LMS/SRE-SRW/S07699

Verification Monitoring Report for the Slick Rock, Colorado, Processing Sites

June 2011

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Verification Monitoring Report for the Slick Rock, Colorado, Processing Sites, 2011 Update

The U.S. Department of Energy (DOE) has prepared a Verification Monitoring Report to evaluate groundwater and surface water monitoring data collected at the Slick Rock processing sites since 2000 and to asses the status of the compliance strategy for groundwater cleanup. At your request, you are receiving a hard copy of the report.

The report can also be found on the Internet at the DOE Legacy Management (LM) website – www.lm.doe.gov. From the LM website home page, select the United States map icon titled Legacy Management Sites. Then select the Slick Rock Sites from the drop-down list. The report will be available on the Slick Rock Processing Sites page of the LM website under Documents and Links.

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Abbreviations

ACL	alternate concentration limit
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDPHE	Colorado Department of Public Health and Environment
CFR	*Code of Federal Regulations*
COPC	constituent of potential concern
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ft	feet
GCAP	Groundwater Compliance Action Plan
IC	institutional control
MCL	maximum concentration limit (listed in 40 CFR 192, Table 1 to Subpart A) *or* maximum contaminant level (EPA Safe Drinking Water Act)
mg/L	milligrams per liter
N	number of samples or data points
NAPL	nonaqueous phase liquid
NRC	U.S. Nuclear Regulatory Commission
pCi/L	picocuries per liter
Ra-226	radium-226
Ra-228	radium-228
SDWA	Safe Drinking Water Act
SOWP	Site Observational Work Plan
SRE	Slick Rock East
SRW	Slick Rock West
UMTRCA	Uranium Mill Tailings Radiation Control Act
VMR	Verification Monitoring Report
VSP	Visual Sample Plan

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1.0 Introduction

The Slick Rock, Colorado, Processing Sites consist of two former uranium-ore processing facilities, referred to as the Slick Rock East (SRE) site (formerly the North Continent site) and, approximately 1 mile downstream from SRE, the Slick Rock West (SRW) site (formerly the Union Carbide site). The Slick Rock processing sites are located along the banks of the Dolores River in San Miguel County (Figure 1 and Figure 2). Surface remediation of the two sites was completed in 1996. Mill tailings and other residual radioactive materials were disposed of in a cell located approximately 5 miles east of the processing sites.

1.1 Purpose of Report

The purpose of this Verification Monitoring Report (VMR) is to evaluate groundwater and surface water monitoring data collected at the Slick Rock processing sites since 2000 and to assess the status of the compliance strategy for groundwater cleanup.

1.2 Compliance Strategy

The proposed compliance strategy for the Slick Rock sites is natural flushing combined with institutional controls (ICs) and compliance monitoring as stated in the *Draft Final Groundwater Compliance Action Plan for the Slick Rock, Colorado, UMTRA Project Sites* (DOE 2006). This groundwater compliance action plan (GCAP) states that public health will be protected during the natural flushing process through ICs, which will restrict access to contaminated alluvial groundwater. The ICs that will be used for the Slick Rock sites are environmental covenants between the State of Colorado, represented by the Colorado Department of Public Health and Environment (CDPHE), and the landowner, which is UMETCO Minerals Corporation. As of June 2011, the IC issue was still pending for the Slick Rock sites.

Constituents of potential concern (COPCs) at the Slick Rock sites include manganese, molybdenum, nitrate, selenium, and uranium. Selenium and uranium are the only COPCs common to both the SRE and SRW sites. Several other COPCs, including BTEX (benzene, toluene, ethylbenzene, and xylenes), radium-226 (Ra-226), and radium-228 (Ra-228), are limited to a single SRW alluvial well (0319). To assess the status of compliance, COPC concentrations at the Slick Rock sites are compared to maximum concentration limits or maximum contaminant levels (MCLs). The MCLs are established by the U.S. Environmental Protection Agency (EPA) and include Uranium Mill Tailings Radiation Control Act (UMTRCA) MCLs, which are codified in Title 40 *Code of Federal Regulations* Part 192 (40 CFR 192), and Safe Drinking Water Act (SDWA) MCLs. Because no UMTRCA or SDWA MCL has been established for manganese, manganese concentrations are instead compared to the maximum background concentration (4.2 milligrams per liter [mg/L]).

Groundwater modeling conducted for the Site Observational Work Plan (SOWP) predicted that natural flushing for all COPCs except selenium would be completed within the 100-year regulatory time frame established in 40 CFR 192 (DOE 2002b). Because selenium concentrations at SRW were not expected to decrease to levels below the UMTRCA MCL within 100 years, a human-health risk-based alternate concentration limit (ACL) of 0.18 mg/L was proposed (DOE 2006). Table 1 lists COPCs for the Slick Rock sites along with MCLs and other benchmark values.

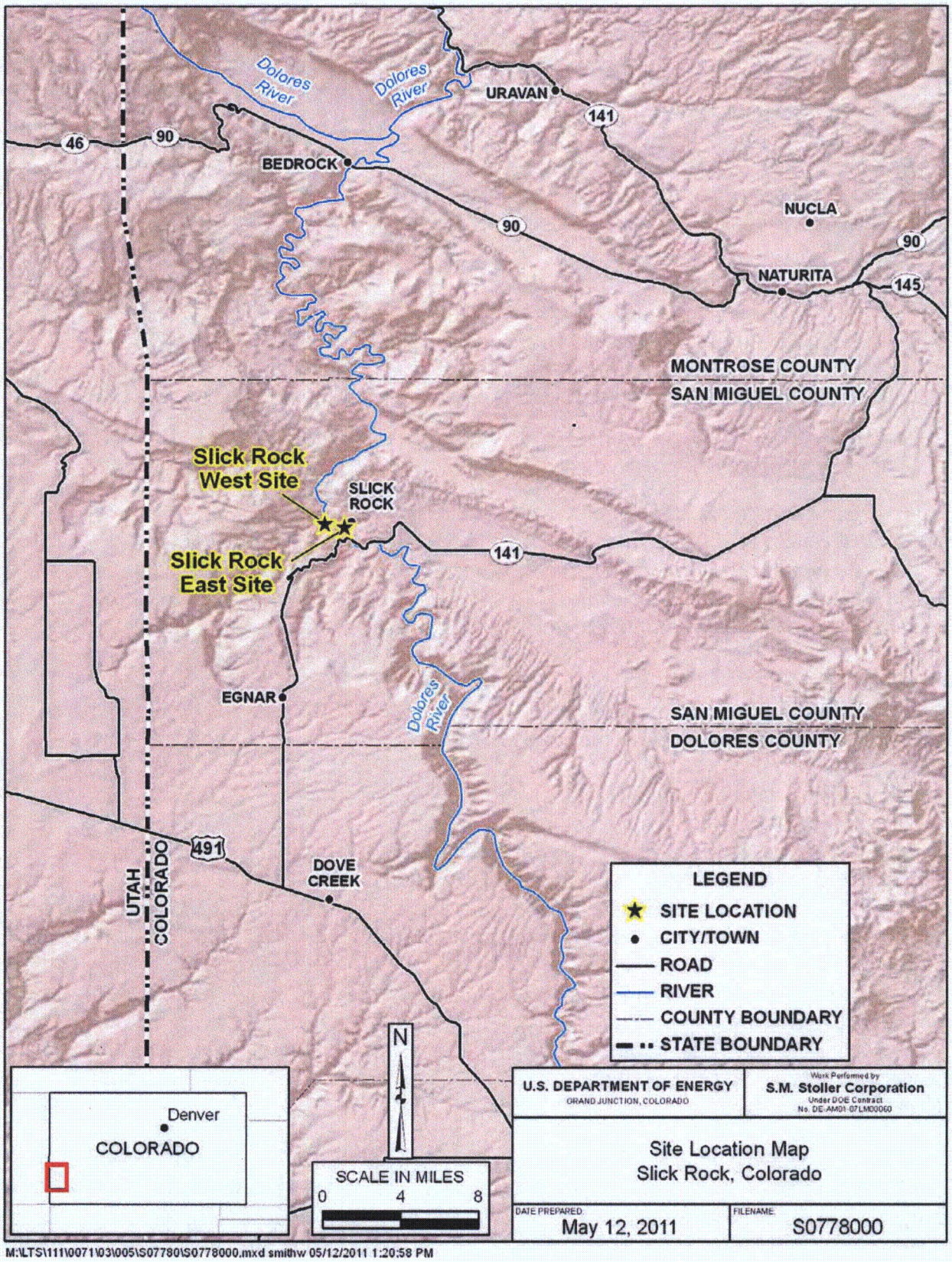

Figure 1. Slick Rock, Colorado, Processing Sites Location Map

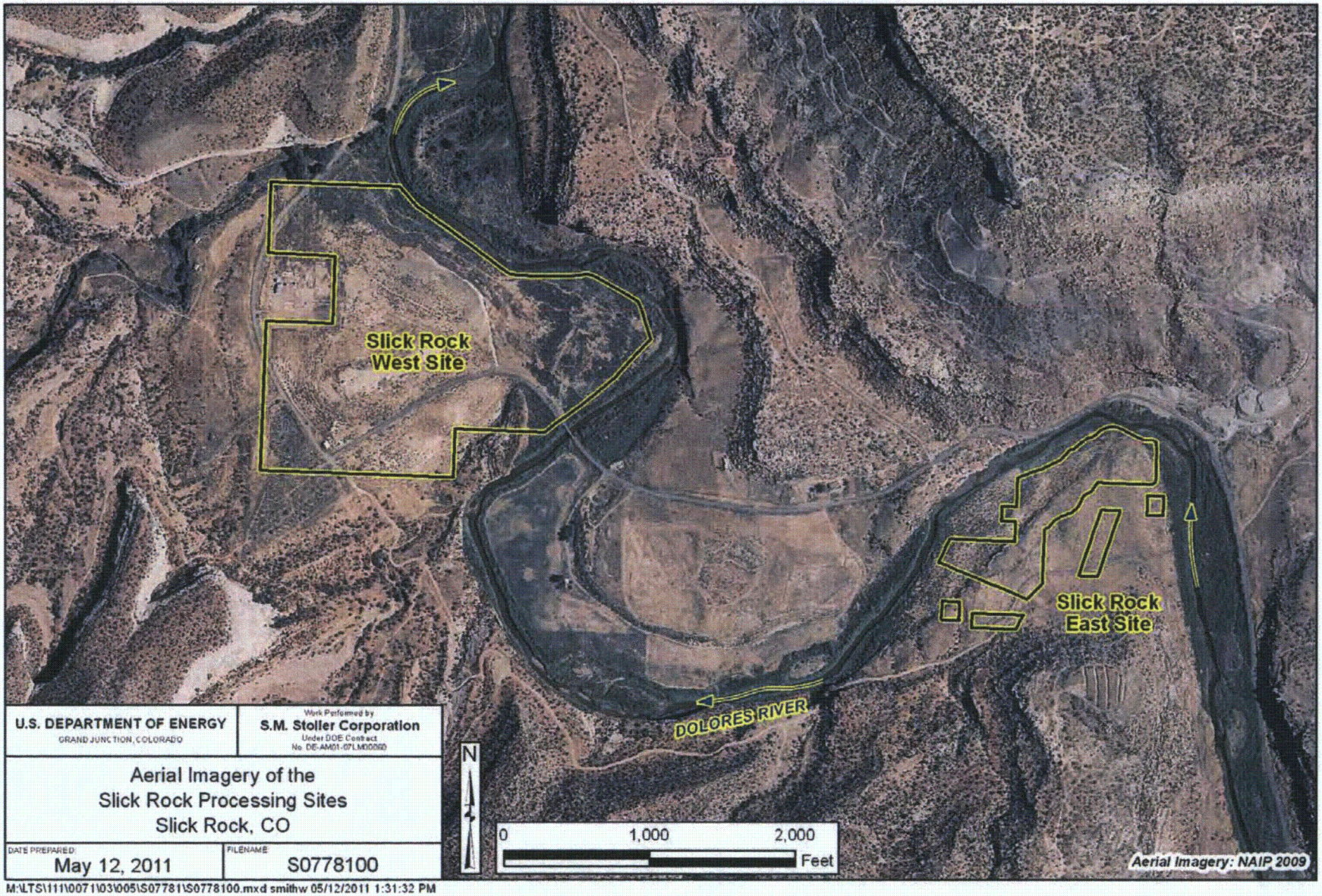

Figure 2. Aerial Photograph of the Slick Rock, Colorado, Processing Sites

Table 1. Groundwater Benchmarks for Slick Rock East and West Site COPCs

COPC[a]	Benchmark	Basis for Benchmark[b]	Applicable Site[c]	Applicable Wells[d]	Comment
Uranium	0.044 mg/L	40 CFR 192	SRE, SRW	All wells except SRW wells 0317 and 0319	Uranium is the most prevalent constituent at both sites.
Selenium	SRE: 0.01 mg/L SRW: 0.18 mg/L (ACL)	SRE: 40 CFR 192 SRW: Risk-based ACL[e] (DOE 2002b)	SRE, SRW	SRE wells 0300, 0305, and 0307 All SRW wells	Note that the UMTRCA standard is less than the 0.05 mg/L SDWA MCL.
Manganese	4.2 mg/L	Maximum background	SRW	All SRW wells except 0317 and 0319	Maximum concentration measured at well 0300 in August 2001.[f]
Molybdenum	0.10 mg/L	40 CFR 192	SRW	All SRW wells except 0319	
Nitrate as NO_3	44.3 mg/L	40 CFR 192	SRW	All SRW wells except 0317 and 0319	The 44.3 mg/L standard is equivalent to the nitrate as nitrogen standard of 10 mg/L in 40 CFR 192.
Radium-226 + Radium-228 (Ra-226 and Ra-228)	5 pCi/L	40 CFR 192	SRW	0319	Analysis for radium in other SRW wells was discontinued after 2001 (given levels below 5 pCi/L).
Benzene	0.005 mg/L	SDWA MCL	SRW	0319	
Toluene	1 mg/L	SDWA MCL	SRW	0319	
Ethylbenzene	0.7 mg/L	SDWA MCL	SRW	0319	The 0.7 mg/L SDWA MCL has never been exceeded.
Xylenes	10 mg/L	SDWA MCL	SRW	0319	The 10 mg/L SDWA MCL has never been exceeded.

Notes

[a] Generally, constituents are listed in order of prevalence as COPCs. For example, uranium is most common to both sites, whereas Ra-226 and Ra-228 are limited to the immediate vicinity of SRW well 0319.

[b] UMTRCA MCL = maximum concentration limit in 40 CFR 192, Table 1 to Subpart A. SDWA MCL = Safe Drinking Water Act maximum contaminant level.

[c] Some constituents—manganese, molybdenum, and nitrate—that are not COPCs at SRE are nonetheless measured at the SRE background well (0300) because that well is considered a representative background location for SRW.

[d] Applicable wells are only those currently monitored. For historical results, refer to the SOWP (DOE 2002b) and previous VMRs.

[e] A risk-based value for selenium was established in the SOWP (DOE 2002b) based on the EPA Risk Table (http://www.epa.gov/reg3hscd/risk/human/rb-concentration_table/Generic_Tables/index.htm [see tapwater screening level in the Summary Table]). As of last access (April 2011), the most recent EPA update was November 2010.

[f] The GCAP cited a maximum background value for manganese of 3.5 mg/L, which was the first (September 2000) measurement in background well 0300, not eventually the highest measurement. (http://gems.lm.doe.gov/imf/imf.jsp?site=slickrockeastprocessing&title=Slick%20Rock%20West%20and%20East,%20CO,%20Processing%20Sites).

Abbreviations

mg/L = milligrams per liter
pCi/L = picocuries per liter

2.0 Site Conditions

2.1 Hydrogeology

The hydrostratigraphic units at the Slick Rock sites are, in descending stratigraphic order, the Quaternary Dolores River alluvium, the Salt Wash Member of the Jurassic Morrison Formation, the Jurassic Summerville Formation, the Jurassic Entrada Sandstone, and the Jurassic Navajo Sandstone. Although both sites overlie Dolores River alluvium, not all other units are present at both sites. The site hydrogeology is described further below.

The Dolores River alluvium contains the uppermost aquifer and, as the only unit affected by site-related contamination, is the primary subject of this VMR.[1] The alluvial aquifer consists of unconsolidated material ranging in thickness from 15 to 20 feet (ft) and consists primarily of silty sands and silty sandy gravels with an occasional interbedded clay lens. The Dolores River alluvium is laterally restricted by bedrock that forms the terraces and canyon walls adjacent to the Dolores River. In addition, the Dolores River floodplain is discontinuous and pinches out in areas where the river meets the canyon wall. Depth to groundwater in the unconfined alluvial aquifer ranges from 7 to 15 ft below ground surface. Groundwater flow direction in the alluvial aquifer generally follows the downstream direction of the Dolores River. The Dolores River is the main recharge source for the alluvial aquifer.

At the SRE site, the Salt Wash Member of the Morrison Formation and the Summerville Formation underlie the Dolores River alluvium. Because these formations have an abundance of fine-grained, low-permeability units, they are considered aquitards at the SRE site (DOE 2002b).

At the SRW site, Entrada Sandstone underlies the Dolores River alluvium. The Entrada Sandstone ranges from 40 to 60 ft in thickness in the floodplain area. The Entrada aquifer is unconfined near the top of the unit (in contact with the alluvial aquifer), and it may be semi-confined near the bottom of the unit. It receives recharge primarily from infiltration of precipitation in upgradient areas, creating artesian pressure. Groundwater has a slight upward vertical gradient between the Entrada and the overlying alluvium, and hydraulic conductivity in the alluvial aquifer is two orders of magnitude greater than that of the Entrada aquifer. These conditions inhibit groundwater from flowing vertically downward from the alluvial aquifer into the Entrada aquifer.

The thickness of the Navajo Sandstone is approximately 180 ft in the Slick Rock area (DOE 2002b). Groundwater in wells completed in the Navajo Sandstone and located on the floodplain at the SRW site has an upward vertical gradient with respect to water in the alluvial aquifer and the Entrada Sandstone; therefore, contamination in the alluvial aquifer does not cross-contaminate the Navajo Sandstone aquifer. The Navajo aquifer discharges into the overlying Entrada.

[1] Samples from wells completed in the Entrada Sandstone at the SRW site (wells 0317 and 0324) have historically exceeded MCLs for molybdenum, nitrate, and selenium, probably the result of cross contamination from drilling through the alluvial aquifer. Sampling of well 0324 was discontinued in 2004 because nitrate and selenium concentrations were below the MCLs for three consecutive rounds of sampling.

2.2 Groundwater Quality

2.2.1 SRE Site

Alluvial groundwater beneath the SRE site was contaminated as a result of former uranium-ore processing activities. This contamination is limited to the uppermost (alluvial) aquifer at the SRE site and consists only of uranium (the primary COPC) and selenium (DOE 2002b). In the alluvial aquifer, the highest uranium concentrations have been approximately 40 times the 0.044 mg/L UMTRCA MCL. Selenium is not considered a major contaminant at the SRE site, as it has been elevated (just slightly) in only one well (0305). While concentrations in well 0305 have been about twice the UMTRCA groundwater standard of 0.01 mg/L, they have remained below the SDWA primary drinking water standard of 0.05 mg/L.

2.2.2 SRW Site

Former uranium-ore processing activities also contaminated the groundwater beneath the SRW site. COPCs in the uppermost (alluvial) aquifer at the SRW site include manganese, molybdenum, nitrate (as NO_3), selenium, uranium, Ra-226, Ra-228, and BTEX. Contaminant plumes in the alluvial aquifer are all contained on site. The Ra-226, Ra-228, and BTEX contamination is isolated to one well (0319). The most pervasive contaminants in the alluvial aquifer are molybdenum, nitrate, selenium, and uranium, with concentrations generally less than one order of magnitude greater than their respective UMTRCA MCLs.

2.3 Surface Water Quality

The Dolores River is the only perennial surface water feature in the vicinity of the Slick Rock sites. As discussed in Section 4.3, results from surface water sampling have demonstrated minimal impact to the Dolores River from site contamination.[2]

2.4 Remediation Activities

Surface remediation at the Slick Rock sites began in 1995 and was completed in 1996. Abandoned uranium mill tailings and other residual radioactive material associated with the former milling operations were relocated to the Slick Rock disposal cell (formerly the Burro Canyon disposal cell), approximately 5 miles east of the Slick Rock Processing Sites. The sites were regraded with on-site material, and subsequent revegetation efforts have been deemed successful.

2.5 Land and Water Use

UMETCO Minerals Corporation currently owns the SRE and SRW sites. The SRE site is not fenced and is used for livestock grazing. The majority of the SRW site is enclosed with a barbed-wire fence. Land between the two sites is privately owned, and land use includes irrigated alfalfa

[2] This stream segment of the Lower Dolores River Basin is classified as Aquatic Life Cold 1, Recreation E, Water Supply, and Agriculture, and the classifications with the most restrictive water quality standards apply (CDPHE 2010).

fields, livestock grazing, and gravel-mining operations. Water used to irrigate the alfalfa is pumped from the Dolores River. There is no current use of alluvial groundwater beneath the former processing sites. There are also no known uses of groundwater from the Entrada Sandstone in the area near the SRE and SRW sites. Groundwater for domestic or agricultural use in the Slick Rock area is primarily supplied by the Navajo Sandstone aquifer. Historically, wells completed in the Navajo Sandstone provided water for the milling operations and for the mill community at the SRW site.

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3.0 Monitoring Program

Monitoring at the Slick Rock processing site is to be performed annually for the first 10 years following U.S. Nuclear Regulatory Commission (NRC) concurrence with the GCAP (DOE 2006). The NRC has not yet concurred with the GCAP. This section describes the monitoring programs for the SRE and SRW sites.

3.1 SRE Site

At the SRE site, the current monitoring network consists of eight monitoring wells and three surface water locations (Table 2 and Figure 3). Sampling at two monitoring wells, 0310 and 0312, was resumed in 2005 (after a 3-year hiatus) to better characterize the extent of uranium contamination detected in well 0311. The farthest downstream SRE surface water location (0700) was also established at that time. In 2010, sampling was resumed at upgradient well 0300 to reestablish a groundwater background location for the SRE and SRW sites.

Table 2. Monitoring Program at the SRE Site

ID	Matrix	Location[a]	Rationale	Analytes
0300	Groundwater	Upgradient	Groundwater background for both SRE and SRW sites.	Manganese, molybdenum, nitrate, selenium, and uranium
0303	Groundwater	On site	Hot spot for uranium.	Uranium
0305	Groundwater	On site	Hot spot for uranium; selenium above the UMTRCA MCL.	Selenium and uranium
0307	Groundwater	On site	Downgradient of hot spots, monitor plume migration.	Selenium and uranium
0309	Groundwater	On site	Farthest downgradient well on site.	Uranium
0310	Groundwater	Off site (across the Dolores River)	Monitor migration of uranium between the SRE and SRW sites.	Uranium
0311	Groundwater	Off site, downgradient	Adjacent to and north of well 0310.	Uranium
0312	Groundwater	Off site, downgradient	Adjacent to and north of well 0311.	Uranium
0696	Surface Water	Upstream	Surface water background.	Uranium
0692	Surface Water	Adjacent to site	Predicted location where the centroid of the uranium plume intersects the river.	Uranium
0700	Surface Water	Downstream	Established in 2005; located about 100 ft southwest of well 0309	Uranium

Notes

[a] The sampling locations in this table are listed first in order of matrix, and then by general flow direction (upgradient or upstream are listed first).

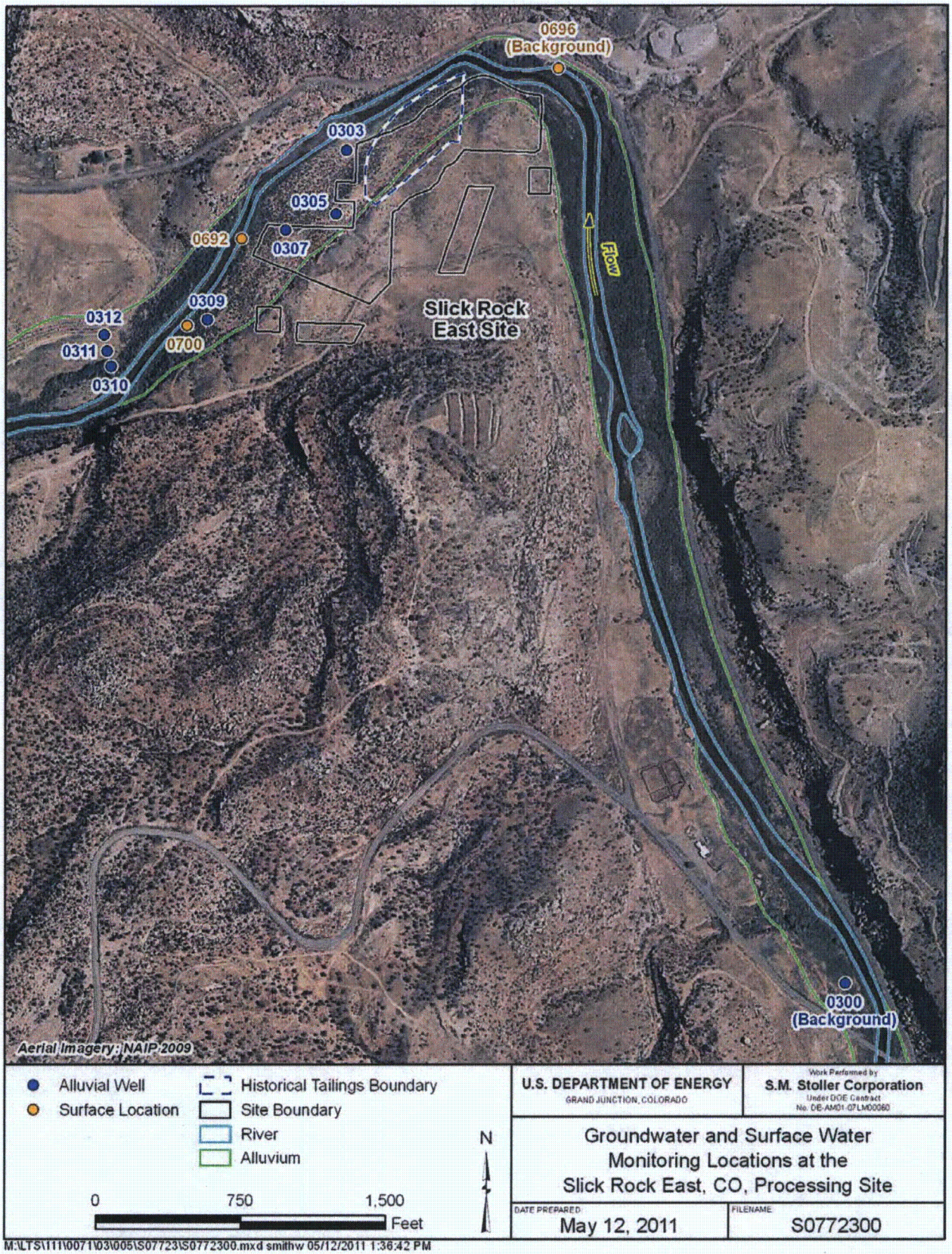

Figure 3. Groundwater and Surface Water Monitoring Locations at the Slick Rock East Site

3.2 SRW Site

At the SRW site, the monitoring network consists of nine monitoring wells and four surface water locations (Table 3 and Figure 4). On September 28, 2010, three new wells were installed at the SRW site: 0318A, 0339, and 0340. Wells 0339 and 0340 were installed to better characterize selenium contamination at the site. Well 0318 had a broken well screen, which resulted in siltation within the well, allowing for sampling of only the top foot or so of water. To allow for representative samples at this location, well 0318 was abandoned on September 29, 2010, and was replaced by well 0318A.

Table 3. Monitoring Program at the SRW Site

ID	Matrix	Location[a]	Rationale	Analytes
0317	Groundwater	On site	Entrada Sandstone well, exceeds molybdenum UMTRCA MCL.	Molybdenum and selenium
0318	Groundwater	On site	Hot spot for several COPCs. Abandoned in September 2010 and replaced by well 0318A.	Manganese, molybdenum, nitrate, selenium, and uranium
0318A	Groundwater	On site	Hot spot for several COPCs. Replaced well 0318.	Manganese, molybdenum, nitrate, selenium, and uranium
0339	Groundwater	On site	Installed in September 2010 to better characterize selenium within the aquifer.	Manganese, molybdenum, nitrate, selenium, and uranium
0340	Groundwater	On site	Installed in September 2010; see rationale for 0339 above.	Manganese, molybdenum, nitrate, selenium, and uranium
0508	Groundwater	On site	High selenium, nitrate, molybdenum, and uranium.	Manganese, molybdenum, nitrate, selenium, and uranium
0324	Groundwater	On site	Entrada Sandstone well. Sampling discontinued in 2004 because nitrate and selenium concentrations had dropped below UMTRCA MCLs.	Although sampling was discontinued, time-trend plots are still provided herein.
0510	Groundwater	On site	Edge of former tailings pile, high COPC concentrations.	Manganese, molybdenum, nitrate, selenium, and uranium
0319	Groundwater	On site	Hot spot for BTEX and radium.	BTEX, radium (Ra-226, Ra-228), and selenium
0320	Groundwater	On site	Farthest downgradient well on site; monitor plume movement.	Manganese, molybdenum, nitrate, selenium, and uranium
0684	Groundwater	Off site	Farthest downgradient well; purpose is to verify that contaminants are not migrating off site.	Manganese, molybdenum, nitrate, selenium, and uranium
0693	Surface Water	Upstream	Upstream SRW surface water location (but downstream of SRE).	Manganese, molybdenum, nitrate, selenium, and uranium
0347	Surface Water	Adjacent to site	Predicted location where the centroid of the selenium plume intersects the river; potential point of exposure for selenium (DOE 2006).	Manganese, molybdenum, nitrate, selenium, and uranium
0349	Surface Water	Adjacent to site	Predicted location where the centroids of contaminant plumes intersect the river. Potential point of exposure.	Manganese, molybdenum, nitrate, selenium, and uranium
0694	Surface Water	Downstream	Potential for contaminant plumes to discharge to the river at this location.	Manganese, molybdenum, nitrate, selenium, and uranium

Notes

[a] The sampling locations in this table are listed first in order of matrix, and then by general flow direction (upgradient or upstream are listed first).

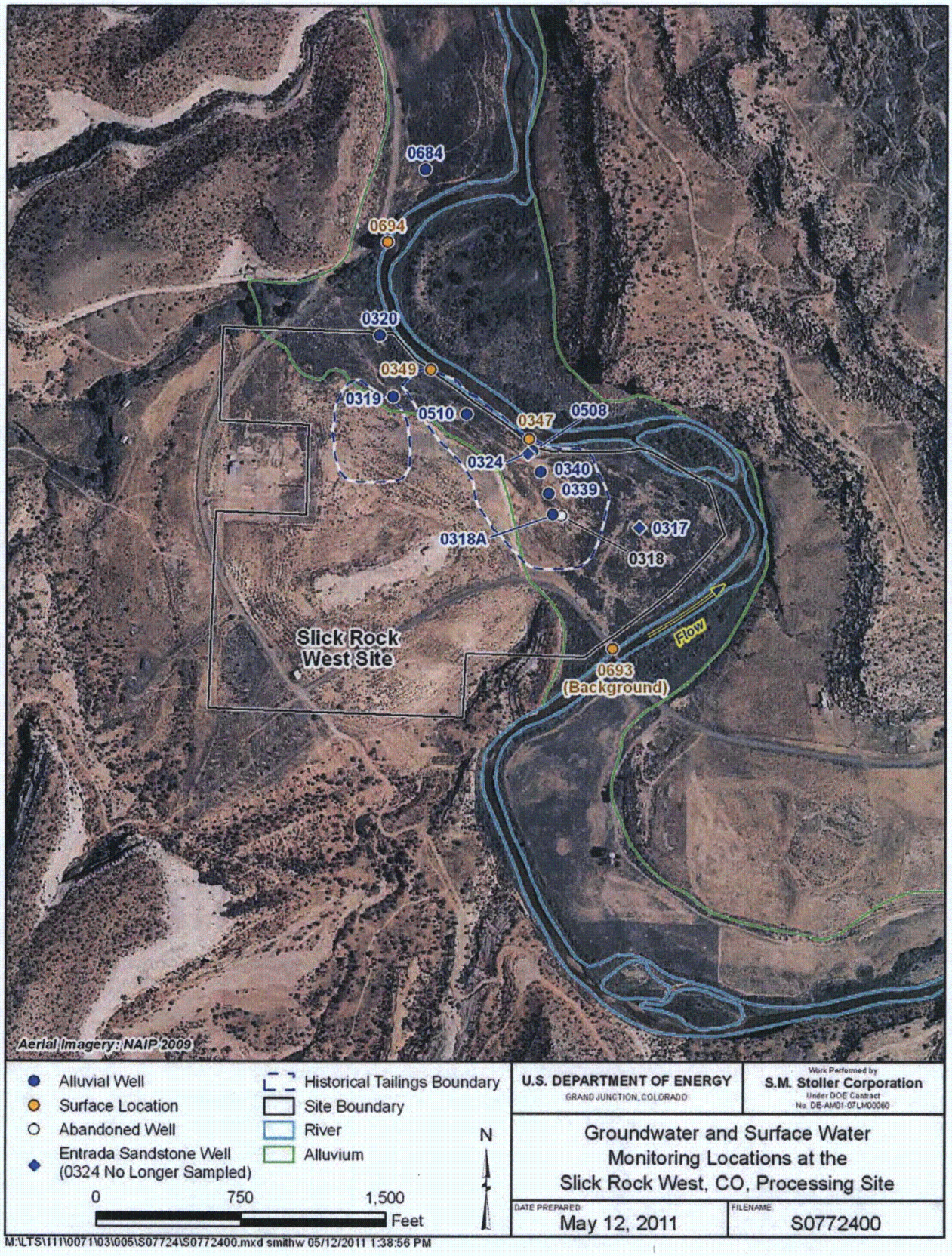

Figure 4. Groundwater and Surface Water Monitoring Locations at the Slick Rock West Site

4.0 Results of 2010 Monitoring

This section documents the results of groundwater and surface water monitoring conducted in 2010 for the SRE and SRW sites. Detailed analytical results are provided in Appendix A for groundwater and in Appendix B for surface water. Appendix C provides supporting static water level data and hydrographs.

4.1 SRE Site Groundwater Monitoring Results

Uranium and selenium are the only constituents currently monitored at SRE, as levels of other constituents have been below respective benchmarks. While uranium is monitored at all SRE well locations, selenium is only monitored at two wells (0305 and 0307). Recent and historical trends observed for each of these constituents are discussed below.

Uranium

The box plots in Figure 5 show the historical distribution of uranium in all SRE wells, ordered (from left to right) by direction of groundwater flow (upgradient to downgradient). This figure shows that uranium concentrations are highest—greater than 10 times the 0.044 mg/L UMTRCA MCL—in SRE wells 0303, 0305, and 0307, located in the central portion of the SRE site, just downgradient of the historical tailings boundary. Figure 6 plots the results of the most recent (August and September 2010) sampling. Although uranium levels attenuate farther downgradient, concentrations are still above the UMTRCA MCL at wells 0309 and 0311.

The time-trend plot in Figure 7 shows uranium concentrations over time for SRE on-site alluvial wells located south of the Dolores River: 0303, 0305, 0307, and 0309. As shown in Figure 5, these wells have historically had the highest uranium concentrations. The uranium concentrations in SRE central wells (0303, 0305, and 0307) fluctuated between 2004 and 2007 but have since stabilized to pre-2005 averages—about 1 mg/L for wells 0303 and 0305, and 0.5 mg/L for well 0307. In well 0309, located farther downgradient but still south of the river, uranium concentrations are about 0.1 mg/L. No attenuation over time (e.g., attributable to natural flushing) is apparent in any wells.[3]

As documented in the previous VMR (DOE 2010), a correlation was apparent between uranium concentrations and corresponding water levels in the SRE central wells. While uranium in wells 0305 and 0307 varied directly with water levels, the opposite trend (an inverse correlation) was apparent for well 0303. It is not clear what specific factors account for these differing trends.

Figure 8 plots uranium concentrations over time for the remaining SRE wells completed in the alluvium north of the Dolores River: 0310, 0311, and 0312. Uranium concentrations in SRE well 0310 have always been below the 0.044 mg/L UMTRCA MCL. In well 0311, although uranium concentrations increased significantly between 2001 and 2008, they have since declined. Those in well 0312 have ranged between 0.02 and 0.07 mg/L, but the last (2010) measurement (0.041 mg/L) was below the MCL. Although the cause of the elevated uranium in wells 0311 and 0312 is not clear, these findings might reflect contamination from the numerous uranium mining operations north of the Dolores River. These wells will continue to be monitored.

[3] Table 5 (in Section 5.1) documents uranium trend analysis results for all SRE wells. Also see Figure 22, which plots actual uranium concentrations in SRE well 0305 versus prior groundwater model predictions.

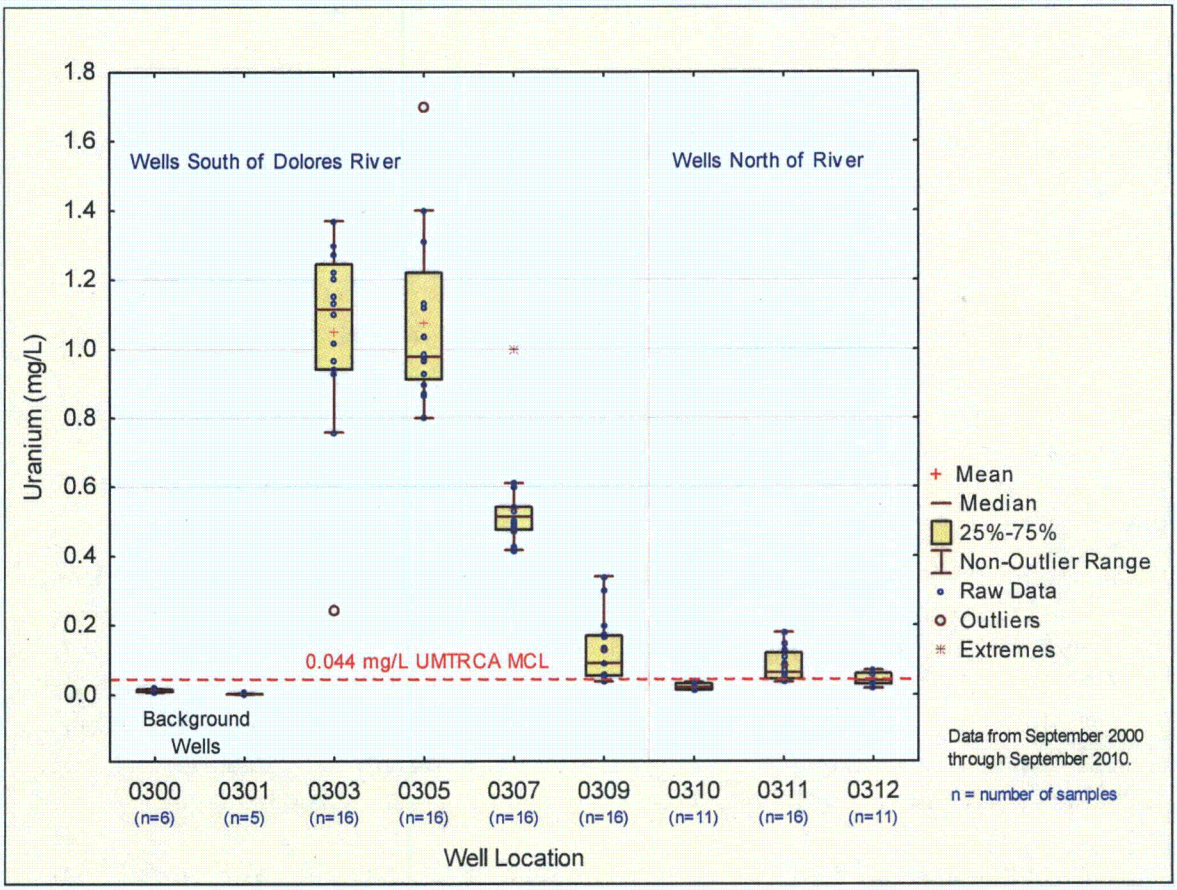

Figure 5. Box Plot and Scatter Plot of Uranium in SRE Wells

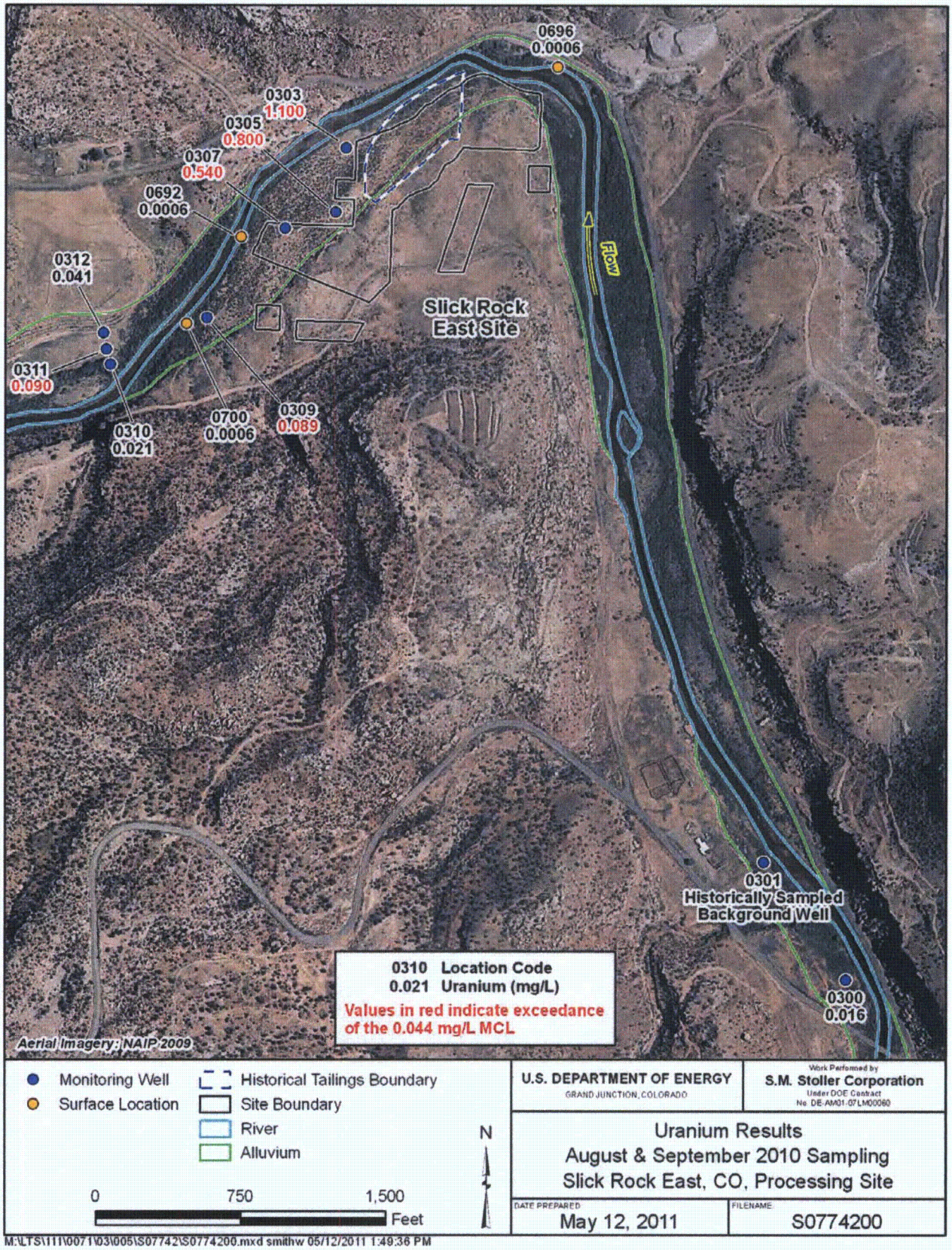

Figure 6. Uranium Distribution at SRE Monitoring Locations: August and September 2010 Sampling

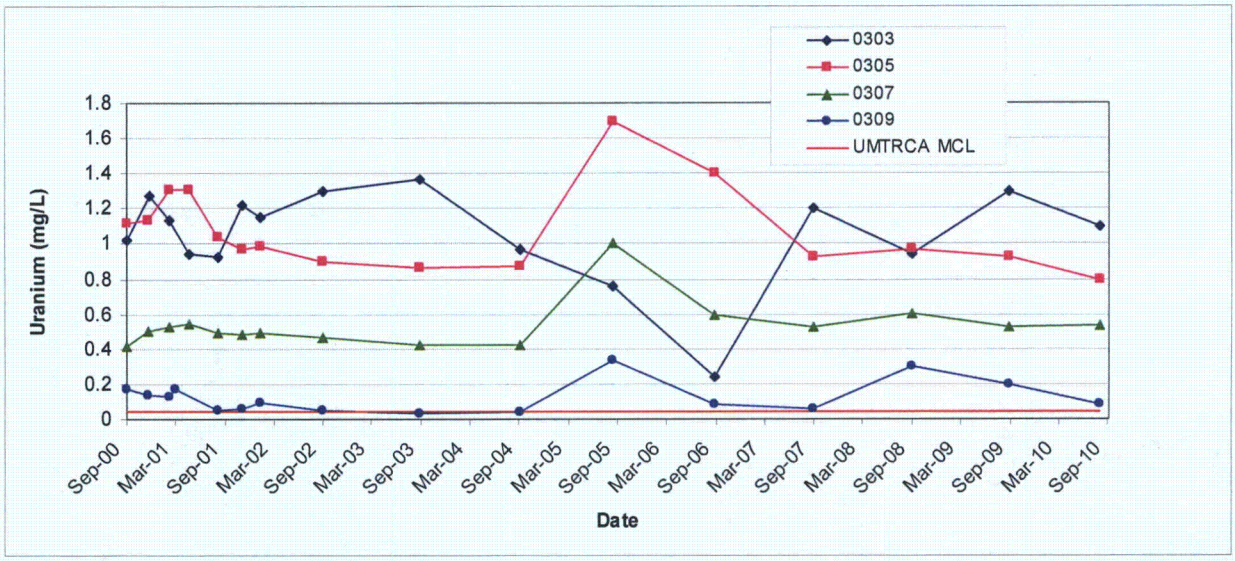

Figure 7. Uranium Concentrations Versus Time in SRE Wells South of Dolores River

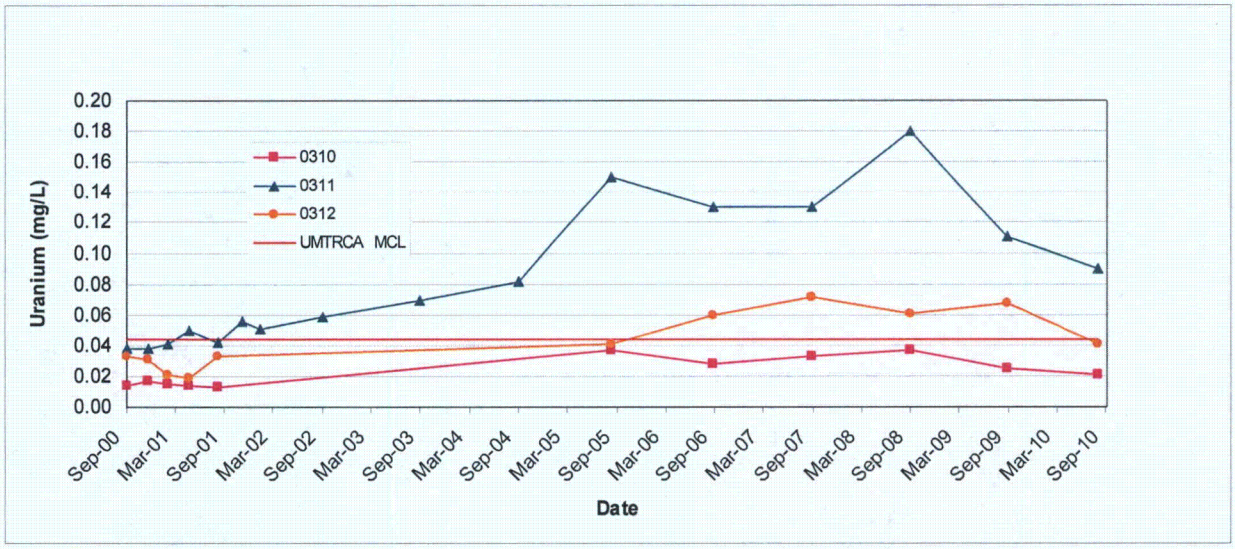

Figure 8. Uranium Concentrations Versus Time in SRE Wells North of the Dolores River

Selenium

Figure 9 shows the historical distribution of selenium in SRE wells (again ordered by direction of groundwater flow). As shown in this figure, selenium has been elevated only in well 0305. Therefore, unlike at SRW, selenium is not considered a major contaminant at the SRE site. Only wells 0305, 0307, and background well 0300 are currently monitored. Although selenium concentrations in well 0305 have historically exceeded the 0.01 mg/L UMTRCA MCL, they have always been below the 0.05 mg/L SDWA primary drinking water standard (average of 0.03 mg/L; see Figure 10). Selenium concentrations in well 0307 have been consistently below the 0.01 mg/L UMTRCA MCL. In fact, 9 of 16 measurements were nondetects (<0.0001 mg/L). Given these findings, discontinuation of monitoring for selenium in well 0307 might be justified.

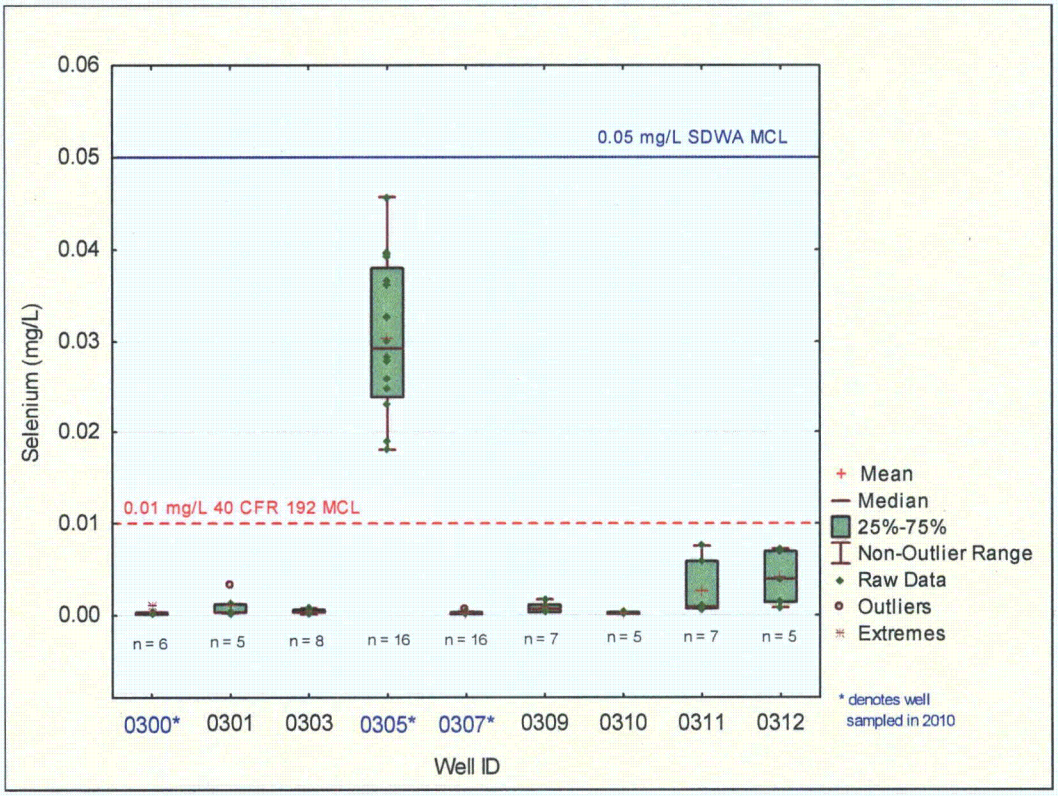

Figure 9. Box Plot and Scatter Plot of Selenium in SRE Wells

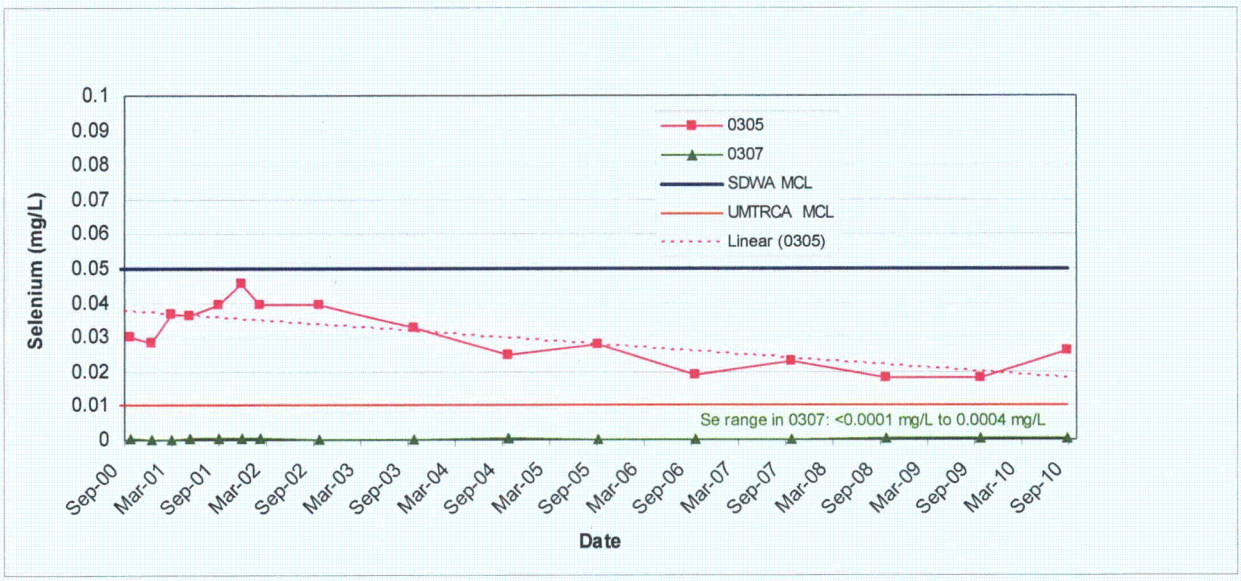

Figure 10. Selenium Concentrations Versus Time in SRE Wells 0305 and 0307

4.2 SRW Site Groundwater Monitoring Results

This section begins with a discussion of historical and recent trends for the two COPCs common to both SRE and SRW: uranium and selenium. Other COPCs monitored in most SRW wells—manganese, molybdenum, and nitrate—are then discussed. This section concludes with a discussion of trends observed for the COPCs limited to alluvial well 0319—BTEX and Ra-226/Ra-228. As an introductory overview of all SRW monitoring results, Figure 11 presents historical box plot diagrams for all COPCs at all SRW wells.

On September 28, 2010, three new alluvial wells were installed at SRW—0318A, 0339, and 0340. Well 0318 was sampled in August 2010 but abandoned in September 2010 because a broken well screen prevented sampling to the same depth as other alluvial wells. Well 0318A is located several feet from well 0318 and has replaced well 0318 at this monitoring location. Data from these newly installed wells are plotted in Figures 11 through 18. However, because these wells were sampled only one day after they were installed, corresponding results might not be representative and any interpretation may be premature. Therefore, discussion and analysis of these results is largely reserved for the subsequent (2011) VMR.

Uranium

Figure 12 maps the most recent (August and September 2010) uranium results. Figure 13 plots uranium concentrations over time for active SRW wells except wells installed in 2010. Historically, uranium has exceeded the 0.044 mg/L UMTRCA MCL in only three wells—alluvial wells 0318, 0508, and 0510, all located within the historical tailings boundary. Since August 2001, uranium in well 0318 has been below the standard, having stabilized at about 0.03 mg/L since 2007. The general distributions (range and average) of uranium in wells 0508 and 0510 are very similar: historically ranging from about 0.07 to 0.14 mg/L, with an average of about 0.1 mg/L.

Selenium

Like uranium, selenium has been elevated only in SRW alluvial wells 0318, 0508, and 0510 within the historical tailings area (Figure 11); selenium in remaining SRW wells has been below the UMTRCA MCL.

Figure 14 shows that selenium levels in well 0508 have stabilized at about 1 mg/L; those in well 0510 have been more variable but recently decreased to 0.25 mg/L. However, concentrations in well 0318 have more than doubled since initial measurements in 2000, from 2.5 to nearly 6 mg/L, with a peak of 8 mg/L in 2008. (Based on the previous [2008–2009 VMR], no correlation was apparent between water elevations and selenium levels [DOE 2010].)

To better understand the distribution and movement of selenium in the alluvial aquifer in this area, as discussed previously, two new wells—0339 and 0340—were installed in 2010 between wells 0318 and 0508. Damaged well 0318 was replaced by well 0318A, and sampling for selenium was reinstated at wells 0317 and 0319. Figure 15 maps the most recent (August and September 2010) selenium results. Selenium concentrations in the newly installed wells (2-3 mg/L) are lower than recent measurements in well 0318 (5–8 mg/L). However, they are still higher than concentrations in remaining SRW wells (note caveat in the introduction to Section 4.2 above; also see Figures 11, 13, and 14).

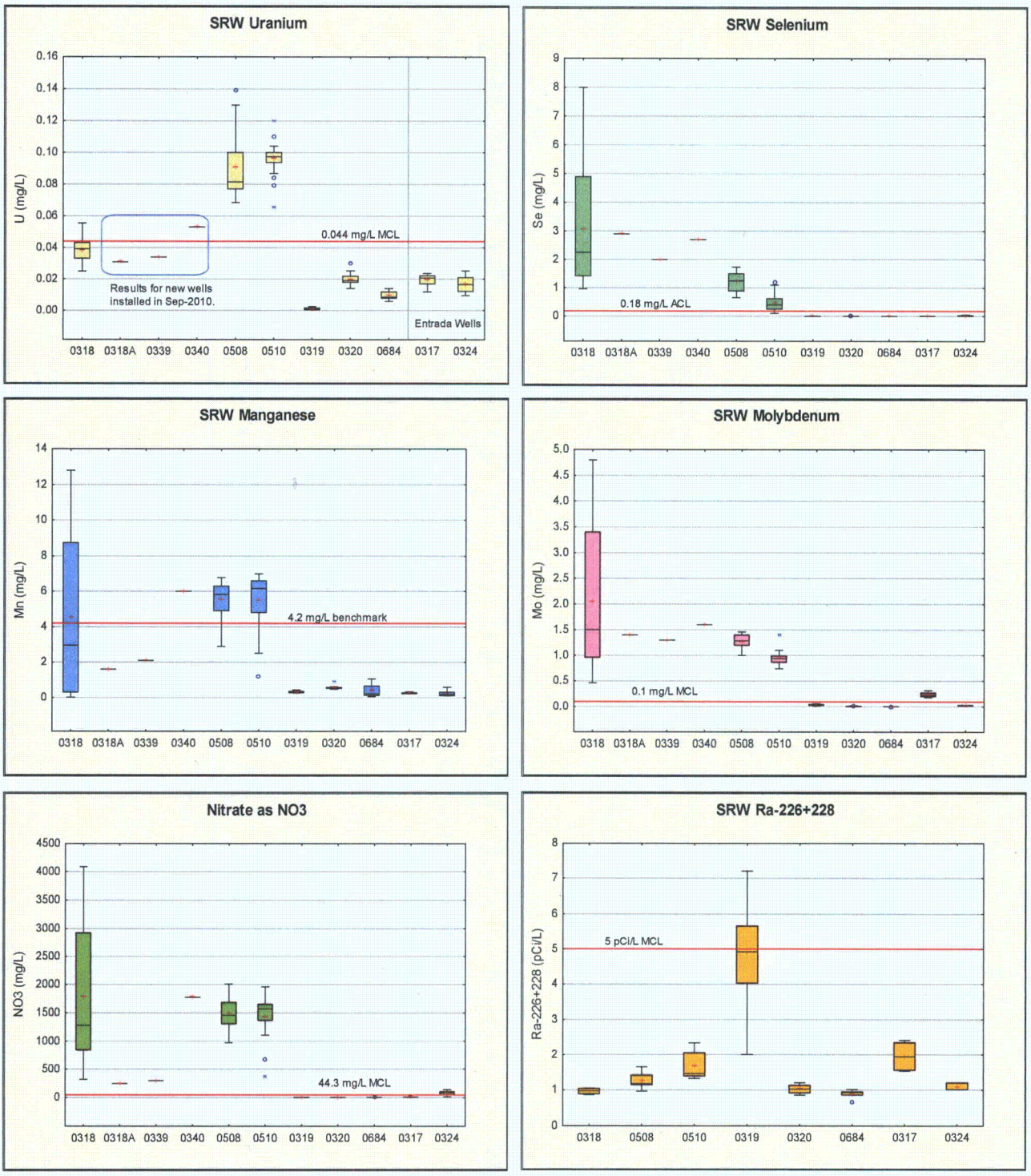

Figure 11. Historical Distributions of SRW COPCs[4]

[4] The box plots above are similar to those shown previously for SRE COPCs (see Figure 5 and Figure 9) in that they depict the mean (+), median, lower and upper quartiles, and the non-outlier range. Points plotted beyond these limits are outliers. In each plot, wells are ordered according to the general direction of groundwater flow: alluvial wells are plotted first, followed by Entrada wells 0317 and 0324. BTEX data are not plotted above, as these were generally limited to well 0319 (refer instead to the time trend plots shown in Figure 19).

Figure 12. Uranium Distribution at Slick Rock West Site: August and September 2010

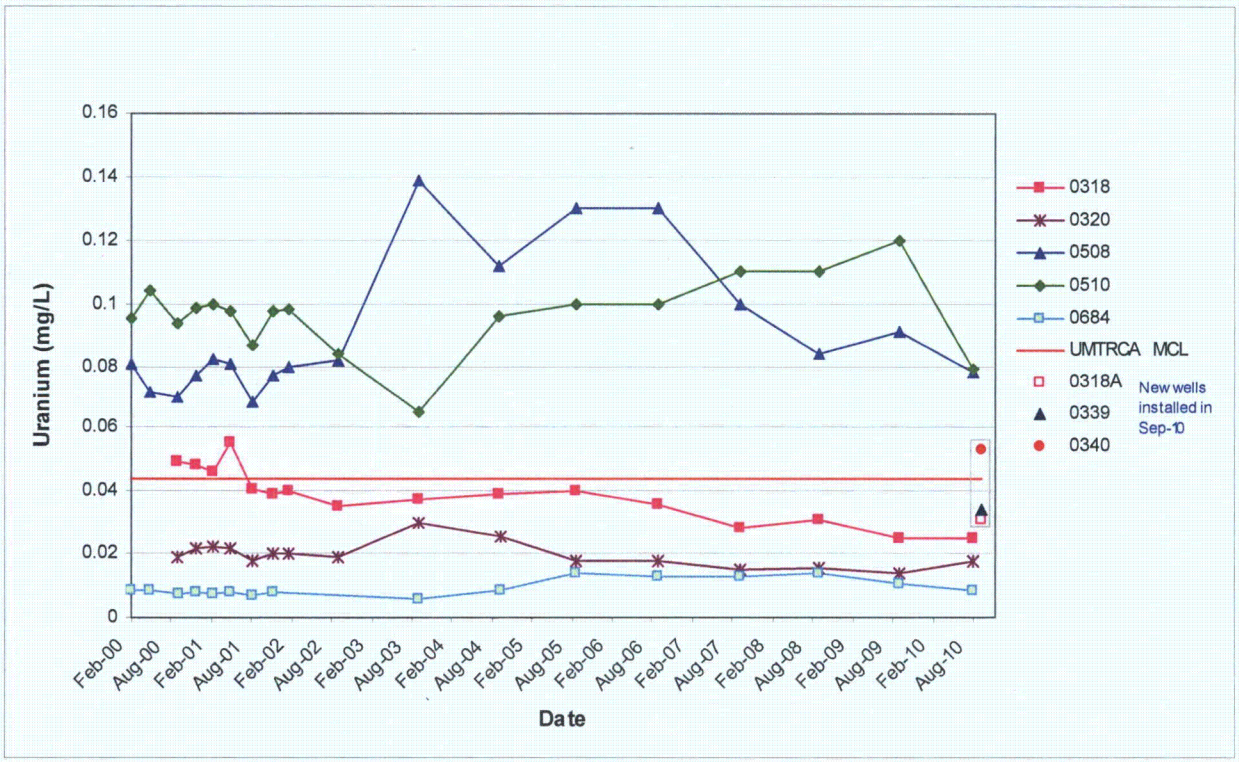

Figure 13. Uranium Concentrations Versus Time in SRW Wells

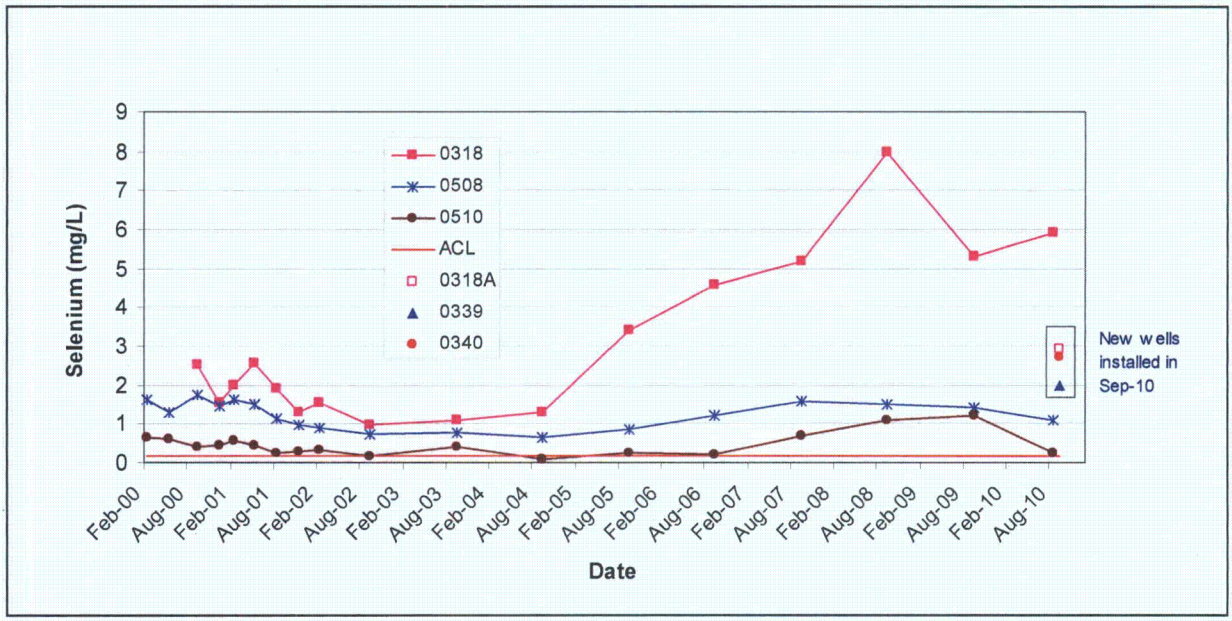

Figure 14. Selenium Concentrations Versus Time in SRW Wells 0318, 0508, and 0510

Figure 15. Selenium Distribution at Slick Rock West Site: August and September 2010

Manganese

Elevated concentrations of manganese have been limited to alluvial wells coinciding with the former tailings area (0318, 0508, and 0510; see Figure 11). As shown in Figure 16, although historically manganese has been highest in well 0318 (the hot spot for selenium, molybdenum, and nitrate), levels in that well have declined significantly since April 2002, to well below the 4.2 mg/L (background) benchmark. Concentrations in 0508 and 0510 have also decreased, but more gradually.

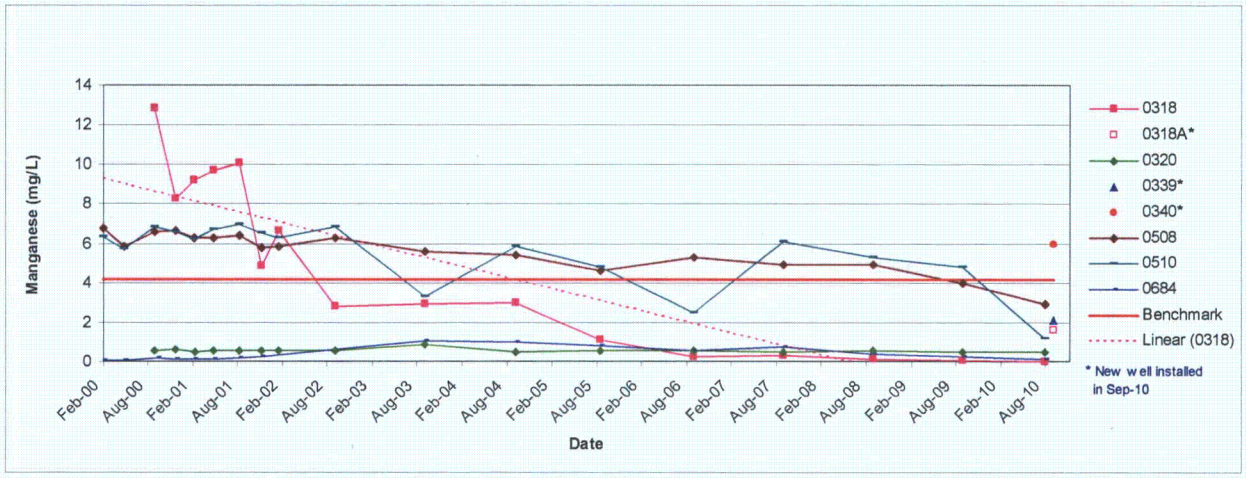

Figure 16. Manganese Concentrations Versus Time at the SRW Site

Molybdenum

Like other SRW COPCs, molybdenum is most elevated in alluvial wells 0318, 0508, and 0510 (see Figure 11). Acknowledging the caveat noted previously, it is also elevated in the newly installed wells. As shown in Figure 17, levels in these wells are over an order of magnitude higher than the 0.1 mg/L UMTRCA MCL and are increasing in well 0318 (often correlated with selenium increases). Concentrations in Entrada Sandstone well 0317 have also exceeded the UMTRCA MCL, but only slightly.

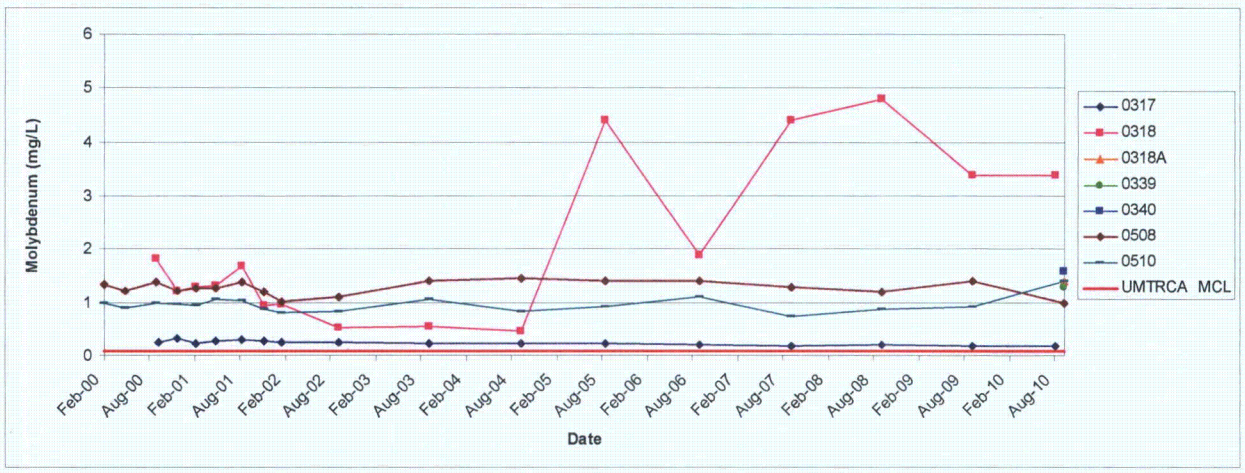

Figure 17. Molybdenum Concentrations Versus Time at the SRW Site

Nitrate

Because there are differences in nitrate levels among wells (see Figure 11), Figure 18 plots nitrate concentrations over time for only those wells with current concentrations above the 44.3 mg/L (as NO_3) UMTRCA MCL, including new wells installed in 2010. Except for Entrada well 0324 (no longer sampled), in which nitrate levels ranged up to 137 mg/L initially but later declined to about 10 mg/L, nitrate in the SRW wells not shown in Figure 18 has remained below the UMTRCA MCL.

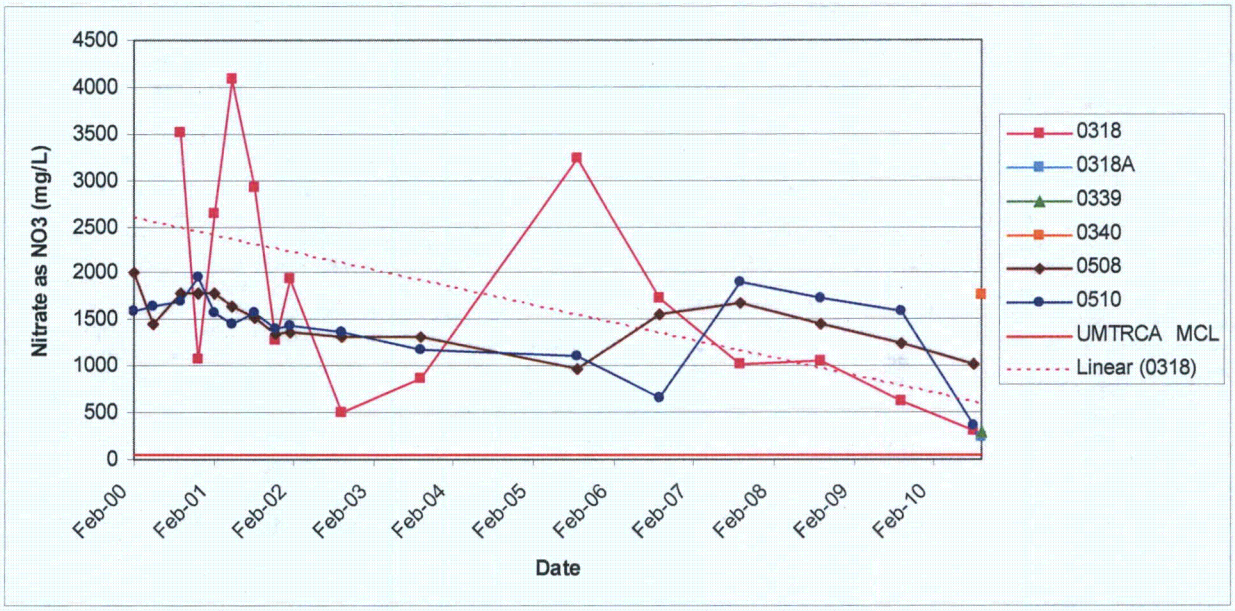

Figure 18. Nitrate (as $N0_3$) Concentrations Versus Time in SRW Wells with Concentrations Above the UMTRCA MCL

BTEX (Well 0319)

During site characterization activities conducted for the SOWP, a localized aromatic hydrocarbon plume was identified in the area of alluvial well 0319 (DOE 2002b), where nonaqueous phase liquid (NAPL) had been identified. This is the only SRW well currently monitored for BTEX[5]. Corresponding time-trends are plotted in Figure 19.

As shown in Figure 19, benzene concentrations reached a peak in May 2001 (19.8 mg/L) and have fluctuated over time, with an overall decline. Similar fluctuations are apparent for toluene. Both benzene and toluene have consistently exceeded corresponding SDWA MCLs (only one exception for toluene in 2002). However, these benchmarks are drinking water standards and as such are not relevant to the SRW site, where there is no known exposure to alluvial groundwater. The SDWA MCLs of 0.7 mg/L for ethylbenzene and 10 mg/L for xylenes have never been exceeded.

[5] During initial site characterization activities, nine other SRW wells were monitored for BTEX in addition to well 0319: 0320, 0326, and 0332–0338 (0332–0338 have since been decommissioned). Although the maximum benzene concentration was detected in well 0319 (nearly 20 mg/L), in 2000–2001 elevated levels were also detected in wells 0332 and 0333 (located within 100 ft of 0319 to the south and southwest, respectively).

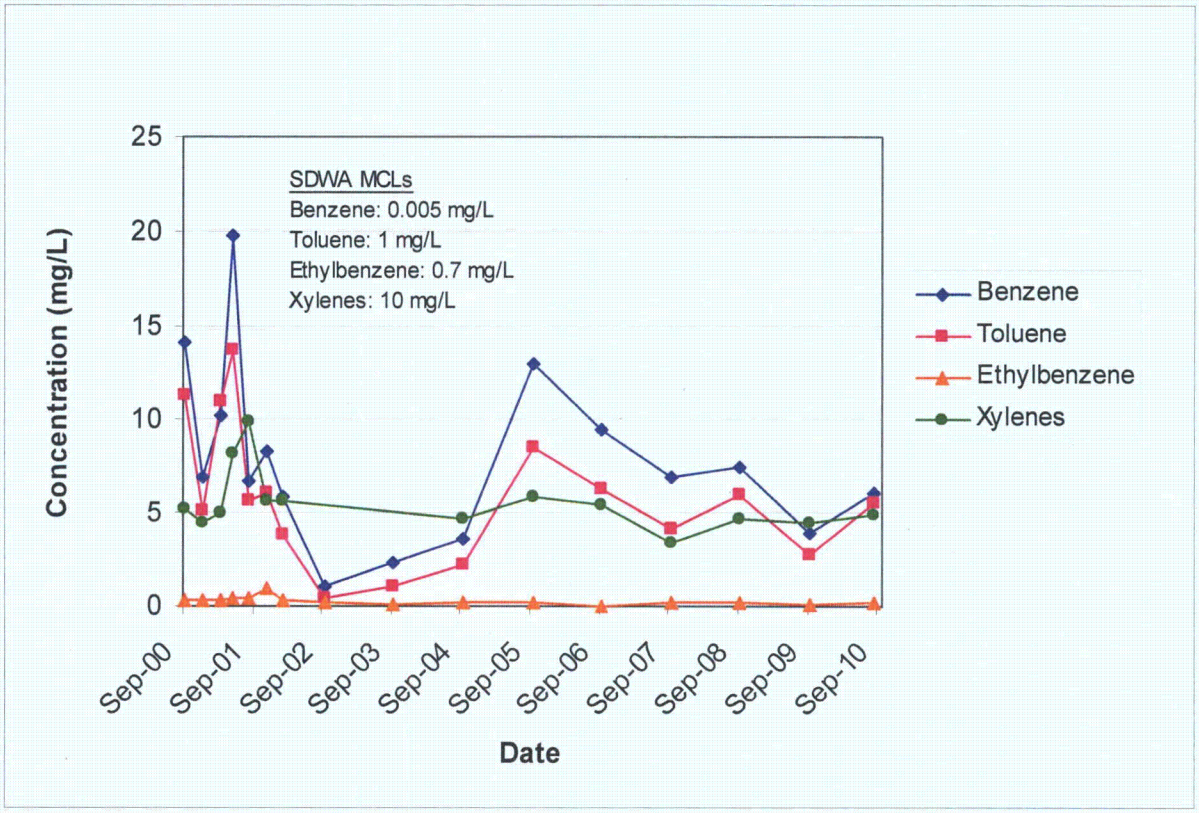

Figure 19. BTEX Concentrations Versus Time in SRW Well 0319

Ra-226, Ra-228 (Well 0319)

Although radium (Ra-226 + Ra-228) has been detected in other wells, its presence above the 5 picocuries per liter (pCi/L) UMTRCA MCL has historically been limited to well 0319, coinciding with the BTEX hot spot. Figure 20, which plots Ra-226 and Ra-228 concentrations in well 0319 over time, shows that radium levels (Ra-226/228 combined) have been below the UMTRCA MCL since 2008. Historically, concentrations have ranged from 3.6 to 7.7 pCi/L. However, Figure 11 shows that both the median and the average radium concentrations have been just at 5 pCi/L, suggesting that radium's localized presence is not a major concern at SRW.

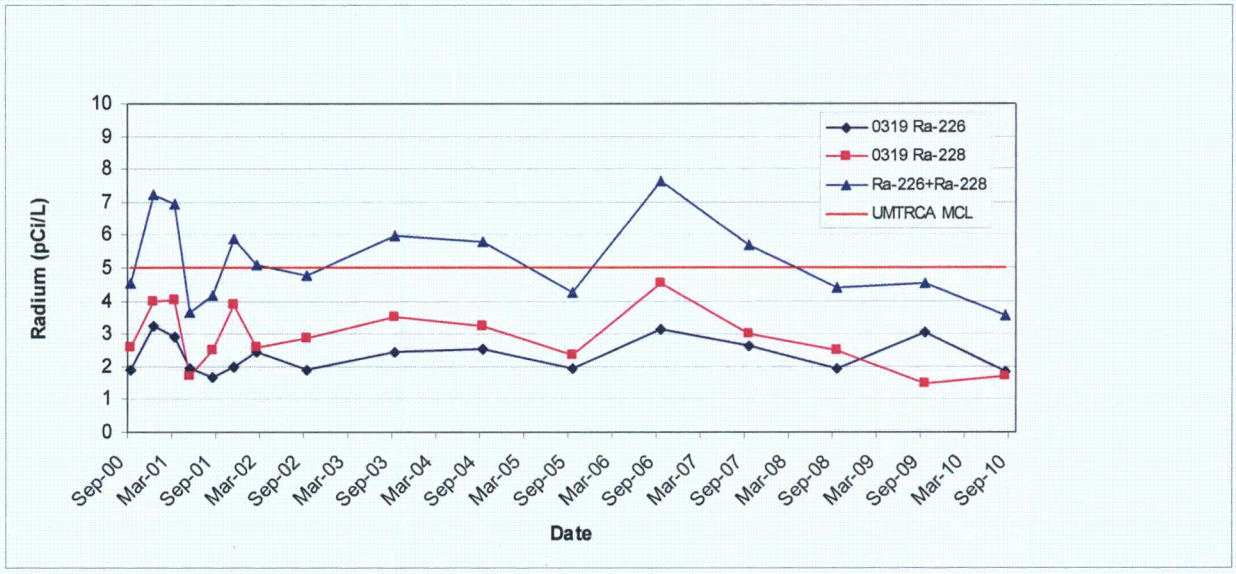

Figure 20. Ra-226 + Ra-228 Concentrations Versus Time in SRW Well 0319

4.3 Surface Water Monitoring Results (Both SRE and SRW Sites)

Surface water sampling results for the 2010 monitoring period demonstrate essentially no impact to the Dolores River from site activities at either the SRE or SRW sites. As shown in Table 4, no CDPHE water quality benchmarks were exceeded in 2010 (detailed results are in Appendix B). Figure 21 plots the distribution of uranium in historical Dolores River samples for both SRE and SRW sites (uranium is the only surface water COPC common to both). This plot demonstrates that, with the exception of a single outlier in 2006 (0.055 mg/L), uranium has always been below the CDPHE benchmark.[6]

Table 4. Comparison of 2010 COPC Concentrations in the Dolores River to CDPHE Benchmarks

COPC	CDPHE Benchmark[a] (mg/L)	Dolores River Location						
		SRE Site			SRW Site			
		0696 Bkgd.	0692	0700	0693 Bkgd.	0347	0349	0694
		2010 Maximum Concentration (mg/L)						
Manganese[b]	0.05	–	–	–	0.0018	0.010	0.016	0.0062
Nitrate	10				< 0.01	0.011	0.12	0.025
Selenium	0.0046	–	–	–	0.0003	0.0003	0.0007	0.0004
Uranium	0.03[c]	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007	0.0007

Notes
[a] CDPHE 2010
[b] The standard listed for manganese is for chronic exposure.
[c] The uranium standard was recently revised to 0.03 mg/L for this segment of river. It was previously 40 pCi/L (approximately 0.059 mg/L).

[6] The September 2006 sampling event occurred during a period of heavy rain. The anomalous 0696 measurement noted above (0.055 mg/L) was likely influenced by storm water runoff.

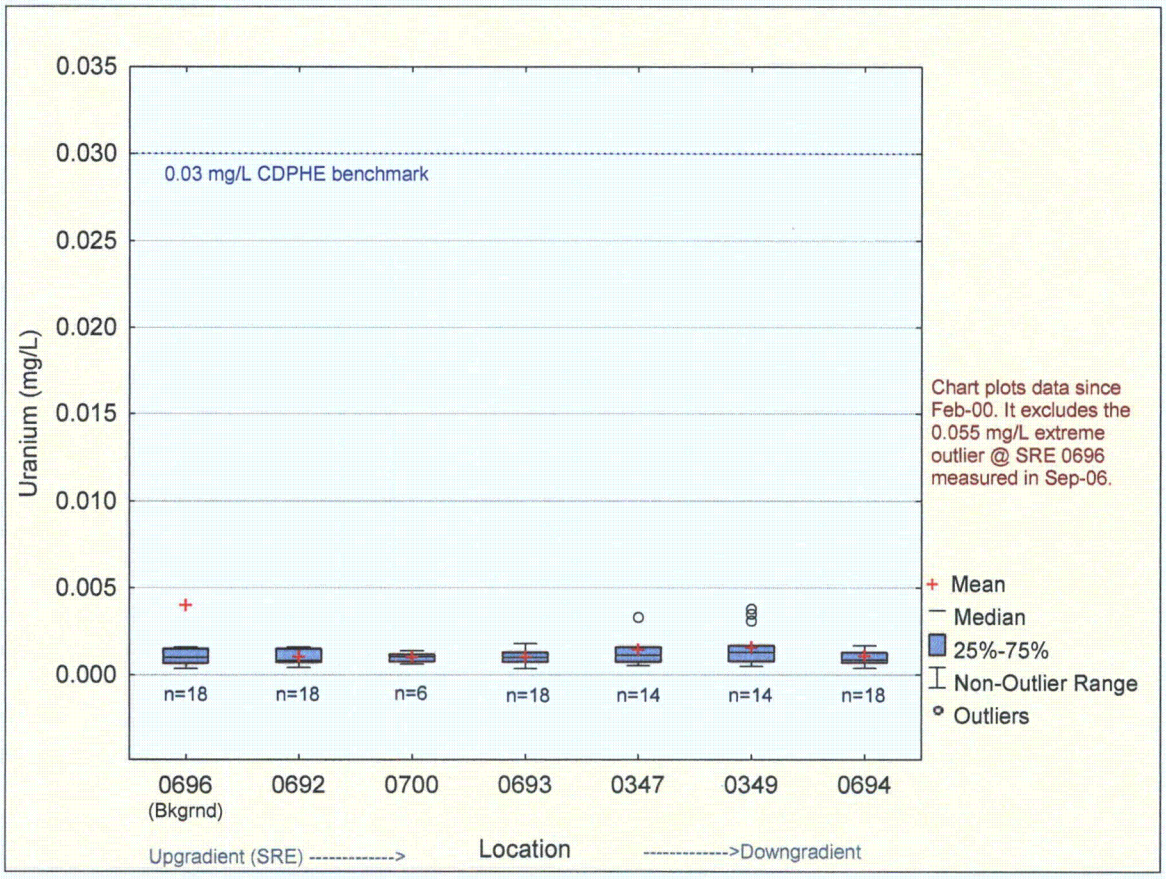

Figure 21. Box Plot of Uranium in Historical Slick Rock Surface Water (Dolores River) Samples

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5.0 Natural Flushing Assessment

In support of the SOWP for the Slick Rock site, a groundwater flow and transport model was developed to evaluate whether natural flushing would reduce site COPCs to levels below UMTRCA or SDWA MCLs or alternative benchmarks in the alluvial aquifer within 100 years (DOE 2002b, Section 5.3 and Appendix H). Because modeling predicted that site COPCs would be below benchmarks within 50 years, natural flushing was selected as a compliance strategy.

This section evaluates the status of natural flushing for both the SRE and SRW sites, plotting predicted versus actual concentrations for the modeled constituents in the target wells (SRE well 0305 and SRW well 0508). To buttress the analysis, trends are evaluated for all COPCs and all wells. Trend analysis was performed using the Mann-Kendall test (see Gilbert 1987); this test determines if an upward trend, a downward trend, or no trend exists. Note, however, that some trends identified as significant are sometimes barely so, and/or reflect data that are highly variable (e.g., reflecting a single [outlier] peak in concentrations). Therefore, to facilitate review and interpretation of these findings, it is recommended that the reader also refer to the time-trend plots provided in the previous section.

5.1 SRE Site

Figure 22 plots uranium concentrations in SRE well 0305 versus groundwater model predictions. This figure shows that uranium concentrations are not attenuating as rapidly as predicted; in fact, actual concentrations are about an order of magnitude above predicted values. A corresponding plot for selenium, the only other SRE COPC, is not provided because levels in well 0305 have stabilized at about 0.02 mg/L, close to the 0.01 mg/L UMTRCA MCL and below the 0.05 mg/L SDWA MCL (Figure 10).

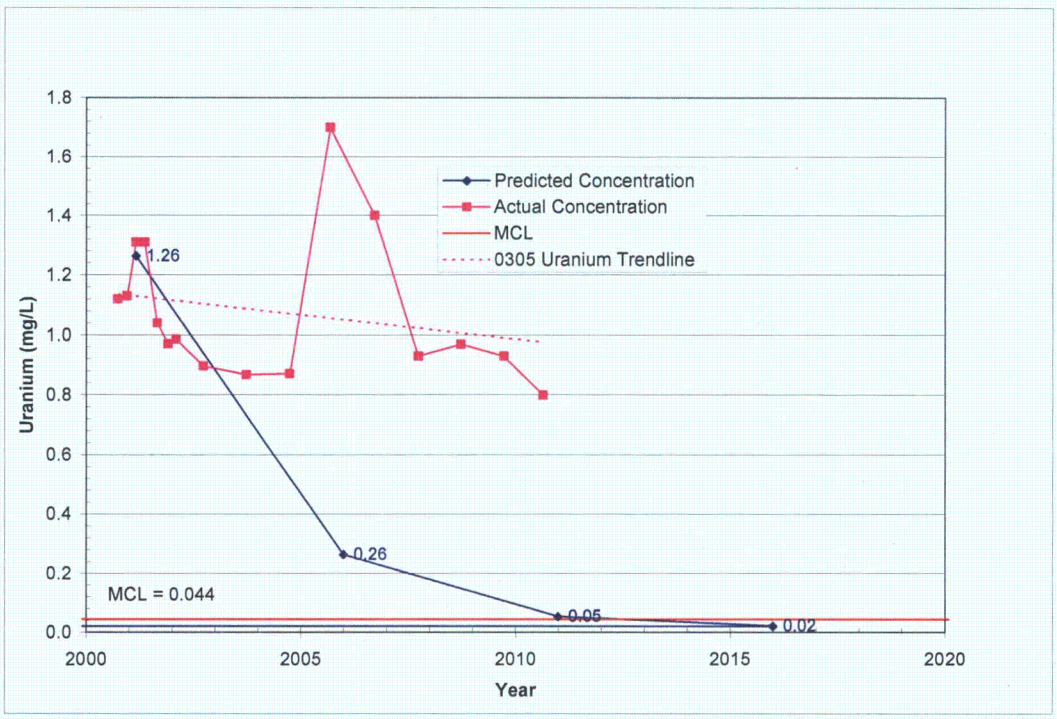

Figure 22. Predicted Versus Actual Uranium Concentrations in SRE Well 0305

Table 5 and Table 6, respectively, show results of the trend analyses for uranium and selenium in SRE monitoring wells. Although a slight downward trend is apparent at well 0305, and increasing trends are indicated in the two farthest downgradient SRE wells (0311 and 0312), none of these trends are compelling (see Table 5, notes "c" and "d"). As noted previously, selenium is not considered a major contaminant at the SRE site, and only wells 0305 and 0307 are currently monitored. Table 6 indicates a slight downward trend in well 0305—the most recent measurement in this well still exceeds the 0.01 mg/L UMTRCA MCL but is below the 0.05 mg/L SDWA standard.

Table 5. Assessment of Uranium Trends in SRE Site Monitoring Wells

Location	No. of Samples	Trend[a]	2010 Result (mg/L)[b]	Standard Exceeded in 2010?
0303	16	No trend	1.1	Yes
0305	16	Downward[c]	0.8	Yes
0307	16	No trend	0.54	Yes
0309	16	No trend	0.089	Yes
0310	11	No trend	0.021	No
0311	16	Upward[d]	0.09	Yes
0312	11	Upward[d]	0.041	No

Notes

[a] Data from 2000 to 2010. Trend analysis was based on the Mann-Kendall test (see Gilbert 1987) and performed using the Visual Sampling Plan (VSP) software developed by the U.S. Department of Energy (DOE); see http://vsp.pnl.gov/.

[b] Results listed in red exceed the 0.044 mg/L UMTRCA MCL for SRE.

[c] Significance of the downward trend is likely a vestige of the September 2005 peak and subsequent decline in uranium concentrations (see Figure 7). Otherwise, uranium levels have remained relatively stable.

[d] Trend test result, although significant, is not compelling (refer to Figure 8 and the supporting text).

Table 6. Assessment of Selenium Trends in SRE Site Monitoring Wells

Location	No. of Samples	Trend[a]	2010 Result (mg/L)[b]	Standard Exceeded in 2010?
0305	16	Downward[c]	0.026	Yes
0307	16	No Trend	0.00023	No

Notes

[a] Data from 1997 to 2010.

[b] Results listed in red exceed the 0.01 mg/L (40 CFR 192) selenium standard for SRE; note that this differs from the 0.18 mg/L ACL benchmark established for SRW.

[c] The downward trend is rather weak as shown in Figure 10.

5.2 SRW Site

Figures 23 through 27 plot concentrations of manganese, molybdenum, nitrate, selenium, and uranium in SRW well 0508 versus model predictions. Table 7 summarizes the results of the trend analyses for these constituents. Newly installed wells—0318A, 0339 and 0340 at SRW—are not included in the trend analysis because there are not enough data points to evaluate a trend. Again, when interpreting these results (in particular, for the wells/parameters listed as having upward or downward trends), the reader should refer back to the time-trend plots provided in the previous section.

Manganese (Figure 23) is the only SRW constituent for which the actual trend agrees with the groundwater model prediction: concentrations in well 0508 have decreased to below background levels. Results for the other constituents are not in close agreement with values predicted from the model. However, these figures plot results only for a single SRW well, 0508, which was considered most representative for assessing natural flushing progress.

The trend analysis matrix in Table 7 reveals mixed results. In general, no trend predominates in the alluvial wells. As reported in 2009, uranium is increasing in well 0508, but the previous upward trend in wells 0510 and 0317 is no longer significant. Although the Mann-Kendall test indicates an upward trend for uranium and manganese in well 0684, review of the corresponding time-trend plots (Figures 13 and 16) suggests that these trends are negligible. Manganese is below the benchmark value of 4.2 mg/L in all SRW wells and, except for well 0684, is generally trending downward.

Molybdenum is increasing at well 0320 but remains near the benchmark value of 0.10 mg/L. Nitrate is decreasing at 5 of the 8 wells and is not increasing at any of the SRW wells. As stated in the previous VMR, the recent increases in selenium at well 0318 (most recent result 5.9 mg/L, more than 30 times the ACL) may have been influenced by siltation. This well was replaced with well 0318A (most recent result 2.9 mg/L)—results for this and additional new wells 0339 and 0340 will be evaluated in the future. Downward trend results for COPCs in Entrada well 0324 support the decision to discontinue monitoring at this well several years ago. A downward trend is apparent for molybdenum at Entrada well 0317 as it approaches the benchmark value of 0.10 mg/L. Except for well 0318, no significant trending is apparent for selenium in remaining SRW wells.

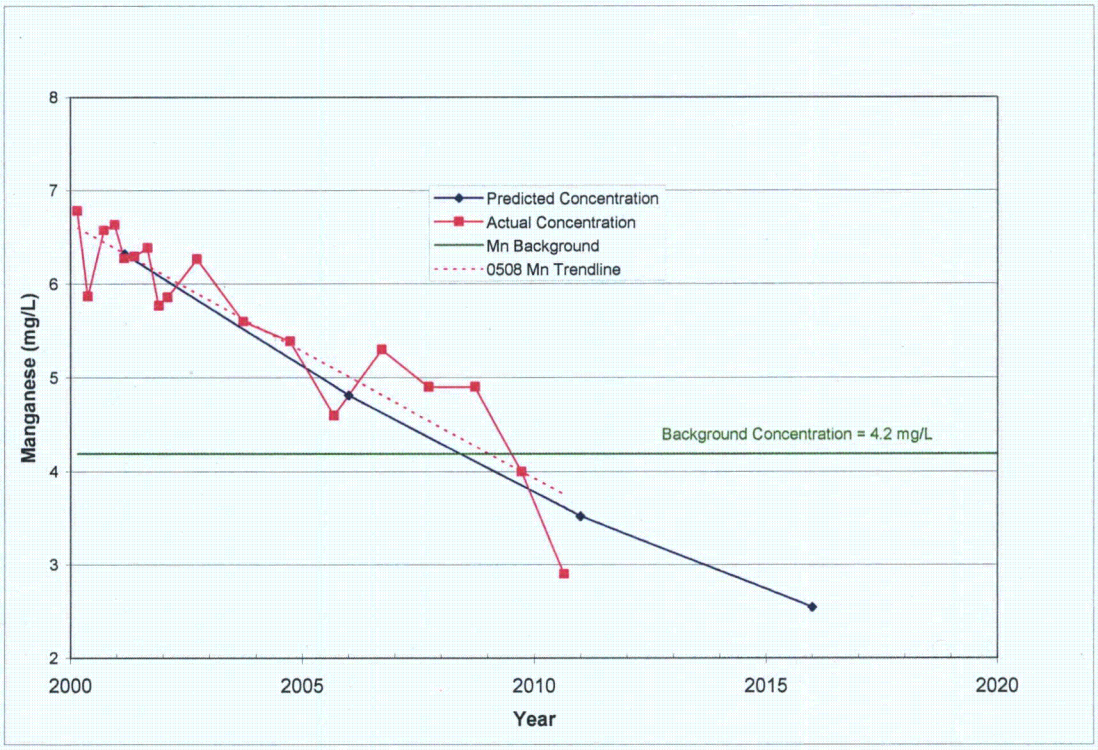

Figure 23. Manganese Concentrations in SRW Well 0508 Versus Groundwater Model Predictions

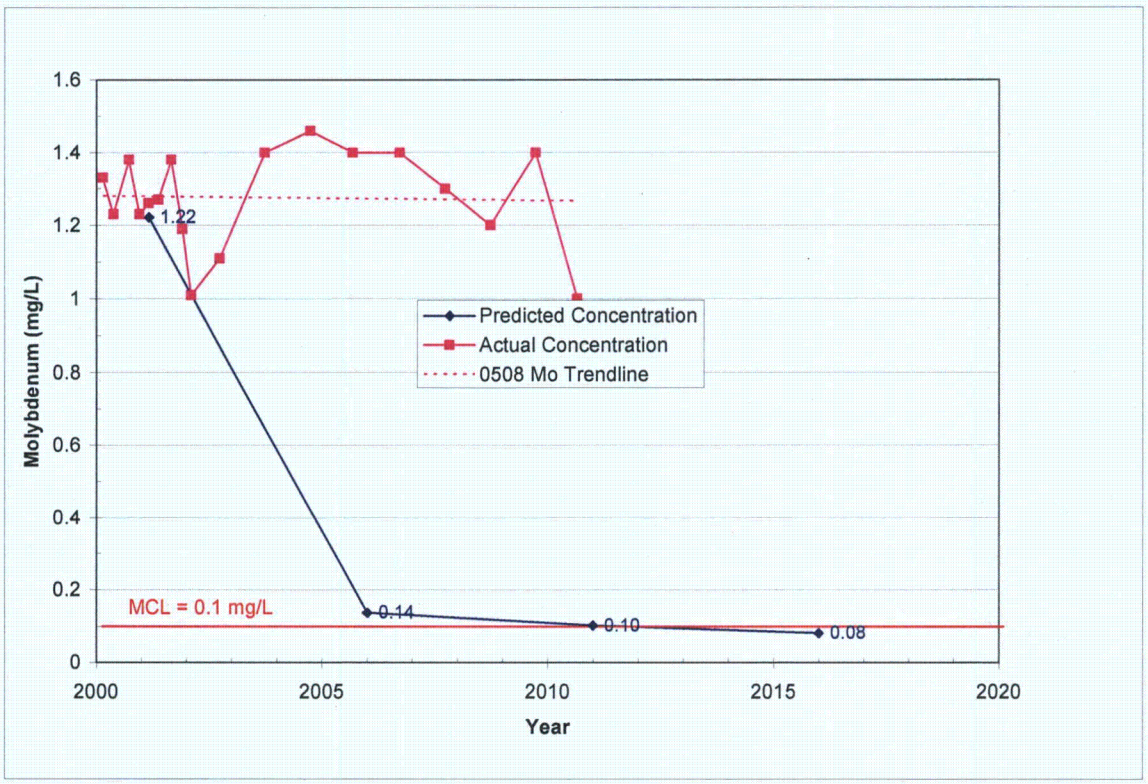

Figure 24. Molybdenum Concentrations in SRW Well 0508 Versus Groundwater Model Predictions

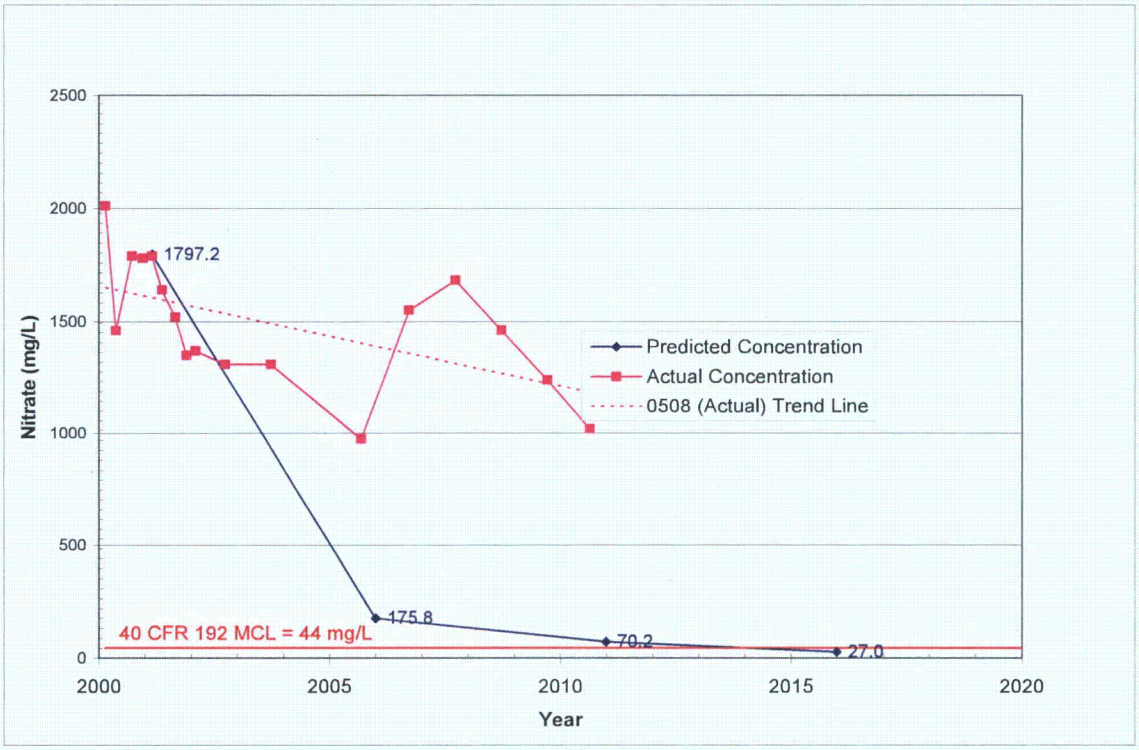

Figure 25. Nitrate (as NO_3) Concentrations in SRW Well 0508 Versus Groundwater Model Predictions

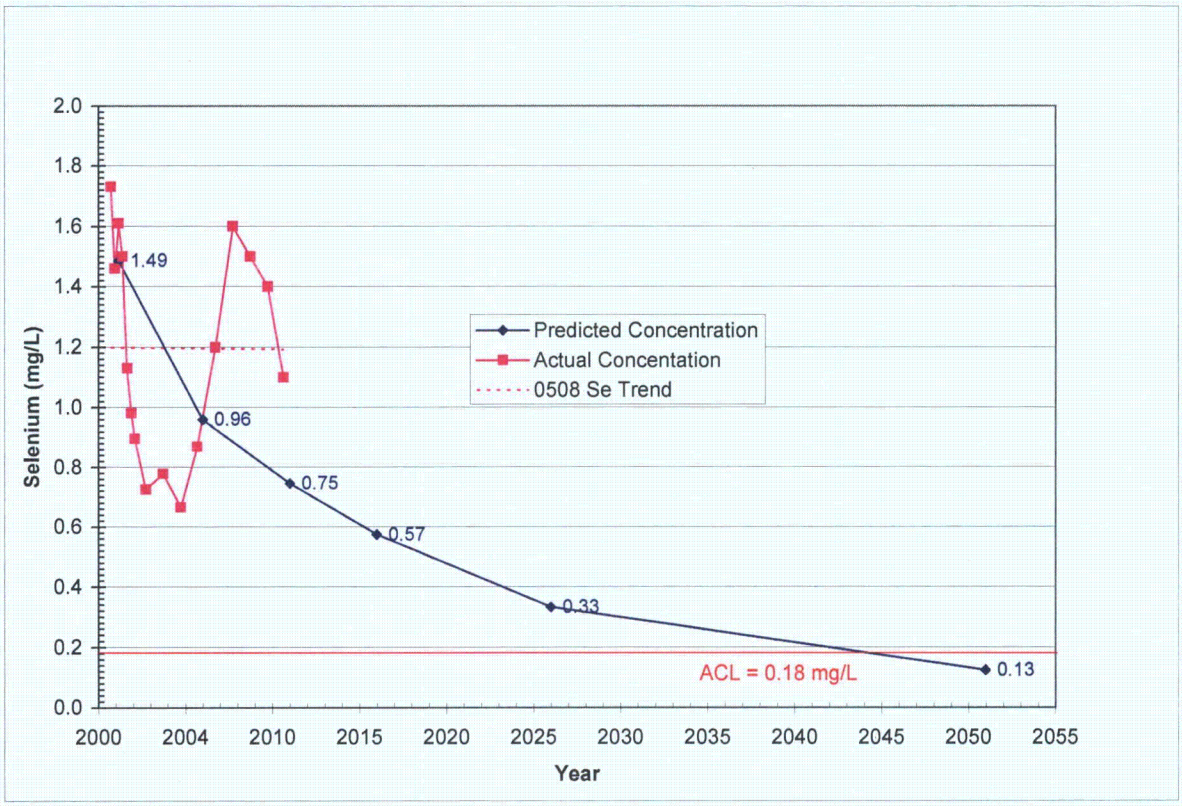

Figure 26. Selenium Concentrations in SRW Well 0508 Versus Groundwater Model Predictions

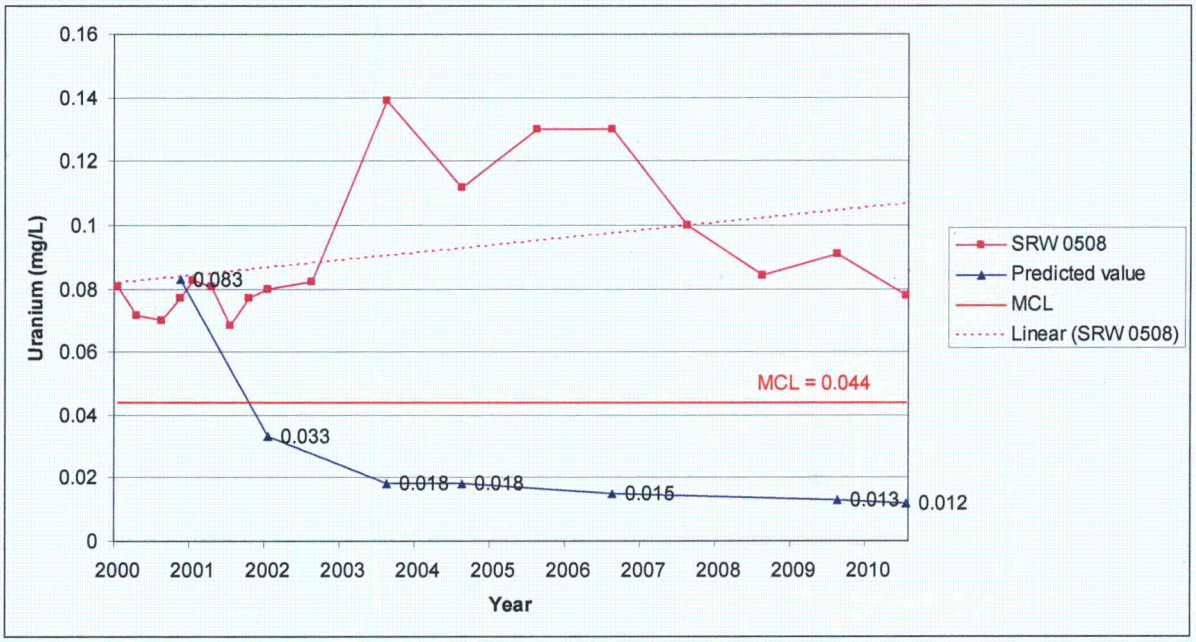

Figure 27. Uranium Concentrations in SRW Well 0508 Versus Groundwater Model Predictions

Table 7. COPC Trend Matrix for Groundwater at SRW Site Monitoring Wells

Location[a]	Manganese	Molybdenum	Nitrate (as NO_3)	Selenium	Uranium
Benchmark (mg/L)	4.2	0.10	44.3	0.18	0.044
0317 (Entrada well)	No trend	Downward	No trend	No trend	No trend
N	7	16	7	8	7
Most recent result:	0.2 (Feb-02)	0.18	5.5 (Feb-02)	0.006	0.02 (Feb-02)
0318	Downward	No trend	Downward	Upward	Downward
N	16	16	15	16	16
Most recent result:	0.007	3.4	315	5.9	0.025
0319[a] (BTEX hot spot)	No trend	No trend	No trend	No trend	No trend
N	7	7	7	8	7
Most recent result:	0.3 (Feb-02)	0.014 (Feb-02)	0.45 (Feb-02)	0.001	0.0003 (Feb-02)
0320	Downward	Upward	No trend	No trend	No trend
N	16	16	15	16	16
Most recent result:	0.49	0.013	0.11	0.0002	0.018
0324[b] (Entrada well)	Downward	Downward	Downward	Downward	No trend
N	7	7	9	9	7
Most recent result:	0.1 (Feb-02)	0.019 (Feb-02)	10.6 (Sep-03)	0.004 (Sep-03)	0.0096 (Feb-02)
0508	Downward	No trend	Downward	No trend	Upward
N	18	18	17	18	18
Most recent result:	2.9	1.0	1019	1.1	0.078
0510	Downward	No trend	Downward	No trend	No trend
N	18	18	17	18	18
Most recent result:	1.2	1.4	368	0.25	0.079
0684	Upward	No trend	Downward	No trend	Upward
N	16	16	15	16	16
Most recent result:	0.12	0.005	0.36	0.0005	0.009

General Notes

Trend analysis was performed using the Mann-Kendall test and DOE's VSP software (http://vsp.pnl.gov/).

All results listed above are reported in milligrams per liter (mg/L); results listed in red exceed the corresponding standard. N = number of data points.

Data are from 2000 to 2010; only wells with more than 5 data points are included. Most recent results are from the August–September 2010 sampling unless noted otherwise. Some wells are only monitored for one constituent (e.g., molybdenum in Entrada well 0317); in these cases the last monitoring result for other constituents may not be recent.

Specific Notes

[a] BTEX and radium (Ra-226 + Ra-228) are not addressed in this table because they apply only to well 0319. Trend analysis for these constituents yielded no significant trend except a downward trend for ethylbenzene.

[b] Entrada well 0324 was removed from the monitoring network. The trend analysis results listed above (downward for most constituents) support this decision.

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6.0 Conclusions

6.1 Status of Site Compliance

Evaluation of trends documented in Section 5.0 suggest that certain constituents might not attenuate as initially predicted based on groundwater modeling conducted for the SOWP (DOE 2002b). Although it is still early in the 100-year time frame established in 40 CFR 192, time trend analysis for many constituents and wells indicate a stable (flat) or, in some cases, an increasing trend.

6.2 Recommendations

It is recommended that annual verification monitoring of groundwater from designated monitoring wells and surface water locations continue as specified in the draft final GCAP (DOE 2006). Annual monitoring is planned for 10 years after NRC concurrence with the GCAP, after which monitoring requirements will be reevaluated. Based on modeling predictions, it had been anticipated that monitoring could eventually be decreased to once every 5 years. However, if recently observed fluctuations in contaminant concentrations continue, or if contamination persists north of the Dolores River, it may be advisable to continue monitoring annually until contaminant concentrations decline.

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7.0 References

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Appendix A

Groundwater Quality Data by Parameter

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GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 12:34 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	0303	WL	08/25/2010	N001	4.30 - 14.30	523		F	#	-	-
	mg/L	0305	WL	08/25/2010	N001	8.70 - 18.70	415		F	#	-	-
	mg/L	0307	WL	08/25/2010	N001	4.40 - 14.40	718		F	#	-	-
	mg/L	0309	WL	08/25/2010	N001	10.20 - 20.20	759		F	#	-	-
	mg/L	0310	WL	08/25/2010	N001	14.70 - 19.70	206		F	#	-	-
	mg/L	0311	WL	08/25/2010	N001	14.10 - 19.10	310		F	#	-	-
	mg/L	0312	WL	08/25/2010	N001	14.50 - 19.50	297		F	#	-	-
Manganese	mg/L	0300	WL	09/29/2010	N001	9.50 - 19.50	2.100	E	FJ	#	0.00011	-
Molybdenum	mg/L	0300	WL	09/29/2010	N001	9.50 - 19.50	0.0098		F	#	0.00032	-
Nitrate + Nitrite as Nitrogen	mg/L	0300	WL	09/29/2010	N001	9.50 - 19.50	0.014		F	#	0.01	-
Oxidation Reduction Potential	mV	0300	WL	09/29/2010	N001	9.50 - 19.50	-94.6		F	#	-	-
	mV	0303	WL	08/25/2010	N001	4.30 - 14.30	-95.0		F	#	-	-
	mV	0305	WL	08/25/2010	N001	8.70 - 18.70	74.5		F	#	-	-
	mV	0307	WL	08/25/2010	N001	4.40 - 14.40	-76.7		F	#	-	-
	mV	0309	WL	08/25/2010	N001	10.20 - 20.20	-89.9		F	#	-	-
	mV	0310	WL	08/25/2010	N001	14.70 - 19.70	-106.7		F	#	-	-
	mV	0311	WL	08/25/2010	N001	14.10 - 19.10	24.4		F	#	-	-
	mV	0312	WL	08/25/2010	N001	14.50 - 19.50	63.5		F	#	-	-
pH	s.u.	0300	WL	09/29/2010	N001	9.50 - 19.50	6.59		F	#	-	-
	s.u.	0303	WL	08/25/2010	N001	4.30 - 14.30	7.14		F	#	-	-
	s.u.	0305	WL	08/25/2010	N001	8.70 - 18.70	7.11		F	#	-	-
	s.u.	0307	WL	08/25/2010	N001	4.40 - 14.40	7.09		F	#	-	-
	s.u.	0309	WL	08/25/2010	N001	10.20 - 20.20	7.52		F	#	-	-
	s.u.	0310	WL	08/25/2010	N001	14.70 - 19.70	7.39		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 12:34 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.	0311	WL	08/25/2010	N001	14.10 - 19.10	7.06		F	#	-	-
	s.u.	0312	WL	08/25/2010	N001	14.50 - 19.50	7.33		F	#	-	-
Selenium	mg/L	0300	WL	09/29/2010	N001	9.50 - 19.50	0.001		UF	#	0.00032	-
	mg/L	0305	WL	08/25/2010	N001	8.70 - 18.70	0.026		F	#	0.0032	-
	mg/L	0307	WL	08/25/2010	N001	4.40 - 14.40	0.00023		F	#	3.2E-05	-
Specific Conductance	umhos/cm	0300	WL	09/29/2010	N001	9.50 - 19.50	8585		F	#	-	-
	umhos/cm	0303	WL	08/25/2010	N001	4.30 - 14.30	3484		F	#	-	-
	umhos/cm	0305	WL	08/25/2010	N001	8.70 - 18.70	3376		F	#	-	-
	umhos/cm	0307	WL	08/25/2010	N001	4.40 - 14.40	6053		F	#	-	-
	umhos/cm	0309	WL	08/25/2010	N001	10.20 - 20.20	3438		F	#	-	-
	umhos/cm	0310	WL	08/25/2010	N001	14.70 - 19.70	850		F	#	-	-
	umhos/cm	0311	WL	08/25/2010	N001	14.10 - 19.10	2271		F	#	-	-
	umhos/cm	0312	WL	08/25/2010	N001	14.50 - 19.50	2364		F	#	-	-
Temperature	C	0300	WL	09/29/2010	N001	9.50 - 19.50	15.23		F	#	-	-
	C	0303	WL	08/25/2010	N001	4.30 - 14.30	18.75		F	#	-	-
	C	0305	WL	08/25/2010	N001	8.70 - 18.70	16.79		F	#	-	-
	C	0307	WL	08/25/2010	N001	4.40 - 14.40	16.86		F	#	-	-
	C	0309	WL	08/25/2010	N001	10.20 - 20.20	14.85		F	#	-	-
	C	0310	WL	08/25/2010	N001	14.70 - 19.70	15.70		F	#	-	-
	C	0311	WL	08/25/2010	N001	14.10 - 19.10	19.72		F	#	-	-
	C	0312	WL	08/25/2010	N001	14.50 - 19.50	18.22		F	#	-	-
Turbidity	NTU	0300	WL	09/29/2010	N001	9.50 - 19.50	4.06		F	#	-	-
	NTU	0303	WL	08/25/2010	N001	4.30 - 14.30	1.72		F	#	-	-
	NTU	0305	WL	08/25/2010	N001	8.70 - 18.70	2.22		F	#	-	-
	NTU	0307	WL	08/25/2010	N001	4.40 - 14.40	8.31		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 12:34 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	0309	WL	08/25/2010	N001	10.20 - 20.20	7.69		F	#	-	-
	NTU	0310	WL	08/25/2010	N001	14.70 - 19.70	8.95		F	#	-	-
	NTU	0311	WL	08/25/2010	N001	14.10 - 19.10	5.18		F	#	-	-
	NTU	0312	WL	08/25/2010	N001	14.50 - 19.50	2.69		F	#	-	-
Uranium	mg/L	0300	WL	09/29/2010	N001	9.50 - 19.50	0.016		F	#	2.9E-05	-
	mg/L	0303	WL	08/25/2010	N001	4.30 - 14.30	1.100		F	#	0.00029	-
	mg/L	0305	WL	08/25/2010	N001	8.70 - 18.70	0.800		F	#	0.00029	-
	mg/L	0307	WL	08/25/2010	N001	4.40 - 14.40	0.540		F	#	2.9E-05	-
	mg/L	0309	WL	08/25/2010	N001	10.20 - 20.20	0.089		F	#	2.9E-05	-
	mg/L	0310	WL	08/25/2010	N001	14.70 - 19.70	0.021		F	#	2.9E-05	-
	mg/L	0311	WL	08/25/2010	N001	14.10 - 19.10	0.090		F	#	2.9E-05	-
	mg/L	0312	WL	08/25/2010	N001	14.50 - 19.50	0.041		F	#	2.9E-05	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 12:34 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='SRK06' AND location_code in('0300','0303','0305','0307','0309','0310','0311','0312') AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2010# and #12/31/2010#

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.

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:35 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	0317	WL	08/25/2010	N001	19.46 - 39.52	270		F	#	-	-
	mg/L	0318	WL	08/25/2010	N001	4.99 - 15.02	271		F	#	-	-
	mg/L	0319	WL	08/24/2010	N001	4.55 - 14.58	921		F	#	-	-
	mg/L	0320	WL	08/25/2010	N001	4.92 - 9.96	379		F	#	-	-
	mg/L	0508	WL	08/25/2010	N001	1.01 - 11.01	326		F	#	-	-
	mg/L	0510	WL	08/25/2010	N001	4.92 - 13.92	195		F	#	-	-
	mg/L	0684	WL	08/24/2010	N001	11.00 - 21.00	184		F	#	-	-
Benzene	ug/L	0319	WL	08/24/2010	N001	4.55 - 14.58	6100		F	#	42	-
	ug/L	0319	WL	08/24/2010	N002	4.55 - 14.58	5400		F	#	42	-
Ethylbenzene	ug/L	0319	WL	08/24/2010	N001	4.55 - 14.58	200	J	F	#	45	-
	ug/L	0319	WL	08/24/2010	N002	4.55 - 14.58	180	J	F	#	45	-
m,p-Xylene	ug/L	0319	WL	08/24/2010	N001	4.55 - 14.58	4000		F	#	42	-
	ug/L	0319	WL	08/24/2010	N002	4.55 - 14.58	3600		F	#	42	-
Manganese	mg/L	0318	WL	08/25/2010	N001	4.99 - 15.02	0.0069		F	#	0.00011	-
	mg/L	0318A	WL	09/29/2010	N001	9.20 - 14.20	1.600		F	#	0.00011	-
	mg/L	0320	WL	08/25/2010	N001	4.92 - 9.96	0.490		F	#	0.00011	-
	mg/L	0339	WL	09/29/2010	N001	11.00 - 14.00	2.100		F	#	0.00011	-
	mg/L	0339	WL	09/29/2010	N002	11.00 - 14.00	2.100		F	#	0.00011	-
	mg/L	0340	WL	09/29/2010	N001	6.51 - 11.51	6.000		F	#	0.00011	-
	mg/L	0508	WL	08/25/2010	N001	1.01 - 11.01	2.900		F	#	0.00011	-
	mg/L	0510	WL	08/25/2010	N001	4.92 - 13.92	1.200		F	#	0.00011	-
	mg/L	0684	WL	08/24/2010	N001	11.00 - 21.00	0.120		F	#	0.00011	-
	mg/L	0684	WL	08/24/2010	N002	11.00 - 21.00	0.120		F	#	0.00011	-
Molybdenum	mg/L	0317	WL	08/25/2010	N001	19.46 - 39.52	0.180		F	#	3.2E-05	-
	mg/L	0318	WL	08/25/2010	N001	4.99 - 15.02	3.400		F	#	0.0032	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:35 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
Molybdenum	mg/L	0318A	WL	09/29/2010	N001	9.20 - 14.20	1.400		F	#	0.0032	-
	mg/L	0320	WL	08/25/2010	N001	4.92 - 9.96	0.013		F	#	3.2E-05	-
	mg/L	0339	WL	09/29/2010	N001	11.00 - 14.00	1.300		F	#	0.0032	-
	mg/L	0339	WL	09/29/2010	N002	11.00 - 14.00	1.300		F	#	0.0032	-
	mg/L	0340	WL	09/29/2010	N001	6.51 - 11.51	1.600		F	#	0.0032	-
	mg/L	0508	WL	08/25/2010	N001	1.01 - 11.01	1.000		F	#	0.0032	-
	mg/L	0510	WL	08/25/2010	N001	4.92 - 13.92	1.400		F	#	0.0032	-
	mg/L	0684	WL	08/24/2010	N001	11.00 - 21.00	0.0052		F	#	3.2E-05	-
	mg/L	0684	WL	08/24/2010	N002	11.00 - 21.00	0.0053		F	#	3.2E-05	-
Nitrate + Nitrite as Nitrogen	mg/L	0318	WL	08/25/2010	N001	4.99 - 15.02	71		F	#	1	-
	mg/L	0318A	WL	09/29/2010	N001	9.20 - 14.20	55		F	#	2	-
	mg/L	0320	WL	08/25/2010	N001	4.92 - 9.96	0.025		F	#	0.01	-
	mg/L	0339	WL	09/29/2010	N001	11.00 - 14.00	66		FJ	#	2	-
	mg/L	0339	WL	09/29/2010	N002	11.00 - 14.00	63		F	#	2	-
	mg/L	0340	WL	09/29/2010	N001	6.51 - 11.51	400		F	#	5	-
	mg/L	0508	WL	08/25/2010	N001	1.01 - 11.01	230		F	#	5	-
	mg/L	0510	WL	08/25/2010	N001	4.92 - 13.92	83		F	#	1	-
	mg/L	0684	WL	08/24/2010	N001	11.00 - 21.00	0.082		F	#	0.01	-
	mg/L	0684	WL	08/24/2010	N002	11.00 - 21.00	0.078		F	#	0.01	-
Oxidation Reduction Potential	mV	0317	WL	08/25/2010	N001	19.46 - 39.52	133.5		F	#	-	-
	mV	0318	WL	08/25/2010	N001	4.99 - 15.02	62.1		F	#	-	-
	mV	0318A	WL	09/29/2010	N001	9.20 - 14.20	-177.1		F	#	-	-
	mV	0319	WL	08/24/2010	N001	4.55 - 14.58	-124.7		F	#	-	-
	mV	0320	WL	08/25/2010	N001	4.92 - 9.96	37.2		F	#	-	-
	mV	0339	WL	09/29/2010	N001	11.00 - 14.00	-185.8		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:35 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
Oxidation Reduction Potential	mV	0340	WL	09/29/2010	N001	6.51 - 11.51	-230.9		F	#	-	-
	mV	0508	WL	08/25/2010	N001	1.01 - 11.01	64.1		F	#	-	-
	mV	0510	WL	08/25/2010	N001	4.92 - 13.92	95.0		F	#	-	-
	mV	0684	WL	08/24/2010	N001	11.00 - 21.00	28.1		F	#	-	-
o-Xylene	ug/L	0319	WL	08/24/2010	N001	4.55 - 14.58	890		F	#	50	-
	ug/L	0319	WL	08/24/2010	N002	4.55 - 14.58	770		F	#	50	-
pH	s.u.	0317	WL	08/25/2010	N001	19.46 - 39.52	7.32		F	#	-	-
	s.u.	0318	WL	08/25/2010	N001	4.99 - 15.02	6.89		F	#	-	-
	s.u.	0318A	WL	09/29/2010	N001	9.20 - 14.20	6.73		F	#	-	-
	s.u.	0319	WL	08/24/2010	N001	4.55 - 14.58	6.93		F	#	-	-
	s.u.	0320	WL	08/25/2010	N001	4.92 - 9.96	7.06		F	#	-	-
	s.u.	0339	WL	09/29/2010	N001	11.00 - 14.00	6.77		F	#	-	-
	s.u.	0340	WL	09/29/2010	N001	6.51 - 11.51	6.38		F	#	-	-
	s.u.	0508	WL	08/25/2010	N001	1.01 - 11.01	6.58		F	#	-	-
	s.u.	0510	WL	08/25/2010	N001	4.92 - 13.92	6.89		F	#	-	-
	s.u.	0684	WL	08/24/2010	N001	11.00 - 21.00	7.28		F	#	-	-
Radium-226	pCi/L	0319	WL	08/24/2010	N001	4.55 - 14.58	0.915		F	#	0.26	± 0.44
	pCi/L	0319	WL	08/24/2010	N002	4.55 - 14.58	1.84		F	#	0.4	± 0.70
Radium-228	pCi/L	0319	WL	08/24/2010	N001	4.55 - 14.58	1.09		FJ	#	0.51	± 0.47
	pCi/L	0319	WL	08/24/2010	N002	4.55 - 14.58	1.73		FJ	#	0.58	± 0.66
Selenium	mg/L	0317	WL	08/25/2010	N001	19.46 - 39.52	0.006		F	#	3.2E-05	-
	mg/L	0318	WL	08/25/2010	N001	4.99 - 15.02	5.900		F	#	0.0032	-
	mg/L	0318A	WL	09/29/2010	N001	9.20 - 14.20	2.900		F	#	0.0032	-
	mg/L	0319	WL	08/24/2010	N001	4.55 - 14.58	0.0014		F	#	3.2E-05	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:35 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	0320	WL	08/25/2010	N001	4.92 - 9.96	0.00019		F	#	3.2E-05	-
	mg/L	0339	WL	09/29/2010	N001	11.00 - 14.00	2.000		F	#	0.0032	-
	mg/L	0339	WL	09/29/2010	N002	11.00 - 14.00	1.900		F	#	0.0032	-
	mg/L	0340	WL	09/29/2010	N001	6.51 - 11.51	2.700		F	#	0.0032	-
	mg/L	0508	WL	08/25/2010	N001	1.01 - 11.01	1.100		F	#	0.0032	-
	mg/L	0510	WL	08/25/2010	N001	4.92 - 13.92	0.250		F	#	0.0032	-
	mg/L	0684	WL	08/24/2010	N001	11.00 - 21.00	0.00045		F	#	3.2E-05	-
	mg/L	0684	WL	08/24/2010	N002	11.00 - 21.00	0.00047		F	#	3.2E-05	-
Specific Conductance	umhos/cm	0317	WL	08/25/2010	N001	19.46 - 39.52	2353		F	#	-	-
	umhos/cm	0318	WL	08/25/2010	N001	4.99 - 15.02	2335		F	#	-	-
	umhos/cm	0318A	WL	09/29/2010	N001	9.20 - 14.20	2178		F	#	-	-
	umhos/cm	0319	WL	08/24/2010	N001	4.55 - 14.58	3661		F	#	-	-
	umhos/cm	0320	WL	08/25/2010	N001	4.92 - 9.96	1058		F	#	-	-
	umhos/cm	0339	WL	09/29/2010	N001	11.00 - 14.00	2282		F	#	-	-
	umhos/cm	0340	WL	09/29/2010	N001	6.51 - 11.51	5168		F	#	-	-
	umhos/cm	0508	WL	08/25/2010	N001	1.01 - 11.01	4250		F	#	-	-
	umhos/cm	0510	WL	08/25/2010	N001	4.92 - 13.92	2267		F	#	-	-
	umhos/cm	0684	WL	08/24/2010	N001	11.00 - 21.00	689		F	#	-	-
Temperature	C	0317	WL	08/25/2010	N001	19.46 - 39.52	15.00		F	#	-	-
	C	0318	WL	08/25/2010	N001	4.99 - 15.02	17.80		F	#	-	-
	C	0318A	WL	09/29/2010	N001	9.20 - 14.20	17.62		F	#	-	-
	C	0319	WL	08/24/2010	N001	4.55 - 14.58	17.47		F	#	-	-
	C	0320	WL	08/25/2010	N001	4.92 - 9.96	17.51		F	#	-	-
	C	0339	WL	09/29/2010	N001	11.00 - 14.00	16.34		F	#	-	-
	C	0340	WL	09/29/2010	N001	6.51 - 11.51	18.08		F	#	-	-
	C	0508	WL	08/25/2010	N001	1.01 - 11.01	18.14		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:35 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	0510	WL	08/25/2010	N001	4.92 - 13.92	18.98		F	#	-	-
	C	0684	WL	08/24/2010	N001	11.00 - 21.00	14.94		F	#	-	-
Toluene	ug/L	0319	WL	08/24/2010	N001	4.55 - 14.58	5500		F	#	48	-
	ug/L	0319	WL	08/24/2010	N002	4.55 - 14.58	4500		F	#	48	-
Turbidity	NTU	0317	WL	08/25/2010	N001	19.46 - 39.52	4.61		F	#	-	-
	NTU	0318	WL	08/25/2010	N001	4.99 - 15.02	8.87		F	#	-	-
	NTU	0318A	WL	09/29/2010	N001	9.20 - 14.20	9.62		F	#	-	-
	NTU	0319	WL	08/24/2010	N001	4.55 - 14.58	9.52		F	#	-	-
	NTU	0320	WL	08/25/2010	N001	4.92 - 9.96	6.19		F	#	-	-
	NTU	0339	WL	09/29/2010	N001	11.00 - 14.00	9.31		F	#	-	-
	NTU	0340	WL	09/29/2010	N001	6.51 - 11.51	9.49		F	#	-	-
	NTU	0508	WL	08/25/2010	N001	1.01 - 11.01	2.74		F	#	-	-
	NTU	0510	WL	08/25/2010	N001	4.92 - 13.92	2.72		F	#	-	-
	NTU	0684	WL	08/24/2010	N001	11.00 - 21.00	2.98		F	#	-	-
Uranium	mg/L	0318	WL	08/25/2010	N001	4.99 - 15.02	0.025		F	#	0.00029	-
	mg/L	0318A	WL	09/29/2010	N001	9.20 - 14.20	0.031		F	#	0.00029	-
	mg/L	0320	WL	08/25/2010	N001	4.92 - 9.96	0.018		F	#	2.9E-06	-
	mg/L	0339	WL	09/29/2010	N001	11.00 - 14.00	0.034		F	#	0.00029	-
	mg/L	0339	WL	09/29/2010	N002	11.00 - 14.00	0.034		F	#	0.00029	-
	mg/L	0340	WL	09/29/2010	N001	6.51 - 11.51	0.053		F	#	0.00029	-
	mg/L	0508	WL	08/25/2010	N001	1.01 - 11.01	0.078		F	#	0.00029	-
	mg/L	0510	WL	08/25/2010	N001	4.92 - 13.92	0.079		F	#	0.00029	-
	mg/L	0684	WL	08/24/2010	N001	11.00 - 21.00	0.0088		F	#	2.9E-06	-
	mg/L	0684	WL	08/24/2010	N002	11.00 - 21.00	0.0088		F	#	2.9E-06	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:35 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='SRK05' AND location_code in('0317','0318','0318A','0319','0320','0339','0340','0508','0510','0684') AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2010# and #12/31/2010#

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.

Appendix B

Surface Water Quality Data by Parameter

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SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 12:37 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	0692	08/25/2010	0001	129				#	- -
	mg/L	0696	08/24/2010	0001	120				#	- -
	mg/L	0700	08/25/2010	0001	151				#	- -
Oxidation Reduction Potential	mV	0692	08/25/2010	N001	21.0				#	- -
	mV	0696	08/24/2010	N001	19.8				#	- -
	mV	0700	08/25/2010	N001	-35.7				#	- -
pH	s.u.	0692	08/25/2010	N001	8.44				#	- -
	s.u.	0696	08/24/2010	N001	8.41				#	- -
	s.u.	0700	08/25/2010	N001	8.45				#	- -
Specific Conductance	umhos/cm	0692	08/25/2010	N001	367				#	- -
	umhos/cm	0696	08/24/2010	N001	378				#	- -
	umhos/cm	0700	08/25/2010	N001	380				#	- -
Temperature	C	0692	08/25/2010	N001	25.59				#	- -
	C	0696	08/24/2010	N001	24.82				#	- -
	C	0700	08/25/2010	N001	26.43				#	- -
Turbidity	NTU	0692	08/25/2010	N001	62.2				#	- -
	NTU	0696	08/24/2010	N001	66.70				#	- -
	NTU	0700	08/25/2010	N001	161				#	- -
Uranium	mg/L	0692	08/25/2010	0001	0.0006				#	2.9E-05 -
	mg/L	0696	08/24/2010	0001	0.0006				#	2.9E-05 -
	mg/L	0700	08/25/2010	0001	0.0006				#	2.9E-05 -

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 12:37 pm

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

RECORDS: SELECTED FROM USEE800 WHERE site_code='SRK06' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2010# and #12/31/2010#

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.

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:37 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	0347	08/25/2010	0001	128			#	-	-
	mg/L	0349	08/25/2010	0001	131			#	-	-
	mg/L	0693	08/24/2010	0001	165			#	-	-
	mg/L	0694	08/24/2010	0001	125			#	-	-
Manganese	mg/L	0347	08/25/2010	0001	0.010			#	0.00011	-
	mg/L	0349	08/25/2010	0001	0.016			#	0.00011	-
	mg/L	0693	08/24/2010	0001	0.0018	B		#	0.00011	-
	mg/L	0694	08/24/2010	0001	0.0062			#	0.00011	-
Molybdenum	mg/L	0347	08/25/2010	0001	0.0013			#	3.2E-05	-
	mg/L	0349	08/25/2010	0001	0.0015			#	3.2E-05	-
	mg/L	0693	08/24/2010	0001	0.0012			#	3.2E-05	-
	mg/L	0694	08/24/2010	0001	0.0014			#	3.2E-05	-
Nitrate + Nitrite as Nitrogen	mg/L	0347	08/25/2010	0001	0.011			#	0.01	-
	mg/L	0349	08/25/2010	0001	0.12			#	0.01	-
	mg/L	0693	08/24/2010	0001	0.01	U		#	0.01	-
	mg/L	0694	08/24/2010	0001	0.025			#	0.01	-
Oxidation Reduction Potential	mV	0347	08/25/2010	N001	17.4			#	-	-
	mV	0349	08/25/2010	N001	64.2			#	-	-
	mV	0693	08/24/2010	N001	5.2			#	-	-
	mV	0694	08/24/2010	N001	39.4			#	-	-
pH	s.u.	0347	08/25/2010	N001	8.35			#	-	-
	s.u.	0349	08/25/2010	N001	8.40			#	-	-
	s.u.	0693	08/24/2010	N001	8.38			#	-	-
	s.u.	0694	08/24/2010	N001	8.45			#	-	-
Selenium	mg/L	0347	08/25/2010	0001	0.0003			#	3.2E-05	-
	mg/L	0349	08/25/2010	0001	0.0007			#	3.2E-05	-
	mg/L	0693	08/24/2010	0001	0.0003			#	3.2E-05	-
	mg/L	0694	08/24/2010	0001	0.0004			#	3.2E-05	-
Specific Conductance	umhos/cm	0347	08/25/2010	N001	381			#	-	-
	umhos/cm	0349	08/25/2010	N001	380			#	-	-
	umhos/cm	0693	08/24/2010	N001	383			#	-	-
	umhos/cm	0694	08/24/2010	N001	389			#	-	-
Temperature	C	0347	08/25/2010	N001	20.42			#	-	-
	C	0349	08/25/2010	N001	23.00			#	-	-
	C	0693	08/24/2010	N001	27.64			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 12:37 pm

PARAMETER	UNITS	LOCATION CODE	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0694	08/24/2010	N001	24.90			#	-	-
Turbidity	NTU	0347	08/25/2010	N001	543			#	-	-
	NTU	0349	08/25/2010	N001	613			#	-	-
	NTU	0693	08/24/2010	N001	192			#	-	-
	NTU	0694	08/24/2010	N001	66.40			#	-	-
Uranium	mg/L	0347	08/25/2010	0001	0.0007			#	2.9E-06	-
	mg/L	0349	08/25/2010	0001	0.0007			#	2.9E-06	-
	mg/L	0693	08/24/2010	0001	0.0006			#	2.9E-06	-
	mg/L	0694	08/24/2010	0001	0.0007			#	2.9E-06	-

RECORDS: SELECTED FROM USEE800 WHERE site_code='SRK05' AND location_code in('0347','0349','0693','0694') AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2010# and #12/31/2010#

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.

Appendix C

Hydrographs and Static Water Level Data

Note

New wells installed in 2010 (0318A, 0339, and 0340) are not included in the hydrographs because they were sampled one day after they were installed and elevation data have not been calibrated.

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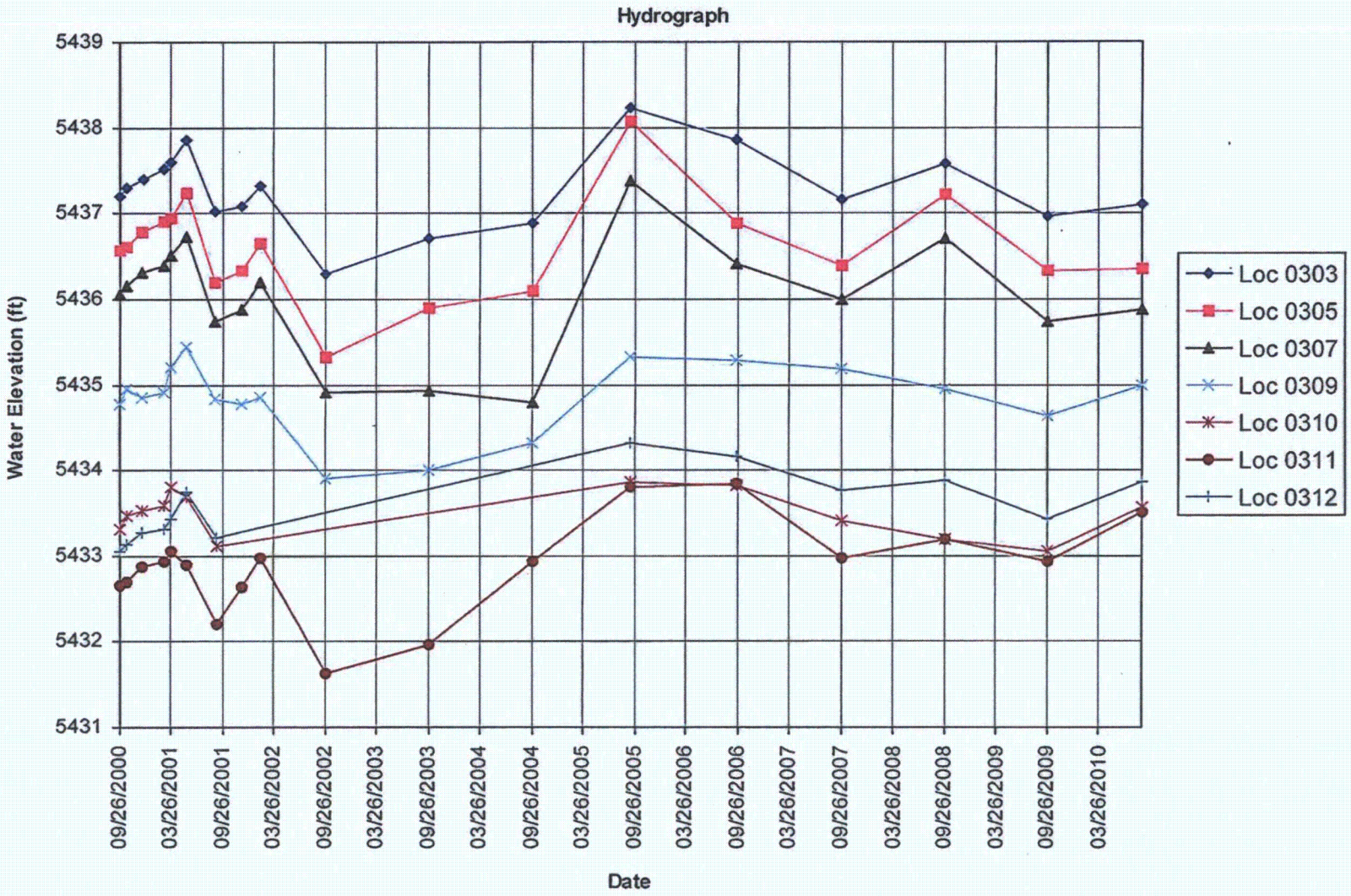
Slick Rock East Processing Site (SRK06)



STATIC WATER LEVELS (USEE700) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 1:31 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0300	U	5467.35	09/27/2000	11:12	14.73	5452.62	
		5467.35	10/20/2000	12:13	14.32	5453.03	
		5467.35	12/19/2000	10:45	13.99	5453.36	
		5467.35	02/28/2001	13:16	13.78	5453.57	
		5467.35	03/27/2001	11:20	13.54	5453.81	
		5467.35	05/14/2001	11:40	13.26	5454.09	
		5467.35	08/29/2001	09:00	15.30	5452.05	
		5467.35	09/29/2010	13:55	14.15	5453.20	
0303	O	5446.91	09/26/2000	17:12	9.70	5437.21	
		5446.91	10/20/2000	11:22	9.61	5437.30	
		5446.91	12/19/2000	10:03	9.51	5437.40	
		5446.91	02/28/2001	15:18	9.39	5437.52	
		5446.91	03/27/2001	11:45	9.31	5437.60	
		5446.91	05/15/2001	09:44	9.05	5437.86	
		5446.91	08/29/2001	11:31	9.89	5437.02	
		5446.91	11/28/2001	14:39	9.82	5437.09	
		5446.91	02/04/2002	16:49	9.58	5437.33	
		5446.91	09/24/2002	14:45	10.61	5436.30	
		5446.91	09/24/2003	14:12	10.20	5436.71	
		5446.91	09/27/2004	12:47	10.02	5436.89	
		5446.91	09/06/2005	14:46	8.69	5438.22	
		5446.91	09/20/2006	15:35	9.05	5437.86	
		5446.91	09/25/2007		9.75	5437.16	
		5446.91	09/24/2008		9.34	5437.57	
		5446.91	09/23/2009		9.94	5436.97	
		5446.91	08/25/2010	14:20	9.80	5437.11	
0305	O	5448.75	09/26/2000	12:27	12.18	5436.57	
		5448.75	10/20/2000	11:26	12.15	5436.60	
		5448.75	12/15/2000	11:08	11.96	5436.79	
		5448.75	02/28/2001	16:42	11.84	5436.91	
		5448.75	03/27/2001	11:42	11.80	5436.95	
		5448.75	05/14/2001	15:51	11.51	5437.24	
		5448.75	08/29/2001	12:50	12.55	5436.20	
		5448.75	11/28/2001	13:22	12.42	5436.33	
		5448.75	02/05/2002	09:33	12.11	5436.64	
		5448.75	09/24/2002	14:20	13.43	5435.32	
		5448.75	09/24/2003	13:41	12.85	5435.90	

STATIC WATER LEVELS (USEE700) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 1:31 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0305	O	5448.75	09/27/2004	12:21	12.66	5436.09	
		5448.75	09/06/2005	15:14	10.67	5438.08	
		5448.75	09/20/2006	14:32	11.87	5436.88	
		5448.75	09/26/2007		12.35	5436.40	
		5448.75	09/24/2008		11.52	5437.23	
		5448.75	09/23/2009		12.42	5436.33	
		5448.75	08/25/2010	13:58	12.40	5436.35	
0307	O	5447.10	09/26/2000	15:29	11.04	5436.06	
		5447.10	10/20/2000	11:30	10.94	5436.16	
		5447.10	12/15/2000	10:17	10.79	5436.31	
		5447.10	03/01/2001	08:53	10.71	5436.39	
		5447.10	03/27/2001	11:36	10.59	5436.51	
		5447.10	05/14/2001	14:49	10.38	5436.72	
		5447.10	08/29/2001	10:27	11.36	5435.74	
		5447.10	11/28/2001	12:33	11.23	5435.87	
		5447.10	02/04/2002	15:57	10.91	5436.19	
		5447.10	09/24/2002	13:52	12.18	5434.92	
		5447.10	09/24/2003	13:08	12.17	5434.93	
		5447.10	09/27/2004	11:56	12.31	5434.79	
		5447.10	09/06/2005	14:10	9.71	5437.39	
		5447.10	09/20/2006	13:51	10.68	5436.42	
		5447.10	09/25/2007		11.11	5435.99	
		5447.10	09/24/2008		10.40	5436.70	
		5447.10	09/23/2009		11.35	5435.75	
		5447.10	08/25/2010	15:38	11.22	5435.88	
0309	O	5450.18	09/26/2000	09:29	15.40	5434.78	
		5450.18	10/20/2000	11:35	15.23	5434.95	
		5450.18	12/15/2000	09:43	15.32	5434.86	
		5450.18	03/01/2001	09:26	15.26	5434.92	
		5450.18	03/27/2001	11:30	14.97	5435.21	
		5450.18	05/14/2001	14:04	14.74	5435.44	
		5450.18	08/29/2001	09:43	15.35	5434.83	
		5450.18	11/28/2001	11:53	15.40	5434.78	
		5450.18	02/04/2002	13:30	15.32	5434.86	
		5450.18	09/24/2002	12:38	16.27	5433.91	
		5450.18	09/24/2003	12:42	16.18	5434.00	
		5450.18	09/27/2004	10:44	15.86	5434.32	

STATIC WATER LEVELS (USEE700) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 1:31 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0309	O	5450.18	09/06/2005	13:22	14.85	5435.33	
		5450.18	09/20/2006	12:34	14.90	5435.28	
		5450.18	09/26/2007		15.00	5435.18	
		5450.18	09/23/2008		15.22	5434.96	
		5450.18	09/24/2009		15.54	5434.64	
		5450.18	08/25/2010	14:53	15.19	5434.99	
0310	D	5450.56	09/27/2000	13:34	17.25	5433.31	
		5450.56	10/20/2000	12:52	17.10	5433.46	
		5450.56	12/14/2000	16:34	17.04	5433.52	
		5450.56	02/28/2001	10:28	16.98	5433.58	
		5450.56	03/27/2001	12:45	16.75	5433.81	
		5450.56	05/16/2001	14:35	16.88	5433.68	
		5450.56	08/30/2001	09:28	17.44	5433.12	
		5450.56	09/06/2005	17:14	16.70	5433.86	
		5450.56	09/19/2006	17:34	16.73	5433.83	
		5450.56	09/25/2007		17.15	5433.41	
		5450.56	09/22/2008		17.36	5433.20	
		5450.56	09/23/2009		17.51	5433.05	
		5450.56	08/25/2010	11:57	17.00	5433.56	
0311	D	5450.70	09/27/2000	14:00	18.05	5432.65	
		5450.70	10/20/2000	12:49	18.01	5432.69	
		5450.70	12/14/2000	17:00	17.83	5432.87	
		5450.70	02/28/2001	11:03	17.76	5432.94	
		5450.70	03/27/2001	12:41	17.65	5433.05	
		5450.70	05/16/2001	13:46	17.81	5432.89	
		5450.70	08/30/2001	08:50	18.49	5432.21	
		5450.70	11/28/2001	15:59	18.06	5432.64	
		5450.70	02/05/2002	10:48	17.72	5432.98	
		5450.70	09/24/2002	16:10	19.07	5431.63	
		5450.70	09/24/2003	15:14	18.73	5431.97	
		5450.70	09/27/2004	14:07	17.76	5432.94	
		5450.70	09/06/2005	16:46	16.89	5433.81	
		5450.70	09/19/2006	17:11	16.85	5433.85	
		5450.70	09/25/2007		17.72	5432.98	
		5450.70	09/22/2008		17.50	5433.20	
		5450.70	09/23/2009		17.77	5432.93	
		5450.70	08/25/2010	12:14	17.20	5433.50	

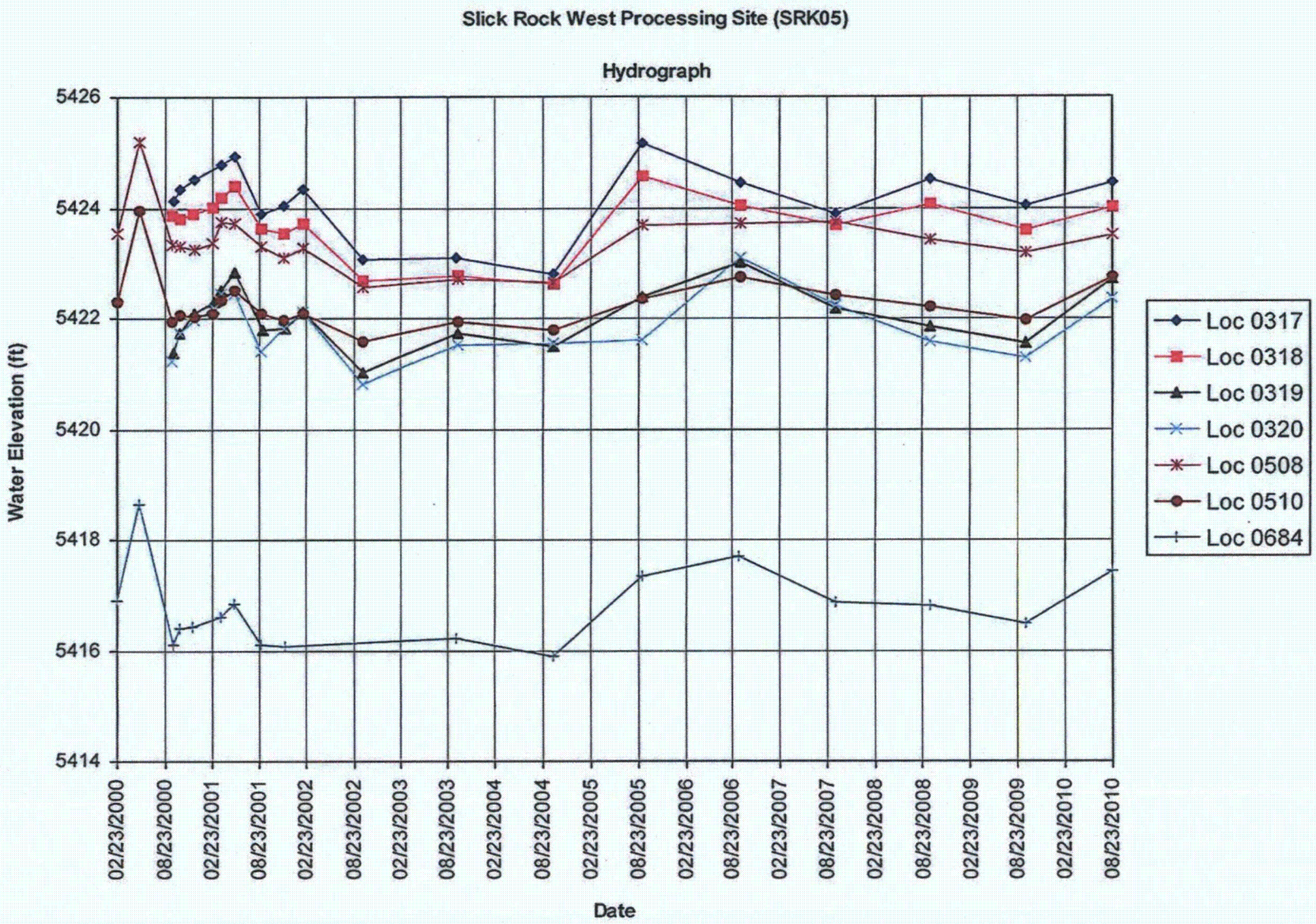
STATIC WATER LEVELS (USEE700) FOR SITE SRK06, Slick Rock East Processing Site
REPORT DATE: 4/27/2011 1:31 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0312	D	5451.06	09/27/2000	14:56	18.01	5433.05	
		5451.06	10/20/2000	12:47	17.92	5433.14	
		5451.06	12/15/2000	09:04	17.79	5433.27	
		5451.06	02/28/2001	11:38	17.75	5433.31	
		5451.06	03/27/2001	12:44	17.64	5433.42	
		5451.06	05/16/2001	13:06	17.31	5433.75	
		5451.06	08/30/2001	08:07	17.85	5433.21	
		5451.06	09/06/2005	16:22	16.75	5434.31	
		5451.06	09/19/2006	16:42	16.90	5434.16	
		5451.06	09/25/2007		17.29	5433.77	
		5451.06	09/22/2008		17.18	5433.88	
		5451.06	09/23/2009		17.63	5433.43	
		5451.06	08/25/2010	12:36	17.19	5433.87	

RECORDS: SELECTED FROM USEE700 WHERE site_code='SRK06' AND location_code in('0300','0303','0305','0307','0309','0310','0311','0312')

FLOW CODES: D DOWN GRADIENT O ON-SITE U UPGRADIENT

WATER LEVEL FLAGS:


Slick Rock West Processing Site (SRK05)
Hydrograph
Water Elevation (ft)
5426
5424
5422
5420
5418
5416
5414
02/23/2000
08/23/2000
02/23/2001
08/23/2001
02/23/2002
08/23/2002
02/23/2003
08/23/2003
02/23/2004
08/23/2004
02/23/2005
08/23/2005
02/23/2006
08/23/2006
02/23/2007
08/23/2007
02/23/2008
08/23/2008
02/23/2009
08/23/2009
02/23/2010
08/23/2010
Date
Loc 0317
Loc 0318
Loc 0319
Loc 0320
Loc 0508
Loc 0510
Loc 0684

STATIC WATER LEVELS (USEE700) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 1:30 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0317		5435.18	09/28/2000	16:00	11.04	5424.14	
		5435.18	10/20/2000	14:59	10.84	5424.34	
		5435.18	12/14/2000	09:52	10.67	5424.51	
		5435.18	03/27/2001	14:19	10.40	5424.78	
		5435.18	05/17/2001	08:47	10.24	5424.94	
		5435.18	08/30/2001	12:55	11.27	5423.91	
		5435.18	11/27/2001	11:31	11.15	5424.03	
		5435.18	02/05/2002	13:50	10.85	5424.33	
		5435.18	09/25/2002	11:35	12.11	5423.07	
		5435.18	09/24/2003	16:34	12.07	5423.11	
		5435.18	09/27/2004	16:04	12.38	5422.80	
		5435.18	09/07/2005	11:57	10.02	5425.16	
		5435.18	09/21/2006	12:09	10.72	5424.46	
		5435.18	09/24/2007		11.28	5423.90	
		5435.18	09/23/2008		10.65	5424.53	
		5435.18	09/23/2009	11:00	11.13	5424.05	
		5435.18	08/25/2010	09:27	10.71	5424.47	
0318	O	5435.22	09/19/2000	13:27	11.35	5423.87	
		5435.22	10/20/2000	14:47	11.40	5423.82	
		5435.22	12/13/2000	16:40	11.31	5423.91	
		5435.22	02/27/2001	10:49	11.21	5424.01	
		5435.22	03/27/2001	14:05	11.02	5424.20	
		5435.22	05/17/2001	09:47	10.83	5424.39	
		5435.22	08/30/2001	14:34	11.59	5423.63	
		5435.22	11/27/2001	12:36	11.68	5423.54	
		5435.22	02/05/2002	14:33	11.50	5423.72	
		5435.22	09/25/2002	10:52	12.54	5422.68	
		5435.22	09/25/2003	09:00	12.45	5422.77	
		5435.22	09/27/2004	15:28	12.59	5422.63	
		5435.22	09/07/2005	12:24	10.65	5424.57	
		5435.22	09/21/2006	12:42	11.17	5424.05	
		5435.22	09/24/2007		11.52	5423.70	
		5435.22	09/23/2008		11.14	5424.08	
		5435.22	09/23/2009	11:30	11.61	5423.61	
		5435.22	08/25/2010	09:52	11.20	5424.02	
0318A		-	09/29/2010	16:25	12.08	-12.08	
0319	O	5430.66	09/28/2000	15:28	9.27	5421.39	

STATIC WATER LEVELS (USEE700) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 1:30 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0319	O	5430.66	10/20/2000	14:25	8.93	5421.73	
		5430.66	12/19/2000	13:40	8.56	5422.10	
		5430.66	03/02/2001	09:00	8.35	5422.31	
		5430.66	03/27/2001	13:49	8.17	5422.49	
		5430.66	05/18/2001	08:32	7.82	5422.84	
		5430.66	08/31/2001	08:53	8.87	5421.79	
		5430.66	11/28/2001	08:45	8.85	5421.81	
		5430.66	02/06/2002	09:34	8.54	5422.12	
		5430.66	09/25/2002	14:58	9.65	5421.01	
		5430.66	09/25/2003	10:56	8.93	5421.73	
		5430.66	09/27/2004	17:00	9.17	5421.49	
		5430.66	09/07/2005	13:13	8.28	5422.38	
		5430.66	09/21/2006	09:49	7.64	5423.02	
		5430.66	09/25/2007		8.47	5422.19	
		5430.66	09/23/2008		8.80	5421.86	
		5430.66	09/22/2009	15:55	9.11	5421.55	
		5430.66	08/24/2010	16:54	7.94	5422.72	
0320	O	5427.40	09/20/2000	16:28	6.17	5421.23	
		5427.40	10/20/2000	14:11	5.66	5421.74	
		5427.40	12/14/2000	12:51	5.42	5421.98	
		5427.40	03/02/2001	11:30	5.21	5422.19	
		5427.40	03/27/2001	13:39	4.95	5422.45	
		5427.40	05/17/2001	12:49	4.95	5422.45	
		5427.40	08/30/2001	16:17	5.99	5421.41	
		5427.40	11/27/2001	15:38	5.59	5421.81	
		5427.40	02/05/2002	16:36	5.29	5422.11	
		5427.40	09/25/2002	13:57	6.58	5420.82	
		5427.40	09/25/2003	12:37	5.87	5421.53	
		5427.40	09/28/2004	08:45	5.85	5421.55	
		5427.40	09/07/2005	14:10	5.79	5421.61	
		5427.40	09/21/2006	16:15	4.31	5423.09	
		5427.40	09/25/2007		5.15	5422.25	
		5427.40	09/23/2008		5.81	5421.59	
		5427.40	09/23/2009	12:50	6.11	5421.29	
		5427.40	08/25/2010	11:01	5.04	5422.36	
0339		-	09/29/2010	15:40	10.95	-10.95	
0340		-	09/29/2010	14:55	9.69	-9.69	

STATIC WATER LEVELS (USEE700) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 1:30 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0508	O	5439.77	02/18/1986	14:22	14.32	5425.45	
		5439.77	03/31/1986	12:55	13.24	5426.53	
		5439.77	06/29/1986	13:50	13.65	5426.12	
		5439.77	10/09/1987	10:00	14.25	5425.52	
		5439.77	02/18/1988	14:00	14.12	5425.65	
		5439.77	12/02/1990	15:18	14.64	5425.13	
		5439.77	03/27/1991	16:00	14.50	5425.27	
		5439.77	08/28/1991	11:00	14.64	5425.13	
		5439.77	12/05/1991	13:52	16.00	5423.77	
		5439.77	10/10/1992	15:55	15.87	5423.90	
		5439.77	02/16/1994	14:18	16.21	5423.56	
		5439.77	02/17/1995	14:09	15.52	5424.25	
		5430.20	03/04/1997		6.67	5423.53	
		5430.20	09/14/1998	14:05	6.44	5423.76	
		5430.20	02/23/2000	15:01	6.65	5423.55	
		5430.20	05/17/2000	14:38	5.00	5425.20	
		5430.20	09/20/2000	09:30	6.87	5423.33	
		5430.20	10/20/2000	14:44	6.90	5423.30	
		5430.20	12/14/2000	10:30	6.96	5423.24	
		5430.20	02/26/2001	11:26	6.84	5423.36	
		5430.20	03/27/2001	13:57	6.46	5423.74	
		5430.20	05/17/2001	10:45	6.49	5423.71	
		5430.20	08/30/2001	15:14	6.91	5423.29	
		5430.20	11/27/2001	13:08	7.09	5423.11	
		5430.20	02/05/2002	15:00	6.93	5423.27	
		5430.20	09/25/2002	13:00	7.64	5422.56	
		5430.20	09/25/2003	09:41	7.49	5422.71	
		5430.20	09/27/2004	14:45	7.55	5422.65	
		5430.20	09/07/2005	11:01	6.52	5423.68	
		5430.20	09/21/2006	14:14	6.48	5423.72	
		5430.20	09/24/2007		6.45	5423.75	
		5430.20	09/23/2008		6.77	5423.43	
		5430.20	09/23/2009	09:45	7.00	5423.20	
		5430.20	08/25/2010	08:34	6.69	5423.51	
0510	O	5438.59	02/18/1986	13:00	15.93	5422.66	
		5438.59	03/31/1986	13:05	15.09	5423.50	
		5438.59	06/28/1986	13:50	14.84	5423.75	
		5438.59	10/09/1987	13:30	15.87	5422.72	

STATIC WATER LEVELS (USEE700) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 1:30 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0510	O	5438.59	02/20/1988	09:10	15.82	5422.77	
		5438.59	05/14/1990	13:49	16.21	5422.38	
		5438.59	12/02/1990	15:22	16.21	5422.38	
		5438.59	03/28/1991	09:45	16.10	5422.49	
		5438.59	08/28/1991	12:15	16.22	5422.37	
		5438.59	12/05/1991	15:12	16.13	5422.46	
		5438.59	10/08/1992	16:47	15.90	5422.69	
		5438.59	02/16/1994	14:21	16.25	5422.34	
		5438.59	02/17/1995	10:47	16.20	5422.39	
		5427.87	03/04/1997		5.80	5422.07	
		5427.87	09/14/1998	12:51	5.52	5422.35	
		5427.87	02/24/2000	08:38	5.56	5422.31	
		5427.87	05/17/2000	15:56	3.92	5423.95	
		5427.87	09/20/2000	11:04	5.92	5421.95	
		5427.87	10/20/2000	14:38	5.80	5422.07	
		5427.87	12/14/2000	12:02	5.83	5422.04	
		5427.87	02/27/2001	12:05	5.77	5422.10	
		5427.87	03/27/2001	13:51	5.53	5422.34	
		5427.87	05/17/2001	11:23	5.38	5422.49	
		5427.87	08/30/2001	15:46	5.79	5422.08	
		5427.87	11/27/2001	14:58	5.90	5421.97	
		5427.87	02/05/2002	15:41	5.78	5422.09	
		5427.87	09/25/2002	13:24	6.28	5421.59	
		5427.87	09/25/2003	10:17	5.93	5421.94	
		5427.87	09/27/2004	16:34	6.07	5421.80	
		5427.87	09/07/2005	10:13	5.52	5422.35	
		5427.87	09/21/2006	15:17	5.13	5422.74	
		5427.87	09/24/2007		5.45	5422.42	
		5427.87	09/23/2008		5.65	5422.22	
		5427.87	09/23/2009	09:15	5.91	5421.96	
		5427.87	08/25/2010	10:15	5.12	5422.75	
0684	D	5432.68	06/20/1986	15:20	12.94	5419.57	
		5432.68	06/29/1986	12:25	13.73	5418.78	
		5432.68	04/06/1987	15:30	13.83	5418.68	
		5432.68	10/13/1987	08:50	15.21	5417.30	
		5432.68	02/19/1988	14:50	15.08	5417.43	
		5432.68	12/02/1990	15:51	16.11	5416.40	
		5432.68	03/28/1991	15:30	5.90	5426.61	

STATIC WATER LEVELS (USEE700) FOR SITE SRK05, Slick Rock West Processing Site
REPORT DATE: 4/27/2011 1:30 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0684	D	5432.68	08/06/1991	14:05	16.30	5416.21	
		5432.68	11/19/1991	14:12	16.28	5416.23	
		5432.68	10/15/1992	10:50	16.20	5416.31	
		5432.68	02/16/1994	11:36	15.93	5416.58	
		5432.68	02/19/1995	16:50	16.03	5416.48	
		5432.68	03/04/1997		16.02	5416.66	
		5432.68	09/14/1998	16:00	15.66	5417.02	
		5432.68	02/23/2000	12:31	15.78	5416.90	
		5432.68	05/17/2000	12:36	14.03	5418.65	
		5432.68	09/28/2000	13:49	16.57	5416.11	
		5432.68	10/20/2000	14:00	16.29	5416.39	
		5432.68	12/13/2000	14:06	16.25	5416.43	
		5432.68	03/27/2001	13:27	16.08	5416.60	
		5432.68	05/16/2001	16:37	15.85	5416.83	
		5432.68	08/30/2001	10:56	16.58	5416.10	
		5432.68	11/28/2001	10:15	16.62	5416.06	
		5432.68	09/24/2003	15:45	16.47	5416.21	
		5432.68	09/28/2004	10:10	16.79	5415.89	
		5432.68	09/07/2005	09:09	15.34	5417.34	
		5432.68	09/19/2006	15:08	14.98	5417.70	
		5432.68	09/25/2007		15.82	5416.86	
		5432.68	09/23/2008		15.88	5416.80	
		5432.68	09/23/2009	13:55	16.18	5416.50	
		5432.68	08/24/2010	15:27	15.24	5417.44	

RECORDS: SELECTED FROM USEE700 WHERE site_code='SRK05' AND location_code In('0317','0318','0318A','0319','0320','0339','0340','0508','0510','0684')

FLOW CODES: D DOWN GRADIENT O ON-SITE

WATER LEVEL FLAGS:

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