



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

June 2005



U.S. Department
of Energy

Office of Legacy Management

Office of Legacy Management

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

June 2005

Work Performed by S.M. Stoller Corporation under DOE Contract No. DE-AC01-02GJ79491
for the U.S. Department of Energy Office of Legacy Management, Grand Junction, Colorado

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1.0 Introduction

The Slick Rock, Colorado, Processing/Disposal Sites consist of two former uranium-ore processing facilities, which are referred to as the Slick Rock East (SRE) site (formerly the North Continent site) and the Slick Rock West (SRW) site (formerly the Union Carbide site). The Slick Rock sites are located along the banks of the Dolores River in San Miguel County, Colorado (Figure 1). Steep juniper covered hillsides and cliffs of the Dolores River Canyon surround the sites. The SRW site is approximately 1 mile downstream from the SRE site (Figure 2).

1.1 Purpose of Report

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

1.2 Compliance Strategy

The proposed compliance strategy for the Slick Rock sites is natural flushing in conjunction with institutional controls and compliance monitoring as stated in the *Preliminary Final Ground Water Compliance Action Plan for the Slick Rock, Colorado, UMTRA Project Sites* (GCAP) (DOE 2003). Except for manganese and selenium, constituents of potential concern (COPC) concentrations at the Slick Rock sites will be compared to their respective maximum concentration limit (MCL) to assess compliance. Because manganese does not have an MCL, manganese concentrations will be compared to the maximum background concentration (3.5 milligrams per liter [mg/L]) to assess compliance. Ground water modeling predicts that selenium concentrations at the SRW site will not be reduced to below the MCL within 100 years; therefore, a human health risk-based alternate concentration limit (ACL) of 0.18 mg/L is proposed in the GCAP for selenium. Ground water modeling predicts that natural flushing will be completed within the 100-year regulatory time-frame. Public health will be protected during the natural flushing process through institutional controls, which will restrict access to contaminated alluvial ground water. The institutional controls 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, Umetco Minerals Corporation (Umetco). Umetco and CDPHE are finalizing the respective environmental covenants. The GCAP is currently being reviewed by the U.S. Nuclear Regulatory Commission (NRC), which recently requested additional information be provided for clarification of several issues.

2.0 Site Conditions

2.1 Hydrogeology

The Slick Rock sites overlay an alluvial aquifer deposited by the Dolores River. The alluvial aquifer consists of unconsolidated material ranging in thickness from 15 to 20 feet and consists primarily of silty sands and silty sandy gravels with an occasional interbedded clay lens. The

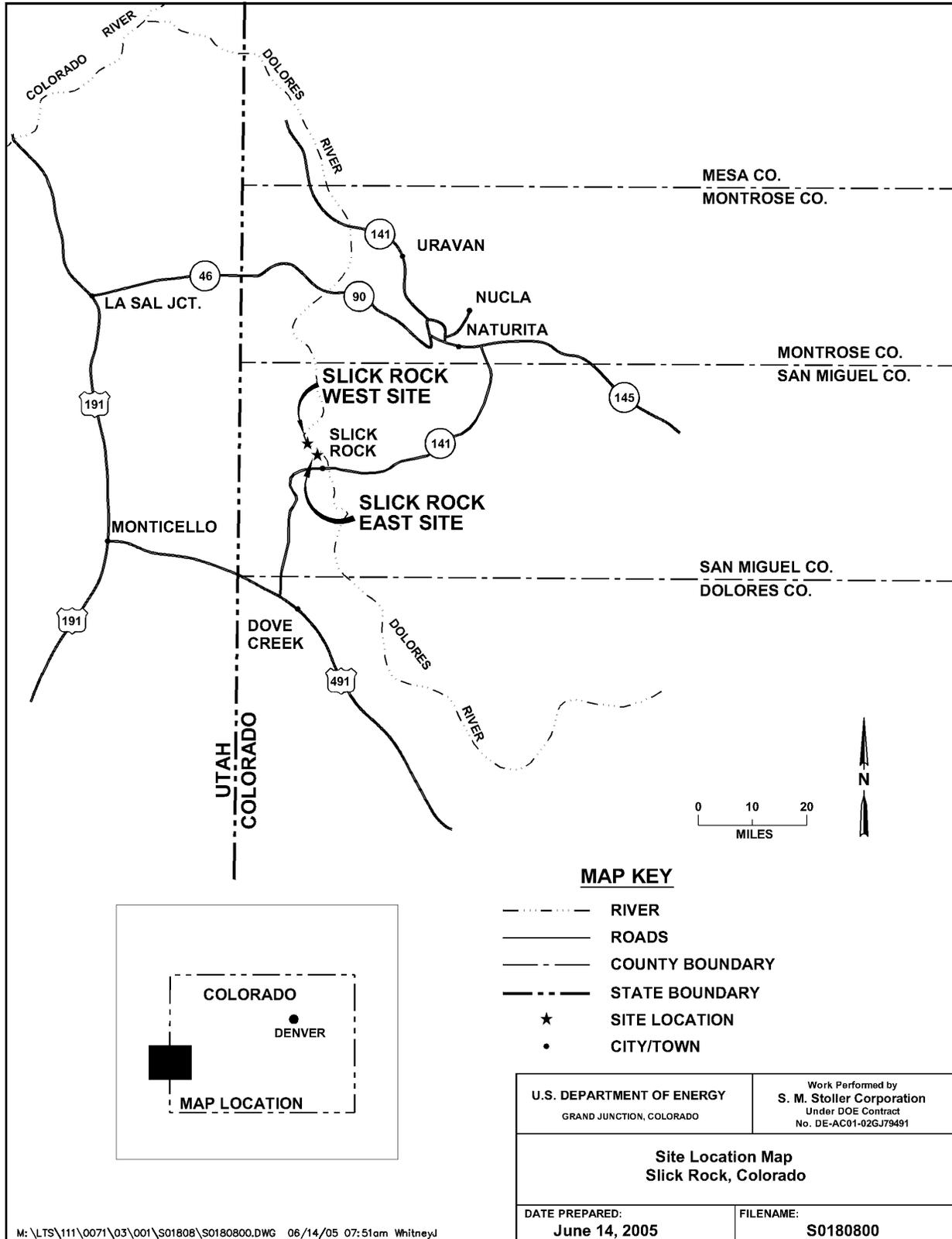


Figure 1. Slick Rock, Colorado, Processing Sites Location Map



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

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 Dolores River meets the canyon wall. Depth to ground water in the unconfined alluvial aquifer ranges from 7 to 15 feet below ground surface.

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

The hydrostratigraphic units at the SRW site are, in descending stratigraphic order, the Quaternary Dolores River alluvium, the Jurassic Entrada Sandstone, and the Jurassic Navajo Sandstone. The Entrada Sandstone ranges from 40 to 60 feet thick in the floodplain area, with depths to ground water ranging from 6 to 8 feet below ground surface. The thickness of the Navajo Sandstone is approximately 180 feet in the Slick Rock area (DOE 2002). Wells completed in the Navajo Sandstone and located on the floodplain at the SRW site have an upward vertical gradient with respect to the alluvial aquifer and the Entrada Sandstone; therefore, contamination in the alluvial aquifer will not cross contaminate the Navajo Sandstone aquifer.

2.2 Ground Water Quality

2.2.1 SRE Site

Alluvial ground water beneath the SRE site was contaminated as a result of former uranium processing activities. COPC in the uppermost (alluvial) aquifer at the SRE site are selenium and uranium. Uranium concentrations in the alluvial aquifer are up to two orders of magnitude greater than the MCL of 0.044 mg/L established by the U.S. Environmental Protection Agency (EPA) at title 40, *Code of Federal Regulations*, Part 192 (40 CFR 192). A snapshot of the distribution of uranium in the alluvial ground water at the SRE site is shown in [Figure 3](#). Selenium contamination at the SRE site is confined to one well (0305) and is not considered a major contaminant at the SRE site. Ground water quality data in 2004 for selenium and uranium are provided in [Appendix A](#).

2.2.2 SRW Site

The former uranium processing activities also contaminated the ground water beneath the SRW site. COPCs in the uppermost (alluvial) aquifer at the SRW site include manganese, molybdenum, nitrate, selenium, uranium, radium-226, radium-228, benzene, and toluene. All of these COPCs are found in concentrations greater than the MCL or background concentrations (in the case of manganese) in the alluvial aquifer. Contaminant plumes in the alluvial aquifer are all contained onsite. Radium-226, radium-228, benzene, toluene, manganese and uranium are all considered minor contaminants in the alluvial ground water. The radium-226, radium-228, benzene, and toluene contamination is isolated to one well (0319), and manganese and uranium concentrations are near background levels and the MCL, respectively. The primary contaminants in the alluvial aquifer are molybdenum, nitrate, and selenium, with concentrations one (molybdenum) to two (nitrate and selenium) orders of magnitude greater than their respective MCLs. Snapshots of the distribution of molybdenum, nitrate, and selenium in the alluvial aquifer at the SRW site are displayed in [Figure 4](#), [Figure 5](#), and [Figure 6](#), respectively.

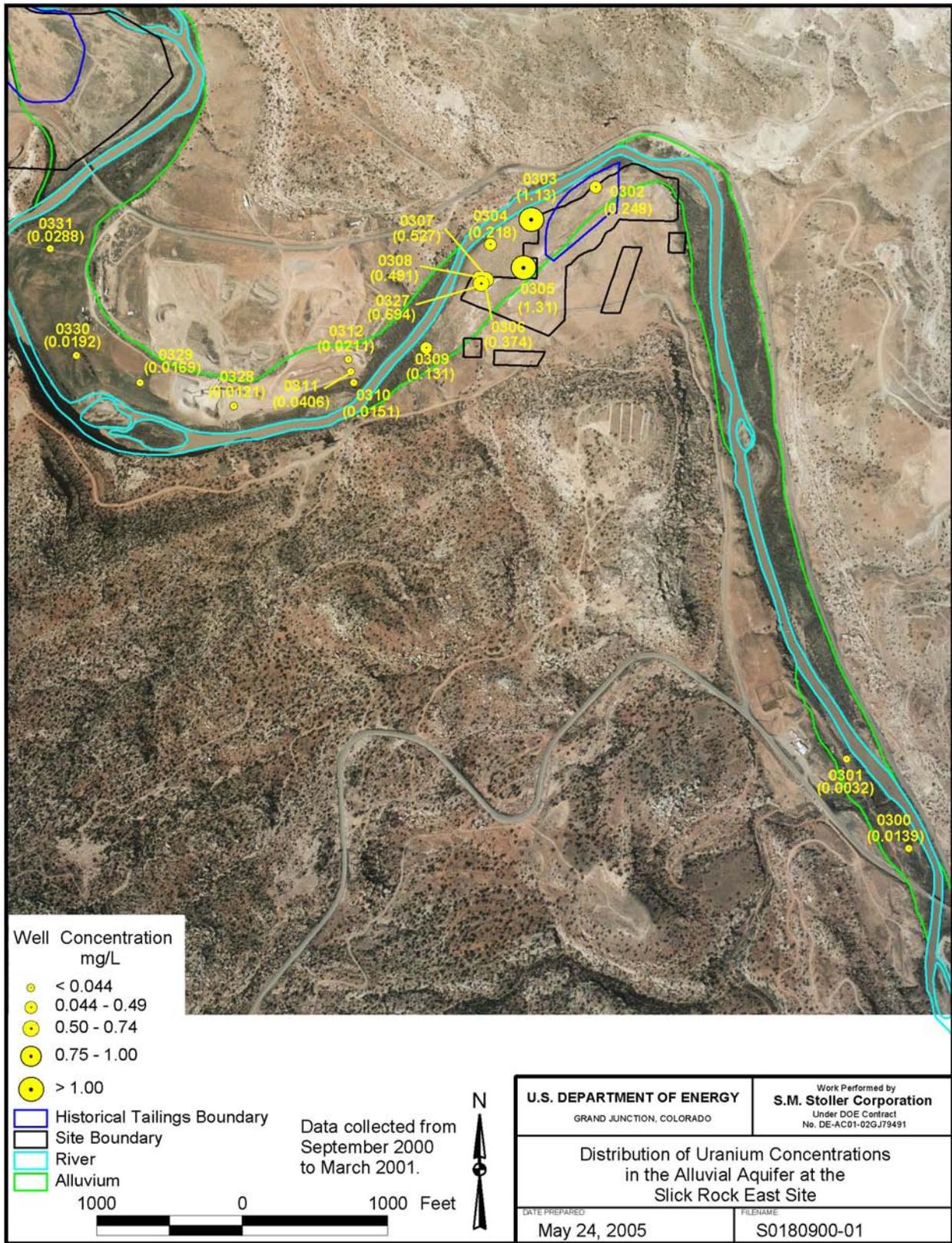


Figure 3. Distribution of Uranium in the Alluvial Aquifer at the SRE Site

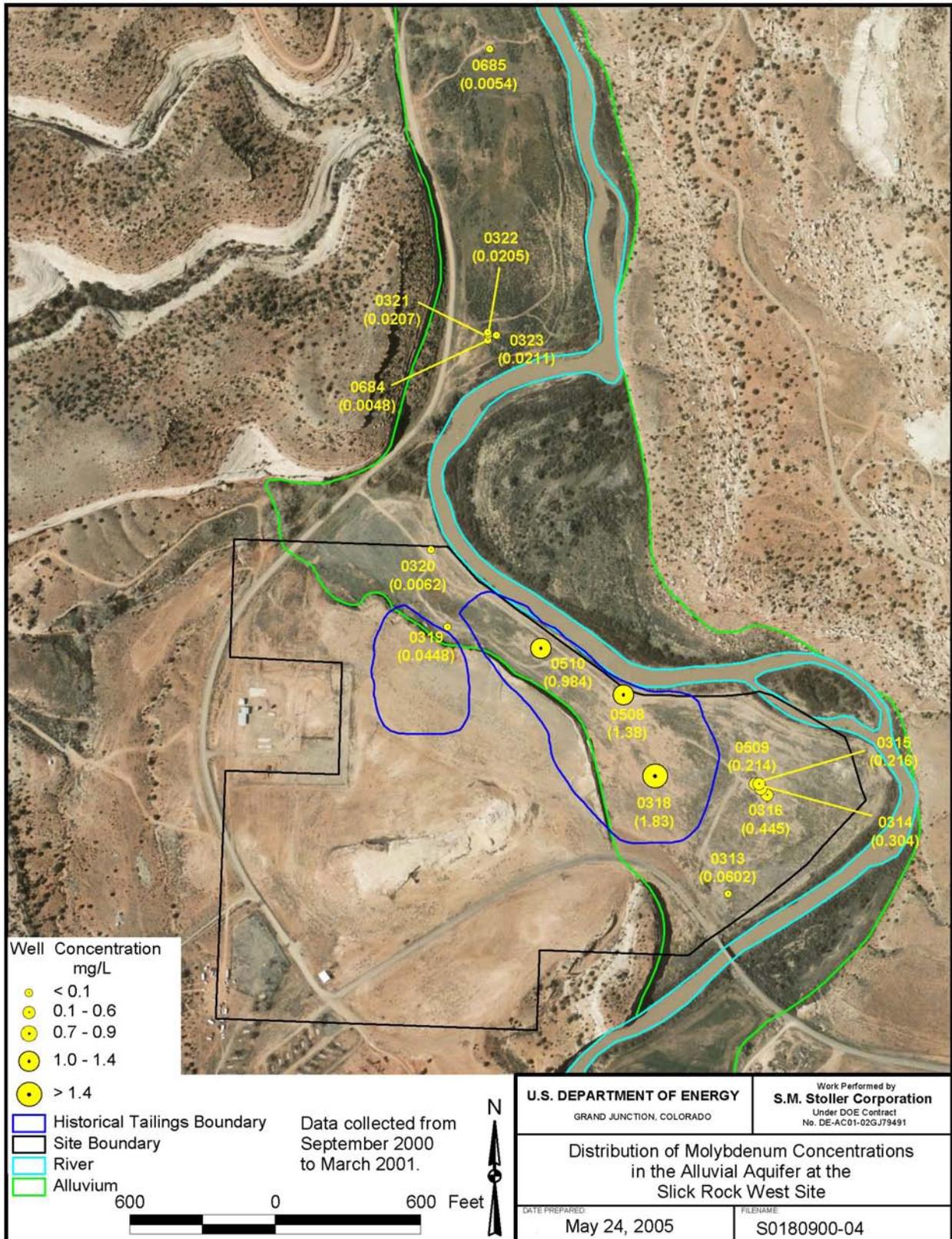
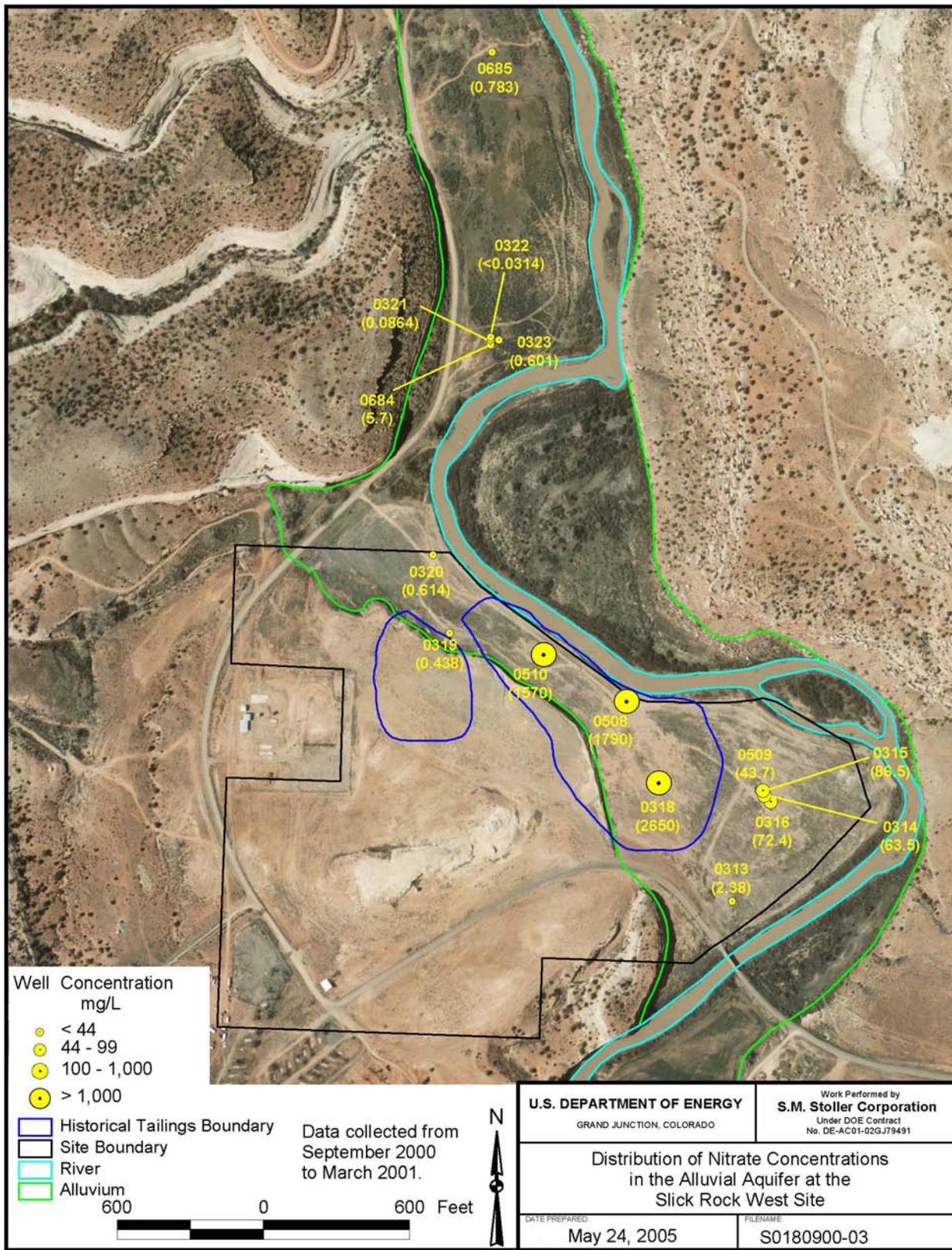


Figure 4. Distribution of Molybdenum in the Alluvial Aquifer at the SRW Site



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Figure 5. Distribution of Nitrate in the Alluvial Aquifer at the SRW Site

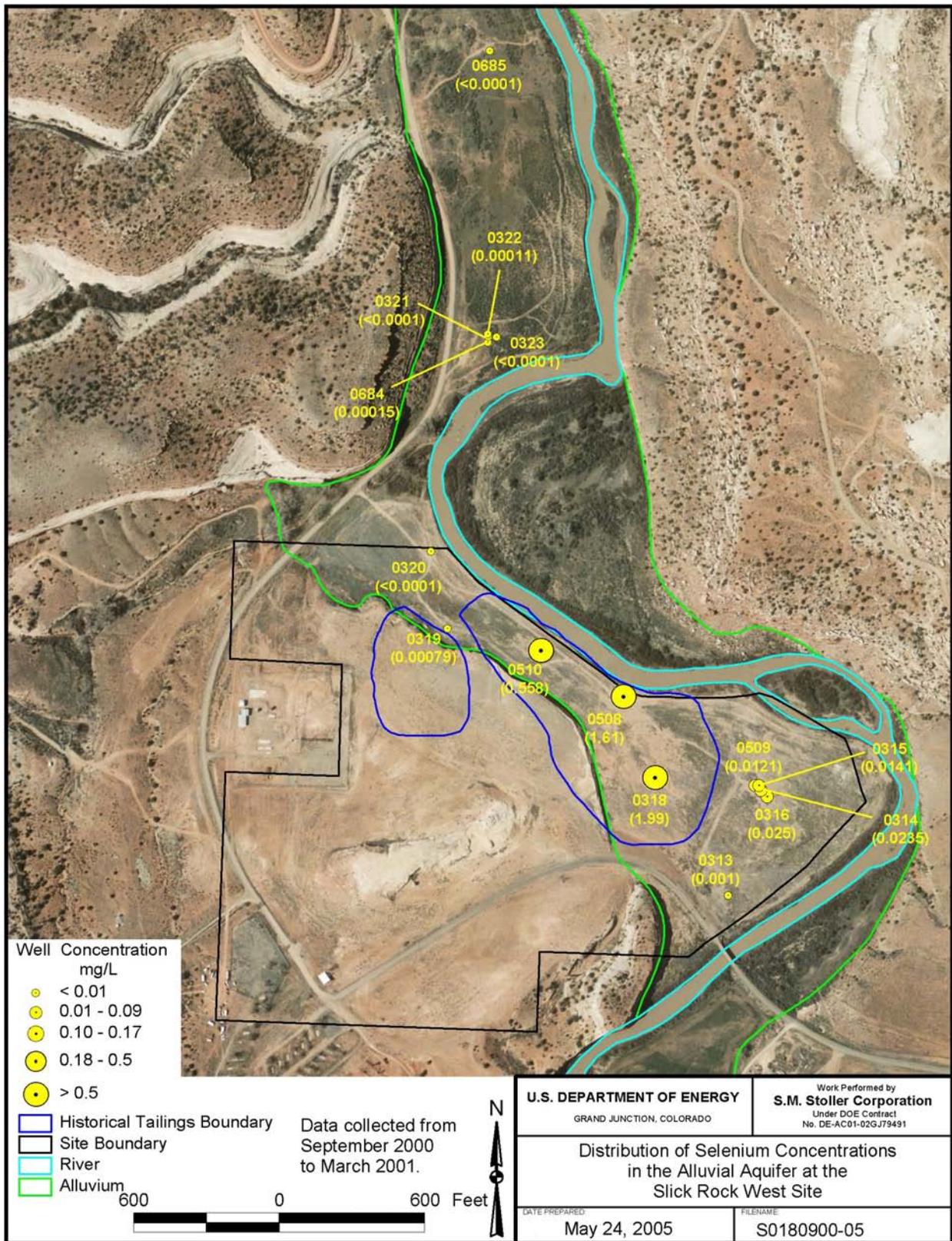


Figure 6. Distribution of Selenium in the Alluvial Aquifer at the SRW Site

Samples from wells completed in the Entrada Sandstone on the floodplain at the SRW site have contained elevated concentrations of COPCs. Historically, concentrations of molybdenum (well 0317), nitrate (well 0324), and selenium (well 0324) exceeded their respective MCLs. However, these concentrations are thought to be a product of drilling and installing monitor wells through the contaminated alluvial aquifer. This theory is supported by hydrologic data that indicate there is slight upward vertical gradient between the alluvial and Entrada aquifers and that the hydraulic conductivity in the alluvial aquifer is two orders of magnitude greater than the Entrada aquifer. These hydrologic conditions should inhibit ground water from flowing vertically downward into the Entrada aquifer. Well 0324 was not sampled in 2004 because the nitrate and selenium concentrations were below the MCLs for three consecutive rounds of sampling.

Results of the 2004 ground water monitoring program are provided in Appendix A.

2.3 Surface Water Quality

The Dolores River is the only perennial surface water feature in the vicinity of the Slick Rock sites. Results from surface-water sampling have demonstrated minimal impact to the Dolores River from site contamination. Concentrations of COPCs in samples collected from the Dolores River have not exceeded their respective CDPHE water quality benchmark (CDPHE 1998).

Results of the 2004 surface-water monitoring program are provided in [Appendix B](#).

2.4 Remediation Activities

Surface remediation at the Slick Rock sites commenced in 1995 and was completed in 1996. Abandoned uranium mill tailings and other contaminated surface 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 sites. The sites were re-graded with on-site material and subsequent revegetation efforts have been deemed successful.

2.5 Land and Water Use

The SRE and SRW sites are currently owned by Umetco. The SRE site is not fenced and is currently 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. Land use between the two sites includes irrigated alfalfa 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 ground water beneath the former processing sites. Historically, a hand dug alluvial well located between the two sites was used as a domestic source, but the well is no longer used. Recent water level measurements show the well is dry.

Ground water use from the Entrada Sandstone is limited. Water from the Entrada Sandstone is used to water livestock via a “collector system.” The collector system consists of a plastic pipe installed into the cliff face formed by the Entrada Sandstone. Water discharges from the pipe into a stock tank at a rate of approximately 1 liter/minute. The collector system is located northwest and upgradient of the SRW site.

Ground water used in the Slick Rock area is primarily supplied by the Navajo Sandstone aquifer. Currently, domestic wells completed in the Navajo Sandstone provide water to three residences and their livestock. Historically, wells completed in the Navajo Sandstone provided water for the milling operations and for the mill community at the SRW site.

3.0 Monitoring Program

3.1 Monitoring Network

Monitoring is to be performed annually for the first 10 years after NRC concurrence with the GCAP to ascertain that natural flushing is progressing as predicted by ground water flow and transport modeling (DOE 2003). After 10 years, the monitoring frequency will decrease to every 5 years. At the SRE site, the monitoring network consists of five monitor wells and two surface water locations (Figure 7 and Table 1). At the SRW site, the monitoring network consists of seven monitor wells and four surface water locations (Figure 8 and Table 2).

Monitoring is to be conducted until analytical data demonstrate that ground water contaminants in the alluvial aquifer have decreased to acceptable levels (MCLs, ACLs, or background). Natural flushing will be considered complete after a COPC is below its respective benchmark (MCL, ACL, or background) in all alluvial wells for three consecutive annual sampling events or two consecutive 5-year sampling events.

Table 1. Monitoring Program at the SRE Site

| ID | Matrix | Location | Rationale | Analytes |
|------|---------------|------------------|--|-------------------|
| 0696 | Surface Water | Upstream | Background for SRE site. | Uranium |
| 0692 | Surface Water | Adjacent to site | Predicted location where the centroid of the uranium plume intersects the river. | Uranium |
| 0303 | Ground Water | On site | Hot spot for uranium. | Uranium |
| 0305 | Ground Water | On site | Hot spot for uranium; selenium above the MCL. | Uranium, Selenium |
| 0307 | Ground Water | On site | Downgradient of hot spots, monitor plume migration. | Uranium, Selenium |
| 0309 | Ground Water | On site | Farthest downgradient well on site. | Uranium |
| 0311 | Ground Water | Downgradient | Off site across the river. Monitor migration of the uranium plume between sites. | Uranium |

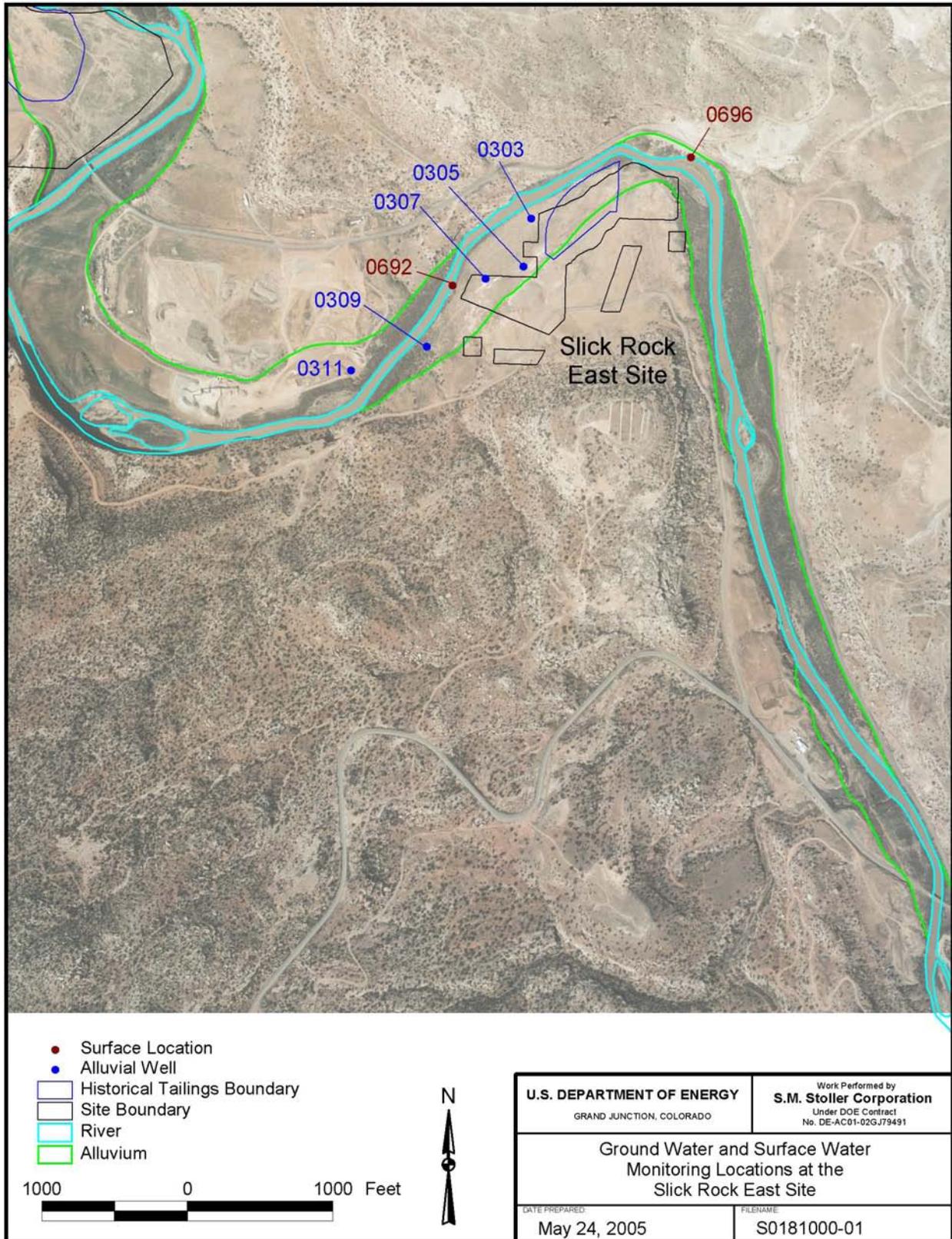
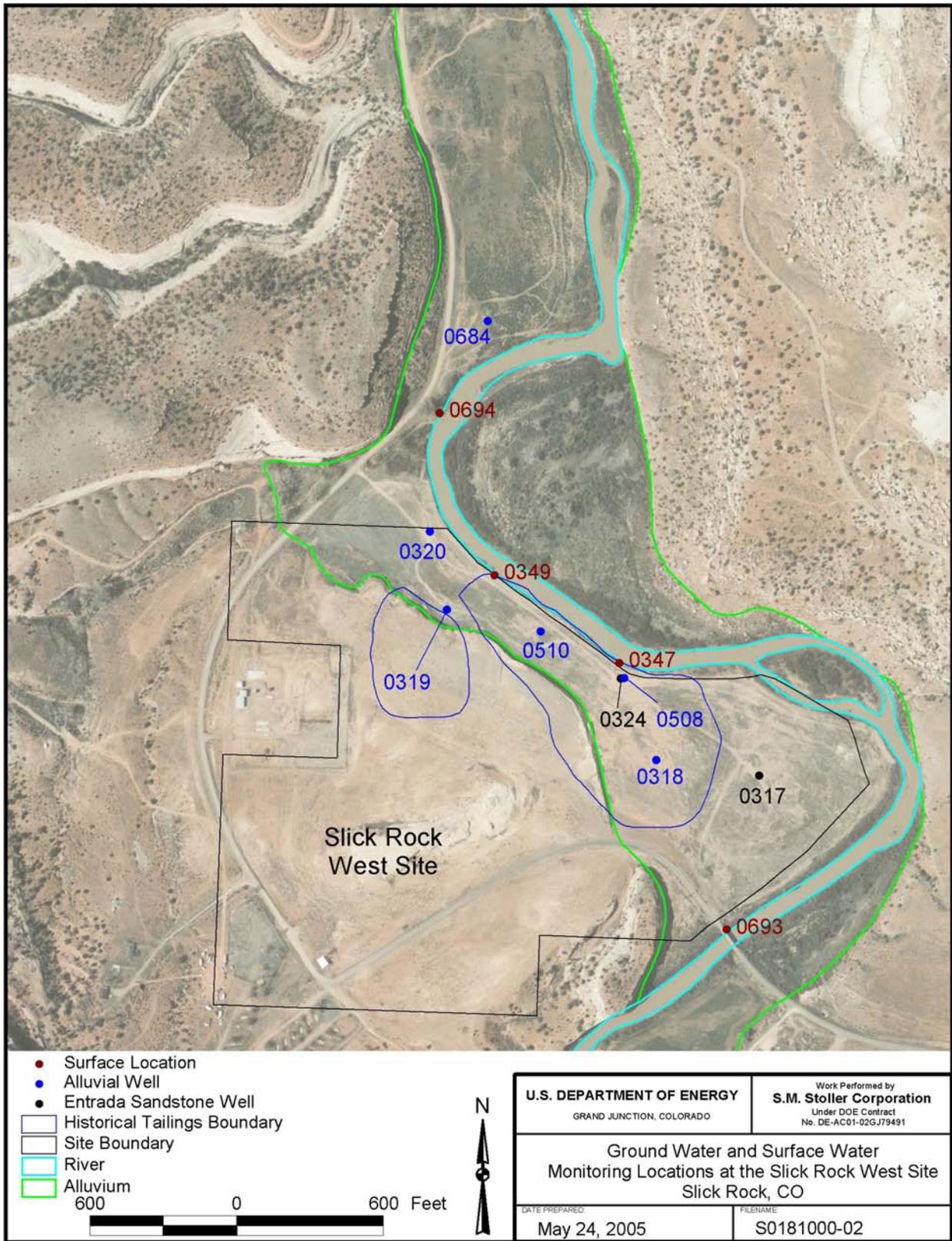


Figure 7. Ground Water and Surface Water Monitoring Locations at the SRE Site



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Figure 8. Ground Water and Surface Water Monitoring Locations at the SRW Site

Table 2. Monitoring Program at the SRW Site

| ID | Matrix | Location | Rationale | Analytes |
|------|---------------|------------------|---|---|
| 0693 | Surface Water | Upstream | Background for SRW site. | Manganese, Molybdenum, Nitrate, Selenium, and Uranium |
| 0347 | Surface Water | Adjacent to site | Predicted location where the centroid of the selenium plume intersects the river. Point of exposure for selenium. | Manganese, Molybdenum, Nitrate, Selenium, and Uranium |
| 0349 | Surface Water | Adjacent to site | Predicted location where the centroid of the contaminant plumes intersect the river. | 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 |
| 0318 | Ground Water | On site | Hot spot for several COPCs. | Manganese, Molybdenum, Nitrate, Selenium, and Uranium |
| 0508 | Ground Water | On site | High selenium, nitrate, molybdenum, and uranium. | Manganese, Molybdenum, Nitrate, Selenium, and Uranium |
| 0510 | Ground Water | On site | Edge of former tailings pile, high COPC concentrations. | Manganese, Molybdenum, Nitrate, Selenium, and Uranium |
| 0317 | Ground Water | On site | Entrada Sandstone well, exceeds molybdenum MCL. | Molybdenum |
| 0324 | Ground Water | On site | Entrada Sandstone well, previously exceeded nitrate and selenium MCLs. | Removed from sampling network in 2004 because contaminant concentrations dropped below MCLs |
| 0319 | Ground Water | On site | Hot spot for benzene, toluene and radium-226/radium-228. | Benzene, Toluene, Ethylbenzene, Xylene, Radium-226, and Radium-228 |
| 0320 | Ground Water | On site | Farthest downgradient well on site; monitor plume movement. | Manganese, Molybdenum, Nitrate, Selenium, and Uranium |
| 0684 | Ground Water | Off site | Verify that contaminants are not migrating off site. | Manganese, Molybdenum, Nitrate, Selenium, and Uranium |

3.2 Results of Monitoring Program

3.2.1 SRE Site

At the SRE site, results of the monitoring program indicate natural flushing is progressing; however slowly, due to the continuing drought conditions and minimal recharge of the aquifer. Although concentrations of uranium in the alluvial aquifer are currently one to two orders of magnitude above the MCL (0.044 mg/L) in the middle of the site, there are indications that natural flushing is occurring. In the centroid of the plume, concentrations of uranium have decreased slightly in well 0305 in the past; however, there has been no significant change during the last three sampling events. Uranium concentrations have been decreasing at greater rates in wells 0303 and 0307 (Figure 9). Uranium concentrations in well 0309 (downgradient of the centroid of the plume) have been declining and are presently below the MCL (Figure 10). Uranium concentrations in well 0311 (across the Dolores River from the SRE site) have been increasing slightly (Figure 10), which indicates uranium is migrating (flushing) from the SRE site. The ground water flow and transport model predicts limited transport of contaminated ground water from the SRE site and under the Dolores River; therefore, uranium concentrations in well 0311 are not expected to increase significantly. Concentrations of uranium in wells 0305 versus ground water model predictions are shown in Figure 11.

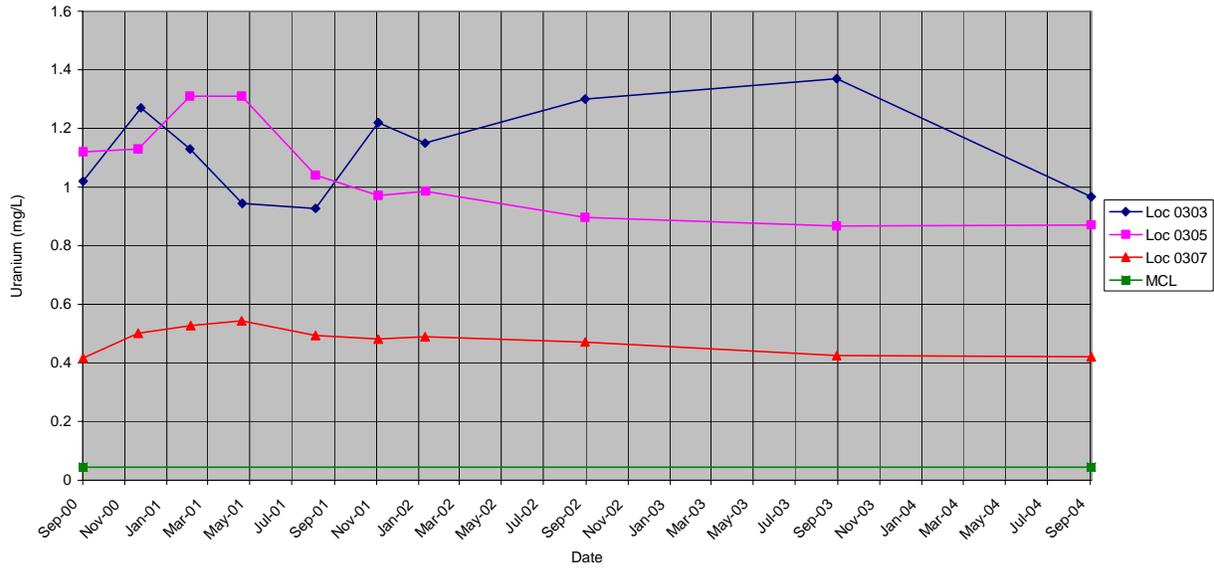


Figure 9. Uranium Concentrations Versus Time in the Middle of the SRE Site

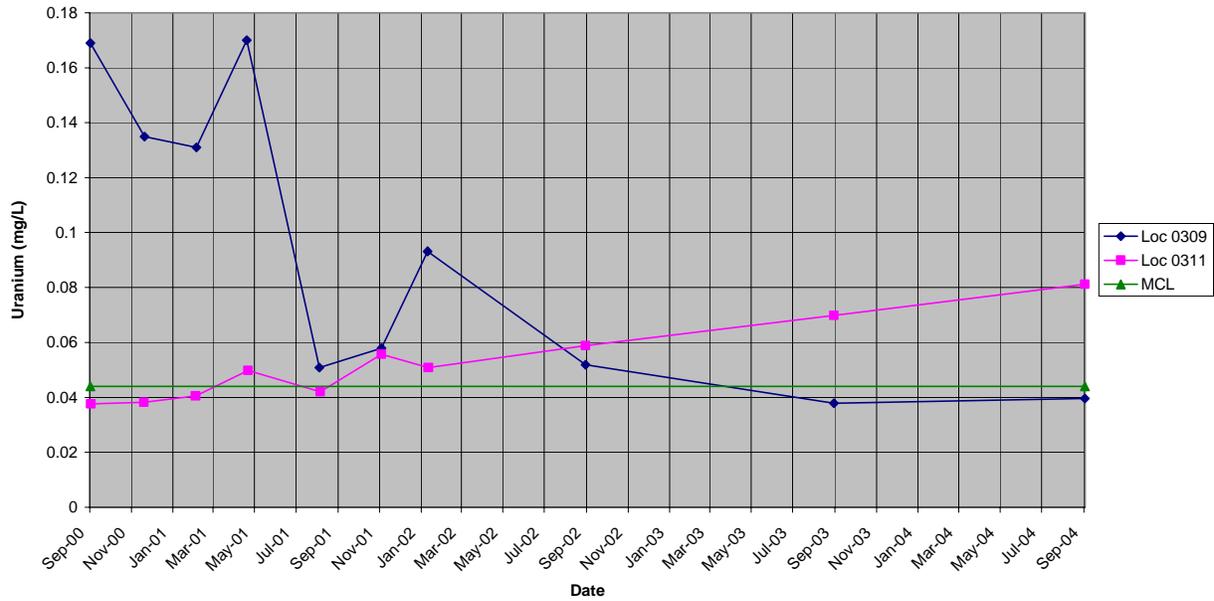


Figure 10. Uranium Concentrations Versus Time in the Downgradient Portion of the SRE Site

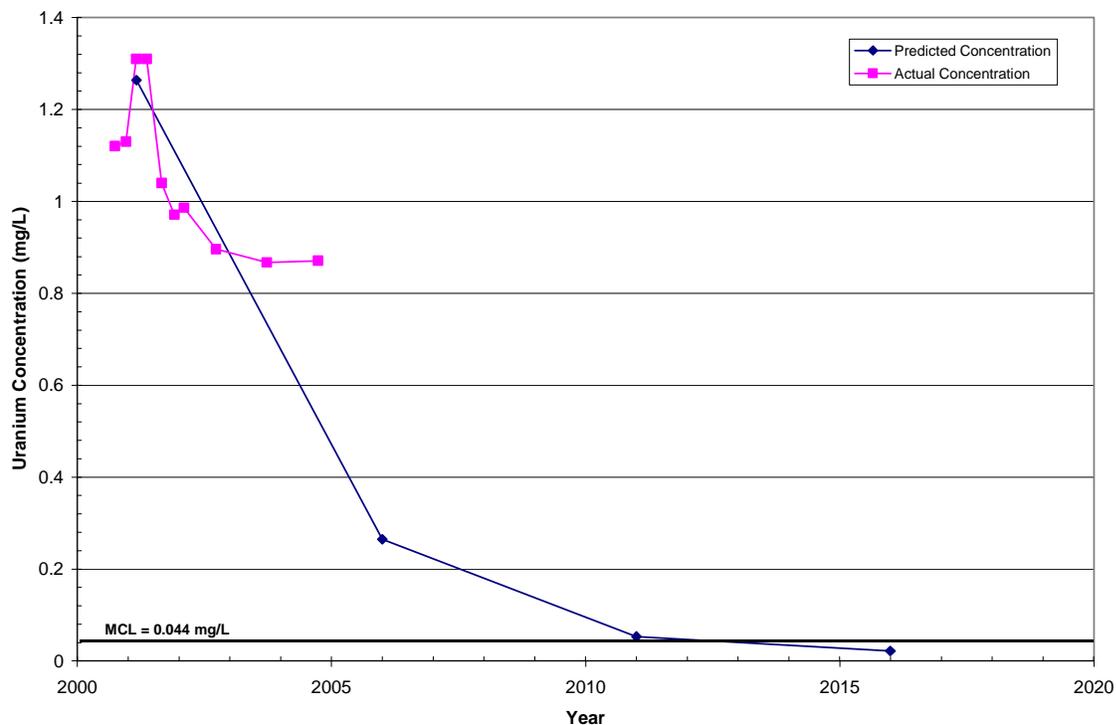


Figure 11. Uranium Concentrations in Well 0305 Versus Ground Water Model Predictions at the SRE Site

3.2.2 SRW Site

Results of the monitoring program from the SRW site also indicate that natural flushing is progressing. Concentrations of selenium in the alluvial ground water have generally decreased over time as shown in Figure 12. Nitrate concentrations have similarly decreased over time; however, no new data were acquired for 2004 due to quality-control problems at the laboratory. Molybdenum concentrations have decreased (by a factor of 4) over time in well 0318, but have been fairly consistent over time in wells 0508 and 0510 as shown in Figure 13. Decreasing molybdenum concentrations in well 0318 may be indicative of contaminant plume movement. The recent fluctuations of molybdenum concentrations in well 0508 and 0510 may also indicate plume movement or simply be the result of the continuing drought conditions noted for the area and the minimal recharge of the alluvial aquifer. Historically, concentrations of molybdenum in the Entrada Sandstone well (well 0317) have been slightly above the MCL and the levels continue to decrease slightly (Figure 13). Concentrations of molybdenum and selenium in well 0508 versus model predictions are displayed in Figure 14 and Figure 15, respectively. The deviation between the actual concentrations of molybdenum in well 0508 and the model predictions appears drastic and should be closely monitored over the next several sampling rounds to better understand the alluvial system. Concentrations of the COPCs in the alluvial aquifer at the SRW site have decreased significantly since 2000 as shown in Table 3.

Table 3. Comparison of COPC Concentrations in the Alluvial Aquifer to Benchmark Values

| COPC | Benchmark ^a | Maximum Concentration ^b | Current Concentration ^c | Well Location | Site |
|-------------------------|------------------------|------------------------------------|------------------------------------|---------------|------|
| Benzene | 0.005 | 19.8 | 3.64 | 0319 | SRW |
| Manganese | 3.5 | 12.80 | 2.97 | 0318 | SRW |
| Molybdenum | 0.10 | 1.83 | 0.459 | 0318 | SRW |
| Nitrate | 44.27 | 4,090 | N/A | 0318 | SRW |
| Radium-226 + Radium-228 | 5 | 7.21 | 5.56 | 0319 | SRW |
| Toluene | 1 | 13.7 | 2.25 | 0319 | SRW |
| Selenium | 0.18 | 2.57 | 1.29 | 0318 | SRW |

^aBenchmark values are MCLs except for selenium (ACL) and manganese (background). Units are in mg/L, except for radium-226 and radium-228, which are in picoCuries per liter (pCi/L).

^bMaximum concentration in the alluvial aquifer from September 2000 to September 2002.

^cConcentration in September 2004.

Several minor COPCs are limited to well 0319 only. Benzene and toluene concentrations in well 0319 have decreased significantly (Table 3) as predicted by published biodegradation rates (Mackay et al. 1992). Radium-226 plus radium-228 activities in well 0319 remain close to the standard of 5 pCi/L (Table 3).

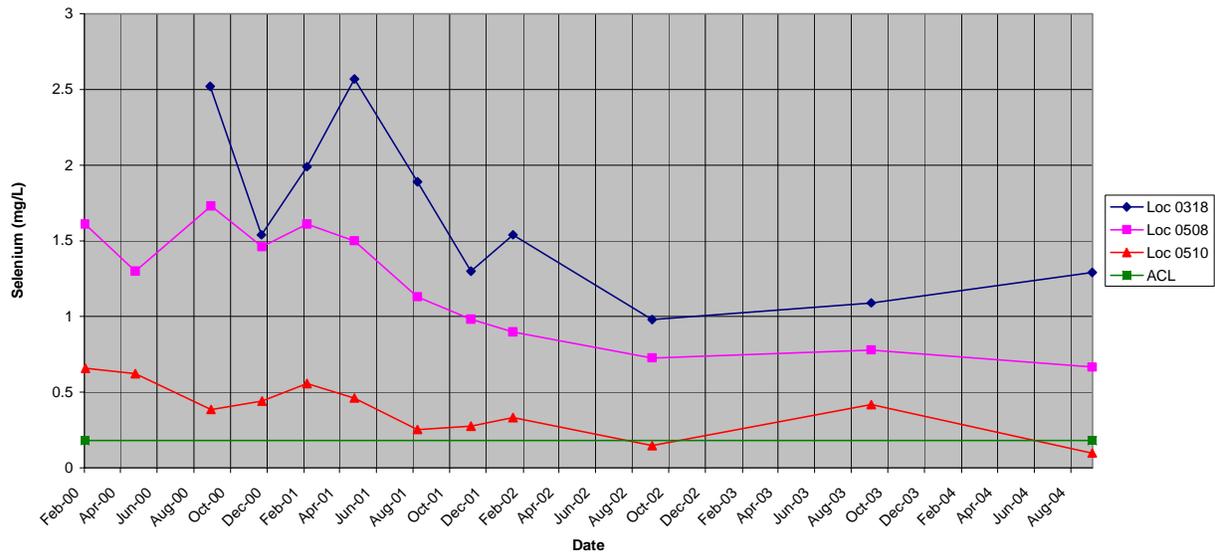


Figure 12. Selenium Concentrations Versus Time at the SRW site

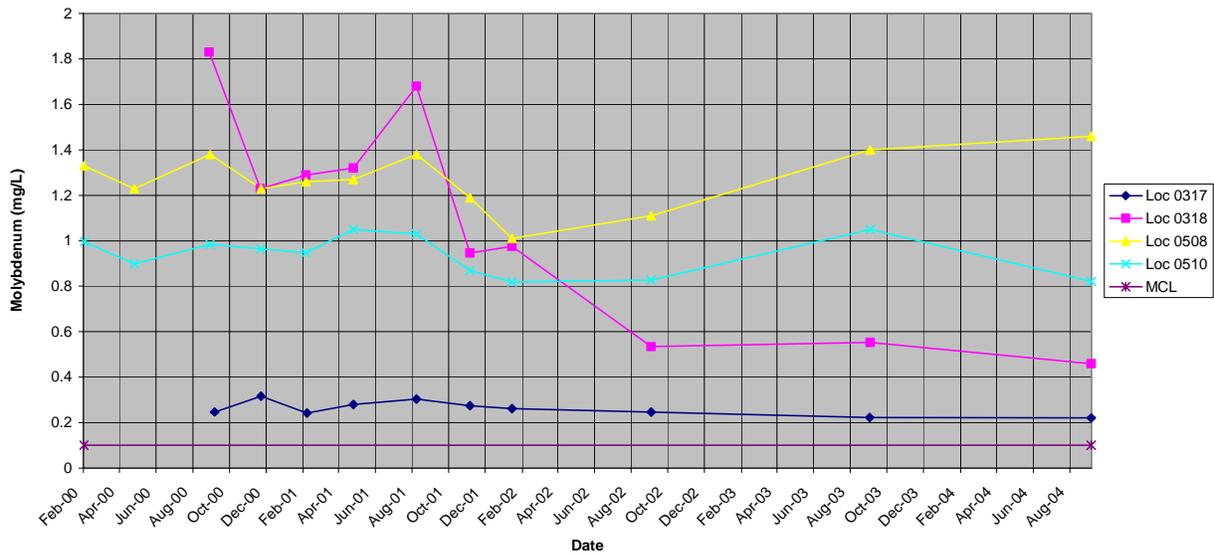


Figure 13. Molybdenum Concentrations Versus Time at the SRW site

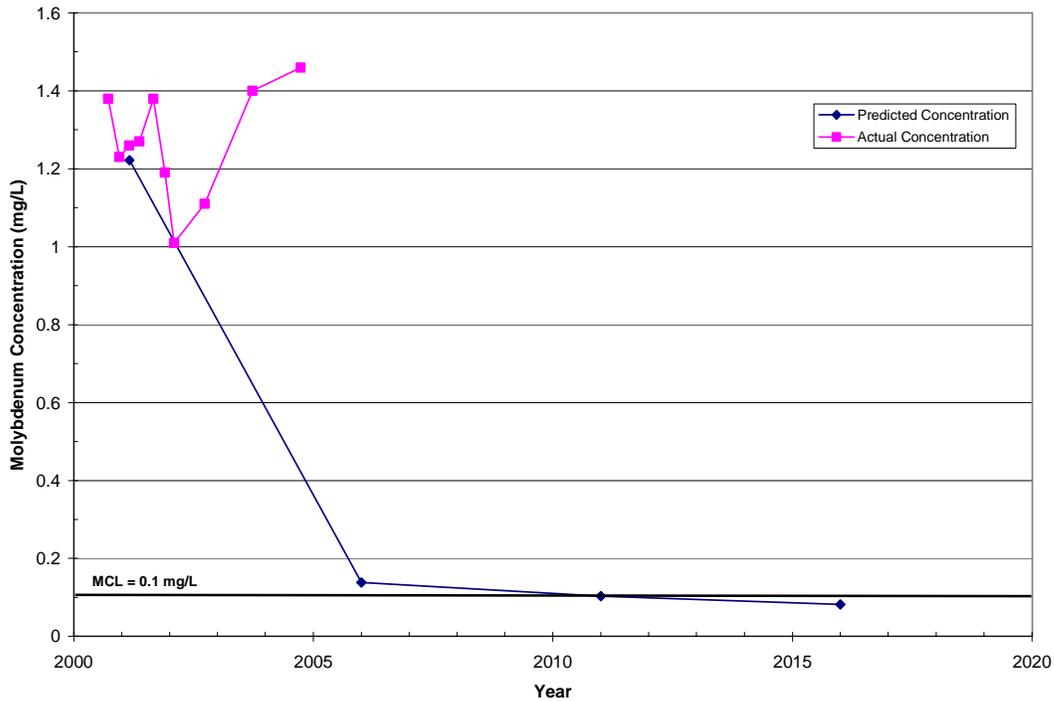


Figure 14. Molybdenum Concentrations in Well 0508 Versus Ground Water Model Predictions at the SRW Site

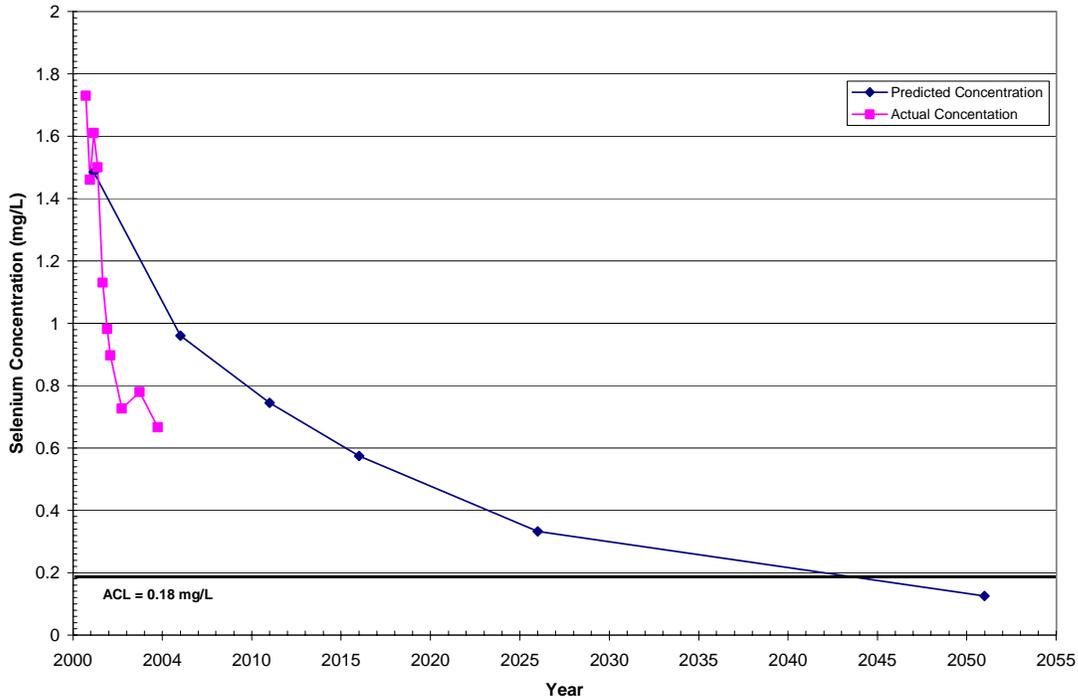


Figure 15. Selenium Concentrations in Well 0508 Versus Ground Water Model Predictions at the SRW Site

3.3 Surface Water

Results from surface-water sampling (Appendix B) demonstrate essentially no impact to the Dolores River from site activities; no CDPHE water quality benchmarks have been exceeded as shown in Table 4.

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

| COPC | CDPHE Benchmark ^a (mg/L) | Dolores River Location | | | | | |
|------------------------|--|---------------------------|--------|----------|---------|---------|---------|
| | | SRE site | | SRW site | | | |
| | | 0696 | 0692 | 0693 | 0347 | 0349 | 0694 |
| | | 2004 Concentration (mg/L) | | | | | |
| Manganese ^b | 0.05 | - | - | 0.0024 | 0.0019 | 0.0022 | 0.0025 |
| Selenium | 0.005 | - | - | <0.0006 | <0.0006 | <0.0006 | <0.0006 |
| Uranium | 0.059 | 0.0008 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0008 |

^aCDPHE surface water benchmark (CDPHE 1998).

^bStandard for chronic exposure.

4.0 Conclusions

4.1 Status of Site Compliance

While both the SRE and SRW sites still have concentrations of COPCs in the alluvial aquifer above the respective MCL, ACL, or background concentrations, levels are generally decreasing, which indicates natural flushing is occurring in the aquifer. In addition, concentrations of most COPCs are comparable to predictions made by the ground water model.

The molybdenum concentration in well 0508 is essentially unchanged from 2000, and represents the largest deviation from model predictions (Figure 14); however, molybdenum concentrations in other portions of the alluvial aquifer (well 0318) have decreased significantly (Figure 13). Decreasing molybdenum concentrations in well 0318 may be indicative of plume movement. Ground water modeling predicts molybdenum concentrations in the alluvial aquifer will decline as natural flushing processes continue. The recent fluctuations in molybdenum concentrations in wells 0508 and 0510 may result from the continuing drought and minimal recharge of the alluvial system.

4.2 Recommendations

To date, the natural flushing strategy has been effective in reducing the COPC concentrations in the alluvial aquifer. Verification monitoring of ground water from designated monitor wells and surface water locations will continue on an annual basis as specified in the GCAP (DOE 2003).

Special attention will be given to nitrate analysis during the next sampling event to ensure that the laboratory problems encountered in 2004 are not repeated. Additionally, molybdenum concentrations in wells 0508 and 0510 should be closely monitored against the model predictions to determine if additional modeling is required.

5.0 References

Colorado Department of Public Health and Environment, 1998. Water Quality Commission, Regulation No. 35, *Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins*, Denver, Colorado.

Mackay, D., W. Y. Shiu, and K. C. Ma, 1992. *Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals*, Lewis Publishers, Chelsea, Michigan.

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———, 2003. *Preliminary Final Ground Water Compliance Action Plan for the Slick Rock, Colorado, UMTRA Project Sites*. GJO-2003-448-TAC GJO-GWSKR 1.9, Grand Junction Office, Grand Junction, Colorado.

40 CFR 192. U.S. Environmental Protection Agency, “Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings,” *Code of Federal Regulations*, July 1, 2002.

Appendix A

Ground Water Quality Data by Parameter

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
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| PARAMETER | UNITS | LOCATION ID | LOCATION TYPE | SAMPLE: | | DEPTH RANGE (FT BLS) | RESULT | QUALIFIERS: | | | DETECTION LIMIT | UN-CERTAINTY |
|------------------------------|---------|-------------|---------------|------------|------------|----------------------|--------------|-------------|------|---------|-----------------|--------------|
| | | | | DATE | ID | | | LAB | DATA | QA | | |
| Alkalinity, Total (As CaCO3) | mg/L | 0303 | WL | 09/27/2004 | 0001 | 4.30 - 14.30 | 500 | F | # | - | - | |
| | mg/L | 0305 | WL | 09/27/2004 | 0001 | 8.70 - 18.70 | 296 | F | # | - | - | |
| | mg/L | 0307 | WL | 09/27/2004 | 0001 | 4.40 - 14.40 | 794 | F | # | - | - | |
| | mg/L | 0309 | WL | 09/27/2004 | 0001 | 10.20 - 20.20 | 800 | F | # | - | - | |
| | mg/L | 0311 | WL | 09/27/2004 | 0001 | 14.10 - 19.10 | 280 | F | # | - | - | |
| | mg/L | 0317 | WL | 09/27/2004 | 0001 | 19.46 - 39.52 | 288 | F | # | - | - | |
| | mg/L | 0318 | WL | 09/27/2004 | 0001 | 4.99 - 15.02 | 292 | F | # | - | - | |
| | mg/L | 0319 | WL | 09/27/2004 | 0001 | 4.55 - 14.58 | 1243 | F | # | - | - | |
| | mg/L | 0320 | WL | 09/28/2004 | 0001 | 4.92 - 9.96 | 333 | F | # | - | - | |
| | mg/L | 0508 | WL | 09/27/2004 | 0001 | 1.01 - 11.01 | 360 | F | # | - | - | |
| | mg/L | 0510 | WL | 09/27/2004 | 0001 | 4.92 - 13.92 | 300 | F | # | - | - | |
| | mg/L | 0684 | WL | 09/28/2004 | 0001 | 11.00 - 21.00 | 164 | F | # | - | - | |
| | Benzene | ug/L | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 3640 | F | # | 50 | - |
| ug/L | | 0319 | WL | 09/27/2004 | N002 | 4.55 - 14.58 | 3500 | F | # | 50 | - | |
| Ethylbenzene | ug/L | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 209 | F | # | 50 | - | |
| | ug/L | 0319 | WL | 09/27/2004 | N002 | 4.55 - 14.58 | 215 | F | # | 50 | - | |
| Manganese | mg/L | 0318 | WL | 09/27/2004 | 0001 | 4.99 - 15.02 | 2.970 | F | # | 0.00161 | - | |
| | mg/L | 0320 | WL | 09/28/2004 | 0001 | 4.92 - 9.96 | 0.470 | F | # | 0.00161 | - | |
| | mg/L | 0508 | WL | 09/27/2004 | 0001 | 1.01 - 11.01 | 5.390 | F | # | 0.00161 | - | |
| | mg/L | 0510 | WL | 09/27/2004 | 0001 | 4.92 - 13.92 | 5.830 | F | # | 0.00161 | - | |
| | mg/L | 0684 | WL | 09/28/2004 | 0001 | 11.00 - 21.00 | 0.994 | F | # | 0.00161 | - | |
| Molybdenum | mg/L | 0317 | WL | 09/27/2004 | 0001 | 19.46 - 39.52 | 0.220 | F | # | 0.00143 | - | |
| | mg/L | 0318 | WL | 09/27/2004 | 0001 | 4.99 - 15.02 | 0.459 | F | # | 0.00143 | - | |
| | mg/L | 0320 | WL | 09/28/2004 | 0001 | 4.92 - 9.96 | 0.0196 | F | # | 0.00143 | - | |
| | mg/L | 0508 | WL | 09/27/2004 | 0001 | 1.01 - 11.01 | 1.460 | F | # | 0.00143 | - | |

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:14 am

| PARAMETER | UNITS | LOCATION ID | LOCATION TYPE | SAMPLE: | | DEPTH RANGE (FT BLS) | RESULT | QUALIFIERS: | | | DETECTION LIMIT | UN-CERTAINTY |
|----------------------------|-------|-------------|---------------|------------|------------|----------------------|--------------|-------------|------|----|-----------------|--------------|
| | | | | DATE | ID | | | LAB | DATA | QA | | |
| Molybdenum | mg/L | 0510 | WL | 09/27/2004 | 0001 | 4.92 - 13.92 | 0.821 | | F | # | 0.00143 | - |
| | mg/L | 0684 | WL | 09/28/2004 | 0001 | 11.00 - 21.00 | 0.0085 | B | F | # | 0.00143 | - |
| Oxidation Reduction Potent | mV | 0303 | WL | 09/27/2004 | N001 | 4.30 - 14.30 | -127 | | F | # | - | - |
| | mV | 0305 | WL | 09/27/2004 | N001 | 8.70 - 18.70 | 15 | | F | # | - | - |
| | mV | 0307 | WL | 09/27/2004 | N001 | 4.40 - 14.40 | -85 | | F | # | - | - |
| | mV | 0309 | WL | 09/27/2004 | N001 | 10.20 - 20.20 | -125 | | F | # | - | - |
| | mV | 0311 | WL | 09/27/2004 | N001 | 14.10 - 19.10 | 102 | | F | # | - | - |
| | mV | 0317 | WL | 09/27/2004 | N001 | 19.46 - 39.52 | 45 | | F | # | - | - |
| | mV | 0318 | WL | 09/27/2004 | N001 | 4.99 - 15.02 | 73 | | F | # | - | - |
| | mV | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | -153 | | F | # | - | - |
| | mV | 0320 | WL | 09/28/2004 | N001 | 4.92 - 9.96 | -59 | | F | # | - | - |
| | mV | 0508 | WL | 09/27/2004 | N001 | 1.01 - 11.01 | 84 | | F | # | - | - |
| | mV | 0510 | WL | 09/27/2004 | N001 | 4.92 - 13.92 | 83 | | F | # | - | - |
| | mV | 0684 | WL | 09/28/2004 | N001 | 11.00 - 21.00 | 11 | | F | # | - | - |
| | pH | s.u. | 0303 | WL | 09/27/2004 | N001 | 4.30 - 14.30 | 7.24 | | F | # | - |
| s.u. | | 0305 | WL | 09/27/2004 | N001 | 8.70 - 18.70 | 7.14 | | F | # | - | - |
| s.u. | | 0307 | WL | 09/27/2004 | N001 | 4.40 - 14.40 | 7.12 | | F | # | - | - |
| s.u. | | 0309 | WL | 09/27/2004 | N001 | 10.20 - 20.20 | 7.50 | | F | # | - | - |
| s.u. | | 0311 | WL | 09/27/2004 | N001 | 14.10 - 19.10 | 6.94 | | F | # | - | - |
| s.u. | | 0317 | WL | 09/27/2004 | N001 | 19.46 - 39.52 | 7.32 | | F | # | - | - |
| s.u. | | 0318 | WL | 09/27/2004 | N001 | 4.99 - 15.02 | 6.80 | | F | # | - | - |
| s.u. | | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 6.91 | | F | # | - | - |
| s.u. | | 0320 | WL | 09/28/2004 | N001 | 4.92 - 9.96 | 7.03 | | F | # | - | - |
| s.u. | | 0508 | WL | 09/27/2004 | N001 | 1.01 - 11.01 | 6.64 | | F | # | - | - |
| s.u. | | 0510 | WL | 09/27/2004 | N001 | 4.92 - 13.92 | 6.59 | | F | # | - | - |
| s.u. | | 0684 | WL | 09/28/2004 | N001 | 11.00 - 21.00 | 7.34 | | F | # | - | - |

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:14 am

| PARAMETER | UNITS | LOCATION ID | LOCATION TYPE | SAMPLE: | | DEPTH RANGE (FT BLS) | RESULT | QUALIFIERS: | | | UN-CERTAINTY |
|----------------------|----------|-------------|---------------|------------|------|----------------------|-----------|-------------|------|---------|--------------|
| | | | | DATE | ID | | | LAB | DATA | QA | |
| Radium-226 | pCi/L | 0319 | WL | 09/27/2004 | 0001 | 4.55 - 14.58 | 2.54 | F | # | 0.38 | ± 0.65 |
| | pCi/L | 0319 | WL | 09/27/2004 | 0002 | 4.55 - 14.58 | 2.53 | F | # | 0.627 | ± 0.69 |
| Radium-228 | pCi/L | 0319 | WL | 09/27/2004 | 0001 | 4.55 - 14.58 | 2.80 | JF | # | 1.21 | ± 0.74 |
| | pCi/L | 0319 | WL | 09/27/2004 | 0002 | 4.55 - 14.58 | 3.25 | F | # | 0.979 | ± 0.66 |
| Selenium | mg/L | 0305 | WL | 09/27/2004 | 0001 | 8.70 - 18.70 | 0.0248 | F | # | 0.00064 | - |
| | mg/L | 0307 | WL | 09/27/2004 | 0001 | 4.40 - 14.40 | 0.00064 U | F | # | 0.00064 | - |
| | mg/L | 0318 | WL | 09/27/2004 | 0001 | 4.99 - 15.02 | 1.290 | F | # | 0.00064 | - |
| | mg/L | 0320 | WL | 09/28/2004 | 0001 | 4.92 - 9.96 | 0.00064 U | F | # | 0.00064 | - |
| | mg/L | 0508 | WL | 09/27/2004 | 0001 | 1.01 - 11.01 | 0.666 | F | # | 0.00064 | - |
| | mg/L | 0510 | WL | 09/27/2004 | 0001 | 4.92 - 13.92 | 0.0977 | F | # | 0.00064 | - |
| | mg/L | 0684 | WL | 09/28/2004 | 0001 | 11.00 - 21.00 | 0.00064 U | F | # | 0.00064 | - |
| Specific Conductance | umhos/cm | 0303 | WL | 09/27/2004 | N001 | 4.30 - 14.30 | 3152 | F | # | - | - |
| | umhos/cm | 0305 | WL | 09/27/2004 | N001 | 8.70 - 18.70 | 2922 | F | # | - | - |
| | umhos/cm | 0307 | WL | 09/27/2004 | N001 | 4.40 - 14.40 | 5715 | F | # | - | - |
| | umhos/cm | 0309 | WL | 09/27/2004 | N001 | 10.20 - 20.20 | 2681 | F | # | - | - |
| | umhos/cm | 0311 | WL | 09/27/2004 | N001 | 14.10 - 19.10 | 1778 | F | # | - | - |
| | umhos/cm | 0317 | WL | 09/27/2004 | N001 | 19.46 - 39.52 | 2715 | F | # | - | - |
| | umhos/cm | 0318 | WL | 09/27/2004 | N001 | 4.99 - 15.02 | 3380 | F | # | - | - |
| | umhos/cm | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 10480 | F | # | - | - |
| | umhos/cm | 0320 | WL | 09/28/2004 | N001 | 4.92 - 9.96 | 1069 | F | # | - | - |
| | umhos/cm | 0508 | WL | 09/27/2004 | N001 | 1.01 - 11.01 | 5079 | F | # | - | - |
| | umhos/cm | 0510 | WL | 09/27/2004 | N001 | 4.92 - 13.92 | 4587 | F | # | - | - |
| | umhos/cm | 0684 | WL | 09/28/2004 | N001 | 11.00 - 21.00 | 980 | F | # | - | - |
| Temperature | C | 0303 | WL | 09/27/2004 | N001 | 4.30 - 14.30 | 18.4 | F | # | - | - |
| | C | 0305 | WL | 09/27/2004 | N001 | 8.70 - 18.70 | 16.4 | F | # | - | - |

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:14 am

| PARAMETER | UNITS | LOCATION ID | LOCATION TYPE | SAMPLE: | | DEPTH RANGE (FT BLS) | RESULT | QUALIFIERS: | | | DETECTION LIMIT | UN-CERTAINTY |
|------------------------|---------------|-------------|---------------|------------|------------|----------------------|--------------|-------------|------|------|-----------------|--------------|
| | | | | DATE | ID | | | LAB | DATA | QA | | |
| Temperature | C | 0307 | WL | 09/27/2004 | N001 | 4.40 - 14.40 | 16.1 | F | # | - | - | |
| | C | 0309 | WL | 09/27/2004 | N001 | 10.20 - 20.20 | 14.0 | F | # | - | - | |
| | C | 0311 | WL | 09/27/2004 | N001 | 14.10 - 19.10 | 16.6 | F | # | - | - | |
| | C | 0317 | WL | 09/27/2004 | N001 | 19.46 - 39.52 | 15.2 | F | # | - | - | |
| | C | 0318 | WL | 09/27/2004 | N001 | 4.99 - 15.02 | 18.5 | F | # | - | - | |
| | C | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 17.4 | F | # | - | - | |
| | C | 0320 | WL | 09/28/2004 | N001 | 4.92 - 9.96 | 16.8 | F | # | - | - | |
| | C | 0508 | WL | 09/27/2004 | N001 | 1.01 - 11.01 | 19.0 | F | # | - | - | |
| | C | 0510 | WL | 09/27/2004 | N001 | 4.92 - 13.92 | 18.5 | F | # | - | - | |
| | C | 0684 | WL | 09/28/2004 | N001 | 11.00 - 21.00 | 13.8 | F | # | - | - | |
| Toluene | ug/L | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 2250 | F | # | 50 | - | |
| | ug/L | 0319 | WL | 09/27/2004 | N002 | 4.55 - 14.58 | 2110 | F | # | 50 | - | |
| Total Dissolved Solids | mg/L | 0303 | WL | 09/27/2004 | 0001 | 4.30 - 14.30 | 1980 | F | # | 3.07 | - | |
| | mg/L | 0305 | WL | 09/27/2004 | 0001 | 8.70 - 18.70 | 1980 | F | # | 3.07 | - | |
| | mg/L | 0307 | WL | 09/27/2004 | 0001 | 4.40 - 14.40 | 5040 | F | # | 3.07 | - | |
| | mg/L | 0309 | WL | 09/27/2004 | 0001 | 10.20 - 20.20 | 1800 | F | # | 5.11 | - | |
| | mg/L | 0311 | WL | 09/27/2004 | 0001 | 14.10 - 19.10 | 1270 | F | # | 3.07 | - | |
| | mg/L | 0317 | WL | 09/27/2004 | 0001 | 19.46 - 39.52 | 1570 | F | # | 3.07 | - | |
| | mg/L | 0318 | WL | 09/27/2004 | 0001 | 4.99 - 15.02 | 3080 | F | # | 3.07 | - | |
| | mg/L | 0319 | WL | 09/27/2004 | 0001 | 4.55 - 14.58 | 5410 | F | # | 3.07 | - | |
| | mg/L | 0319 | WL | 09/27/2004 | 0002 | 4.55 - 14.58 | 5420 | F | # | 3.07 | - | |
| | mg/L | 0320 | WL | 09/28/2004 | 0001 | 4.92 - 9.96 | 664 | F | # | 3.07 | - | |
| | mg/L | 0508 | WL | 09/27/2004 | 0001 | 1.01 - 11.01 | 3940 | F | # | 3.07 | - | |
| | mg/L | 0510 | WL | 09/27/2004 | 0001 | 4.92 - 13.92 | 4590 | F | # | 3.07 | - | |
| | mg/L | 0684 | WL | 09/28/2004 | 0001 | 11.00 - 21.00 | 973 | F | # | 3.07 | - | |
| | Total Xylenes | ug/L | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 4680 | F | # | 50 | - |

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:14 am

| PARAMETER | UNITS | LOCATION ID | LOCATION TYPE | SAMPLE: | | DEPTH RANGE (FT BLS) | RESULT | QUALIFIERS: | | | UN-CERTAINTY |
|---------------|-------|-------------|---------------|------------|------|----------------------|--------|-------------|------|---------|--------------|
| | | | | DATE | ID | | | LAB | DATA | QA | |
| Total Xylenes | ug/L | 0319 | WL | 09/27/2004 | N002 | 4.55 - 14.58 | 4670 | F | # | 50 | - |
| Turbidity | NTU | 0303 | WL | 09/27/2004 | N001 | 4.30 - 14.30 | 2.16 | F | # | - | - |
| | NTU | 0305 | WL | 09/27/2004 | N001 | 8.70 - 18.70 | 8.48 | F | # | - | - |
| | NTU | 0307 | WL | 09/27/2004 | N001 | 4.40 - 14.40 | 7.12 | F | # | - | - |
| | NTU | 0309 | WL | 09/27/2004 | N001 | 10.20 - 20.20 | 9.44 | F | # | - | - |
| | NTU | 0311 | WL | 09/27/2004 | N001 | 14.10 - 19.10 | 5.81 | F | # | - | - |
| | NTU | 0317 | WL | 09/27/2004 | N001 | 19.46 - 39.52 | 4.10 | F | # | - | - |
| | NTU | 0318 | WL | 09/27/2004 | N001 | 4.99 - 15.02 | 4.53 | F | # | - | - |
| | NTU | 0319 | WL | 09/27/2004 | N001 | 4.55 - 14.58 | 6.25 | F | # | - | - |
| | NTU | 0320 | WL | 09/28/2004 | N001 | 4.92 - 9.96 | 7.84 | F | # | - | - |
| | NTU | 0508 | WL | 09/27/2004 | N001 | 1.01 - 11.01 | 4.22 | F | # | - | - |
| | NTU | 0510 | WL | 09/27/2004 | N001 | 4.92 - 13.92 | 2.88 | F | # | - | - |
| | NTU | 0684 | WL | 09/28/2004 | N001 | 11.00 - 21.00 | 1.40 | F | # | - | - |
| Uranium | mg/L | 0303 | WL | 09/27/2004 | 0001 | 4.30 - 14.30 | 0.967 | F | # | 0.00002 | - |
| | mg/L | 0305 | WL | 09/27/2004 | 0001 | 8.70 - 18.70 | 0.871 | F | # | 0.00002 | - |
| | mg/L | 0307 | WL | 09/27/2004 | 0001 | 4.40 - 14.40 | 0.421 | F | # | 0.00002 | - |
| | mg/L | 0309 | WL | 09/27/2004 | 0001 | 10.20 - 20.20 | 0.0396 | F | # | 0.00002 | - |
| | mg/L | 0311 | WL | 09/27/2004 | 0001 | 14.10 - 19.10 | 0.0812 | F | # | 0.00002 | - |
| | mg/L | 0318 | WL | 09/27/2004 | 0001 | 4.99 - 15.02 | 0.0392 | F | # | 0.00002 | - |
| | mg/L | 0320 | WL | 09/28/2004 | 0001 | 4.92 - 9.96 | 0.0253 | F | # | 0.00002 | - |
| | mg/L | 0508 | WL | 09/27/2004 | 0001 | 1.01 - 11.01 | 0.112 | F | # | 0.00002 | - |
| | mg/L | 0510 | WL | 09/27/2004 | 0001 | 4.92 - 13.92 | 0.096 | F | # | 0.00002 | - |
| | mg/L | 0684 | WL | 09/28/2004 | 0001 | 11.00 - 21.00 | 0.0086 | F | # | 0.00002 | - |

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:14 am

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

RECORDS: SELECTED FROM USEE200 WHERE site_code='SRK01' AND quality_assurance = TRUE AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2004# and #12/31/2004#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). 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: 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 compound (TIC).
- P > 25% difference in detected pesticide or Arochlor 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. | 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

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:15 am

| PARAMETER | UNITS | LOCATION | | SAMPLE: | | RESULT | QUALIFIERS: DETECTION UN- | | |
|-----------------------------|----------|----------|------------|---------|----------|--------|---------------------------|---------|-------|
| | | ID | DATE | ID | LAB | | DATA | QA | LIMIT |
| Alkalinity, Total (As CaCO3 | mg/L | 0347 | 09/27/2004 | 0001 | 108 | | # | - | - |
| | mg/L | 0349 | 09/28/2004 | 0001 | 99 | | # | - | - |
| | mg/L | 0692 | 09/27/2004 | 0001 | 122 | | # | - | - |
| | mg/L | 0693 | 09/28/2004 | 0001 | 101 | | # | - | - |
| | mg/L | 0694 | 09/28/2004 | 0001 | 97 | | # | - | - |
| | mg/L | 0696 | 09/27/2004 | 0001 | 102 | | # | - | - |
| Manganese | mg/L | 0347 | 09/27/2004 | 0001 | 0.0019 B | | # | 0.00161 | - |
| | mg/L | 0349 | 09/28/2004 | 0001 | 0.0022 B | | # | 0.00161 | - |
| | mg/L | 0693 | 09/28/2004 | 0001 | 0.0024 B | | # | 0.00161 | - |
| | mg/L | 0694 | 09/28/2004 | 0001 | 0.0025 B | | # | 0.00161 | - |
| Molybdenum | mg/L | 0347 | 09/27/2004 | 0001 | 0.0024 B | | # | 0.00143 | - |
| | mg/L | 0349 | 09/28/2004 | 0001 | 0.0025 B | | # | 0.00143 | - |
| | mg/L | 0693 | 09/28/2004 | 0001 | 0.0026 B | | # | 0.00143 | - |
| | mg/L | 0694 | 09/28/2004 | 0001 | 0.0023 B | | # | 0.00143 | - |
| Oxidation Reduction Potent | mV | 0347 | 09/27/2004 | N001 | 28 | | # | - | - |
| | mV | 0349 | 09/28/2004 | N001 | -58 | | # | - | - |
| | mV | 0692 | 09/27/2004 | N001 | 7.5 | | # | - | - |
| | mV | 0693 | 09/28/2004 | N001 | 18.1 | | # | - | - |
| | mV | 0694 | 09/28/2004 | N001 | 11 | | # | - | - |
| | mV | 0696 | 09/27/2004 | N001 | 9 | | # | - | - |
| pH | s.u. | 0347 | 09/27/2004 | N001 | 8.39 | | # | - | - |
| | s.u. | 0349 | 09/28/2004 | N001 | 8.14 | | # | - | - |
| | s.u. | 0692 | 09/27/2004 | N001 | 8.22 | | # | - | - |
| | s.u. | 0693 | 09/28/2004 | N001 | 8.30 | | # | - | - |
| | s.u. | 0694 | 09/28/2004 | N001 | 8.37 | | # | - | - |
| | s.u. | 0696 | 09/27/2004 | N001 | 8.35 | | # | - | - |
| Selenium | mg/L | 0347 | 09/27/2004 | 0001 | 0.0006 U | | # | 0.00064 | - |
| | mg/L | 0349 | 09/28/2004 | 0001 | 0.0006 U | | # | 0.00064 | - |
| | mg/L | 0693 | 09/28/2004 | 0001 | 0.0006 U | | # | 0.00064 | - |
| | mg/L | 0694 | 09/28/2004 | 0001 | 0.0006 U | | # | 0.00064 | - |
| Specific Conductance | umhos/cm | 0347 | 09/27/2004 | N001 | 415 | | # | - | - |
| | umhos/cm | 0349 | 09/28/2004 | N001 | 394 | | # | - | - |
| | umhos/cm | 0692 | 09/27/2004 | N001 | 677 | | # | - | - |
| | umhos/cm | 0693 | 09/28/2004 | N001 | 361 | | # | - | - |
| | umhos/cm | 0694 | 09/28/2004 | N001 | 346 | | # | - | - |
| | umhos/cm | 0696 | 09/27/2004 | N001 | 370 | | # | - | - |
| Temperature | C | 0347 | 09/27/2004 | N001 | 20.8 | | # | - | - |

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:15 am

| PARAMETER | UNITS | LOCATION ID | SAMPLE: | | RESULT | QUALIFIERS: | | | DETECTION LIMIT | UN-CERTAINTY |
|-------------|-------|-------------|------------|------|--------|-------------|------|----|-----------------|--------------|
| | | | DATE | ID | | LAB | DATA | QA | | |
| Temperature | C | 0349 | 09/28/2004 | N001 | 15.3 | | | # | - | - |
| | C | 0692 | 09/27/2004 | N001 | 17.6 | | | # | - | - |
| | C | 0693 | 09/28/2004 | N001 | 16.3 | | | # | - | - |
| | C | 0694 | 09/28/2004 | N001 | 14.5 | | | # | - | - |
| | C | 0696 | 09/27/2004 | N001 | 19.9 | | | # | - | - |
| Turbidity | NTU | 0347 | 09/27/2004 | N001 | 75.7 | | | # | - | - |
| | NTU | 0349 | 09/28/2004 | N001 | 64.3 | | | # | - | - |
| | NTU | 0692 | 09/27/2004 | N001 | 86.9 | | | # | - | - |
| | NTU | 0693 | 09/28/2004 | N001 | 56.8 | | | # | - | - |
| | NTU | 0694 | 09/28/2004 | N001 | 58.2 | | | # | - | - |
| | NTU | 0696 | 09/27/2004 | N001 | 82.8 | | | # | - | - |
| Uranium | mg/L | 0347 | 09/27/2004 | 0001 | 0.0007 | | | # | 0.00002 | - |
| | mg/L | 0349 | 09/28/2004 | 0001 | 0.0007 | | | # | 0.00002 | - |
| | mg/L | 0692 | 09/27/2004 | 0001 | 0.0007 | | | # | 0.00002 | - |
| | mg/L | 0693 | 09/28/2004 | 0001 | 0.0007 | | | # | 0.00002 | - |
| | mg/L | 0694 | 09/28/2004 | 0001 | 0.0008 | | | # | 0.00002 | - |
| | mg/L | 0696 | 09/27/2004 | 0001 | 0.0008 | | | # | 0.00002 | - |

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 5/23/2005 8:15 am

| PARAMETER | UNITS | LOCATION | | SAMPLE: | | RESULT | QUALIFIERS: | | | UN- CERTAINTY |
|-----------|-------|----------|--|---------|----|--------|-------------|------|----|------------------|
| | | ID | | DATE | ID | | LAB | DATA | QA | |

RECORDS: SELECTED FROM USEE800 WHERE site_code='SRK01' AND quality_assurance = TRUE AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2004# and #12/31/2004#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). 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: 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 compound (TIC).
- P > 25% difference in detected pesticide or Arochlor 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. |
| 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.