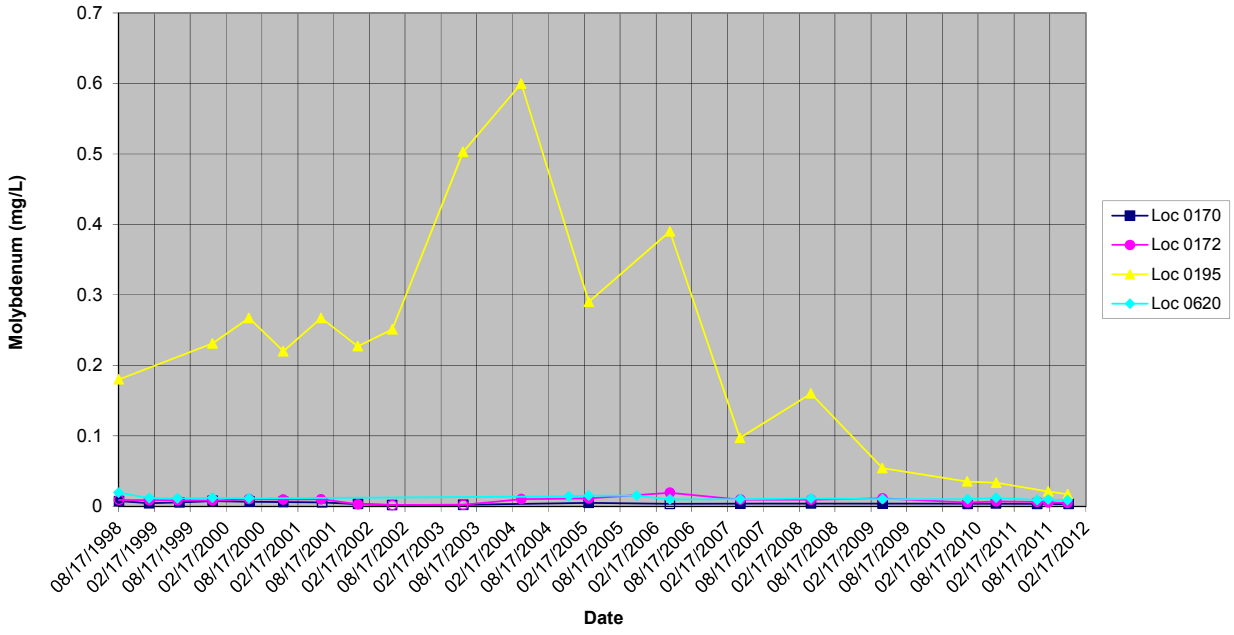
Rifle New Processing Site (RFN01)

Molybdenum Concentration



Rifle New Processing Site (RFN01)

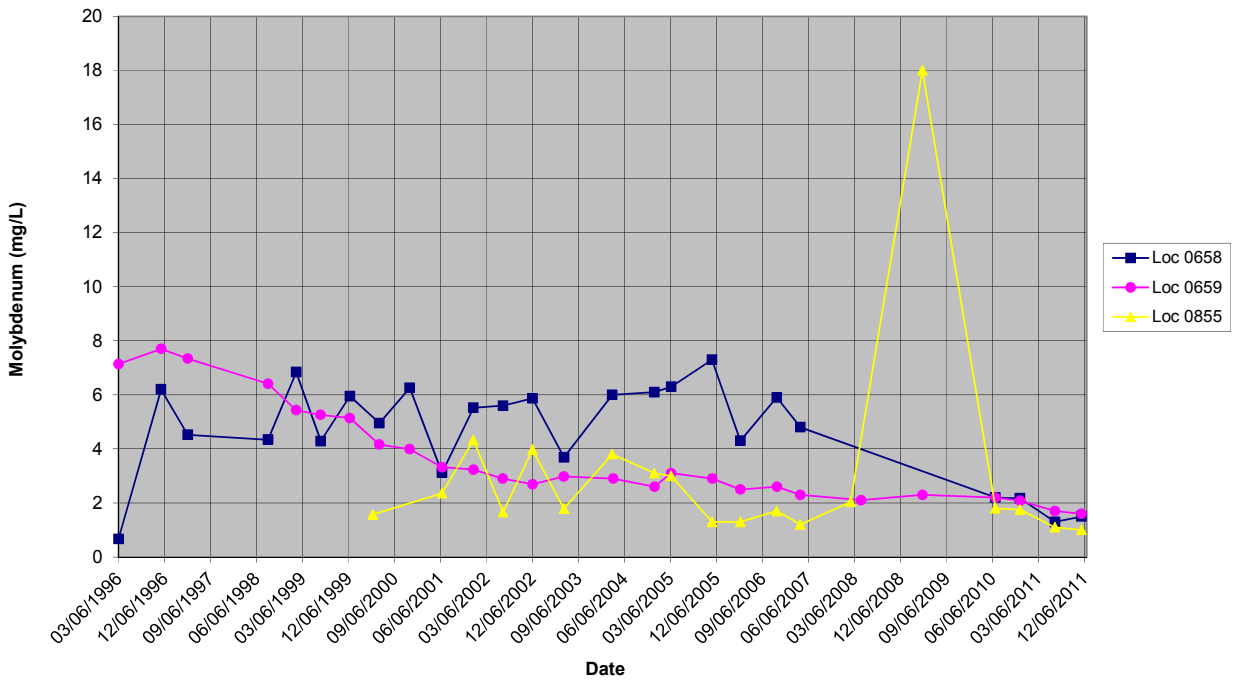
Molybdenum Concentration



Note: A hollow symbol denotes an analytical result below the detection limit.

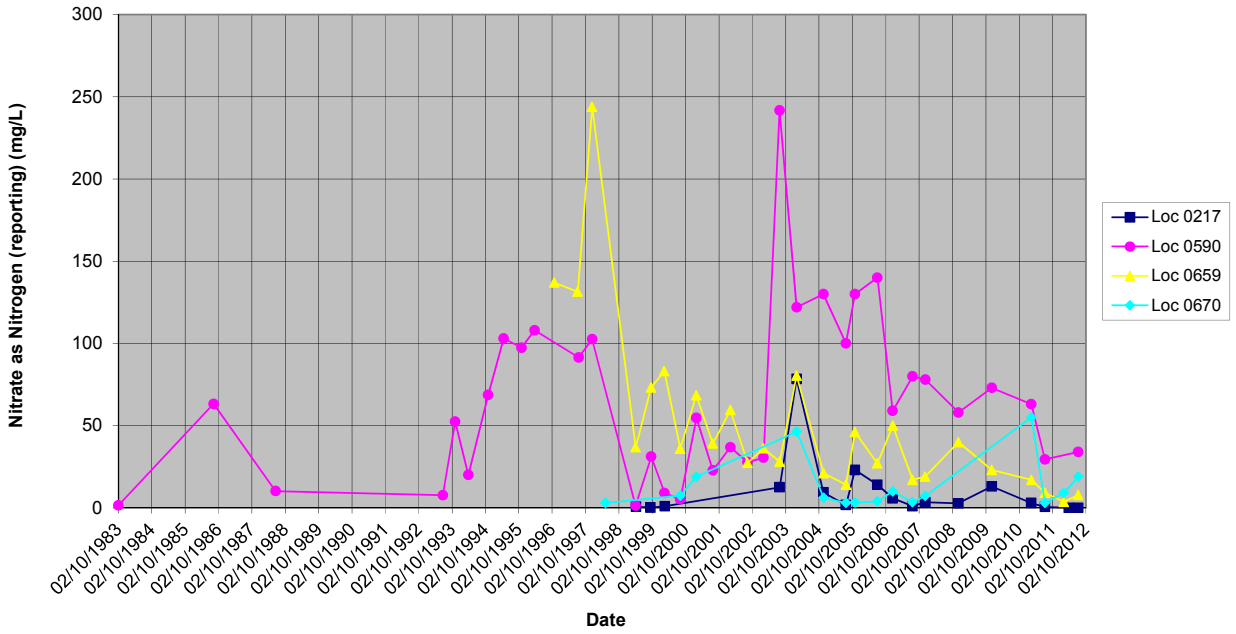
Rifle New Processing Site (RFN01)

Molybdenum Concentration



Rifle New Processing Site (RFN01)

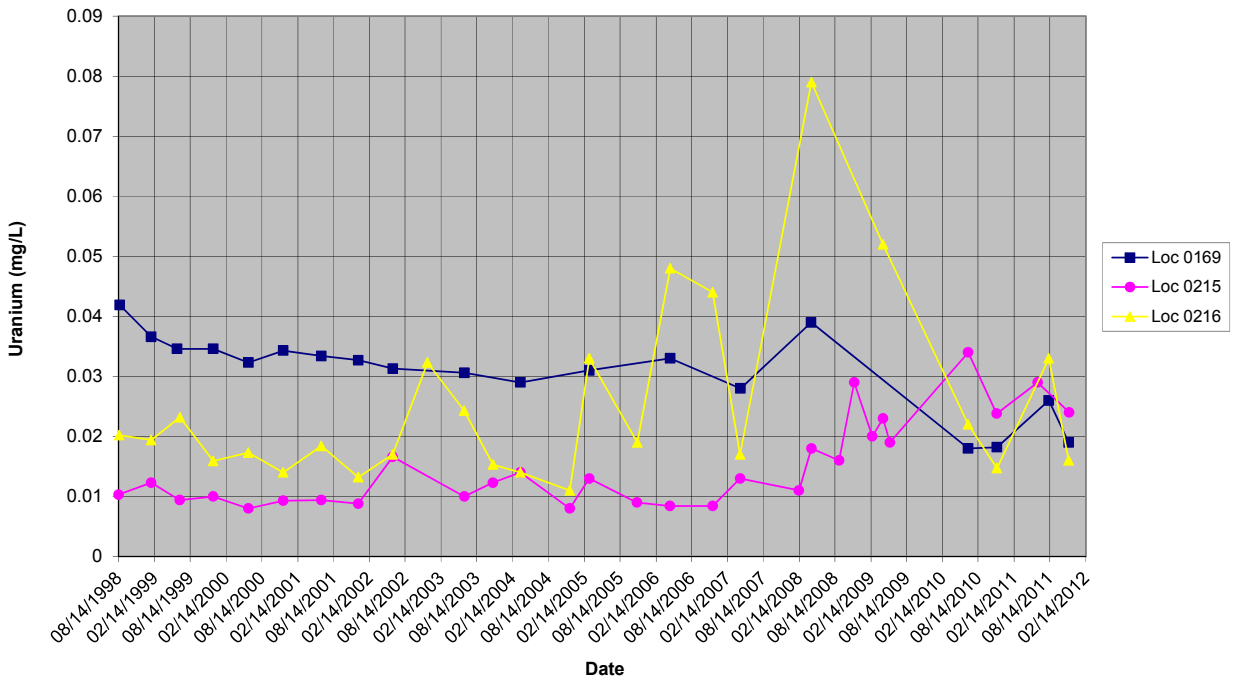
Nitrate as Nitrogen (reporting) Concentration



[1] All nitrate results have been converted to nitrate-as-nitrogen to facilitate comparison.

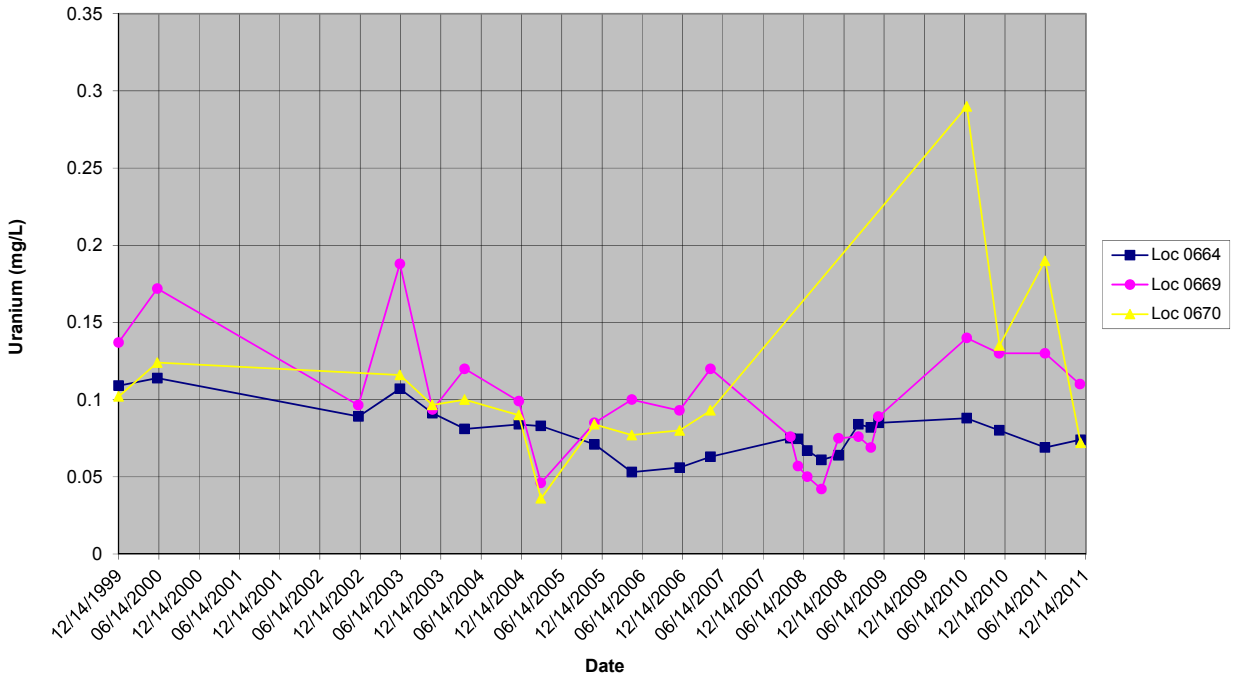
Rifle New Processing Site (RFN01)

Uranium Concentration



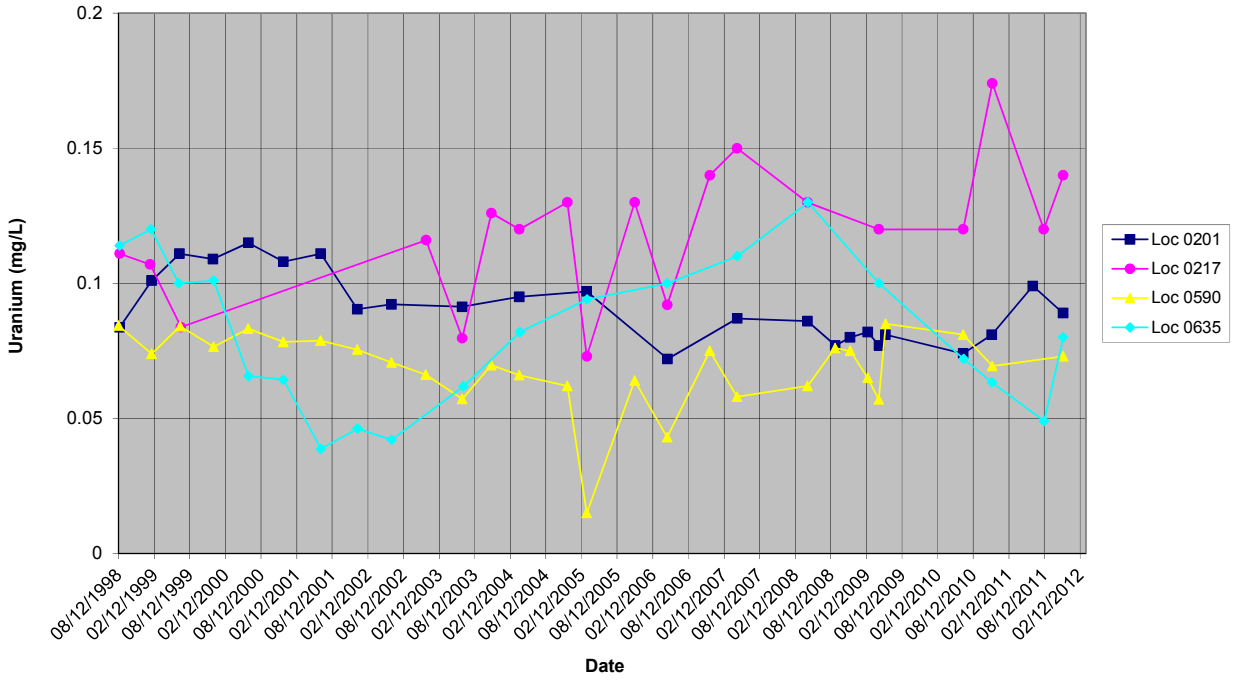
Rifle New Processing Site (RFN01)

Uranium Concentration



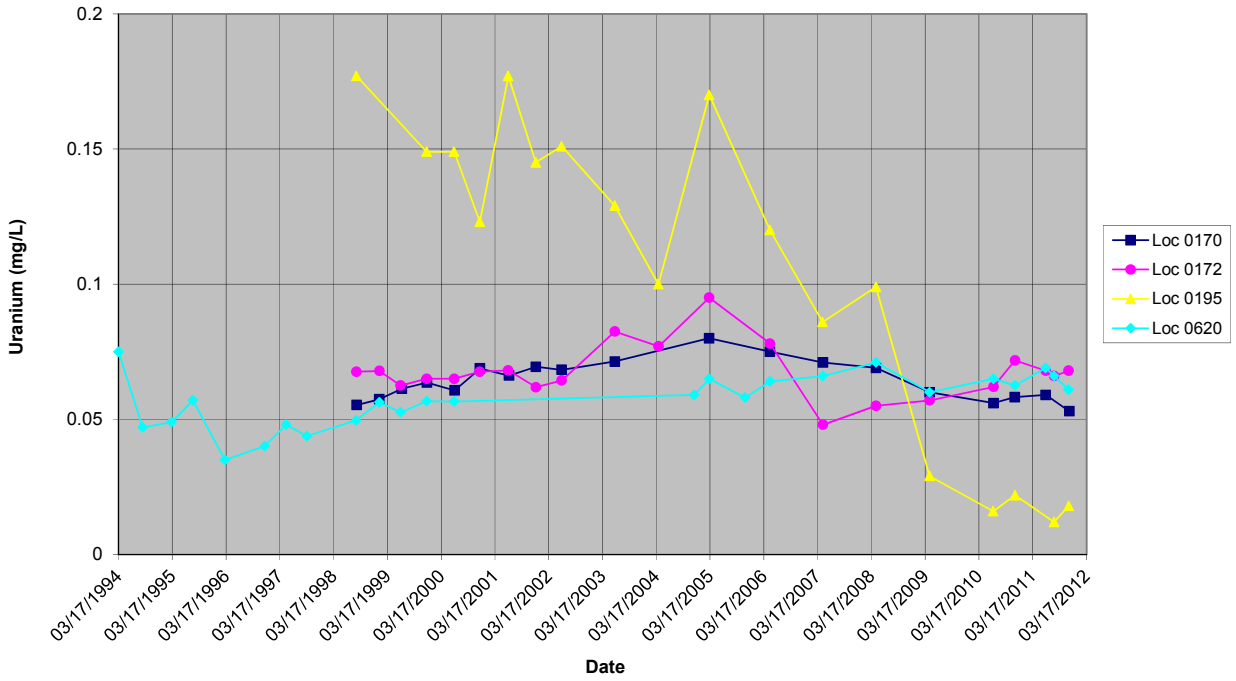
Rifle New Processing Site (RFN01)

Uranium Concentration



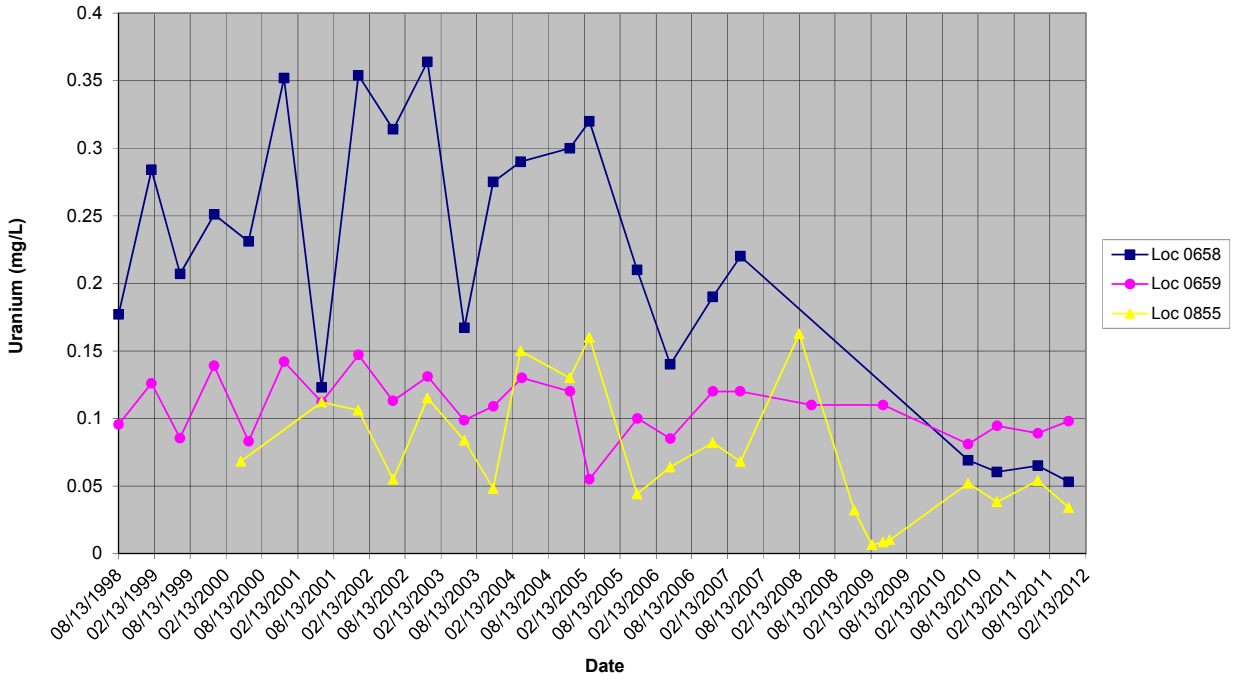
Rifle New Processing Site (RFN01)

Uranium Concentration



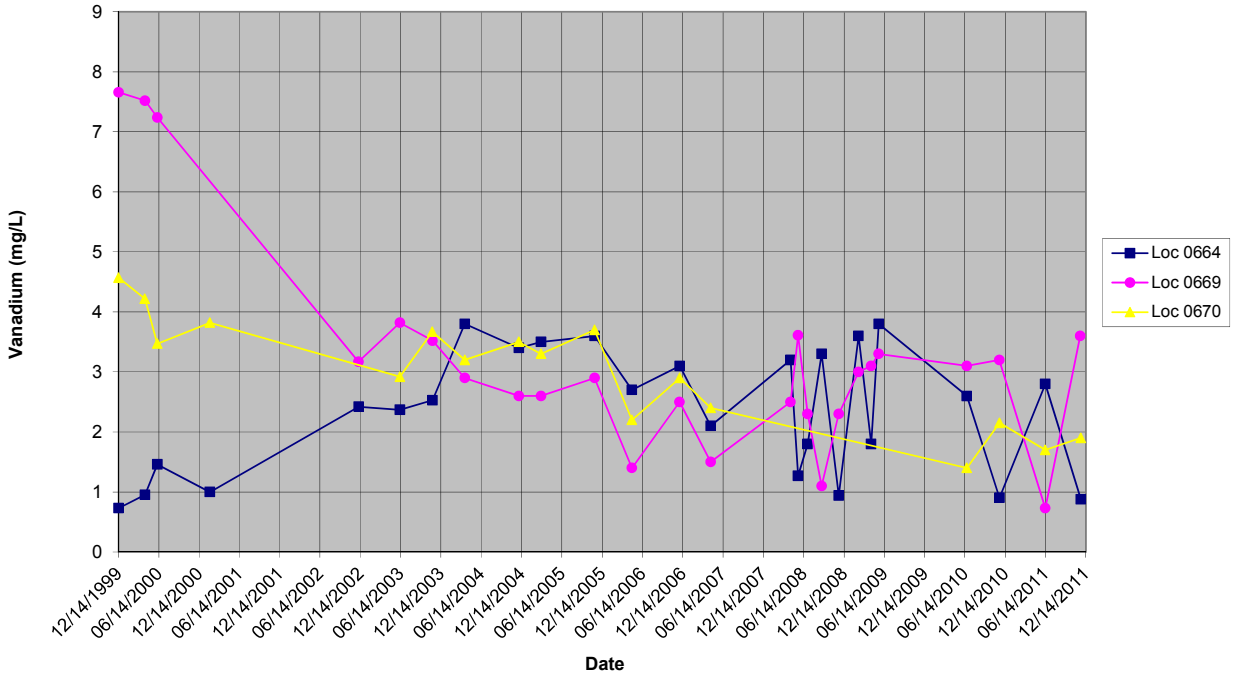
Rifle New Processing Site (RFN01)

Uranium Concentration



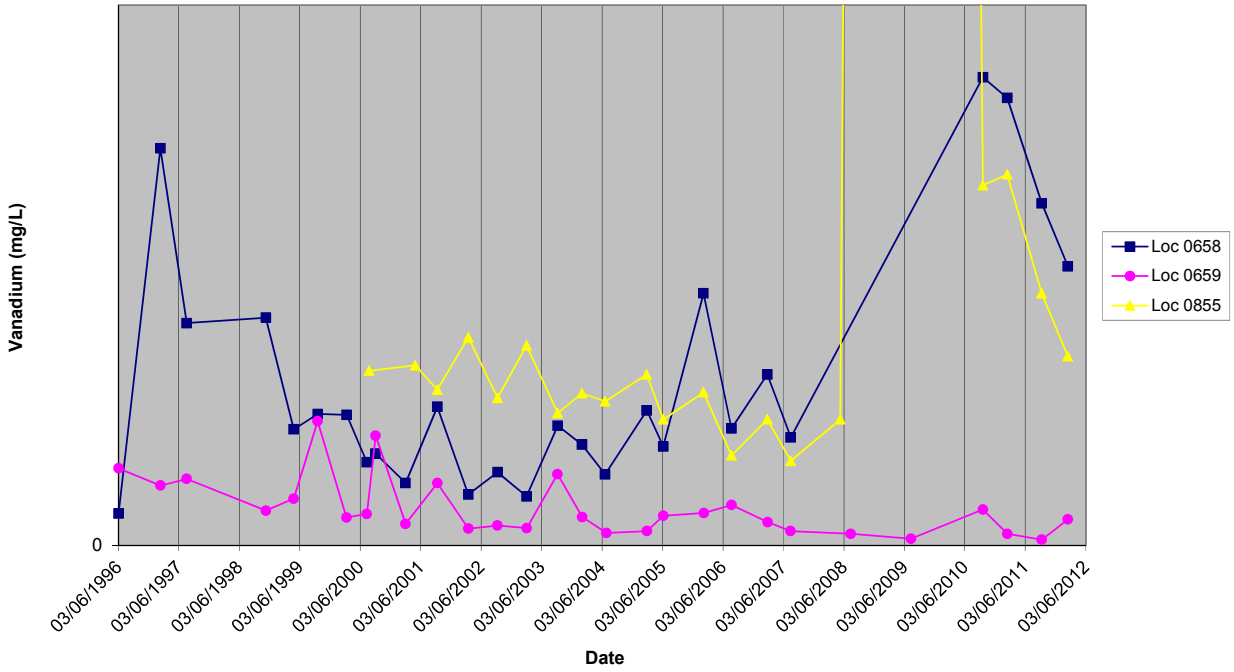
Rifle New Processing Site (RFN01)

Vanadium Concentration



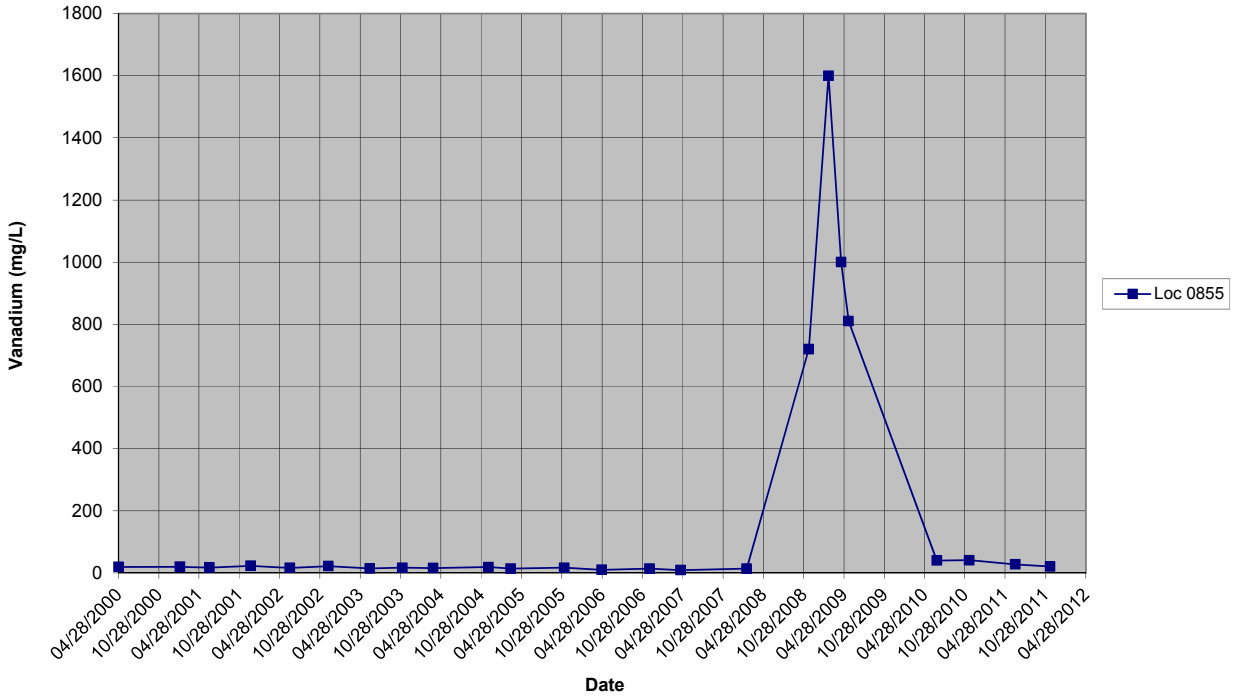
Rifle New Processing Site (RFN01)

Vanadium Concentration



Rifle New Processing Site (RFN01)

Vanadium Concentration



This page intentionally left blank

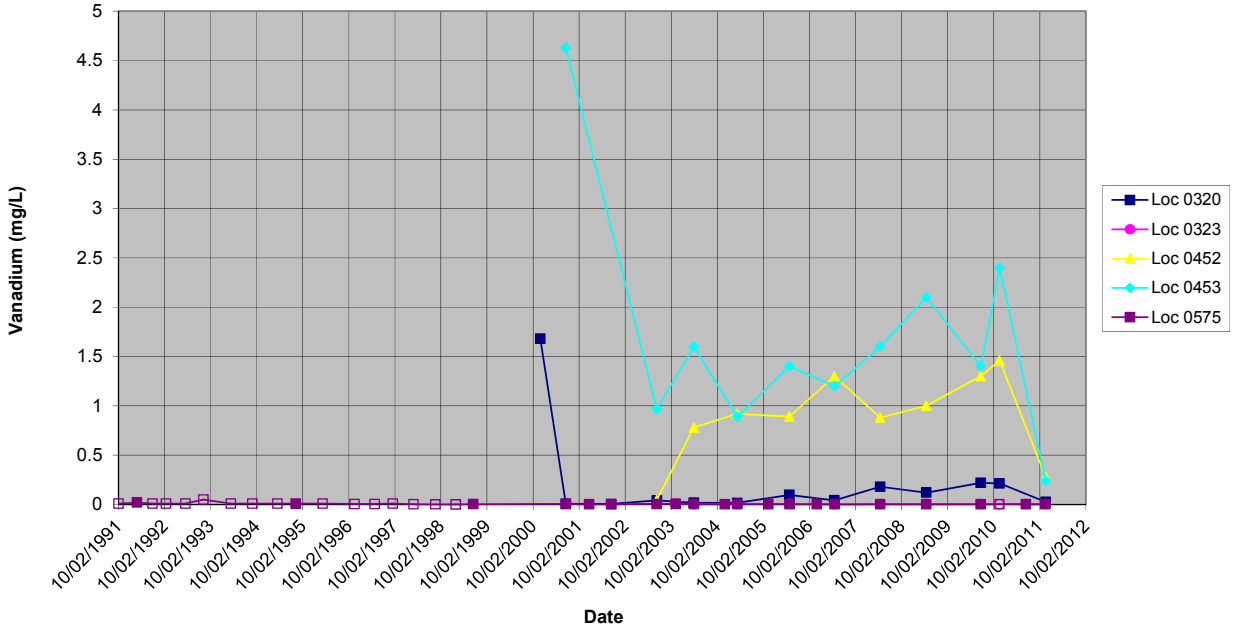
Appendix A−3

New Rifle Ponds

This page intentionally left blank

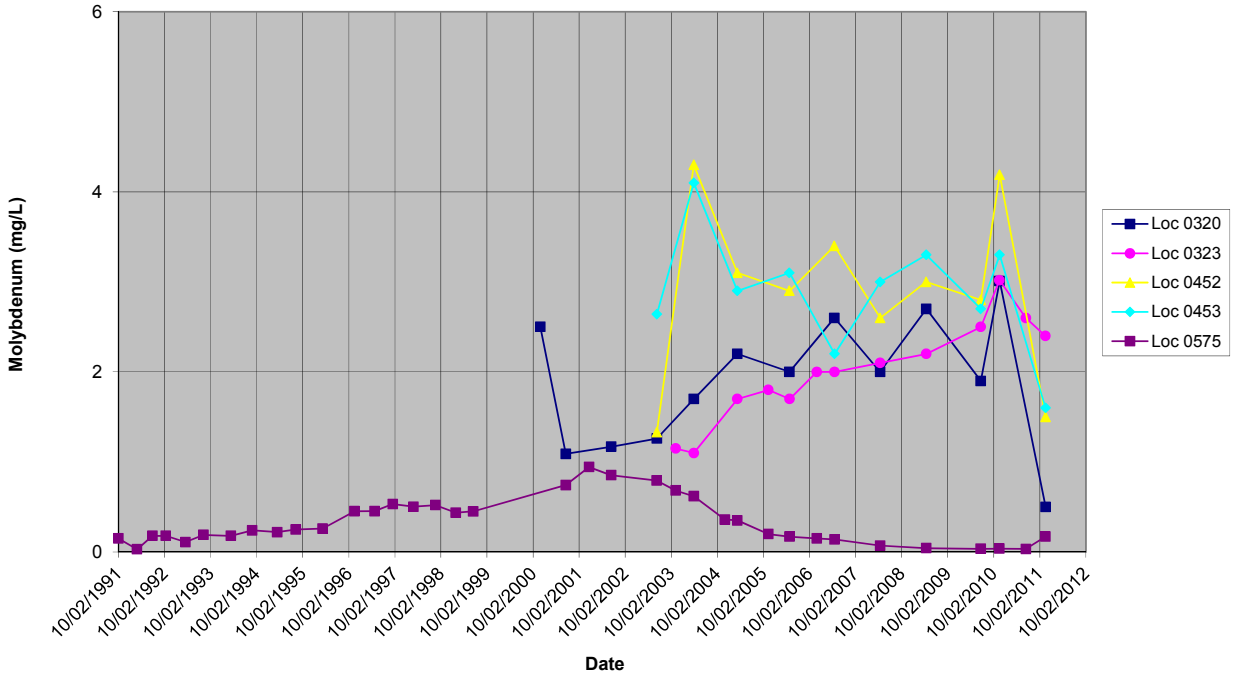
Rifle New Processing Site (RFN01)

Vanadium Concentration

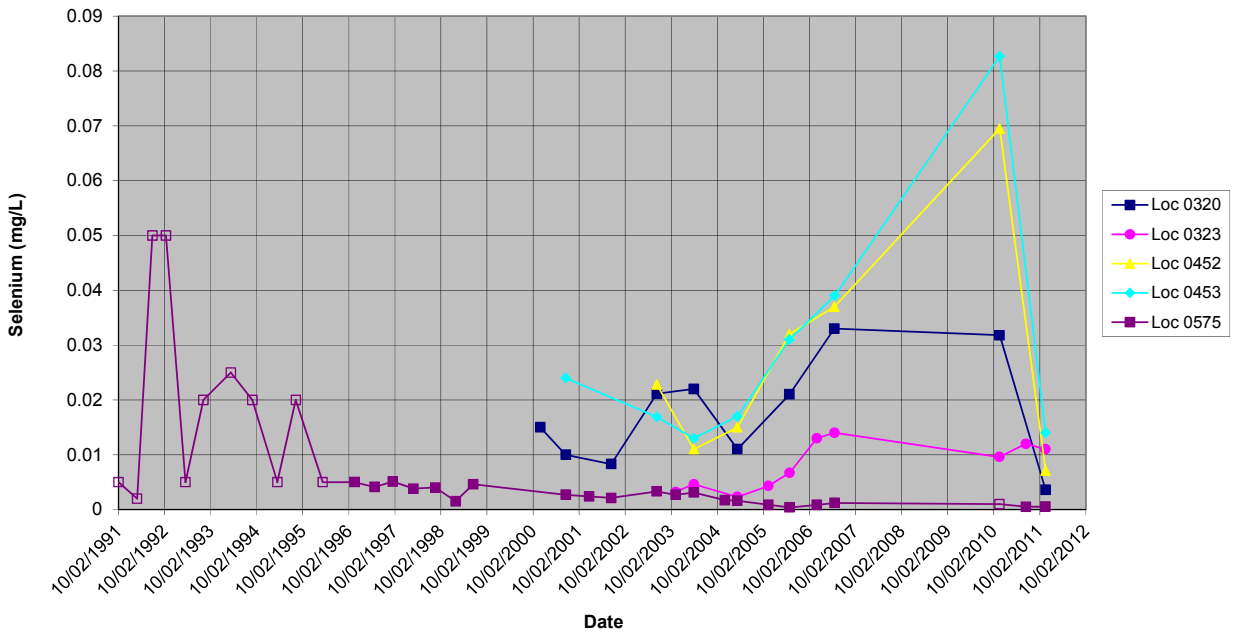


Note: A hollow symbol denotes an analytical result below the detection limit.

Rifle New Processing Site (RFN01)
Ponds
Molybdenum Concentration

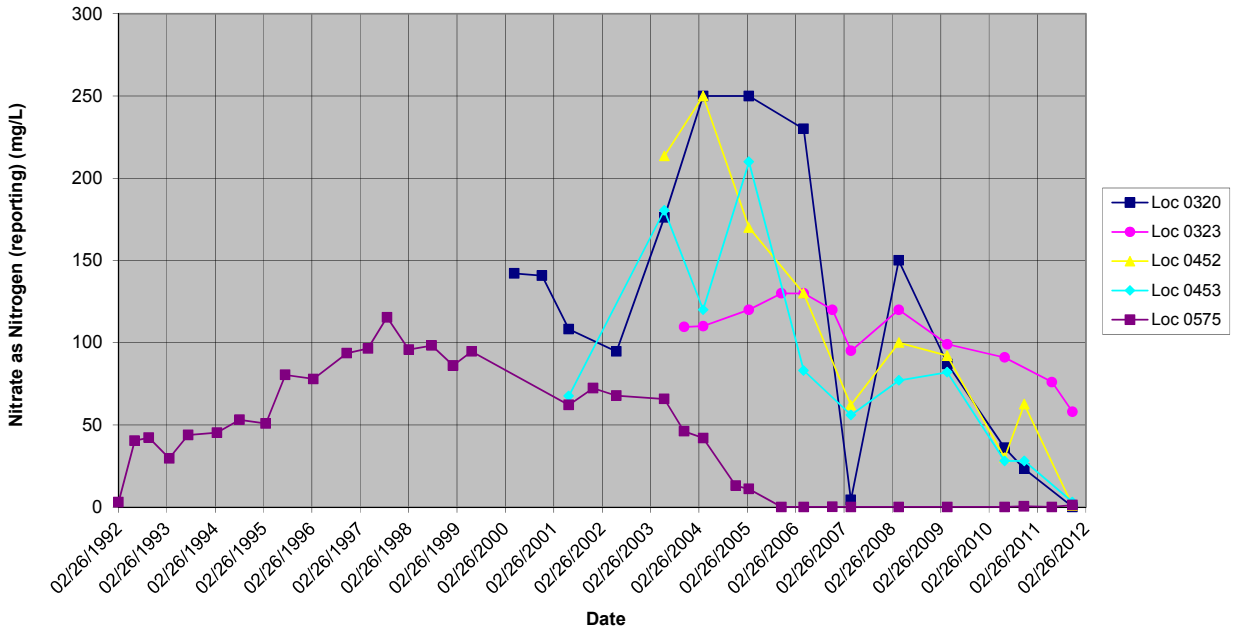


Rifle New Processing Site (RFN01)
Ponds
Selenium Concentration



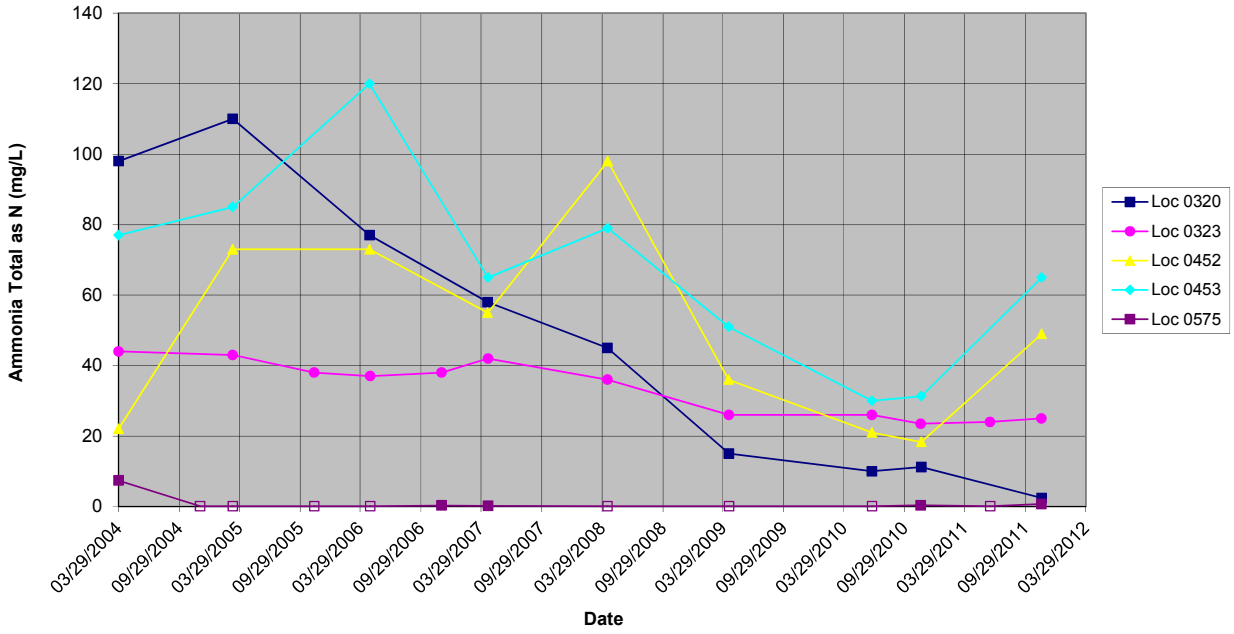
Note: A hollow symbol denotes an analytical result below the detection limit.

Rifle New Processing Site (RFN01)
Ponds
Nitrate as Nitrogen (reporting) Concentration



[1] All nitrate results have been converted to nitrate-as-nitrogen to facilitate comparison.

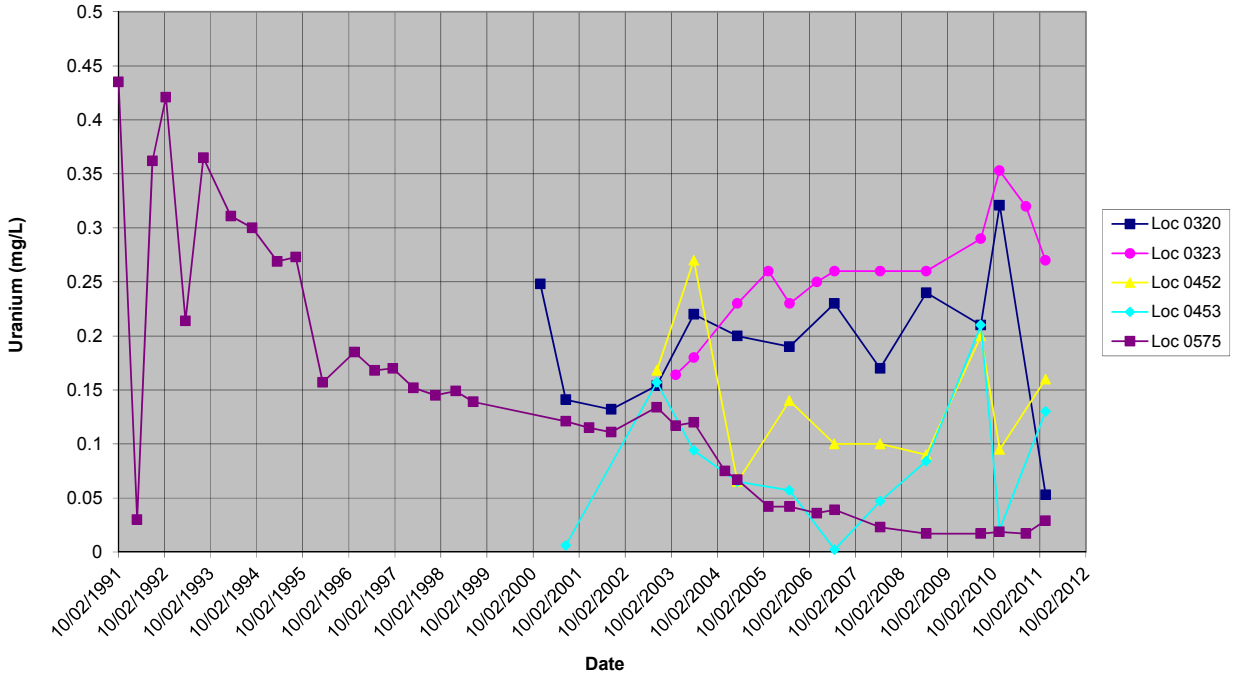
Rifle New Processing Site (RFN01)
Ponds
Ammonia Total as N Concentration



Note: A hollow symbol denotes an analytical result below the detection limit.

Rifle New Processing Site (RFN01)

Uranium Concentration



This page intentionally left blank

Appendix B

Application of the Mann-Kendall Test to the 2012 New Rifle Monitoring Data

This page intentionally left blank

The Visual Sample Plan (VSP) computer module used for the trend analysis is the nonparametric Mann-Kendall test for trend (Gilbert 1987). In this procedure, missing values are allowed, and the data need not conform to any particular distribution. In this Mann-Kendall test, only the relative magnitudes of the data, rather than the measured values, are used.

A one-tailed test is used because it is desired to test the null hypothesis, H_O, of no trend against the alternative hypothesis, H_A, of a downward trend. If no trend is detected, then it is desired to test the null hypothesis, H_O, of no trend against the alternative hypothesis, H_A, of an upward trend.

Alpha (α) is often called the level of significance. It is also referred to as a Type I error. For α = .05, this would be a 5 percent probability of rejecting the null hypothesis when the null hypothesis is true (i.e., there is a 5 percent probability of concluding there is a trend when no trend is present). In table format, the Type I and Type II errors can be expressed as shown in Table B−1.

Table B−1. Type I and Type II Errors

	Hypothesis is correct	**Hypothesis is incorrect**
Hypothesis is accepted	Correct decision	Type II error (β)
Hypothesis is rejected	Type I error (α)	Correct decision

Table A18 (Gilbert 1987) gives probability values only for *n* less than or equal to 10. An extension of this table up to *n* = 40 is given in Table A.21 in Hollander and Wolfe (1973) and has been incorporated into the VSP.

The VSP module was used to analyze monitoring data collected from four wells at the New Rifle site. Results are based on data collected since surface remediation was completed in 1998. Data for both uranium and molybdenum were used in the analysis. Table B−2 summarizes the results. All trends are down at the 5 percent level of significance (α = 0.05) except uranium at location RFN-0669. The trend for uranium at location RFN-0669 is down at the 10 percent level of significance (α = 0.10).

Table B−2. 2012 Summary of Mann-Kendall Test Results for Selected Wells at the New Rifle Site

Location	**Uranium Trend**	**Alpha**	**Molybdenum Trend**	**Alpha**
RFN-0195	Down	5%	Down	5%
RFN-0201	Down	5%	Down	5%
RFN-0664	Down	5%	Down	5%
RFN-0669	Down	10%	Down	5%

References:

Gilbert, R.O., 1987. *Statistical Methods of Environmental Pollution Monitoring*, Van Nostrand Reinhold Company, New York.

Hollander, M. and D.A. Wolfe, 1973. *Nonparametric Statistical Methods*, Wildy, New York.

This page intentionally left blank

Appendix C

Groundwater and Surface Water Monitoring Results for CY 2011

This page intentionally left blank

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	0169	WL	08/09/2011	N001	3.13 - 18.13	436		F	#	-	-
	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	468		F	#	-	-
	mg/L	0170	WL	06/14/2011	N001	92.23 - 112.23	513		F	#	-	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	510		F	#	-	-
	mg/L	0172	WL	06/14/2011	N001	6.98 - 31.98	807		F	#	-	-
	mg/L	0172	WL	08/09/2011	N001	6.98 - 31.98	820		F	#	-	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	798		F	#	-	-
	mg/L	0195	WL	08/09/2011	N001	5.29 - 25.29	388		F	#	-	-
	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	530		F	#	-	-
	mg/L	0201	WL	06/14/2011	N001	7.35 - 22.35	249		F	#	-	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	266		F	#	-	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	334		F	#	-	-
	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	330		F	#	-	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	212		F	#	-	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	174		F	#	-	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	203		F	#	-	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	199		F	#	-	-
	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	295		F	#	-	-
	mg/L	0620	WL	06/14/2011	N001	6.70 - 10.70	556		F	#	-	-
	mg/L	0620	WL	08/09/2011	N001	6.70 - 10.70	549		F	#	-	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	574		F	#	-	-
	mg/L	0635	WL	08/11/2011	N001	12.00 - 17.00	288		F	#	-	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	292		F	#	-	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	811		F	#	-	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	285		F	#	-	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	214		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	185		F	#	-	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	436		F	#	-	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	393		F	#	-	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	328		FQ	#	-	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	357		FQ	#	-	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	314		FQ	#	-	-
	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	385		FQ	#	-	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	245		F	#	-	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	272		F	#	-	-
Ammonia Total as N	mg/L	0169	WL	08/09/2011	N001	3.13 - 18.13	0.1	U	F	#	0.1	-
	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	0.1	UN	JF	#	0.1	-
	mg/L	0170	WL	06/14/2011	N001	92.23 - 112.23	0.18	N	FJ	#	0.1	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	0.1		F	#	0.1	-
	mg/L	0172	WL	06/14/2011	N001	6.98 - 31.98	0.1	U	F	#	0.1	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	0.1	U	F	#	0.1	-
	mg/L	0195	WL	08/09/2011	N001	5.29 - 25.29	0.23		F	#	0.1	-
	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	0.1	U	F	#	0.1	-
	mg/L	0201	WL	06/14/2011	N001	7.35 - 22.35	85		F	#	2	-
	mg/L	0201	WL	06/14/2011	N002	7.35 - 22.35	87		F	#	2	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	79		F	#	10	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	3.3		F	#	0.1	-
	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	1.5		F	#	0.1	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	4.7		F	#	0.1	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	4.5		F	#	0.1	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	68		F	#	2	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	47		F	#	5	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	150		F	#	10	-
	mg/L	0620	WL	06/14/2011	N001	6.70 - 10.70	0.1	U	F	#	0.1	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	0.1	U	F	#	0.1	-
	mg/L	0620	WL	11/16/2011	N002	6.70 - 10.70	0.1	U	F	#	0.1	-
	mg/L	0635	WL	08/11/2011	N001	12.00 - 17.00	77		F	#	2	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	96		F	#	10	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	47		F	#	1	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	52		F	#	5	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	44		F	#	1	-
	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	31		F	#	2	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	35		F	#	1	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	26		F	#	1	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	130		FQ	#	5	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	92		FQ	#	10	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	9.5		FQ	#	0.2	-
	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	15		FQ	#	0.5	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	41		F	#	1	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	43		F	#	5	-
Arsenic	mg/L	0169	WL	08/09/2011	N001	3.13 - 18.13	0.00064		F	#	1.5E-05	-
	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	0.00049		F	#	1.5E-05	-
	mg/L	0170	WL	06/14/2011	N001	92.23 - 112.23	0.00032		F	#	1.5E-05	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	0.00026		F	#	1.5E-05	-
	mg/L	0172	WL	06/14/2011	N001	6.98 - 31.98	0.0079		F	#	1.5E-05	-
	mg/L	0172	WL	08/09/2011	N001	6.98 - 31.98	0.0057		F	#	1.5E-05	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	0.0054		F	#	1.5E-05	-
	mg/L	0195	WL	08/09/2011	N001	5.29 - 25.29	0.0014		F	#	1.5E-05	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Arsenic	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	0.00098		F	#	1.5E-05	-
	mg/L	0201	WL	06/14/2011	N001	7.35 - 22.35	0.0005		F	#	0.00003	-
	mg/L	0201	WL	06/14/2011	N002	7.35 - 22.35	0.00057		F	#	0.00003	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	0.00054		F	#	1.5E-05	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	0.00044		F	#	1.5E-05	-
	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	0.00057		F	#	1.5E-05	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	0.032	E	F	#	0.00015	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	0.033		F	#	7.4E-05	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	0.001		F	#	7.4E-05	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	0.00087		F	#	7.4E-05	-
	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	0.0011		F	#	7.4E-05	-
	mg/L	0620	WL	06/14/2011	N001	6.70 - 10.70	0.00062		F	#	1.5E-05	-
	mg/L	0620	WL	08/09/2011	N001	6.70 - 10.70	0.00063		F	#	1.5E-05	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	0.0006		F	#	1.5E-05	-
	mg/L	0620	WL	11/16/2011	N002	6.70 - 10.70	0.00059		F	#	1.5E-05	-
	mg/L	0635	WL	08/11/2011	N001	12.00 - 17.00	0.00029		F	#	1.5E-05	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	0.00031		F	#	1.5E-05	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	0.150		F	#	0.003	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	0.083		F	#	0.0015	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	0.0083		F	#	0.00015	-
	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	0.047		F	#	0.00074	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	0.0048		F	#	0.00015	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	0.0017		F	#	7.4E-05	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	0.0029		FQ	#	0.00015	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	0.0083		FQ	#	0.00074	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	0.0039		FQ	#	0.00015	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Arsenic	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	0.0044		FQ	#	7.4E-05	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	0.520		F	#	0.003	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	0.510		F	#	0.0015	-
Molybdenum	mg/L	0169	WL	08/09/2011	N001	3.13 - 18.13	0.0056		F	#	3.2E-05	-
	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	0.007		F	#	3.2E-05	-
	mg/L	0170	WL	06/14/2011	N001	92.23 - 112.23	0.0033		F	#	3.2E-05	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	0.003		F	#	3.2E-05	-
	mg/L	0172	WL	06/14/2011	N001	6.98 - 31.98	0.0062		F	#	3.2E-05	-
	mg/L	0172	WL	08/09/2011	N001	6.98 - 31.98	0.0054		F	#	3.2E-05	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	0.0046		F	#	3.2E-05	-
	mg/L	0195	WL	08/09/2011	N001	5.29 - 25.29	0.021		F	#	3.2E-05	-
	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	0.017		F	#	3.2E-05	-
	mg/L	0201	WL	06/14/2011	N001	7.35 - 22.35	1.800		F	#	0.00032	-
	mg/L	0201	WL	06/14/2011	N002	7.35 - 22.35	1.700		F	#	0.00032	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	1.900		F	#	0.00016	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	0.013		F	#	3.2E-05	-
	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	0.013		F	#	3.2E-05	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	0.085		F	#	0.00032	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	0.058		F	#	0.00016	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	1.100		F	#	0.0016	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	1.400		F	#	0.0016	-
	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	1.800		F	#	0.00016	-
	mg/L	0620	WL	06/14/2011	N001	6.70 - 10.70	0.0088		F	#	3.2E-05	-
	mg/L	0620	WL	08/09/2011	N001	6.70 - 10.70	0.0093		F	#	3.2E-05	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	0.0086		F	#	3.2E-05	-
	mg/L	0620	WL	11/16/2011	N002	6.70 - 10.70	0.0085		F	#	3.2E-05	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Molybdenum	mg/L	0635	WL	08/11/2011	N001	12.00 - 17.00	0.420		F	#	0.00016	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	0.370		F	#	3.2E-05	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	1.300		F	#	0.0064	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	1.500		F	#	0.0032	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	1.700		F	#	0.00032	-
	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	1.600		F	#	0.0016	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	0.240		F	#	0.00032	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	0.440		F	#	0.00016	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	1.500		FQ	#	0.00032	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	1.200		FQ	#	0.0016	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	0.280		FQ	#	0.00032	-
	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	0.230		FQ	#	0.0016	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	1.100		F	#	0.0064	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	1.000		F	#	0.0032	-
Nitrate + Nitrite as Nitrogen	mg/L	0169	WL	08/09/2011	N001	3.13 - 18.13	0.01	U	F	#	0.01	-
	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	1.2	N	JF	#	0.01	-
	mg/L	0170	WL	06/14/2011	N001	92.23 - 112.23	13		F	#	0.1	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	11		F	#	0.2	-
	mg/L	0172	WL	06/14/2011	N001	6.98 - 31.98	0.01		F	#	0.01	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	0.01	U	F	#	0.01	-
	mg/L	0195	WL	08/09/2011	N001	5.29 - 25.29	0.01	U	F	#	0.01	-
	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	0.01	U	F	#	0.01	-
	mg/L	0201	WL	06/14/2011	N001	7.35 - 22.35	38		F	#	0.2	-
	mg/L	0201	WL	06/14/2011	N002	7.35 - 22.35	38		F	#	0.2	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	35		F	#	0.2	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	0.03		F	#	0.01	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Nitrate + Nitrite as Nitrogen	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	0.01	U	F	#	0.01	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	0.01	U	F	#	0.01	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	0.01	U	F	#	0.01	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	0.01	U	F	#	0.01	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	0.01	U	F	#	0.01	-
	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	34		F	#	0.2	-
	mg/L	0620	WL	06/14/2011	N001	6.70 - 10.70	19		F	#	0.1	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	24		F	#	0.2	-
	mg/L	0620	WL	11/16/2011	N002	6.70 - 10.70	25		F	#	0.2	-
	mg/L	0635	WL	08/11/2011	N001	12.00 - 17.00	4		F	#	0.05	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	17		F	#	0.2	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	4.1		F	#	0.05	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	3.9		F	#	0.05	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	3.7		F	#	0.02	-
	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	7.8		F	#	0.2	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	8.7		F	#	0.05	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	20		F	#	0.2	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	0.019		FQ	#	0.01	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	2.8		FQ	#	0.05	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	9		FQ	#	0.05	-
	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	19		FQ	#	0.2	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	2.9		F	#	0.02	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	14		F	#	0.2	-
Oxidation Reduction Potential	mV	0169	WL	08/09/2011	N001	3.13 - 18.13	54.9		F	#	-	-
	mV	0169	WL	11/18/2011	N001	3.13 - 18.13	17.5		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	0170	WL	06/14/2011	N001	92.23 - 112.23	57.5		F	#	-	-
	mV	0170	WL	11/21/2011	N001	92.23 - 112.23	120		F	#	-	-
	mV	0172	WL	06/14/2011	N001	6.98 - 31.98	-64.6		F	#	-	-
	mV	0172	WL	08/09/2011	N001	6.98 - 31.98	-88		F	#	-	-
	mV	0172	WL	11/16/2011	N001	6.98 - 31.98	-36.6		F	#	-	-
	mV	0195	WL	08/09/2011	N001	5.29 - 25.29	-58.2		F	#	-	-
	mV	0195	WL	11/17/2011	N001	5.29 - 25.29	6		F	#	-	-
	mV	0201	WL	06/14/2011	N001	7.35 - 22.35	164.3		F	#	-	-
	mV	0201	WL	11/16/2011	N001	7.35 - 22.35	233.1		F	#	-	-
	mV	0215	WL	06/13/2011	N001	6.84 - 21.84	17.3		F	#	-	-
	mV	0215	WL	11/21/2011	N001	6.84 - 21.84	120		F	#	-	-
	mV	0216	WL	08/09/2011	N001	5.50 - 20.50	-10.3		F	#	-	-
	mV	0216	WL	11/18/2011	N001	5.50 - 20.50	45.8		F	#	-	-
	mV	0217	WL	08/09/2011	N001	7.40 - 22.40	92.2		F	#	-	-
	mV	0217	WL	11/17/2011	N001	7.40 - 22.40	110		F	#	-	-
	mV	0590	WL	11/17/2011	N001	5.21 - 19.21	116.2		F	#	-	-
	mV	0620	WL	06/14/2011	N001	6.70 - 10.70	-23		F	#	-	-
	mV	0620	WL	08/09/2011	N001	6.70 - 10.70	19		F	#	-	-
	mV	0620	WL	11/16/2011	N001	6.70 - 10.70	208.4		F	#	-	-
	mV	0635	WL	08/11/2011	N001	12.00 - 17.00	203.8		F	#	-	-
	mV	0635	WL	11/17/2011	N001	12.00 - 17.00	248.2		F	#	-	-
	mV	0658	WL	06/13/2011	N001	0.50 - 5.50	156.7		F	#	-	-
	mV	0658	WL	11/18/2011	N001	0.50 - 5.50	125.0		F	#	-	-
	mV	0659	WL	06/13/2011	N001	0.50 - 10.50	159.3		F	#	-	-
	mV	0659	WL	11/18/2011	N001	0.50 - 10.50	95.2		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	0664	WL	06/13/2011	N001	7.70 - 14.70	116.8		F	#	-	-
	mV	0664	WL	11/21/2011	N001	7.70 - 14.70	240		F	#	-	-
	mV	0669	WL	06/13/2011	N001	4.00 - 10.60	162.6		FQ	#	-	-
	mV	0669	WL	11/18/2011	N001	4.00 - 10.60	111.6		FQ	#	-	-
	mV	0670	WL	06/13/2011	N001	5.20 - 12.20	112.5		FQ	#	-	-
	mV	0670	WL	11/21/2011	N001	5.20 - 12.20	210		FQ	#	-	-
	mV	0855	WL	06/13/2011	N001	6.00 - 11.00	145.6		F	#	-	-
	mV	0855	WL	11/18/2011	N001	6.00 - 11.00	119.2		F	#	-	-
pH	s.u.	0169	WL	08/09/2011	N001	3.13 - 18.13	6.95		F	#	-	-
	s.u.	0169	WL	11/18/2011	N001	3.13 - 18.13	6.97		F	#	-	-
	s.u.	0170	WL	06/14/2011	N001	92.23 - 112.23	6.95		F	#	-	-
	s.u.	0170	WL	11/21/2011	N001	92.23 - 112.23	6.99		F	#	-	-
	s.u.	0172	WL	06/14/2011	N001	6.98 - 31.98	6.91		F	#	-	-
	s.u.	0172	WL	08/09/2011	N001	6.98 - 31.98	6.95		F	#	-	-
	s.u.	0172	WL	11/16/2011	N001	6.98 - 31.98	6.92		F	#	-	-
	s.u.	0195	WL	08/09/2011	N001	5.29 - 25.29	6.95		F	#	-	-
	s.u.	0195	WL	11/17/2011	N001	5.29 - 25.29	6.94		F	#	-	-
	s.u.	0201	WL	06/14/2011	N001	7.35 - 22.35	6.76		F	#	-	-
	s.u.	0201	WL	11/16/2011	N001	7.35 - 22.35	6.84		F	#	-	-
	s.u.	0215	WL	06/13/2011	N001	6.84 - 21.84	7.13		F	#	-	-
	s.u.	0215	WL	11/21/2011	N001	6.84 - 21.84	7.20		F	#	-	-
	s.u.	0216	WL	08/09/2011	N001	5.50 - 20.50	7.49		F	#	-	-
	s.u.	0216	WL	11/18/2011	N001	5.50 - 20.50	7.46		F	#	-	-
	s.u.	0217	WL	08/09/2011	N001	7.40 - 22.40	6.80		F	#	-	-
	s.u.	0217	WL	11/17/2011	N001	7.40 - 22.40	6.81		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	0590	WL	11/17/2011	N001	5.21 - 19.21	6.70		F	#	-	-
	s.u.	0620	WL	06/14/2011	N001	6.70 - 10.70	6.99		F	#	-	-
	s.u.	0620	WL	08/09/2011	N001	6.70 - 10.70	7.08		F	#	-	-
	s.u.	0620	WL	11/16/2011	N001	6.70 - 10.70	7.12		F	#	-	-
	s.u.	0635	WL	08/11/2011	N001	12.00 - 17.00	6.94		F	#	-	-
	s.u.	0635	WL	11/17/2011	N001	12.00 - 17.00	6.77		F	#	-	-
	s.u.	0658	WL	06/13/2011	N001	0.50 - 5.50	6.79		F	#	-	-
	s.u.	0658	WL	11/18/2011	N001	0.50 - 5.50	6.79		F	#	-	-
	s.u.	0659	WL	06/13/2011	N001	0.50 - 10.50	6.96		F	#	-	-
	s.u.	0659	WL	11/18/2011	N001	0.50 - 10.50	6.93		F	#	-	-
	s.u.	0664	WL	06/13/2011	N001	7.70 - 14.70	6.82		F	#	-	-
	s.u.	0664	WL	11/21/2011	N001	7.70 - 14.70	6.69		F	#	-	-
	s.u.	0669	WL	06/13/2011	N001	4.00 - 10.60	6.87		FQ	#	-	-
	s.u.	0669	WL	11/18/2011	N001	4.00 - 10.60	6.89		FQ	#	-	-
	s.u.	0670	WL	06/13/2011	N001	5.20 - 12.20	6.89		FQ	#	-	-
	s.u.	0670	WL	11/21/2011	N001	5.20 - 12.20	6.89		FQ	#	-	-
	s.u.	0855	WL	06/13/2011	N001	6.00 - 11.00	6.68		F	#	-	-
	s.u.	0855	WL	11/18/2011	N001	6.00 - 11.00	6.70		F	#	-	-
Selenium	mg/L	0169	WL	08/09/2011	N001	3.13 - 18.13	0.0019		F	#	3.2E-05	-
	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	0.0046	E	F	#	3.2E-05	-
	mg/L	0170	WL	06/14/2011	N001	92.23 - 112.23	0.013		F	#	3.2E-05	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	0.011		F	#	3.2E-05	-
	mg/L	0172	WL	06/14/2011	N001	6.98 - 31.98	0.00052		F	#	3.2E-05	-
	mg/L	0172	WL	08/09/2011	N001	6.98 - 31.98	0.00027		F	#	3.2E-05	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	0.00032		F	#	3.2E-05	-
	mg/L	0195	WL	08/09/2011	N001	5.29 - 25.29	0.00024		F	#	3.2E-05	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Selenium	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	0.00024		F	#	3.2E-05	-
	mg/L	0201	WL	06/14/2011	N001	7.35 - 22.35	0.046		F	#	0.00032	-
	mg/L	0201	WL	06/14/2011	N002	7.35 - 22.35	0.045		F	#	0.00032	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	0.036		F	#	0.00016	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	0.0021		F	#	3.2E-05	-
	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	0.002		F	#	3.2E-05	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	0.00047		F	#	3.2E-05	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	0.00032		F	#	3.2E-05	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	0.011		F	#	0.00016	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	0.012		F	#	0.0016	-
	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	0.052		F	#	0.00016	-
	mg/L	0620	WL	06/14/2011	N001	6.70 - 10.70	0.015		F	#	3.2E-05	-
	mg/L	0620	WL	08/09/2011	N001	6.70 - 10.70	0.023		F	#	3.2E-05	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	0.031		F	#	3.2E-05	-
	mg/L	0620	WL	11/16/2011	N002	6.70 - 10.70	0.031		F	#	3.2E-05	-
	mg/L	0635	WL	08/11/2011	N001	12.00 - 17.00	0.0029		F	#	3.2E-05	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	0.0064		F	#	3.2E-05	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	1.300		F	#	0.0065	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	1.200		F	#	0.0032	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	0.038		F	#	0.00032	-
	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	0.062		F	#	0.0016	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	0.190		F	#	0.00032	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	0.084		F	#	0.00016	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	0.0046		FQ	#	0.00032	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	0.037		FQ	#	0.0016	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	0.280		FQ	#	0.00032	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Selenium	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	0.240		FQ	#	0.0016	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	1.100		F	#	0.0065	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	1.100		F	#	0.0032	-
Specific Conductance	umhos/cm	0169	WL	08/09/2011	N001	3.13 - 18.13	2752		F	#	-	-
	umhos/cm	0169	WL	11/18/2011	N001	3.13 - 18.13	2117		F	#	-	-
	umhos/cm	0170	WL	06/14/2011	N001	92.23 - 112.23	3155		F	#	-	-
	umhos/cm	0170	WL	11/21/2011	N001	92.23 - 112.23	3100		F	#	-	-
	umhos/cm	0172	WL	06/14/2011	N001	6.98 - 31.98	17604		F	#	-	-
	umhos/cm	0172	WL	08/09/2011	N001	6.98 - 31.98	17770		F	#	-	-
	umhos/cm	0172	WL	11/16/2011	N001	6.98 - 31.98	18531		F	#	-	-
	umhos/cm	0195	WL	08/09/2011	N001	5.29 - 25.29	1238		F	#	-	-
	umhos/cm	0195	WL	11/17/2011	N001	5.29 - 25.29	1438		F	#	-	-
	umhos/cm	0201	WL	06/14/2011	N001	7.35 - 22.35	4214		F	#	-	-
	umhos/cm	0201	WL	11/16/2011	N001	7.35 - 22.35	4589		F	#	-	-
	umhos/cm	0215	WL	06/13/2011	N001	6.84 - 21.84	1673		F	#	-	-
	umhos/cm	0215	WL	11/21/2011	N001	6.84 - 21.84	1435		F	#	-	-
	umhos/cm	0216	WL	08/09/2011	N001	5.50 - 20.50	1020		F	#	-	-
	umhos/cm	0216	WL	11/18/2011	N001	5.50 - 20.50	826		F	#	-	-
	umhos/cm	0217	WL	08/09/2011	N001	7.40 - 22.40	3759		F	#	-	-
	umhos/cm	0217	WL	11/17/2011	N001	7.40 - 22.40	3440		F	#	-	-
	umhos/cm	0590	WL	11/17/2011	N001	5.21 - 19.21	5248		F	#	-	-
	umhos/cm	0620	WL	06/14/2011	N001	6.70 - 10.70	6557		F	#	-	-
	umhos/cm	0620	WL	08/09/2011	N001	6.70 - 10.70	6661		F	#	-	-
	umhos/cm	0620	WL	11/16/2011	N001	6.70 - 10.70	6703		F	#	-	-
	umhos/cm	0635	WL	08/11/2011	N001	12.00 - 17.00	2632		F	#	-	-
	umhos/cm	0635	WL	11/17/2011	N001	12.00 - 17.00	3959		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	0658	WL	06/13/2011	N001	0.50 - 5.50	2696		F	#	-	-
	umhos/cm	0658	WL	11/18/2011	N001	0.50 - 5.50	2896		F	#	-	-
	umhos/cm	0659	WL	06/13/2011	N001	0.50 - 10.50	3370		F	#	-	-
	umhos/cm	0659	WL	11/18/2011	N001	0.50 - 10.50	3467		F	#	-	-
	umhos/cm	0664	WL	06/13/2011	N001	7.70 - 14.70	2530		F	#	-	-
	umhos/cm	0664	WL	11/21/2011	N001	7.70 - 14.70	2660		F	#	-	-
	umhos/cm	0669	WL	06/13/2011	N001	4.00 - 10.60	4069		FQ	#	-	-
	umhos/cm	0669	WL	11/18/2011	N001	4.00 - 10.60	3039		FQ	#	-	-
	umhos/cm	0670	WL	06/13/2011	N001	5.20 - 12.20	2366		FQ	#	-	-
	umhos/cm	0670	WL	11/21/2011	N001	5.20 - 12.20	2380		FQ	#	-	-
	umhos/cm	0855	WL	06/13/2011	N001	6.00 - 11.00	2515		F	#	-	-
	umhos/cm	0855	WL	11/18/2011	N001	6.00 - 11.00	2741		F	#	-	-
Temperature	C	0169	WL	08/09/2011	N001	3.13 - 18.13	15.47		F	#	-	-
	C	0169	WL	11/18/2011	N001	3.13 - 18.13	15.00		F	#	-	-
	C	0170	WL	06/14/2011	N001	92.23 - 112.23	14.94		F	#	-	-
	C	0170	WL	11/21/2011	N001	92.23 - 112.23	13.8		F	#	-	-
	C	0172	WL	06/14/2011	N001	6.98 - 31.98	14.84		F	#	-	-
	C	0172	WL	08/09/2011	N001	6.98 - 31.98	14.95		F	#	-	-
	C	0172	WL	11/16/2011	N001	6.98 - 31.98	14.23		F	#	-	-
	C	0195	WL	08/09/2011	N001	5.29 - 25.29	18.77		F	#	-	-
	C	0195	WL	11/17/2011	N001	5.29 - 25.29	13.49		F	#	-	-
	C	0201	WL	06/14/2011	N001	7.35 - 22.35	13.14		F	#	-	-
	C	0201	WL	11/16/2011	N001	7.35 - 22.35	14.03		F	#	-	-
	C	0215	WL	06/13/2011	N001	6.84 - 21.84	13.20		F	#	-	-
	C	0215	WL	11/21/2011	N001	6.84 - 21.84	14.7		F	#	-	-
	C	0216	WL	08/09/2011	N001	5.50 - 20.50	16.34		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0216	WL	11/18/2011	N001	5.50 - 20.50	13.26		F	#	-	-
	C	0217	WL	08/09/2011	N001	7.40 - 22.40	15.42		F	#	-	-
	C	0217	WL	11/17/2011	N001	7.40 - 22.40	10.28		F	#	-	-
	C	0590	WL	11/17/2011	N001	5.21 - 19.21	13.45		F	#	-	-
	C	0620	WL	06/14/2011	N001	6.70 - 10.70	14.42		F	#	-	-
	C	0620	WL	08/09/2011	N001	6.70 - 10.70	16.44		F	#	-	-
	C	0620	WL	11/16/2011	N001	6.70 - 10.70	13.50		F	#	-	-
	C	0635	WL	08/11/2011	N001	12.00 - 17.00	16.11		F	#	-	-
	C	0635	WL	11/17/2011	N001	12.00 - 17.00	10.77		F	#	-	-
	C	0658	WL	06/13/2011	N001	0.50 - 5.50	18.35		F	#	-	-
	C	0658	WL	11/18/2011	N001	0.50 - 5.50	12.88		F	#	-	-
	C	0659	WL	06/13/2011	N001	0.50 - 10.50	15.45		F	#	-	-
	C	0659	WL	11/18/2011	N001	0.50 - 10.50	12.60		F	#	-	-
	C	0664	WL	06/13/2011	N001	7.70 - 14.70	14.56		F	#	-	-
	C	0664	WL	11/21/2011	N001	7.70 - 14.70	13.4		F	#	-	-
	C	0669	WL	06/13/2011	N001	4.00 - 10.60	18.24		FQ	#	-	-
	C	0669	WL	11/18/2011	N001	4.00 - 10.60	13.70		FQ	#	-	-
	C	0670	WL	06/13/2011	N001	5.20 - 12.20	15.02		FQ	#	-	-
	C	0670	WL	11/21/2011	N001	5.20 - 12.20	13.8		FQ	#	-	-
	C	0855	WL	06/13/2011	N001	6.00 - 11.00	15.57		F	#	-	-
	C	0855	WL	11/18/2011	N001	6.00 - 11.00	13.57		F	#	-	-
Turbidity	NTU	0169	WL	08/09/2011	N001	3.13 - 18.13	1.43		F	#	-	-
	NTU	0169	WL	11/18/2011	N001	3.13 - 18.13	1.10		F	#	-	-
	NTU	0170	WL	06/14/2011	N001	92.23 - 112.23	1.73		F	#	-	-
	NTU	0170	WL	11/21/2011	N001	92.23 - 112.23	1.38		F	#	-	-
	NTU	0172	WL	06/14/2011	N001	6.98 - 31.98	9.85		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	0172	WL	08/09/2011	N001	6.98 - 31.98	1.73		F	#	-	-
	NTU	0172	WL	11/16/2011	N001	6.98 - 31.98	1.83		F	#	-	-
	NTU	0195	WL	08/09/2011	N001	5.29 - 25.29	3.80		F	#	-	-
	NTU	0195	WL	11/17/2011	N001	5.29 - 25.29	2.39		F	#	-	-
	NTU	0201	WL	06/14/2011	N001	7.35 - 22.35	1.25		F	#	-	-
	NTU	0201	WL	11/16/2011	N001	7.35 - 22.35	1.67		F	#	-	-
	NTU	0215	WL	06/13/2011	N001	6.84 - 21.84	1.19		F	#	-	-
	NTU	0215	WL	11/21/2011	N001	6.84 - 21.84	2.82		F	#	-	-
	NTU	0216	WL	08/09/2011	N001	5.50 - 20.50	1.03		F	#	-	-
	NTU	0216	WL	11/18/2011	N001	5.50 - 20.50	4.48		F	#	-	-
	NTU	0217	WL	08/09/2011	N001	7.40 - 22.40	1.40		F	#	-	-
	NTU	0217	WL	11/17/2011	N001	7.40 - 22.40	1.74		F	#	-	-
	NTU	0590	WL	11/17/2011	N001	5.21 - 19.21	0.98		F	#	-	-
	NTU	0620	WL	06/14/2011	N001	6.70 - 10.70	2.56		F	#	-	-
	NTU	0620	WL	08/09/2011	N001	6.70 - 10.70	1.42		F	#	-	-
	NTU	0620	WL	11/16/2011	N001	6.70 - 10.70	1.97		F	#	-	-
	NTU	0635	WL	08/11/2011	N001	12.00 - 17.00	4.40		F	#	-	-
	NTU	0635	WL	11/17/2011	N001	12.00 - 17.00	1.89		F	#	-	-
	NTU	0658	WL	06/13/2011	N001	0.50 - 5.50	2.48		F	#	-	-
	NTU	0658	WL	11/18/2011	N001	0.50 - 5.50	4.40		F	#	-	-
	NTU	0659	WL	06/13/2011	N001	0.50 - 10.50	2.4		F	#	-	-
	NTU	0659	WL	11/18/2011	N001	0.50 - 10.50	2.65		F	#	-	-
	NTU	0664	WL	06/13/2011	N001	7.70 - 14.70	7.2		F	#	-	-
	NTU	0664	WL	11/21/2011	N001	7.70 - 14.70	7.77		F	#	-	-
	NTU	0669	WL	06/13/2011	N001	4.00 - 10.60	6.73		FQ	#	-	-
	NTU	0669	WL	11/18/2011	N001	4.00 - 10.60	23.1		FQ	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	0670	WL	06/13/2011	N001	5.20 - 12.20	5.23		FQ	#	-	-
	NTU	0670	WL	11/21/2011	N001	5.20 - 12.20	9.64		FQ	#	-	-
	NTU	0855	WL	06/13/2011	N001	6.00 - 11.00	5.33		F	#	-	-
	NTU	0855	WL	11/18/2011	N001	6.00 - 11.00	7.65		F	#	-	-
Uranium	mg/L	0169	WL	08/09/2011	N001	3.13 - 18.13	0.026		F	#	2.9E-06	-
	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	0.019		F	#	2.9E-06	-
	mg/L	0170	WL	06/14/2011	N001	92.23 - 112.23	0.059		F	#	2.9E-06	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	0.053		F	#	2.9E-06	-
	mg/L	0172	WL	06/14/2011	N001	6.98 - 31.98	0.068		F	#	2.9E-06	-
	mg/L	0172	WL	08/09/2011	N001	6.98 - 31.98	0.066		F	#	2.9E-06	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	0.068		F	#	2.9E-06	-
	mg/L	0195	WL	08/09/2011	N001	5.29 - 25.29	0.012		F	#	2.9E-06	-
	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	0.018		F	#	2.9E-06	-
	mg/L	0201	WL	06/14/2011	N001	7.35 - 22.35	0.099		F	#	2.9E-05	-
	mg/L	0201	WL	06/14/2011	N002	7.35 - 22.35	0.094		F	#	2.9E-05	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	0.089		F	#	1.5E-05	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	0.029		F	#	2.9E-06	-
	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	0.024		F	#	2.9E-06	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	0.033		F	#	2.9E-05	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	0.016		F	#	1.5E-05	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	0.120		F	#	0.00015	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	0.140		F	#	0.00015	-
	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	0.073		F	#	1.5E-05	-
	mg/L	0620	WL	06/14/2011	N001	6.70 - 10.70	0.069		F	#	2.9E-06	-
	mg/L	0620	WL	08/09/2011	N001	6.70 - 10.70	0.066		F	#	2.9E-06	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	0.061		F	#	2.9E-06	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	0620	WL	11/16/2011	N002	6.70 - 10.70	0.061		F	#	2.9E-06	-
	mg/L	0635	WL	08/11/2011	N001	12.00 - 17.00	0.049		F	#	1.5E-05	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	0.080		F	#	2.9E-06	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	0.065		F	#	0.00058	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	0.053		F	#	0.00029	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	0.089		F	#	2.9E-05	-
	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	0.098		F	#	0.00015	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	0.069		F	#	2.9E-05	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	0.074		F	#	1.5E-05	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	0.130		FQ	#	2.9E-05	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	0.110		FQ	#	0.00015	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	0.190		FQ	#	2.9E-05	-
	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	0.072		FQ	#	0.00015	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	0.054		F	#	0.00058	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	0.034		F	#	0.00029	-
Vanadium	mg/L	0169	WL	11/18/2011	N001	3.13 - 18.13	0.00088	E	UJF	#	1.5E-05	-
	mg/L	0170	WL	11/21/2011	N001	92.23 - 112.23	0.0008		JF	#	1.5E-05	-
	mg/L	0172	WL	11/16/2011	N001	6.98 - 31.98	0.00057		JF	#	1.5E-05	-
	mg/L	0195	WL	11/17/2011	N001	5.29 - 25.29	0.00062		JF	#	1.5E-05	-
	mg/L	0201	WL	11/16/2011	N001	7.35 - 22.35	0.00039		JF	#	1.5E-05	-
	mg/L	0215	WL	06/13/2011	N001	6.84 - 21.84	0.0021	E	F	#	1.5E-05	-
	mg/L	0215	WL	11/21/2011	N001	6.84 - 21.84	0.011		F	#	1.5E-05	-
	mg/L	0216	WL	08/09/2011	N001	5.50 - 20.50	0.160		F	#	0.00015	-
	mg/L	0216	WL	11/18/2011	N001	5.50 - 20.50	0.170		F	#	7.6E-05	-
	mg/L	0217	WL	08/09/2011	N001	7.40 - 22.40	1.700		F	#	0.00076	-
	mg/L	0217	WL	11/17/2011	N001	7.40 - 22.40	1.800		F	#	0.00076	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Vanadium	mg/L	0590	WL	11/17/2011	N001	5.21 - 19.21	0.540		F	#	7.6E-05	-
	mg/L	0620	WL	11/16/2011	N001	6.70 - 10.70	0.0017		JF	#	1.5E-05	-
	mg/L	0620	WL	11/16/2011	N002	6.70 - 10.70	0.0017		JF	#	1.5E-05	-
	mg/L	0635	WL	11/17/2011	N001	12.00 - 17.00	0.00039		JF	#	1.5E-05	-
	mg/L	0658	WL	06/13/2011	N001	0.50 - 5.50	38.000		F	#	0.003	-
	mg/L	0658	WL	11/18/2011	N001	0.50 - 5.50	31.000		F	#	0.0015	-
	mg/L	0659	WL	06/13/2011	N001	0.50 - 10.50	0.650		F	#	0.00015	-
	mg/L	0659	WL	11/18/2011	N001	0.50 - 10.50	2.900		F	#	0.00076	-
	mg/L	0664	WL	06/13/2011	N001	7.70 - 14.70	2.800		F	#	0.00015	-
	mg/L	0664	WL	11/21/2011	N001	7.70 - 14.70	0.880		F	#	7.6E-05	-
	mg/L	0669	WL	06/13/2011	N001	4.00 - 10.60	0.730		FQ	#	0.00015	-
	mg/L	0669	WL	11/18/2011	0001	4.00 - 10.60	3.600		FQ	#	0.00076	-
	mg/L	0670	WL	06/13/2011	N001	5.20 - 12.20	1.700		FQ	#	0.00015	-
	mg/L	0670	WL	11/21/2011	N001	5.20 - 12.20	1.900		FQ	#	0.00076	-
	mg/L	0855	WL	06/13/2011	N001	6.00 - 11.00	28.000		F	#	0.003	-
	mg/L	0855	WL	11/18/2011	N001	6.00 - 11.00	21.000		F	#	0.0015	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 1:59 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY

RECORDS: SELECTED FROM USEE200 WHERE site_code='RFN01' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2011# and #12/30/2011#

SAMPLE ID CODES: 000X = Filtered sample. N00X = Unfiltered sample. X = replicate number.

LOCATION TYPES: WL WELL

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	N	Presumptive evidence that analyte is present. The analyte is "tentatively identified".	Q	Qualitative result due to sampling technique
R	Unusable result.	U	Parameter analyzed for but was not detected.	X	Location is undefined.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

This page intentionally left blank

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	0292A	WL	06/14/2011	N001	10.50 - 20.50	488		F	#	-	-
	mg/L	0292A	WL	11/15/2011	N001	10.50 - 20.50	479		F	#	-	-
	mg/L	0304	WL	06/15/2011	N001	13.20 - 18.20	261		F	#	-	-
	mg/L	0304	WL	11/15/2011	N001	13.20 - 18.20	329		F	#	-	-
	mg/L	0305	WL	06/14/2011	N001	13.76 - 18.76	352		F	#	-	-
	mg/L	0305	WL	11/15/2011	N001	13.76 - 18.76	347		F	#	-	-
	mg/L	0309	WL	06/14/2011	N001	16.93 - 21.93	388		F	#	-	-
	mg/L	0309	WL	11/15/2011	N001	16.93 - 21.93	379		F	#	-	-
	mg/L	0310	WL	06/15/2011	N001	17.93 - 22.93	504		F	#	-	-
	mg/L	0310	WL	11/15/2011	N001	17.93 - 22.93	460		F	#	-	-
	mg/L	0655	WL	06/14/2011	N001	13.60 - 23.60	446		F	#	-	-
	mg/L	0655	WL	11/15/2011	N001	13.60 - 23.60	468		F	#	-	-
	mg/L	0656	WL	06/14/2011	N001	6.35 - 21.35	467		F	#	-	-
	mg/L	0656	WL	11/15/2011	N001	6.35 - 21.35	380		F	#	-	-
	mg/L	0658	WL	06/14/2011	N001	2.30 - 17.30	448		F	#	-	-
	mg/L	0658	WL	11/15/2011	N001	2.30 - 17.30	427		F	#	-	-
	mg/L	0742-2	WL	11/18/2011	N001	14.05 - 14.55	349		F	#	-	-
	mg/L	0742-3	WL	11/18/2011	N001	18.05 - 18.55	284		F	#	-	-
	mg/L	0743-2	WL	11/18/2011	N001	12.20 - 12.70	419		F	#	-	-
	mg/L	0743-3	WL	11/18/2011	N001	16.20 - 16.70	424		F	#	-	-
	mg/L	0744-1	WL	11/18/2011	N001	11.20 - 11.70	629		F	#	-	-
	mg/L	0744-2	WL	11/18/2011	N001	15.20 - 15.70	488		F	#	-	-
	mg/L	0744-3	WL	11/18/2011	N001	19.20 - 19.70	472			#	-	-
	mg/L	B-04	WL	06/15/2011	N001	5.00 - 20.00	506		F	#	-	-
	mg/L	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	379		F	#	-	-
	mg/L	LQ-108	WL	06/15/2011	N001		474		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	435		F	#	-	-
Oxidation Reduction Potential	mV	0292A	WL	06/14/2011	N001	10.50 - 20.50	68.3		F	#	-	-
	mV	0292A	WL	11/15/2011	N001	10.50 - 20.50	121		F	#	-	-
	mV	0304	WL	06/15/2011	N001	13.20 - 18.20	13.7		F	#	-	-
	mV	0304	WL	11/15/2011	N001	13.20 - 18.20	74.5		F	#	-	-
	mV	0305	WL	06/14/2011	N001	13.76 - 18.76	122.4		F	#	-	-
	mV	0305	WL	11/15/2011	N001	13.76 - 18.76	103		F	#	-	-
	mV	0309	WL	06/14/2011	N001	16.93 - 21.93	12.7		F	#	-	-
	mV	0309	WL	11/15/2011	N001	16.93 - 21.93	15.2		F	#	-	-
	mV	0310	WL	06/15/2011	N001	17.93 - 22.93	6.3		F	#	-	-
	mV	0310	WL	11/15/2011	N001	17.93 - 22.93	10.6		F	#	-	-
	mV	0655	WL	06/14/2011	N001	13.60 - 23.60	123.0		F	#	-	-
	mV	0655	WL	11/15/2011	N001	13.60 - 23.60	72.5		F	#	-	-
	mV	0656	WL	06/14/2011	N001	6.35 - 21.35	108.8		F	#	-	-
	mV	0656	WL	11/15/2011	N001	6.35 - 21.35	103		F	#	-	-
	mV	0658	WL	06/14/2011	N001	2.30 - 17.30	93.6		F	#	-	-
	mV	0658	WL	11/15/2011	N001	2.30 - 17.30	83		F	#	-	-
	mV	0742-2	WL	11/18/2011	N001	14.05 - 14.55	181.0		F	#	-	-
	mV	0742-3	WL	11/18/2011	N001	18.05 - 18.55	85.2		F	#	-	-
	mV	0743-2	WL	11/18/2011	N001	12.20 - 12.70	69.4		F	#	-	-
	mV	0743-3	WL	11/18/2011	N001	16.20 - 16.70	52.8		F	#	-	-
	mV	0744-1	WL	11/18/2011	N001	11.20 - 11.70	-34.7		F	#	-	-
	mV	0744-2	WL	11/18/2011	N001	15.20 - 15.70	-38.9		F	#	-	-
	mV	0744-3	WL	11/18/2011	N001	19.20 - 19.70	-23.1			#	-	-
	mV	B-04	WL	06/15/2011	N001	5.00 - 20.00	149.0		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	-105.8		F	#	-	-
	mV	LQ-108	WL	06/15/2011	N001		183.1		F	#	-	-
	mV	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	39.7		F	#	-	-
pH	s.u.	0292A	WL	06/14/2011	N001	10.50 - 20.50	6.99		F	#	-	-
	s.u.	0292A	WL	11/15/2011	N001	10.50 - 20.50	7.02		F	#	-	-
	s.u.	0304	WL	06/15/2011	N001	13.20 - 18.20	7.12		F	#	-	-
	s.u.	0304	WL	11/15/2011	N001	13.20 - 18.20	7.02		F	#	-	-
	s.u.	0305	WL	06/14/2011	N001	13.76 - 18.76	7.15		F	#	-	-
	s.u.	0305	WL	11/15/2011	N001	13.76 - 18.76	7.22		F	#	-	-
	s.u.	0309	WL	06/14/2011	N001	16.93 - 21.93	7.00		F	#	-	-
	s.u.	0309	WL	11/15/2011	N001	16.93 - 21.93	7.04		F	#	-	-
	s.u.	0310	WL	06/15/2011	N001	17.93 - 22.93	6.97		F	#	-	-
	s.u.	0310	WL	11/15/2011	N001	17.93 - 22.93	7.04		F	#	-	-
	s.u.	0655	WL	06/14/2011	N001	13.60 - 23.60	6.97		F	#	-	-
	s.u.	0655	WL	11/15/2011	N001	13.60 - 23.60	6.90		F	#	-	-
	s.u.	0656	WL	06/14/2011	N001	6.35 - 21.35	7.01		F	#	-	-
	s.u.	0656	WL	11/15/2011	N001	6.35 - 21.35	7.01		F	#	-	-
	s.u.	0658	WL	06/14/2011	N001	2.30 - 17.30	6.98		F	#	-	-
	s.u.	0658	WL	11/15/2011	N001	2.30 - 17.30	7.00		F	#	-	-
	s.u.	0742-2	WL	11/18/2011	N001	14.05 - 14.55	7.11		F	#	-	-
	s.u.	0742-3	WL	11/18/2011	N001	18.05 - 18.55	7.33		F	#	-	-
	s.u.	0743-2	WL	11/18/2011	N001	12.20 - 12.70	6.81		F	#	-	-
	s.u.	0743-3	WL	11/18/2011	N001	16.20 - 16.70	6.98		F	#	-	-
	s.u.	0744-1	WL	11/18/2011	N001	11.20 - 11.70	6.66		F	#	-	-
	s.u.	0744-2	WL	11/18/2011	N001	15.20 - 15.70	6.95		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	0744-3	WL	11/18/2011	N001	19.20 - 19.70	6.94			#	-	-
	s.u.	B-04	WL	06/15/2011	N001	5.00 - 20.00	6.98		F	#	-	-
	s.u.	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	7.20		F	#	-	-
	s.u.	LQ-108	WL	06/15/2011	N001		6.91		F	#	-	-
	s.u.	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	6.85		F	#	-	-
Selenium	mg/L	0292A	WL	06/14/2011	N001	10.50 - 20.50	0.027		F	#	3.2E-05	-
	mg/L	0292A	WL	11/15/2011	N001	10.50 - 20.50	0.00028		F	#	3.2E-05	-
	mg/L	0304	WL	06/15/2011	N001	13.20 - 18.20	0.0022		F	#	3.2E-05	-
	mg/L	0304	WL	11/15/2011	N001	13.20 - 18.20	0.0022		F	#	3.2E-05	-
	mg/L	0305	WL	06/14/2011	N001	13.76 - 18.76	0.031		F	#	0.00016	-
	mg/L	0305	WL	11/15/2011	N001	13.76 - 18.76	0.023		F	#	0.00016	-
	mg/L	0305	WL	11/15/2011	N002	13.76 - 18.76	0.024		F	#	0.00016	-
	mg/L	0309	WL	06/14/2011	N001	16.93 - 21.93	0.00017		F	#	3.2E-05	-
	mg/L	0309	WL	11/15/2011	N001	16.93 - 21.93	0.00017		F	#	3.2E-05	-
	mg/L	0310	WL	06/15/2011	N001	17.93 - 22.93	0.0027		F	#	0.00016	-
	mg/L	0310	WL	06/15/2011	N002	17.93 - 22.93	0.0026		F	#	0.00016	-
	mg/L	0310	WL	11/15/2011	N001	17.93 - 22.93	0.00055		F	#	0.00016	-
	mg/L	0655	WL	06/14/2011	N001	13.60 - 23.60	0.076		F	#	0.00016	-
	mg/L	0655	WL	11/15/2011	N001	13.60 - 23.60	0.012		F	#	0.00016	-
	mg/L	0656	WL	06/14/2011	N001	6.35 - 21.35	0.00094		F	#	0.00016	-
	mg/L	0656	WL	11/15/2011	N001	6.35 - 21.35	0.017		F	#	0.00016	-
	mg/L	0658	WL	06/14/2011	N001	2.30 - 17.30	0.013		F	#	3.2E-05	-
	mg/L	0658	WL	11/15/2011	N001	2.30 - 17.30	0.00042		F	#	3.2E-05	-
	mg/L	0742-2	WL	11/18/2011	N001	14.05 - 14.55	0.0073		F	#	0.00016	-
	mg/L	0742-3	WL	11/18/2011	N001	18.05 - 18.55	0.00091		F	#	0.00016	-
	mg/L	0743-2	WL	11/18/2011	N001	12.20 - 12.70	0.160		F	#	0.0016	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Selenium	mg/L	0743-3	WL	11/18/2011	N001	16.20 - 16.70	0.022		F	#	0.0016	-
	mg/L	0744-1	WL	11/18/2011	N001	11.20 - 11.70	0.0011		F	#	3.2E-05	-
	mg/L	0744-2	WL	11/18/2011	N001	15.20 - 15.70	0.001		F	#	6.5E-05	-
	mg/L	0744-3	WL	11/18/2011	N001	19.20 - 19.70	0.00093			#	6.5E-05	-
	mg/L	B-04	WL	06/15/2011	N001	5.00 - 20.00	0.140		F	#	0.0032	-
	mg/L	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	0.00063		F	#	0.00016	-
	mg/L	LQ-108	WL	06/15/2011	N001		0.063		F	#	0.0032	-
	mg/L	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	0.0018		F	#	3.2E-05	-
Specific Conductance	umhos/cm	0292A	WL	06/14/2011	N001	10.50 - 20.50	2142		F	#	-	-
	umhos/cm	0292A	WL	11/15/2011	N001	10.50 - 20.50	2087		F	#	-	-
	umhos/cm	0304	WL	06/15/2011	N001	13.20 - 18.20	2212		F	#	-	-
	umhos/cm	0304	WL	11/15/2011	N001	13.20 - 18.20	2285		F	#	-	-
	umhos/cm	0305	WL	06/14/2011	N001	13.76 - 18.76	2156		F	#	-	-
	umhos/cm	0305	WL	11/15/2011	N001	13.76 - 18.76	1866		F	#	-	-
	umhos/cm	0309	WL	06/14/2011	N001	16.93 - 21.93	2351		F	#	-	-
	umhos/cm	0309	WL	11/15/2011	N001	16.93 - 21.93	2481		F	#	-	-
	umhos/cm	0310	WL	06/15/2011	N001	17.93 - 22.93	2627		F	#	-	-
	umhos/cm	0310	WL	11/15/2011	N001	17.93 - 22.93	2715		F	#	-	-
	umhos/cm	0655	WL	06/14/2011	N001	13.60 - 23.60	2512		F	#	-	-
	umhos/cm	0655	WL	11/15/2011	N001	13.60 - 23.60	2070		F	#	-	-
	umhos/cm	0656	WL	06/14/2011	N001	6.35 - 21.35	2107		F	#	-	-
	umhos/cm	0656	WL	11/15/2011	N001	6.35 - 21.35	2269		F	#	-	-
	umhos/cm	0658	WL	06/14/2011	N001	2.30 - 17.30	1734		F	#	-	-
	umhos/cm	0658	WL	11/15/2011	N001	2.30 - 17.30	1399		F	#	-	-
	umhos/cm	0742-2	WL	11/18/2011	N001	14.05 - 14.55	1500		F	#	-	-
	umhos/cm	0742-3	WL	11/18/2011	N001	18.05 - 18.55	1546		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	0743-2	WL	11/18/2011	N001	12.20 - 12.70	2482		F	#	-	-
	umhos/cm	0743-3	WL	11/18/2011	N001	16.20 - 16.70	2605		F	#	-	-
	umhos/cm	0744-1	WL	11/18/2011	N001	11.20 - 11.70	2928		F	#	-	-
	umhos/cm	0744-2	WL	11/18/2011	N001	15.20 - 15.70	2419		F	#	-	-
	umhos/cm	0744-3	WL	11/18/2011	N001	19.20 - 19.70	2418			#	-	-
	umhos/cm	B-04	WL	06/15/2011	N001	5.00 - 20.00	2676		F	#	-	-
	umhos/cm	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	2052		F	#	-	-
	umhos/cm	LQ-108	WL	06/15/2011	N001		2773		F	#	-	-
	umhos/cm	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	1809		F	#	-	-
Stable isotope ratio H2/H1 in Water	parts per t	0304	WL	06/15/2011	0001	13.20 - 18.20	-117.81			#	-	-
	parts per t	0310	WL	06/15/2011	0001	17.93 - 22.93	-112.3			#	-	-
	parts per t	LQ-107	WL	06/15/2011	0001	9.67 - 19.67	-116.66			#	-	-
	parts per t	LQ-109	WL	06/15/2011	0001	9.60 - 19.60	-115.06			#	-	-
Stable isotope ratio O18/O16 in Water	parts per t	0304	WL	06/15/2011	0001	13.20 - 18.20	-15.48			#	-	-
	parts per t	0310	WL	06/15/2011	0001	17.93 - 22.93	-15.03			#	-	-
	parts per t	LQ-107	WL	06/15/2011	0001	9.67 - 19.67	-15.36			#	-	-
	parts per t	LQ-109	WL	06/15/2011	0001	9.60 - 19.60	-15.14			#	-	-
Stable isotope ratio S-34/S-32 in Sulfate	parts per t	0304	WL	06/15/2011	0001	13.20 - 18.20	-4.04			#	-	-
	parts per t	0310	WL	06/15/2011	0001	17.93 - 22.93	-7.06			#	-	-
	parts per t	LQ-107	WL	06/15/2011	0001	9.67 - 19.67	-5.84			#	-	-
	parts per t	LQ-109	WL	06/15/2011	0001	9.60 - 19.60	-3.5			#	-	-
Temperature	C	0292A	WL	06/14/2011	N001	10.50 - 20.50	13.10		F	#	-	-
	C	0292A	WL	11/15/2011	N001	10.50 - 20.50	13.83		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0304	WL	06/15/2011	N001	13.20 - 18.20	11.83		F	#	-	-
	C	0304	WL	11/15/2011	N001	13.20 - 18.20	13.82		F	#	-	-
	C	0305	WL	06/14/2011	N001	13.76 - 18.76	12.82		F	#	-	-
	C	0305	WL	11/15/2011	N001	13.76 - 18.76	14.57		F	#	-	-
	C	0309	WL	06/14/2011	N001	16.93 - 21.93	14.02		F	#	-	-
	C	0309	WL	11/15/2011	N001	16.93 - 21.93	14.35		F	#	-	-
	C	0310	WL	06/15/2011	N001	17.93 - 22.93	13.68		F	#	-	-
	C	0310	WL	11/15/2011	N001	17.93 - 22.93	14.62		F	#	-	-
	C	0655	WL	06/14/2011	N001	13.60 - 23.60	13.47		F	#	-	-
	C	0655	WL	11/15/2011	N001	13.60 - 23.60	14.27		F	#	-	-
	C	0656	WL	06/14/2011	N001	6.35 - 21.35	14.06		F	#	-	-
	C	0656	WL	11/15/2011	N001	6.35 - 21.35	16.53		F	#	-	-
	C	0658	WL	06/14/2011	N001	2.30 - 17.30	10.27		F	#	-	-
	C	0658	WL	11/15/2011	N001	2.30 - 17.30	10.31		F	#	-	-
	C	0742-2	WL	11/18/2011	N001	14.05 - 14.55	12.33		F	#	-	-
	C	0742-3	WL	11/18/2011	N001	18.05 - 18.55	12.43		F	#	-	-
	C	0743-2	WL	11/18/2011	N001	12.20 - 12.70	14.23		F	#	-	-
	C	0743-3	WL	11/18/2011	N001	16.20 - 16.70	14.43		F	#	-	-
	C	0744-1	WL	11/18/2011	N001	11.20 - 11.70	14.59		F	#	-	-
	C	0744-2	WL	11/18/2011	N001	15.20 - 15.70	14.45		F	#	-	-
	C	0744-3	WL	11/18/2011	N001	19.20 - 19.70	14.59			#	-	-
	C	B-04	WL	06/15/2011	N001	5.00 - 20.00	14.42		F	#	-	-
	C	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	13.71		F	#	-	-
	C	LQ-108	WL	06/15/2011	N001		18.75		F	#	-	-
	C	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	13.64		F	#	-	-
Turbidity	NTU	0292A	WL	06/14/2011	N001	10.50 - 20.50	3.1		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	0292A	WL	11/15/2011	N001	10.50 - 20.50	0.79		F	#	-	-
	NTU	0304	WL	06/15/2011	N001	13.20 - 18.20	1.31		F	#	-	-
	NTU	0304	WL	11/15/2011	N001	13.20 - 18.20	0.73		F	#	-	-
	NTU	0305	WL	06/14/2011	N001	13.76 - 18.76	1.30		F	#	-	-
	NTU	0305	WL	11/15/2011	N001	13.76 - 18.76	1.85		F	#	-	-
	NTU	0309	WL	06/14/2011	N001	16.93 - 21.93	1.67		F	#	-	-
	NTU	0309	WL	11/15/2011	N001	16.93 - 21.93	1.17		F	#	-	-
	NTU	0310	WL	06/15/2011	N001	17.93 - 22.93	1.28		F	#	-	-
	NTU	0310	WL	11/15/2011	N001	17.93 - 22.93	6.96		F	#	-	-
	NTU	0655	WL	06/14/2011	N001	13.60 - 23.60	1.72		F	#	-	-
	NTU	0655	WL	11/15/2011	N001	13.60 - 23.60	0.56		F	#	-	-
	NTU	0656	WL	06/14/2011	N001	6.35 - 21.35	1.01		F	#	-	-
	NTU	0656	WL	11/15/2011	N001	6.35 - 21.35	0.95		F	#	-	-
	NTU	0658	WL	06/14/2011	N001	2.30 - 17.30	1.69		F	#	-	-
	NTU	0658	WL	11/15/2011	N001	2.30 - 17.30	2.19		F	#	-	-
	NTU	0742-2	WL	11/18/2011	N001	14.05 - 14.55	1.84		F	#	-	-
	NTU	0742-3	WL	11/18/2011	N001	18.05 - 18.55	1.46		F	#	-	-
	NTU	0743-2	WL	11/18/2011	N001	12.20 - 12.70	8.98		F	#	-	-
	NTU	0743-3	WL	11/18/2011	N001	16.20 - 16.70	5.56		F	#	-	-
	NTU	0744-1	WL	11/18/2011	N001	11.20 - 11.70	6.80		F	#	-	-
	NTU	0744-2	WL	11/18/2011	N001	15.20 - 15.70	7.35		F	#	-	-
	NTU	0744-3	WL	11/18/2011	N001	19.20 - 19.70	2.59			#	-	-
	NTU	B-04	WL	06/15/2011	N001	5.00 - 20.00	6.15		F	#	-	-
	NTU	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	6.94		F	#	-	-
	NTU	LQ-108	WL	06/15/2011	N001		7.30		F	#	-	-
	NTU	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	0.55		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	QUALIFIERS: DATA	QUALIFIERS: QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	0292A	WL	06/14/2011	N001	10.50 - 20.50	0.030		F	#	2.9E-06	-
	mg/L	0292A	WL	11/15/2011	N001	10.50 - 20.50	0.025		F	#	2.9E-06	-
	mg/L	0304	WL	06/15/2011	N001	13.20 - 18.20	0.044		F	#	2.9E-06	-
	mg/L	0304	WL	11/15/2011	N001	13.20 - 18.20	0.044		F	#	2.9E-06	-
	mg/L	0305	WL	06/14/2011	N001	13.76 - 18.76	0.057		F	#	1.5E-05	-
	mg/L	0305	WL	11/15/2011	N001	13.76 - 18.76	0.059		F	#	1.5E-05	-
	mg/L	0305	WL	11/15/2011	N002	13.76 - 18.76	0.062		F	#	1.5E-05	-
	mg/L	0309	WL	06/14/2011	N001	16.93 - 21.93	0.022		F	#	2.9E-06	-
	mg/L	0309	WL	11/15/2011	N001	16.93 - 21.93	0.017		F	#	2.9E-06	-
	mg/L	0310	WL	06/15/2011	N001	17.93 - 22.93	0.200		F	#	1.5E-05	-
	mg/L	0310	WL	06/15/2011	N002	17.93 - 22.93	0.200		F	#	1.5E-05	-
	mg/L	0310	WL	11/15/2011	N001	17.93 - 22.93	0.160		F	#	1.5E-05	-
	mg/L	0655	WL	06/14/2011	N001	13.60 - 23.60	0.140		F	#	1.5E-05	-
	mg/L	0655	WL	11/15/2011	N001	13.60 - 23.60	0.093		F	#	1.5E-05	-
	mg/L	0656	WL	06/14/2011	N001	6.35 - 21.35	0.170		F	#	1.5E-05	-
	mg/L	0656	WL	11/15/2011	N001	6.35 - 21.35	0.210		F	#	1.5E-05	-
	mg/L	0658	WL	06/14/2011	N001	2.30 - 17.30	0.020		F	#	2.9E-06	-
	mg/L	0658	WL	11/15/2011	N001	2.30 - 17.30	0.010		F	#	2.9E-06	-
	mg/L	0742-2	WL	11/18/2011	N001	14.05 - 14.55	0.036		F	#	1.5E-05	-
	mg/L	0742-3	WL	11/18/2011	N001	18.05 - 18.55	0.026		F	#	1.5E-05	-
	mg/L	0743-2	WL	11/18/2011	N001	12.20 - 12.70	0.180		F	#	0.00015	-
	mg/L	0743-3	WL	11/18/2011	N001	16.20 - 16.70	0.140		F	#	0.00015	-
	mg/L	0744-1	WL	11/18/2011	N001	11.20 - 11.70	0.055		F	#	2.9E-06	-
	mg/L	0744-2	WL	11/18/2011	N001	15.20 - 15.70	0.270		F	#	2.9E-05	-
	mg/L	0744-3	WL	11/18/2011	N001	19.20 - 19.70	0.270			#	2.9E-05	-
	mg/L	B-04	WL	06/15/2011	N001	5.00 - 20.00	0.270		F	#	0.00029	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	0.210		F	#	1.5E-05	-
	mg/L	LQ-108	WL	06/15/2011	N001		0.160		F	#	0.00029	-
	mg/L	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	0.091		F	#	2.9E-06	-
Uranium-234	pCi/L	0304	WL	06/15/2011	N001	13.20 - 18.20	15.7		F	#	0.048	± 2.72
	pCi/L	0310	WL	06/15/2011	N001	17.93 - 22.93	70.5		F	#	0.078	± 13.0
	pCi/L	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	68.9		F	#	0.086	± 12.3
	pCi/L	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	34		F	#	0.052	± 5.79
Uranium-235	pCi/L	0304	WL	06/15/2011	N001	13.20 - 18.20	0.591		F	#	0.039	± 0.17
	pCi/L	0310	WL	06/15/2011	N001	17.93 - 22.93	3.06		F	#	0.07	± 0.70
	pCi/L	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	3.27		F	#	0.07	± 0.71
	pCi/L	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	1.48		F	#	0.04	± 0.33
Uranium-238	pCi/L	0304	WL	06/15/2011	N001	13.20 - 18.20	13.8		F	#	0.051	± 2.40
	pCi/L	0310	WL	06/15/2011	N001	17.93 - 22.93	65.6		F	#	0.059	± 12.1
	pCi/L	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	66.4		F	#	0.1	± 11.9
	pCi/L	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	29.9		F	#	0.044	± 5.10
Vanadium	mg/L	0292A	WL	06/14/2011	N001	10.50 - 20.50	0.00074		UF	#	1.5E-05	-
	mg/L	0292A	WL	11/15/2011	N001	10.50 - 20.50	0.00021	B	JF	#	1.5E-05	-
	mg/L	0304	WL	06/15/2011	N001	13.20 - 18.20	0.022		F	#	1.5E-05	-
	mg/L	0304	WL	11/15/2011	N001	13.20 - 18.20	0.043		F	#	1.5E-05	-
	mg/L	0305	WL	06/14/2011	N001	13.76 - 18.76	0.340		F	#	7.6E-05	-
	mg/L	0305	WL	11/15/2011	N001	13.76 - 18.76	0.410		F	#	7.6E-05	-
	mg/L	0305	WL	11/15/2011	N002	13.76 - 18.76	0.400		F	#	7.6E-05	-
	mg/L	0309	WL	06/14/2011	N001	16.93 - 21.93	0.00048		UF	#	1.5E-05	-
	mg/L	0309	WL	11/15/2011	N001	16.93 - 21.93	0.00007	B	JF	#	1.5E-05	-
	mg/L	0310	WL	06/15/2011	N001	17.93 - 22.93	0.011		F	#	7.6E-05	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Vanadium	mg/L	0310	WL	06/15/2011	N002	17.93 - 22.93	0.012		F	#	7.6E-05	-
	mg/L	0310	WL	11/15/2011	N001	17.93 - 22.93	0.011		JF	#	7.6E-05	-
	mg/L	0655	WL	06/14/2011	N001	13.60 - 23.60	0.370		F	#	7.6E-05	-
	mg/L	0655	WL	11/15/2011	N001	13.60 - 23.60	0.310		F	#	7.6E-05	-
	mg/L	0656	WL	06/14/2011	N001	6.35 - 21.35	0.021		F	#	7.6E-05	-
	mg/L	0656	WL	11/15/2011	N001	6.35 - 21.35	0.022		F	#	7.6E-05	-
	mg/L	0658	WL	06/14/2011	N001	2.30 - 17.30	0.0016		F	#	1.5E-05	-
	mg/L	0658	WL	11/15/2011	N001	2.30 - 17.30	0.0007		JF	#	1.5E-05	-
	mg/L	0742-2	WL	11/18/2011	N001	14.05 - 14.55	0.480		F	#	7.6E-05	-
	mg/L	0742-3	WL	11/18/2011	N001	18.05 - 18.55	0.290		F	#	7.6E-05	-
	mg/L	0743-2	WL	11/18/2011	N001	12.20 - 12.70	3.200		F	#	0.00076	-
	mg/L	0743-3	WL	11/18/2011	N001	16.20 - 16.70	2.600		F	#	0.00076	-
	mg/L	0744-1	WL	11/18/2011	N001	11.20 - 11.70	0.0055		F	#	1.5E-05	-
	mg/L	0744-2	WL	11/18/2011	N001	15.20 - 15.70	0.056		F	#	0.00015	-
	mg/L	0744-3	WL	11/18/2011	N001	19.20 - 19.70	0.076			#	0.00015	-
	mg/L	B-04	WL	06/15/2011	N001	5.00 - 20.00	2.600		F	#	0.0015	-
	mg/L	LQ-107	WL	06/15/2011	N001	9.67 - 19.67	0.260		F	#	7.6E-05	-
	mg/L	LQ-108	WL	06/15/2011	N001		2.600		F	#	0.0015	-
	mg/L	LQ-109	WL	06/15/2011	N001	9.60 - 19.60	0.0049		F	#	1.5E-05	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:01 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY

RECORDS: SELECTED FROM USEE200 WHERE site_code='RFO01' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2011# and #12/30/2011#

SAMPLE ID CODES: 000X = Filtered sample. N00X = Unfiltered sample. X = replicate number.

LOCATION TYPES: WL WELL

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	N	Presumptive evidence that analyte is present. The analyte is "tentatively identified".	Q	Qualitative result due to sampling technique
R	Unusable result.	U	Parameter analyzed for but was not detected.	X	Location is undefined.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 2:05 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT		UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	0320	11/17/2011	N001	154				#	-	-
	mg/L	0322	08/09/2011	N001	220				#	-	-
	mg/L	0322	11/17/2011	N001	153				#	-	-
	mg/L	0323	06/14/2011	N001	183				#	-	-
	mg/L	0323	11/16/2011	N001	150				#	-	-
	mg/L	0324	06/14/2011	0001	175				#	-	-
	mg/L	0324	11/16/2011	N001	133				#	-	-
	mg/L	0452	11/17/2011	N001	296				#	-	-
	mg/L	0453	11/17/2011	N001	270				#	-	-
	mg/L	0575	06/14/2011	N001	220				#	-	-
	mg/L	0575	11/16/2011	N001	160				#	-	-
Ammonia Total as N	mg/L	0320	11/17/2011	N001	2.4				#	0.1	-
	mg/L	0322	08/09/2011	N001	0.1	U			#	0.1	-
	mg/L	0322	08/09/2011	N002	0.1	U			#	0.1	-
	mg/L	0322	11/17/2011	N001	0.14				#	0.1	-
	mg/L	0323	06/14/2011	N001	24				#	0.5	-
	mg/L	0323	11/16/2011	N001	24				#	1	-
	mg/L	0323	11/16/2011	N002	25				#	1	-
	mg/L	0324	06/14/2011	0001	0.1	U			#	0.1	-
	mg/L	0324	11/16/2011	N001	0.1	U			#	0.1	-
	mg/L	0452	11/17/2011	N001	49				#	5	-
	mg/L	0453	11/17/2011	N001	65				#	5	-
	mg/L	0575	06/14/2011	N001	0.1	U			#	0.1	-
	mg/L	0575	11/16/2011	N001	0.72				#	0.1	-
Arsenic	mg/L	0320	11/17/2011	N001	0.0048				#	7.4E-05	-
	mg/L	0322	08/09/2011	N001	0.0005				#	1.5E-05	-
	mg/L	0322	08/09/2011	N002	0.0005				#	1.5E-05	-
	mg/L	0322	11/17/2011	N001	0.0004				#	1.5E-05	-
	mg/L	0323	06/14/2011	N001	0.0011				#	7.4E-05	-
	mg/L	0323	11/16/2011	N001	0.0014				#	0.00015	-
	mg/L	0323	11/16/2011	N002	0.0012				#	0.00015	-
	mg/L	0324	06/14/2011	0001	0.0004				#	1.5E-05	-
	mg/L	0324	11/16/2011	N001	0.0003				#	1.5E-05	-
	mg/L	0452	11/17/2011	N001	0.0063				#	7.4E-05	-
	mg/L	0453	11/17/2011	N001	0.005				#	7.4E-05	-
	mg/L	0575	06/14/2011	N001	0.0025				#	1.5E-05	-
	mg/L	0575	11/16/2011	N001	0.0026				#	1.5E-05	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 2:05 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT		UN-CERTAINTY
Molybdenum	mg/L	0320	11/17/2011	N001	0.500				#	0.00016	-
	mg/L	0322	08/09/2011	N001	0.0042				#	3.2E-05	-
	mg/L	0322	08/09/2011	N002	0.0043				#	3.2E-05	-
	mg/L	0322	11/17/2011	N001	0.004				#	3.2E-05	-
	mg/L	0323	06/14/2011	N001	2.600				#	0.00032	-
	mg/L	0323	11/16/2011	N001	2.300				#	0.00032	-
	mg/L	0323	11/16/2011	N002	2.400				#	0.00032	-
	mg/L	0324	06/14/2011	0001	0.0021				#	3.2E-05	-
	mg/L	0324	11/16/2011	N001	0.003				#	3.2E-05	-
	mg/L	0452	11/17/2011	N001	1.500				#	0.00016	-
	mg/L	0453	11/17/2011	N001	1.600				#	0.00016	-
	mg/L	0575	06/14/2011	N001	0.034				#	3.2E-05	-
	mg/L	0575	11/16/2011	N001	0.170				#	3.2E-05	-
Nitrate + Nitrite as Nitrogen	mg/L	0320	11/17/2011	N001	0.01	U			#	0.01	-
	mg/L	0322	08/09/2011	N001	0.018				#	0.01	-
	mg/L	0322	08/09/2011	N002	0.011				#	0.01	-
	mg/L	0322	11/17/2011	N001	0.096				#	0.01	-
	mg/L	0323	06/14/2011	N001	76				#	0.5	-
	mg/L	0323	11/16/2011	N001	58				#	0.5	-
	mg/L	0323	11/16/2011	N002	57				#	0.5	-
	mg/L	0324	06/14/2011	0001	0.1				#	0.01	-
	mg/L	0324	11/16/2011	N001	0.087				#	0.01	-
	mg/L	0452	11/17/2011	N001	0.75				#	0.01	-
	mg/L	0453	11/17/2011	N001	3				#	0.05	-
	mg/L	0575	06/14/2011	N001	0.01	U			#	0.01	-
	mg/L	0575	11/16/2011	N001	1.2				#	0.01	-
Oxidation Reduction Potential	mV	0320	11/17/2011	N001	75				#	-	-
	mV	0322	08/09/2011	N001	47.6				#	-	-
	mV	0322	11/17/2011	N001	205.5				#	-	-
	mV	0323	06/14/2011	N001	178.7				#	-	-
	mV	0323	11/16/2011	N001	245.5				#	-	-
	mV	0324	06/14/2011	N001	-63.1				#	-	-
	mV	0324	11/16/2011	N001	161.2				#	-	-
	mV	0452	11/17/2011	N001	80.8				#	-	-
	mV	0453	11/17/2011	N001	111.9				#	-	-
	mV	0575	06/14/2011	N001	-1.3				#	-	-
	mV	0575	11/16/2011	N001	228.0				#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 2:05 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	0320	11/17/2011	N001	7.54			#	-	-
	s.u.	0322	08/09/2011	N001	8.68			#	-	-
	s.u.	0322	11/17/2011	N001	8.01			#	-	-
	s.u.	0323	06/14/2011	N001	7.73			#	-	-
	s.u.	0323	11/16/2011	N001	8.11			#	-	-
	s.u.	0324	06/14/2011	N001	8.08			#	-	-
	s.u.	0324	11/16/2011	N001	8.27			#	-	-
	s.u.	0452	11/17/2011	N001	7.71			#	-	-
	s.u.	0453	11/17/2011	N001	7.29			#	-	-
	s.u.	0575	06/14/2011	N001	8.80			#	-	-
	s.u.	0575	11/16/2011	N001	8.44			#	-	-
Selenium	mg/L	0320	11/17/2011	N001	0.0036			#	0.00016	-
	mg/L	0322	08/09/2011	N001	0.0003			#	3.2E-05	-
	mg/L	0322	08/09/2011	N002	0.0003			#	3.2E-05	-
	mg/L	0322	11/17/2011	N001	0.0006			#	3.2E-05	-
	mg/L	0323	06/14/2011	N001	0.012			#	0.00032	-
	mg/L	0323	11/16/2011	N001	0.010			#	0.00032	-
	mg/L	0323	11/16/2011	N002	0.011			#	0.00032	-
	mg/L	0324	06/14/2011	0001	0.0002			#	3.2E-05	-
	mg/L	0324	11/16/2011	N001	0.0005			#	3.2E-05	-
	mg/L	0452	11/17/2011	N001	0.0071			#	0.00016	-
	mg/L	0453	11/17/2011	N001	0.014			#	0.00016	-
	mg/L	0575	06/14/2011	N001	0.0004			#	3.2E-05	-
	mg/L	0575	11/16/2011	N001	0.0005			#	3.2E-05	-
Specific Conductance	umhos/cm	0320	11/17/2011	N001	3626			#	-	-
	umhos/cm	0322	08/09/2011	N001	562			#	-	-
	umhos/cm	0322	11/17/2011	N001	1126			#	-	-
	umhos/cm	0323	06/14/2011	N001	8171			#	-	-
	umhos/cm	0323	11/16/2011	N001	8052			#	-	-
	umhos/cm	0324	06/14/2011	N001	293			#	-	-
	umhos/cm	0324	11/16/2011	N001	1047			#	-	-
	umhos/cm	0452	11/17/2011	N001	4575			#	-	-
	umhos/cm	0453	11/17/2011	N001	4451			#	-	-
	umhos/cm	0575	06/14/2011	N001	1544			#	-	-
	umhos/cm	0575	11/16/2011	N001	2650			#	-	-
Temperature	C	0320	11/17/2011	N001	6.27			#	-	-
	C	0322	08/09/2011	N001	18.70			#	-	-
	C	0322	11/17/2011	N001	3.01			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 2:05 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0323	06/14/2011	N001	22.45			#	-	-
	C	0323	11/16/2011	N001	6.49			#	-	-
	C	0324	06/14/2011	N001	14.92			#	-	-
	C	0324	11/16/2011	N001	6.07			#	-	-
	C	0452	11/17/2011	N001	7.16			#	-	-
	C	0453	11/17/2011	N001	8.23			#	-	-
	C	0575	06/14/2011	N001	21.23			#	-	-
	C	0575	11/16/2011	N001	6.70			#	-	-
Turbidity	NTU	0320	11/17/2011	N001	6.91			#	-	-
	NTU	0322	08/09/2011	N001	5.23			#	-	-
	NTU	0322	11/17/2011	N001	3.89			#	-	-
	NTU	0323	06/14/2011	N001	3.44			#	-	-
	NTU	0323	11/16/2011	N001	3.44			#	-	-
	NTU	0324	06/14/2011	N001	74.1			#	-	-
	NTU	0324	11/16/2011	N001	4.40			#	-	-
	NTU	0452	11/17/2011	N001	6.45			#	-	-
	NTU	0453	11/17/2011	N001	2.80			#	-	-
	NTU	0575	06/14/2011	N001	7.41			#	-	-
	NTU	0575	11/16/2011	N001	7.87			#	-	-
Uranium	mg/L	0320	11/17/2011	N001	0.053			#	1.5E-05	-
	mg/L	0322	08/09/2011	N001	0.0014			#	2.9E-06	-
	mg/L	0322	08/09/2011	N002	0.0014			#	2.9E-06	-
	mg/L	0322	11/17/2011	N001	0.0026			#	2.9E-06	-
	mg/L	0323	06/14/2011	N001	0.320			#	2.9E-05	-
	mg/L	0323	11/16/2011	N001	0.260			#	2.9E-05	-
	mg/L	0323	11/16/2011	N002	0.270			#	2.9E-05	-
	mg/L	0324	06/14/2011	0001	0.0007			#	2.9E-06	-
	mg/L	0324	11/16/2011	N001	0.0023			#	2.9E-06	-
	mg/L	0452	11/17/2011	N001	0.160			#	1.5E-05	-
	mg/L	0453	11/17/2011	N001	0.130			#	1.5E-05	-
	mg/L	0575	06/14/2011	N001	0.017			#	2.9E-06	-
	mg/L	0575	11/16/2011	N001	0.029			#	2.9E-06	-
Vanadium	mg/L	0320	11/17/2011	N001	0.026			#	7.6E-05	-
	mg/L	0322	08/09/2011	N001	0.0013			#	1.5E-05	-
	mg/L	0322	08/09/2011	N002	0.0012			#	1.5E-05	-
	mg/L	0322	11/17/2011	N001	0.0009		J	#	1.5E-05	-
	mg/L	0323	06/14/2011	N001	0.0049			#	7.6E-05	-
	mg/L	0323	11/16/2011	N001	0.0049		J	#	0.00015	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFN01, Rifle New Processing Site
REPORT DATE: 6/5/2012 2:05 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Vanadium	mg/L	0323	11/16/2011	N002	0.0051		J	#	0.00015	-
	mg/L	0324	06/14/2011	0001	0.0006		U	#	1.5E-05	-
	mg/L	0324	11/16/2011	N001	0.0005		J	#	1.5E-05	-
	mg/L	0452	11/17/2011	N001	0.280			#	7.6E-05	-
	mg/L	0453	11/17/2011	N001	0.240			#	7.6E-05	-
	mg/L	0575	06/14/2011	N001	0.0027			#	1.5E-05	-
	mg/L	0575	11/16/2011	N001	0.002		J	#	1.5E-05	-

RECORDS: SELECTED FROM USEE800 WHERE site_code='RFN01' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2011# and #12/30/2011#

SAMPLE ID CODES: 000X = Filtered sample. N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.
J	Estimated value.
N	Presumptive evidence that analyte is present. The analyte is "tentatively identified".
R	Unusable result.
X	Location is undefined.
G	Possible grout contamination, pH > 9.
L	Less than 3 bore volumes purged prior to sampling.
Q	Qualitative result due to sampling technique
U	Parameter analyzed for but was not detected.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

This page intentionally left blank

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:06 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	0294	06/14/2011	0001	171				#	- -
	mg/L	0294	11/15/2011	N001	130				#	- -
	mg/L	0387	06/15/2011	N001	362				#	- -
	mg/L	0388	06/15/2011	N001	354				#	- -
	mg/L	0394	06/15/2011	N001	220				#	- -
	mg/L	0395	06/15/2011	N001	394				#	- -
	mg/L	0395	11/15/2011	0001	299				#	- -
	mg/L	0396	06/15/2011	N001	127				#	- -
	mg/L	0396	11/15/2011	N001	127				#	- -
	mg/L	0398	06/14/2011	N001	299				#	- -
	mg/L	0398	11/15/2011	N001	248				#	- -
	mg/L	0741	06/14/2011	N001	82				#	- -
	mg/L	0741	11/15/2011	N001	137				#	- -
Arsenic	mg/L	0398	11/15/2011	N001	0.0005				#	1.5E-05 -
Molybdenum	mg/L	0398	11/15/2011	N001	0.008				#	3.2E-05 -
Oxidation Reduction Potential	mV	0294	06/14/2011	N001	59.0				#	- -
	mV	0294	11/15/2011	N001	95				#	- -
	mV	0387	06/15/2011	N001	-26.5				#	- -
	mV	0388	06/15/2011	N001	-52.4				#	- -
	mV	0394	06/15/2011	N001	140.4				#	- -
	mV	0395	06/15/2011	N001	33.0				#	- -
	mV	0395	11/15/2011	N001	16.9				#	- -
	mV	0396	06/15/2011	N001	78.0				#	- -
	mV	0396	11/15/2011	N001	20.9				#	- -
	mV	0398	06/14/2011	N001	107.9				#	- -
	mV	0398	11/15/2011	N001	92				#	- -
	mV	0741	06/14/2011	N001	-58.1				#	- -
	mV	0741	11/15/2011	N001	-10.8				#	- -
pH	s.u.	0294	06/14/2011	N001	7.96				#	- -
	s.u.	0294	11/15/2011	N001	8.07				#	- -
	s.u.	0387	06/15/2011	N001	7.87				#	- -
	s.u.	0388	06/15/2011	N001	7.80				#	- -
	s.u.	0394	06/15/2011	N001	7.33				#	- -
	s.u.	0395	06/15/2011	N001	7.71				#	- -
	s.u.	0395	11/15/2011	N001	7.76				#	- -
	s.u.	0396	06/15/2011	N001	8.46				#	- -

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:06 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT		UN-CERTAINTY
pH	s.u.	0396	11/15/2011	N001	8.47				#	-	-
	s.u.	0398	06/14/2011	N001	8.09				#	-	-
	s.u.	0398	11/15/2011	N001	8.07				#	-	-
	s.u.	0741	06/14/2011	N001	8.22				#	-	-
	s.u.	0741	11/15/2011	N001	8.38				#	-	-
Selenium	mg/L	0294	06/14/2011	0001	0.0003				#	3.2E-05	-
	mg/L	0294	11/15/2011	N001	0.0005				#	3.2E-05	-
	mg/L	0387	06/15/2011	N001	0.0034				#	3.2E-05	-
	mg/L	0388	06/15/2011	N001	0.0081				#	3.2E-05	-
	mg/L	0394	06/15/2011	N001	0.0004				#	3.2E-05	-
	mg/L	0395	06/15/2011	0001	0.0052				#	3.2E-05	-
	mg/L	0395	11/15/2011	0001	0.0047				#	3.2E-05	-
	mg/L	0396	06/15/2011	0001	0.0003				#	3.2E-05	-
	mg/L	0396	11/15/2011	N001	0.0006				#	3.2E-05	-
	mg/L	0398	06/14/2011	N001	0.0023				#	3.2E-05	-
	mg/L	0398	11/15/2011	N001	0.0023	E			#	3.2E-05	-
	mg/L	0741	06/14/2011	0001	0.0003				#	3.2E-05	-
	mg/L	0741	11/15/2011	N001	0.0005				#	3.2E-05	-
Specific Conductance	umhos/cm	0294	06/14/2011	N001	273				#	-	-
	umhos/cm	0294	11/15/2011	N001	1059				#	-	-
	umhos/cm	0387	06/15/2011	N001	1875				#	-	-
	umhos/cm	0388	06/15/2011	N001	2006				#	-	-
	umhos/cm	0394	06/15/2011	N001	1296				#	-	-
	umhos/cm	0395	06/15/2011	N001	1382				#	-	-
	umhos/cm	0395	11/15/2011	N001	1298				#	-	-
	umhos/cm	0396	06/15/2011	N001	281				#	-	-
	umhos/cm	0396	11/15/2011	N001	1036				#	-	-
	umhos/cm	0398	06/14/2011	N001	1400				#	-	-
	umhos/cm	0398	11/15/2011	N001	1356				#	-	-
	umhos/cm	0741	06/14/2011	N001	270				#	-	-
	umhos/cm	0741	11/15/2011	N001	1034				#	-	-
Stable isotope ratio H2/H1 in Water	parts per t	0387	06/15/2011	0001	-112.6				#	-	-
	parts per t	0388	06/15/2011	0001	-113.45				#	-	-
	parts per t	0394	06/15/2011	0001	-119.08				#	-	-
	parts per t	0395	06/15/2011	0002	-114.32				#	-	-
Stable isotope ratio O18/O16 in Water	parts per t	0387	06/15/2011	0001	-14.55				#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:06 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT		UN-CERTAINTY
Stable isotope ratio O18/O16 in Water	parts per t	0388	06/15/2011	0001	-14.8				#	-	-
	parts per t	0394	06/15/2011	0001	-15.54				#	-	-
	parts per t	0395	06/15/2011	0002	-14.83				#	-	-
Stable isotope ratio S-34/S-32 in Sulfate	parts per t	0387	06/15/2011	0001	-7.68				#	-	-
	parts per t	0388	06/15/2011	0001	-10.38				#	-	-
	parts per t	0394	06/15/2011	0001	3.61				#	-	-
	parts per t	0395	06/15/2011	0002	-3.69				#	-	-
Temperature	C	0294	06/14/2011	N001	14.91				#	-	-
	C	0294	11/15/2011	N001	4.70				#	-	-
	C	0387	06/15/2011	N001	23.74				#	-	-
	C	0388	06/15/2011	N001	22.00				#	-	-
	C	0394	06/15/2011	N001	18.36				#	-	-
	C	0395	06/15/2011	N001	20.76				#	-	-
	C	0395	11/15/2011	N001	11.61				#	-	-
	C	0396	06/15/2011	N001	18.09				#	-	-
	C	0396	11/15/2011	N001	6.86				#	-	-
	C	0398	06/14/2011	N001	18.81				#	-	-
	C	0398	11/15/2011	N001	8.70				#	-	-
	C	0741	06/14/2011	N001	16.75				#	-	-
	C	0741	11/15/2011	N001	5.69				#	-	-
Turbidity	NTU	0294	06/14/2011	N001	73.9				#	-	-
	NTU	0294	11/15/2011	N001	3.41				#	-	-
	NTU	0387	06/15/2011	N001	5.63				#	-	-
	NTU	0388	06/15/2011	N001	4.42				#	-	-
	NTU	0394	06/15/2011	N001	3.64				#	-	-
	NTU	0395	06/15/2011	N001	36.7				#	-	-
	NTU	0395	11/15/2011	N001	20.0				#	-	-
	NTU	0396	06/15/2011	N001	51.4				#	-	-
	NTU	0396	11/15/2011	N001	5.33				#	-	-
	NTU	0398	06/14/2011	N001	8.69				#	-	-
	NTU	0741	06/14/2011	N001	78.1				#	-	-
	NTU	0741	11/15/2011	N001	4.13				#	-	-
Uranium	mg/L	0294	06/14/2011	0001	0.0007				#	2.9E-06	-
	mg/L	0294	11/15/2011	N001	0.0022				#	2.9E-06	-
	mg/L	0387	06/15/2011	N001	0.033				#	2.9E-06	-
	mg/L	0388	06/15/2011	N001	0.042				#	2.9E-06	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:06 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT		UN-CERTAINTY
Uranium	mg/L	0394	06/15/2011	N001	0.0077				#	2.9E-06	-
	mg/L	0395	06/15/2011	0001	0.030				#	2.9E-06	-
	mg/L	0395	11/15/2011	0001	0.025				#	2.9E-06	-
	mg/L	0396	06/15/2011	0001	0.0008				#	2.9E-06	-
	mg/L	0396	11/15/2011	N001	0.0023				#	2.9E-06	-
	mg/L	0398	06/14/2011	N001	0.014				#	2.9E-06	-
	mg/L	0398	11/15/2011	N001	0.015				#	2.9E-06	-
	mg/L	0741	06/14/2011	0001	0.0007				#	2.9E-06	-
	mg/L	0741	11/15/2011	N001	0.0023				#	2.9E-06	-
Uranium-234	pCi/L	0387	06/15/2011	N001	14.1				#	0.05	± 2.39
	pCi/L	0388	06/15/2011	N001	18.1				#	0.049	± 3.06
	pCi/L	0394	06/15/2011	N001	3.04				#	0.064	± 0.58
	pCi/L	0395	06/15/2011	0001	12.4				#	0.075	± 2.13
Uranium-235	pCi/L	0387	06/15/2011	N001	0.528				#	0.033	± 0.15
	pCi/L	0388	06/15/2011	N001	0.613				#	0.049	± 0.17
	pCi/L	0394	06/15/2011	N001	0.0852			U	#	0.054	± 0.06
	pCi/L	0395	06/15/2011	0001	0.422				#	0.045	± 0.13
Uranium-238	pCi/L	0387	06/15/2011	N001	10.1				#	0.033	± 1.74
	pCi/L	0388	06/15/2011	N001	13.1				#	0.044	± 2.24
	pCi/L	0394	06/15/2011	N001	2.2				#	0.057	± 0.44
	pCi/L	0395	06/15/2011	0001	8.97				#	0.052	± 1.55
Vanadium	mg/L	0294	06/14/2011	0001	0.0007			U	#	1.5E-05	-
	mg/L	0294	11/15/2011	N001	0.0003			J	#	1.5E-05	-
	mg/L	0387	06/15/2011	N001	0.0063				#	1.5E-05	-
	mg/L	0388	06/15/2011	N001	0.0048				#	1.5E-05	-
	mg/L	0394	06/15/2011	N001	0.0011			U	#	1.5E-05	-
	mg/L	0395	06/15/2011	0001	0.0018				#	1.5E-05	-
	mg/L	0395	11/15/2011	0001	0.0011			J	#	1.5E-05	-
	mg/L	0396	06/15/2011	0001	0.0008			U	#	1.5E-05	-
	mg/L	0396	11/15/2011	N001	0.0009			J	#	1.5E-05	-
	mg/L	0398	06/14/2011	N001	0.0045				#	1.5E-05	-
	mg/L	0398	11/15/2011	N001	0.0032	E			#	1.5E-05	-
	mg/L	0741	06/14/2011	0001	0.0007			U	#	1.5E-05	-
	mg/L	0741	11/15/2011	N001	0.0005			J	#	1.5E-05	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 6/5/2012 2:06 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY

RECORDS: SELECTED FROM USEE800 WHERE site_code='RFO01' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2011# and #12/30/2011#

SAMPLE ID CODES: 000X = Filtered sample. N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.
J	Estimated value.
N	Presumptive evidence that analyte is present. The analyte is "tentatively identified".
R	Unusable result.
X	Location is undefined.
G	Possible grout contamination, pH > 9.
L	Less than 3 bore volumes purged prior to sampling.
Q	Qualitative result due to sampling technique
U	Parameter analyzed for but was not detected.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

This page intentionally left blank