LMS/GUP/44839

2023 Verification Monitoring Report for the Gunnison, Colorado, Processing Site

June 2024

U.S. DEPARTMENT OF ENERGY | Legacy Management

This document is designed for online viewing.

Contents

Figures

Tables

Appendixes

Abbreviations

ACL	alternate concentration limit
bgs	below ground surface
CCR	*Code of Colorado Regulations*
CDPHE	Colorado Department of Public Health and Environment
COPC	constituent of potential concern
CSM	conceptual site model
DOE	U.S. Department of Energy
DWEL	drinking water equivalent level
EPA	U.S. Environmental Protection Agency
EVS	Earth Volumetric Studio
ft	feet
GCAP	Groundwater Compliance Action Plan
gpm	gallons per minute
IC	institutional control
lb	pounds
lidar	light detection and ranging
LM	Office of Legacy Management
LOESS	locally estimated scatterplot smoothing
MCL	maximum concentration limit
mg/L	milligrams per liter
NRC	U.S. Nuclear Regulatory Commission
UMTRCA	Uranium Mill Tailings Radiation Control Act
VMR	Verification Monitoring Report

Executive Summary

This Verification Monitoring Report (VMR) for the Gunnison, Colorado, Processing Site summarizes annual monitoring data through April 2023 and assesses the progress of the current compliance strategy of natural flushing. The site is in Gunnison County, Colorado, approximately 0.5 mile southwest of the city of Gunnison and is managed by the U.S. Department of Energy Office of Legacy Management under the Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I program. The site is within an institutional control (IC) boundary encompassing an area of approximately 1030 acres, which includes the former mill site and the area downgradient of the former mill bounded by Tomichi Creek and U.S. Highway 50. Verification monitoring conducted in 2023 involved routine annual sampling of groundwater and surface water for uranium and manganese, the two constituents of potential concern (COPCs) at the site.

The site compliance strategy was formalized in the 2010 Groundwater Compliance Action Plan, whereby the site was anticipated to naturally flush to a condition in which groundwater cleanup objectives would be met within 100 years, the time frame permitted under UMTRCA regulations. To assess the progress of natural flushing, this VMR evaluates (1) temporal trends in groundwater levels and flow directions, (2) COPC concentration trends in groundwater and surface water, and (3) bulk plume metrics relative to baseline conditions. Uranium concentrations in groundwater are compared to the corresponding maximum concentration limit (MCL) of 0.044 milligrams per liter (mg/L). Because manganese is not regulated under UMTRCA (no corresponding MCL), groundwater concentrations for manganese are compared to the 1.6 mg/L drinking water equivalent level (DWEL) established by the U.S. Environmental Protection Agency.

Gravel pit operations adjacent to the former mill site have been occurring since the early 1970s. Most of the contaminated groundwater originating from the former mill site discharges to the adjacent gravel pits, whether pit dewatering is occurring or not. Milling-impacted groundwater is believed to have been discharging to the gravel pits since the first gravel pit was excavated below the water table and dewatering was initiated. Given the proximity of Tomichi Creek to the gravel pits and the presence of highly permeable material between these two features, water levels in the gravel-pit ponds are similar to those in the creek during periods when gravel pit dewatering is not occurring. Site groundwater, having a higher elevation than the gravel-pit ponds, discharges to and then migrates through the gravel-pit ponds and surrounding aquifer material to the creek.

While most of the contaminated groundwater emanating from the former mill site discharges to the gravel pits, a portion, at least historically based on downgradient single well detections of uranium and manganese, migrates southwest towards and ultimately discharges to Tomichi Creek. It is likely that the percentage of contaminated groundwater originating from the former mill site and discharging to the gravel pits increased with time as mining expanded towards the mill site. The flow path of site groundwater escaping capture by the gravel-pit ponds also likely changed with time in response to gravel pit expansion.

Uranium and manganese plumes extending from the former mill site to the gravel-pit ponds confirm continuing migration of contamination from the site to the gravel pits. For both COPCs, the temporally consistent plume geometries and concentrations in the vicinity of the site and gravel pits suggest active former mill site uranium and manganese sources. Two onsite

wells (0106 and 0112) and four downgradient vicinity monitoring wells (0063, 0135, 0160, and 0161) show increasing uranium concentrations. Average uranium plume concentrations also increased slightly between 2010 and 2023, from approximately 0.076 to 0.080 mg/L. Consistent with conclusions drawn in the previous (2022) VMR, if these trends continue, the uranium MCL will not be achieved within the 100-year performance period of natural flushing.

In late 1999, ICs restricting groundwater usage were assigned to an area encompassing the former mill site boundary and a downgradient area bounded by Tomichi Creek and U.S. Highway 50. To further restrict groundwater usage within the IC boundary, a water supply system was installed in 1994 to provide drinking water to residents of the Dos Rios neighborhood. Connection of vicinity residences to the Dos Rios water supply system, a component of site ICs, effectively halts the potential public consumption of mill-contaminated groundwater. Currently, only one vicinity residence is not connected to the water supply system and relies on groundwater (well 0667) for domestic consumption. Therefore, location 0667 is sampled annually, and results indicate that uranium and manganese concentrations are below the MCL and DWEL, respectively.

Uranium and manganese concentrations measured in surface water samples in the vicinity of the former mill site have been consistently below acute and chronic Colorado surface water standards. Uranium concentrations in Valco Pond, the surface water monitoring location closest to the site which corresponds to one of the gravel-pit ponds, and immediately downstream in Tomichi Creek (monitoring location 0248) are elevated compared to the other surface water sampling locations, demonstrating that uranium from the former mill site is reaching Tomichi Creek.

1.0 Introduction

This Verification Monitoring Report (VMR) provides an update on natural flushing progress at the Gunnison, Colorado, Processing Site, from completion of characterization activities and development of the initial groundwater compliance strategy in 2000 (DOE 2001) to the present. The site is managed by the U.S. Department of Energy (DOE) Office of Legacy Management (LM) under the Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I program and is regulated by the U.S. Nuclear Regulatory Commission (NRC). The site is in Gunnison County, Colorado, approximately 0.5 mile southwest of the city of Gunnison (Figure 1). The site is within an institutional control (IC) boundary encompassing an area of approximately 1030 acres, which includes the former mill site and the area downgradient of the former mill site bounded by Tomichi Creek and U.S. Highway 50.

The approved groundwater compliance strategy for the site, documented in the 2010 Groundwater Compliance Action Plan (GCAP) (DOE 2010), is natural flushing with ICs. Under this strategy, the site is anticipated to naturally flush to a condition in which groundwater cleanup objectives would be met within 100 years, the time frame permitted under UMTRCA regulations. Subsequent reevaluation of the conceptual site model (CSM) indicates that uranium, the primary constituent of potential concern (COPC) at the site, will likely persist in groundwater at concentrations exceeding the corresponding maximum concentration limit (MCL) beyond the 100-year time frame. In 2017, LM submitted a revised GCAP proposing a new compliance strategy consisting of alternate concentration limits (ACLs) and continued implementation of ICs. In 2019, NRC issued a request for additional information; LM is currently revising the CSM in response to that request. This VMR focuses on assessing aquifer restoration progress under the current (NRC-approved) natural flushing compliance strategy.

1.1 Site History

The Gunnison mill was constructed in 1957 and milled locally sourced uranium ore from 1958 to 1962 (DOE 2001) (Figure 2). Milling consisted of mechanically crushing the ore to sand-sized and finer fractions, acid leaching the crushed ore to dissolve uranium, chemically treating the mineral-rich solution to remove uranium, and pumping the waste rock and low-pH processing fluids to the tailings impoundment for volume reduction by evaporation and infiltration (Merritt 1971). During its operating lifespan, the mill processed 540,000 tons of ore with processing requirements of 50 gallons per minute (gpm) to 250 gpm of water per ton of ore (Merritt 1971). Total water usage, which roughly corresponds to the processing fluid discharge to the tailings impoundment, was between 108 and 540 million gallons.

Surface remediation of tailings and contaminated soils, building demolition at the former mill site, and removal of radiologic material from vicinity properties occurred between 1992 and 1995 (DOE 2001). Onsite and offsite materials collected during remediation were transported 6 miles east of the former mill site and encapsulated in a 29-acre, engineered disposal cell. Characterization activities following surface remediation began in the 1980s and continued through the 1990s, consisting primarily of monitoring well installation, groundwater and surface water monitoring, and aquifer testing. In the early 1970s, gravel mining operations began on an adjacent parcel of land extending from the southern boundary of the former mill site to Tomichi Creek (Figure 1). Based on available documentation and limited temporally sequential aerial photographs, Pit 1 (also known as Valco Pond) was excavated from approximately 1972 to 1983.

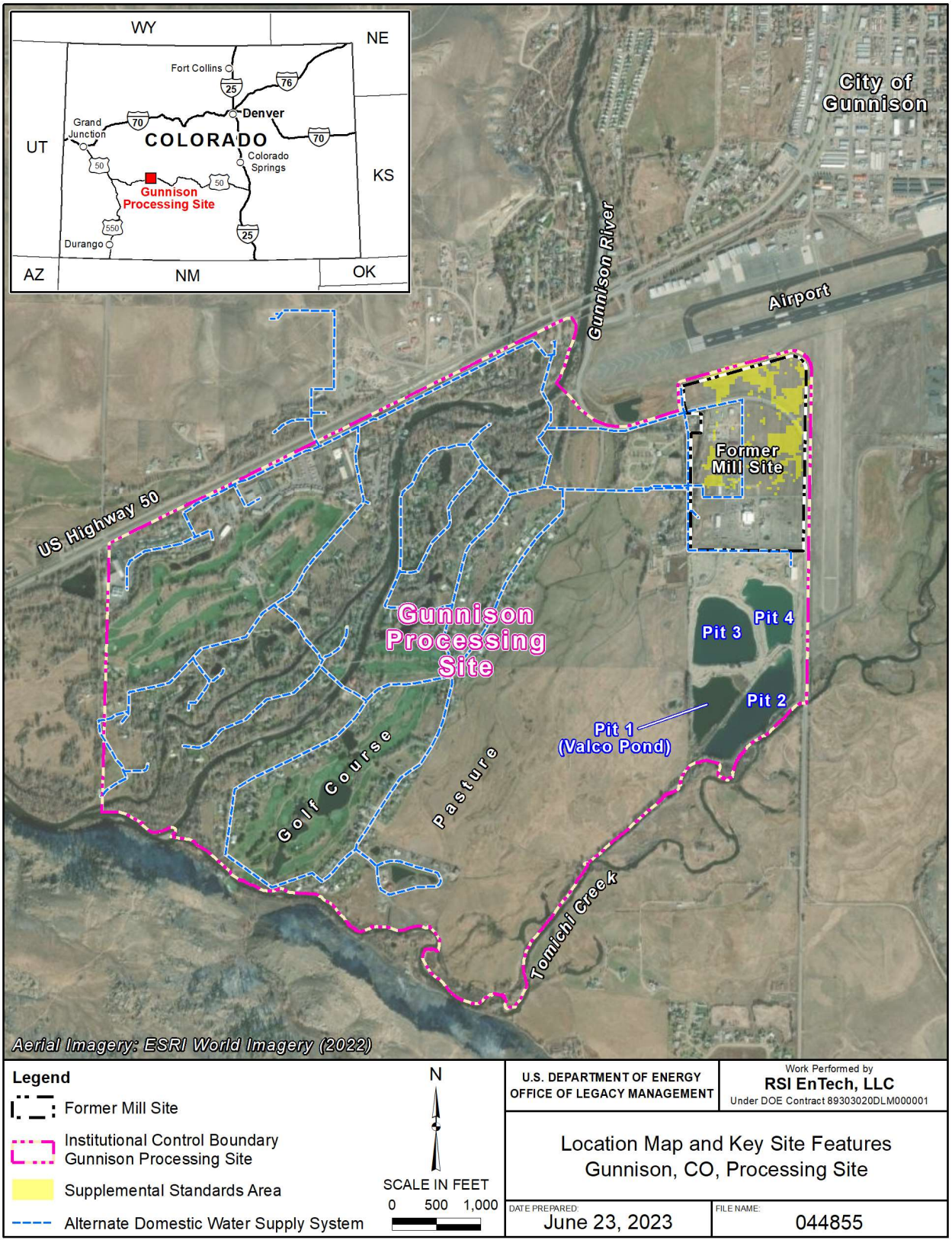


Figure 1. Gunnison Site Location Map and Key Site Features

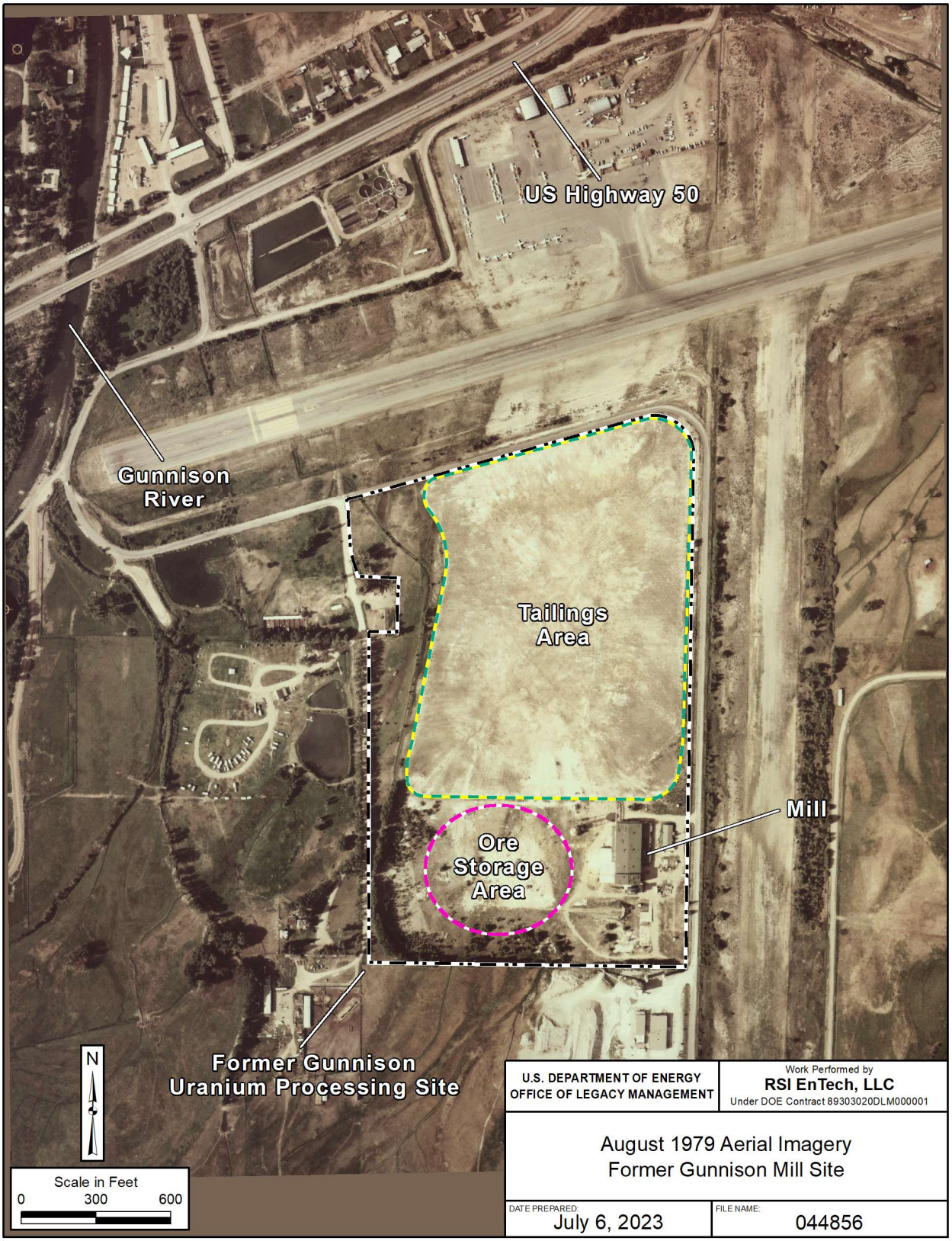


Figure 2. Aerial Photograph of the Former Gunnison Uranium Processing Site, August 1979

Pits 2 and 3 were excavated from approximately 1983 to 1999 and 1999 to 2009, respectively. Following a 4-year hiatus, Pit 4 was excavated from approximately 2013 to 2020. Pit 1 (Valco Pond) differs from the other three pits in that the pit is connected to Tomichi Creek by a drainage ditch. Based on Valco Inc.'s mine planning documentation (Gregg 1994), the pits were likely excavated to depths of approximately 40–50 feet (ft). Gravel mining was performed from annually from mid-May through August with extracted water being discharged to one of the adjacent mined out gravel pits; dewatering rates ranged from 2000 to 4000 gpm (DOE 2001). Gravel mining halted during the winter because of weather-related challenges, causing groundwater levels to recover to ambient conditions.

One-hundred-year natural flushing was selected as the compliance strategy, and ICs restricting groundwater usage were assigned (in 1999) to an area encompassing the former mill site boundary and a downgradient area bounded by Tomichi Creek and U.S. Highway 50 (DOE 2010) (Figure 1). To further restrict groundwater usage, the Dos Rios water supply system was installed in 1994 to provide drinking water to surrounding residents. At that time, six residences chose not to connect to the water supply system. Presently, one resident is not connected to the water supply system and relies on groundwater for domestic consumption. Historically, known active domestic wells within the IC boundary have been sampled annually to ensure that groundwater consumed by these households does not contain mill-related contamination above applicable limits or standards. Annual sampling of the single active domestic well will continue until that residence connects to the water supply system.

1.2 Hydrologic Setting

The unconfined alluvial aquifer beneath and downgradient of the former mill site is bounded to the east and south by Tomichi Creek and to the west by the Gunnison River and is underlain by shales of the Morrison Formation (Figure 3). Based on lithologic logs (DOE 2001), the alluvial aquifer, with a thickness of approximately 130 ft, consists primarily of sands and gravels with intermittent, discontinuous layers of silt and clay. In general, the silt and clay layers are more prevalent at greater depths.

In the spring, snowmelt recharges the alluvial aquifer. Following snowmelt, irrigation of the golf course and pastureland (which combined account for a large portion of the alluvial aquifer) is the primary source of recharge to the alluvial aquifer during late spring and summer. Continuous monitoring of groundwater levels indicates that pastureland groundwater levels in the vicinity of the site increase by as much as 10 ft and that those levels are maintained for the entire irrigation season (DOE 2001). In response to elevated water levels caused by irrigation, the vertical hydraulic gradient in the pastureland is downward.

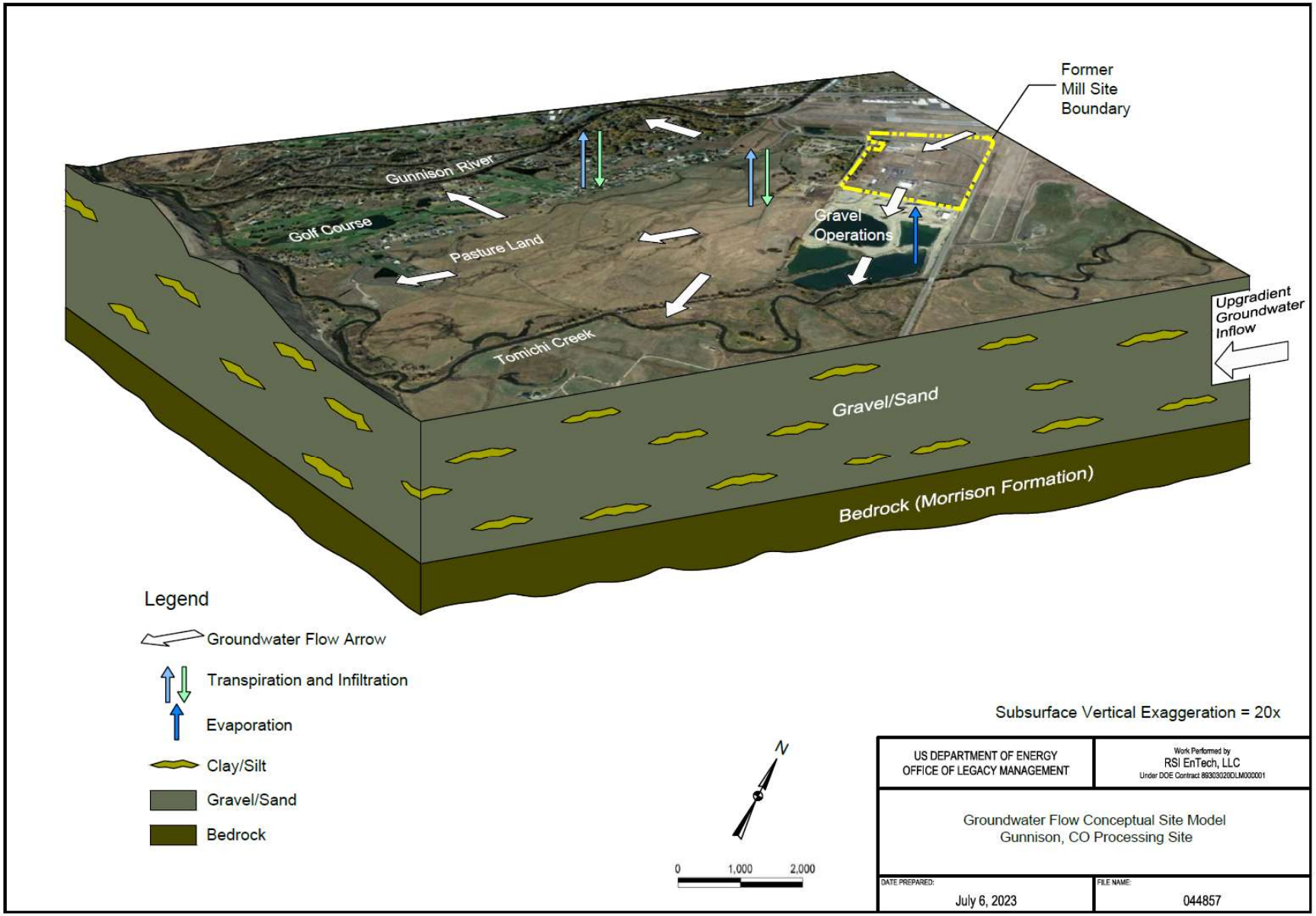


Figure 3. Groundwater Flow CSM

Groundwater in the vicinity of the former mill site discharges to the adjacent gravel pits. When a gravel pit is being dewatered, groundwater levels are maintained at an elevation below the gravel pit excavation depth, which could be as much as 40 to 50 ft (Gregg 1994). Because of the resulting contrast between the water elevations of the gravel pits during dewatering and the surrounding groundwater levels, nearby groundwater flows to the pit being mined. Groundwater continues to flow into the gravel-pit ponds after dewatering halts and pond water levels recover and stabilize. This is because the gravel-pit ponds, have surface water elevations similar to that of the adjacent creek (effectively, they are an extension of the creek surface elevation) but lower than surrounding groundwater elevations. After entering the gravel-pit ponds, water follows the path of least resistance and migrates through the ponds and the underlying aquifer material before discharging to Tomichi Creek, either as groundwater seepage or via the drainage ditch connecting Pit 1 to the creek. Outside the influence of the gravel pit operations, groundwater predominantly discharges to Tomichi Creek. During the warmer months, evaporation removes water from the hydrologic domain, including the gravel-pit ponds that are hydraulically connected to the alluvial aquifer. Evapotranspiration, mostly from pastureland and the golf course, also occurs, mainly during the summer growing season.

1.3 Site Compliance Strategy and Water Quality Monitoring

Groundwater and surface water quality characterization performed in the 1990s identified uranium and manganese as COPCs at the Gunnison site (DOE 1996b). Based on evaluations of COPC migration and attenuation potentials, risk assessment, groundwater flow and transport modeling, and COPC trend evaluations, compliance strategies for the mill tailings and raffinate pond areas were developed. Natural flushing with a 100-year duration with ICs encompassing the site and the area downgradient of the site bounded by Tomichi Creek and U.S. Highway 50 was selected as the compliance strategy for the mill tailings area (DOE 2001).

1.3.1 COPCs and Compliance Goals

The GCAP requires monitoring of two COPCs: uranium (the primary COPC and the focus of previous natural flushing evaluations) and manganese (DOE 2010). The UMTRCA standard for uranium in groundwater is 0.044 milligrams per liter (mg/L), the MCL established in Title 40 *Code of Federal Regulations* Section 192 (40 CFR 192). Manganese is not regulated under UMTRCA nor under the U.S. Environmental Protection Agency (EPA) "Safe Drinking Water Act" (Title 42 *United States Code* Section 300f [42 USC 300f]). However, EPA has established a drinking water equivalent level (DWEL) of 1.6 mg/L based on a lifetime-exposure concentration protective of adverse, noncancer health effects that assumes the exposure to manganese is from drinking water (EPA 2018). This 1.6 mg/L DWEL is applied as a point of comparison for interpreting monitoring results.

1.3.2 Groundwater and Surface Water Monitoring Schedule and Locations

Gunnison site groundwater and surface water samples are typically collected in April from the monitoring locations listed in Table 1 and shown in Figure 4.

Table 1. Gunnison Site Sampling Locations

Monitoring Location	Screened Interval (ft bgs)	Alluvial Aquifer Zone	Location or Description
Groundwater (DOE Monitoring Wells)			
0002	10–15	Shallow	Upgradient (airport).
0102	42–47	Intermediate	
0005	10–15	Shallow	Former mill site.
0105	42–47	Intermediate	
0006	10–15	Shallow	Former mill site.
0106	34–39	Intermediate	
0012R	6–16	Shallow	Former mill site; 0012R replaced 0012 in 2008.
0112	40–45	Intermediate	
0013	11–16	Shallow	Adjacent to former mill site.
0113	41–46	Intermediate	
0125	18–23	Shallow	Pasture.
0126	54–59	Intermediate	
0127	94–99	Deep	
0135	18–23	Shallow	Pasture.
0136	53–58	Intermediate	
0062	48–58	Intermediate	Pasture.
0063	88–98	Deep	
0064	87–97	Deep	Pasture.
0186	53–58	Intermediate	Golf course and residential area.
0187	93–98	Deep	
0181	18–23	Shallow	Golf course and residential area.
0183	93–98	Deep	
0065	50–60	Intermediate	Golf course and residential area.
0066	40–50	Intermediate	Golf course and residential area.
0188	53–58	Intermediate	West of Gunnison River.
0189	93–98	Deep	
0160	51–56	Intermediate	West of Gunnison River.
0161	93–98	Deep	
Domestic Well			
0667	Not applicable		The only active domestic well sampled as of 2022.
Surface Water			
0780	Not applicable		Valco Pond (Pit 1).
0248			Tomichi Creek, downstream of gravel pit operations.
0777			Tomichi Creek (golf course region, near Gunnison River).
0251			Gunnison River, upstream of IC boundary. Replaced former upstream location 0792 in 2014 to provide safer access for sampling.
0250			Gunnison River (monitor potential aquifer discharge).
0795			Gunnison River, downstream of IC boundary.

Note: DOE monitoring wells are listed in general order of increasing distance from the former mill site (Figure 4). The upgradient wells are listed first, followed by the onsite wells, adjacent offsite wells, and remaining offsite wells. Colocated monitoring wells (i.e., well pairs or clusters) are listed in the same table cell. Surface water sampling locations are also listed in general order of increasing distance from the former mill site, beginning with the Valco Pond location.

Abbreviation: bgs = below ground surface

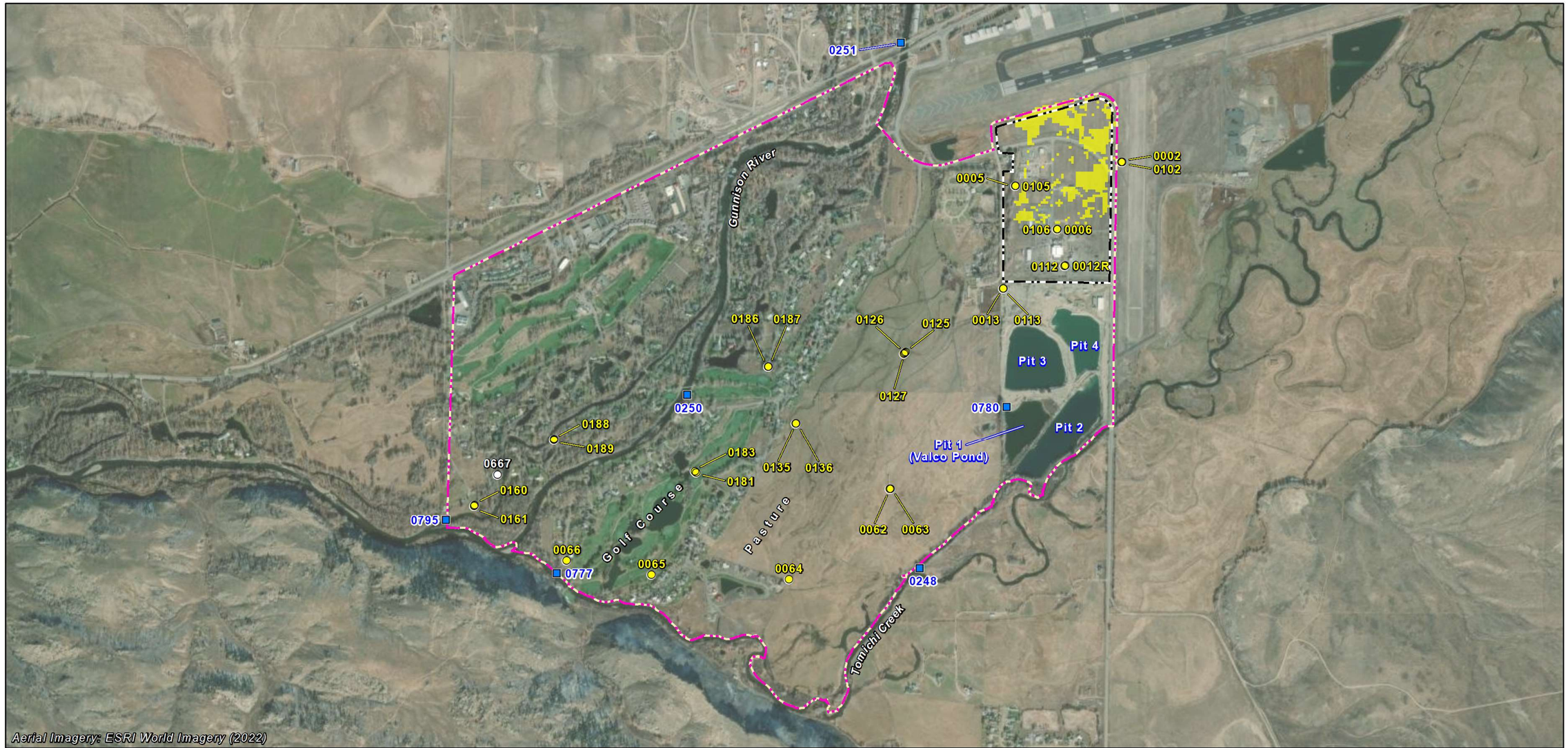


Figure 4. Groundwater and Surface Water Monitoring Locations at the Gunnison Site

1.4 Current Status and Planned Activities and Evaluations

As discussed in Section 1.0, because LM's more recent evaluations demonstrate that the natural flushing compliance strategy for the site is not performing as expected, LM submitted a draft revised GCAP to NRC on May 1, 2017 (DOE 2017). In lieu of the natural flushing remedy (requiring attainment of the 0.044 mg/L uranium MCL within 100 years), the revised GCAP proposed applying an ACL for uranium of 1.43 mg/L to alluvial aquifer groundwater underlying the former mill site and an ACL of 0.56 mg/L within the downgradient IC boundary (DOE 2017). NRC responded in a letter dated October 30, 2019, determining that "additional information and revisions are necessary for NRC to complete its review and concur on the revised GCAP" (Striz 2019). LM responded to NRC's request for additional information on March 2, 2021 (Dayvault 2021). In response to NRC's comments and concerns, LM is currently updating the CSM describing groundwater flow and contaminant transport. This evaluation identified preliminary data gaps requiring resolution before a revised compliance strategy is selected. In addition to continued updates to the CSM, the following near-term activities are planned to support LM's ongoing evaluations and a revised GCAP: (1) three-dimensional data visualization and evaluation, (2) development of data quality objectives, (3) data gap assessment, and (4) data worth analysis.

2.0 Compliance Remedy Performance

The current groundwater compliance strategy at the Gunnison site is natural flushing within a 100-year duration, with ICs encompassing the former mill site and a downgradient area bounded by Tomichi Creek and U.S. Highway 50 (Figure 1). To assess the effectiveness of the compliance strategy, current groundwater flow conditions, with and without adjacent gravel pit mining, were evaluated and compared to groundwater flow conditions assumed when the 2010 GCAP was finalized (DOE 2010). Historical concentrations of uranium and manganese in groundwater and surface water were evaluated to assess localized groundwater trends at and downgradient of the Gunnison site. Maps showing the current (2023) configurations of the uranium and manganese plumes were created and compared to 2010 conditions to evaluate changes in plume geometry over time. To assess temporal plume trends, bulk plume metrics were calculated for both COPCs and compared to 2010 conditions, the conditions on the date when a consistent monitoring well network was initially sampled. Groundwater and surface water quality data collected in 2023 for compliance monitoring are presented in Appendix A; static water level data are provided in Appendix B.

2.1 Gunnison Site Groundwater Flow Directions

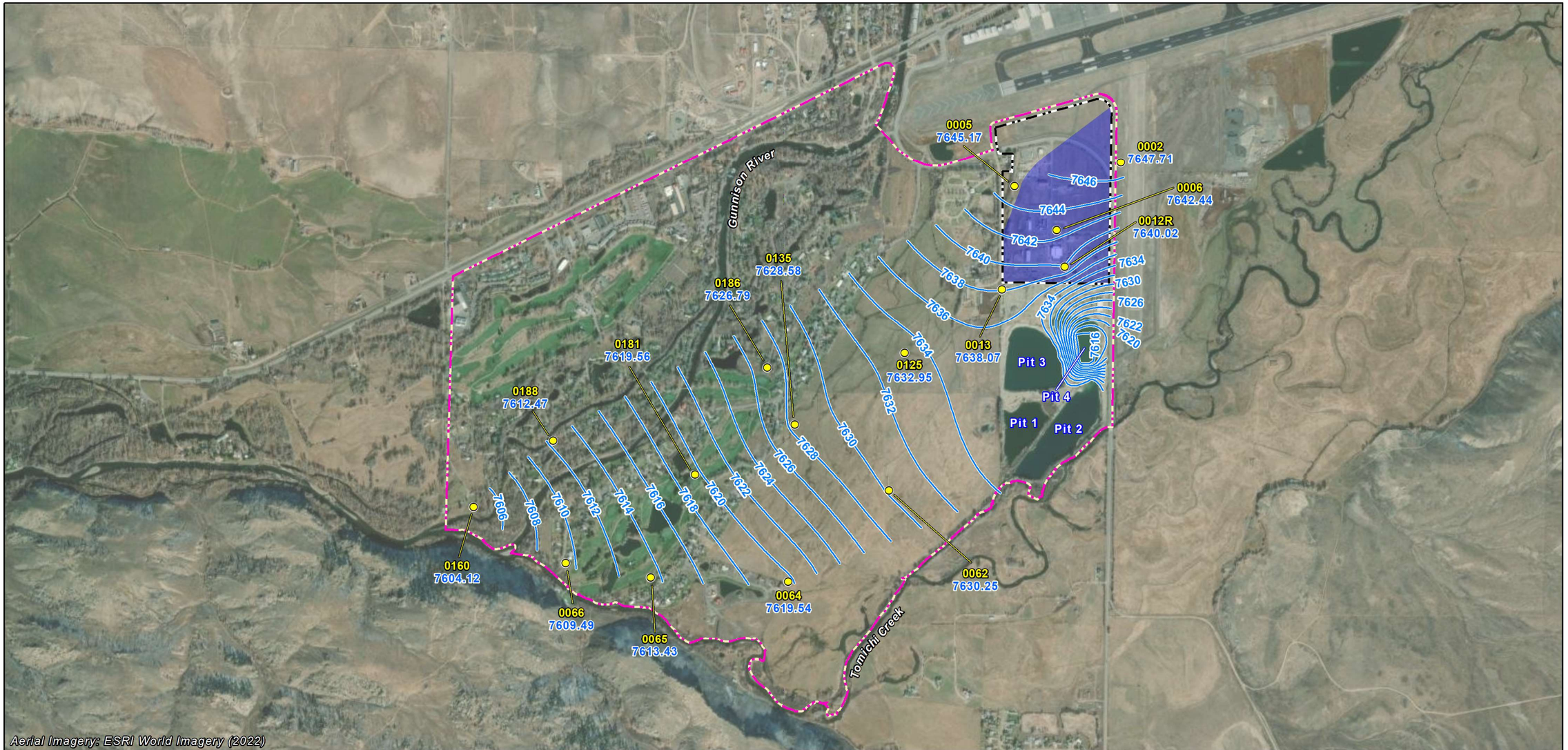
To assess the influence of gravel pit operations on groundwater flow, groundwater elevation maps for the Gunnison site and surrounding area were developed using Earth Volumetric Studio's (EVS's) kriging algorithm, 2023 groundwater levels, and Tomichi Creek and Gunnison River elevations representing baseflow conditions from the 2001 groundwater flow and transport model (DOE 2001). Gravel-pit pond water level elevations were assigned based on the results of a 2019 light detection and ranging (lidar) survey (USGS 2020) that occurred when Pit 4 was being excavated and dewatered. To assess the influence of the gravel pits when dewatering is not occurring, the lidar-determined Pit 3 water level was assigned to Pit 4. Forward particle tracking analysis was performed using the two EVS-determined groundwater elevation surfaces to

determine the portions of groundwater flowing through the former mill site that discharge to the gravel pits and to Tomichi Creek when dewatering was and was not occurring.

Figure 5 shows the 2023 water table when Pit 4 adjacent to the site had been excavated to a depth of 30 ft below ground surface (bgs) and was being dewatered to facilitate gravel mining. The contours indicate southerly flow from the former mill site towards the gravel pits. Purple shading at the former mill site (shown in Figure 5 and Figure 6) denotes the portion of the site within the gravel operations capture zone. The groundwater within the capture zone discharges to the gravel pits. In Figure 5, groundwater flowing through the portion of the site outside of the purple shading ultimately flows southwest and reaches Tomichi Creek.

Figure 6 shows the 2023 water table when none of the gravel pits were being dewatered. Similar to when gravel pit dewatering is occurring, the contours show southerly flow from the former mill site towards the gravel-pit ponds. This flow direction occurs because the gravel-pit pond water elevations are controlled by adjacent Tomichi Creek water level elevations; the creek and gravel-pit ponds have similar water level elevations. The extent of the purple shaded area for this scenario is smaller compared to when gravel pit dewatering is occurring. Groundwater elevation contours confirm southerly flow into the gravel pits in the absence of dewatering activities. Groundwater flowing through the portion of the site outside of the purple shaded area ultimately flows southwest and reaches Tomichi Creek.

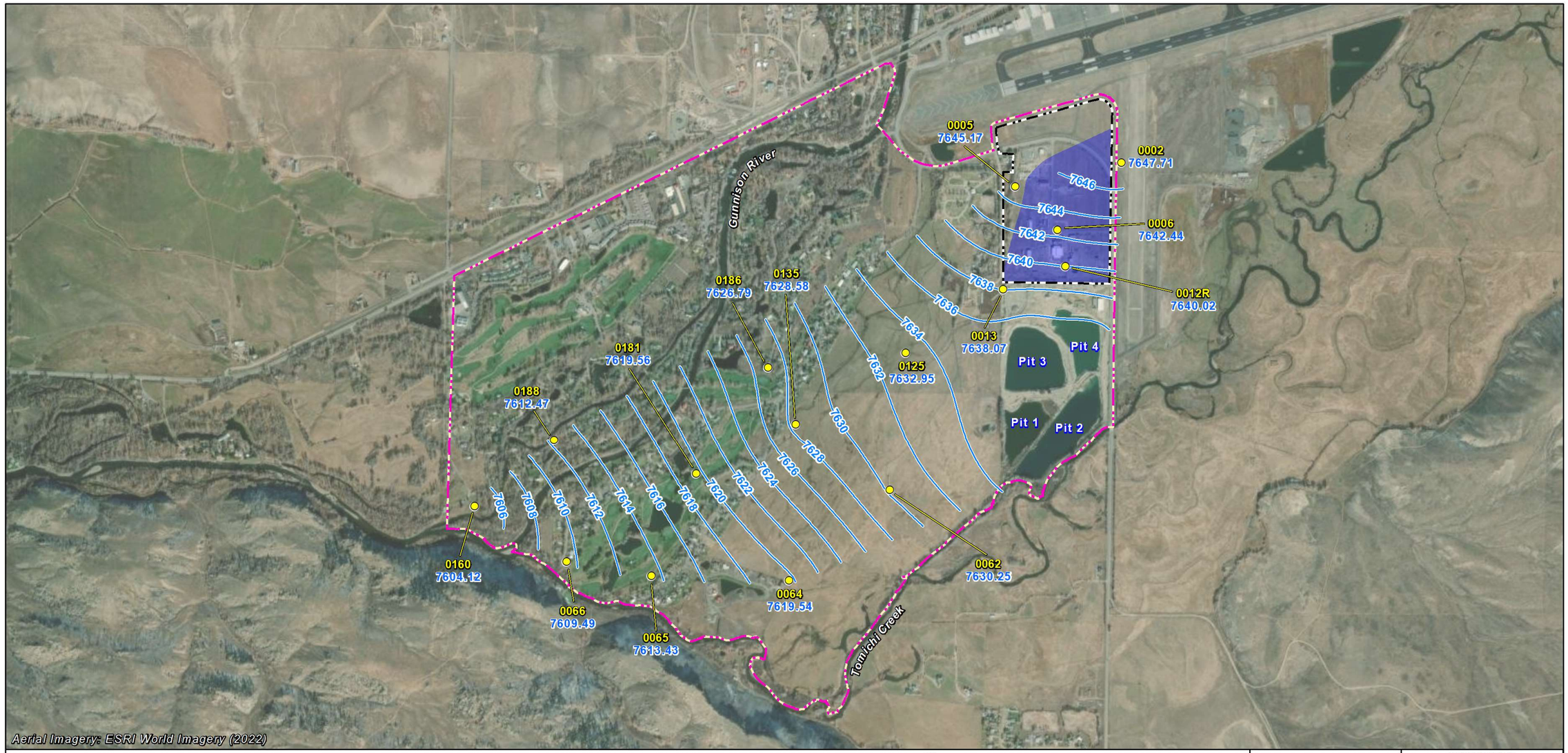
The 1999 groundwater elevation contour (Figure 7) shows groundwater flow from the former mill site towards the gravel pits and Tomichi Creek in the intermediate zone of the alluvial aquifer. Flow directions shown in this figure (taken directly from Figure 5-4 of DOE 2001) suggest that gravel mining operations have likely been influencing groundwater flow since the first gravel pit was excavated below the water table (DOE 2001). Groundwater elevations between the shallow zone and intermediate zone show little variation, suggesting similar flow directions and influence from gravel mining in deeper portions of the aquifer. Similar to conditions in 2023, it is likely that some of the intermediate zone groundwater originating from the former mill site also migrated southwest toward Tomichi Creek.



Abbreviation: NAVD 88 = North American Vertical Datum of 1988

Note: For each well pair or cluster shown in Figure 4, groundwater elevations are shown only for wells screened in the uppermost (shallowest) zone of the aquifer. This is because, for a given well pair or cluster, groundwater elevations in wells screened in deeper zones would not be representative of the water table. For the remaining three (non-paired) locations, groundwater elevations correspond to the screened zone listed in Table 1: deep for well 0064 and intermediate for wells 0065 and 0066.

Figure 5. April 2023 Groundwater Elevations Reflecting Pit 4 Dewatering



Note: For each well pair or cluster shown in Figure 4, groundwater elevations are shown only for wells screened in the uppermost (shallowest) zone of the aquifer. This is because, for a given well pair or cluster, groundwater elevations in wells screened in deeper zones would not be representative of the water table. For the remaining three (non-paired) locations, groundwater elevations correspond to the screened zone listed in Table 1: deep for well 0064 and intermediate for wells 0065 and 0066.
Abbreviation: NAVD 88 = North American Vertical Datum of 1988

Figure 6. April 2023 Groundwater Elevations Reflecting No Gravel Pit Dewatering

Note: This figure was adapted from Figure 5-4 of the Site Observational Work Plan (DOE 2001).

Abbreviation: NGVD 29 = National Geodetic Vertical Datum of 1929

Figure 7. May 1999 Gunnison Site Groundwater Elevations

2.2 COPC Concentration Trends in Alluvial Aquifer Monitoring Wells

To assess natural flushing progress at the Gunnison site, concentrations of uranium and manganese were plotted for active wells within the monitoring well network for the period from 2000 to the present.[1] Mann-Kendall trend analysis was performed to determine whether COPC concentrations in individual monitoring wells are declining, stable, or increasing. For the wells with COPC concentrations exceeding compliance goals and identified as having a statistically significant decreasing concentration trend, linear regression of the log-transformed concentration data was performed to determine when the COPC concentration in each well is expected to decline below the corresponding compliance goal: the 0.044 mg/L MCL for uranium and the 1.6 mg/L DWEL for manganese.[2]

The following sections discuss concentration trends of COPCs in onsite and offsite monitoring wells screened in shallow (<25 ft bgs), intermediate (30–60 ft bgs), and deep (>85 ft bgs) zones of the alluvial aquifer (see Table 1) and domestic wells, also screened in the alluvium. Time-concentration plots presented in this section were developed using a faceting approach, whereby data are partitioned into a matrix of panels, with each panel plotting data for a single well. In each facet, a nonparametric smoothing method—locally estimated scatterplot smoothing (LOESS)—is used. The surrounding shaded areas in these plots represent the 95% confidence interval. Using this approach, overall trends in the data are more apparent and not obscured by "noise" or random variation. Because of the wide range in contaminant concentrations measured across site wells, most data are plotted using a semilogarithmic scale. For each depth category, individual (well-specific) plots are arranged in general order of increasing distance from the site, consistent with their listing in Table 1.

2.2.1 Uranium

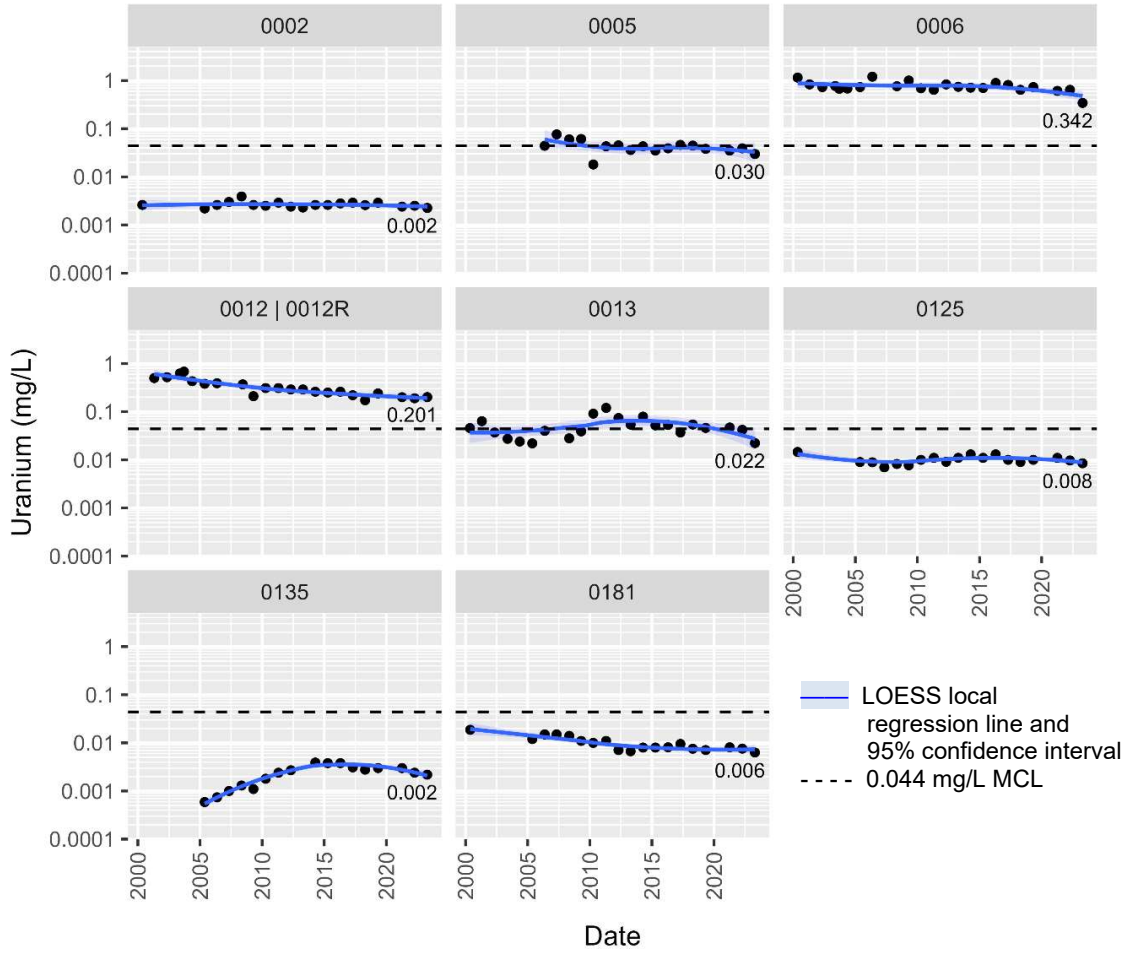
Shallow Monitoring Wells (Figure 8)

Uranium concentrations in shallow onsite monitoring wells 0006 and 0012R have consistently exceeded the 0.044 mg/L MCL, with the most recent results being 0.342 and 0.201 mg/L, respectively (Figure 8). Mann-Kendall trend analysis indicates a significant decreasing concentration trend in both wells; corresponding linear regression predicts attainment of the MCL between 2100 and 2552 and 2042 and 2059, respectively (Table 2). Uranium concentrations in onsite well 0005 and adjacent offsite well 0013 have been at or near the MCL; the most recent results were 0.030 and 0.022 mg/L, respectively. Uranium has not been detected above the MCL in the remaining three shallow downgradient monitoring wells (0125, 0135, and 0181). Uranium concentrations in well 0125 have no trend and have been consistently below the MCL (most recent result of 0.008 mg/L).

[1] Several wells sampled infrequently in the 1980s and early 1990s (e.g., shallow wells 0005 and 0135), and monitoring did not resume until 2005 or 2006. For this reason, some individual plots in Figure 8 through Figure 16 do not have data for the entire 2000–2023 time frame. Also, due to the COVID-19 pandemic, the 2020 monitoring event was limited to the sampling of only five domestic wells and six surface water locations; monitoring wells were not sampled (DOE 2021). Historical sampling data are available on the Geospatial Environmental Mapping System (GEMS) website at https://gems.lm.doe.gov/#site=GUP.

[2] Both Mann-Kendall and linear regression analyses used a significance (alpha) level of 0.05.

Mann-Kendall trend analysis continues to indicate a significant increasing trend in well 0135 (Table 2, consistent with DOE 2023). However, uranium concentrations in this well have always been low relative to the MCL and have decreased since 2014. The most recent result of 0.002 mg/L in well 0135 is equivalent to concentrations measured historically in upgradient well 0002 (Figure 8). While a significant decreasing trend was identified for well 0181 (Table 2), uranium concentrations in this well have stabilized in recent years.



Notes:
The order of facet plots for shallow monitoring wells is consistent with Table 1, in which wells are listed in general order of increasing distance from the former mill site (Figure 4). Former onsite location 0012 (monitored 2001–2006) was replaced with well 0012R in 2008.
Values shown in individual graphs are the most recent (2023) results, rounded to three decimal points.

Figure 8. Uranium Concentration Trends in Shallow Monitoring Wells

Table 2. Uranium Concentration Trends in Alluvial Aquifer Monitoring Wells and Compliance Strategy Attainment Predictions

Well[a]	Initial Trend Analysis Date	Final Trend Analysis Date	Number of Samples[b]	Most Recent Result (mg/L)[c]	Kendall's Tau[d]	p-value[d]	Mann-Kendall Concentration Trend	Half-Life (years)			Year 0.044 mg/L MCL is Reached		
								Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Shallow Wells													
0002	5/10/2000	4/19/2023	19	0.002	−0.15	0.42	None	Not applicable, concentrations less than remediation goal					
0005*	5/15/2006	4/19/2023	17	0.030	−0.39	0.032	Decreasing	Not applicable, concentrations less than remediation goal					
0006*	5/10/2000	4/19/2023	23	0.342	−0.36	0.019	Decreasing	37.695	21.950	133.347	2164	2100	2552
0012/ 0012R*	6/10/2008	4/19/2023	22	0.201	−0.78	<0.001	Decreasing	13.305	10.856	17.181	2049	2042	2059
0013	5/9/2000	4/19/2023	22	0.022	0.04	0.82	None	Not applicable, concentrations less than remediation goal					
0125	5/9/2000	4/17/2023	19	0.008	0.10	0.57	None	Not applicable, concentrations less than remediation goal					
0135	5/18/2005	4/17/2023	17	0.002	0.45	0.013	Increasing	Not applicable, concentrations less than remediation goal					
0181	5/17/2000	4/18/2023	19	0.006	−0.63	<0.001	Decreasing	Not applicable, concentrations less than remediation goal					
Intermediate Wells													
0102	5/10/2000	4/19/2023	19	0.004	−0.01	0.97	None	Not applicable, concentrations less than remediation goal					
0105*	5/20/2005	4/19/2023	18	0.010	−0.42	0.019	Decreasing	Not applicable, concentrations less than remediation goal					
0106*	5/10/2000	4/19/2023	23	0.112	0.94	<0.001	Increasing	Not applicable, increasing concentrations					
0112*	4/26/2001	4/19/2023	22	0.104	0.74	<0.001	Increasing	Not applicable, increasing concentrations					
0113	5/9/2000	4/19/2023	23	0.102	0.16	0.30	None	Not applicable, no trend					
0126	5/9/2000	4/17/2023	23	0.011	−0.17	0.29	None	Not applicable, concentrations less than remediation goal					
0136	5/10/2000	4/17/2023	19	0.002	−0.46	0.006	Decreasing	Not applicable, concentrations less than remediation goal					
0062	5/18/2005	4/17/2023	18	0.006	−0.49	0.006	Decreasing	Not applicable, concentrations less than remediation goal					
0186	5/10/2000	4/19/2023	19	0.015	−0.53	0.003	Decreasing	Not applicable, concentrations less than remediation goal					
0065	5/17/2005	4/18/2023	18	0.017	−0.87	<0.001	Decreasing	Not applicable, concentrations less than remediation goal					
0066	5/17/2005	4/18/2023	18	0.018	−0.60	0.001	Decreasing	Not applicable, concentrations less than remediation goal					
0188	5/10/2000	4/18/2023	23	0.024	−0.59	<0.001	Decreasing	Not applicable, concentrations less than remediation goal					
0160	5/17/2000	4/19/2023	23	0.027	0.57	<0.001	Increasing	Not applicable, concentrations less than remediation goal					
Deep Wells													
0127	5/9/2000	4/17/2023	23	0.014	−0.68	<0.001	Decreasing	Not applicable, concentrations less than remediation goal					
0063	5/19/2005	4/17/2023	18	0.014	0.57	0.002	Increasing	Not applicable, concentrations less than remediation goal					
0064	5/19/2005	4/17/2023	18	0.011	−0.16	0.38	None	Not applicable, concentrations less than remediation goal					
0187	5/17/2006	4/19/2023	17	0.031	0.28	0.14	None	Not applicable, concentrations less than remediation goal					

Table 2. Uranium Concentration Trends in Alluvial Aquifer Monitoring Wells and Compliance Strategy Attainment Predictions (continued)

Well[a]	Initial Trend Analysis Date	Final Trend Analysis Date	Number of Samples[b]	Most Recent Result (mg/L)[c]	Kendall's Tau[d]	p-value[d]	Mann-Kendall Concentration Trend	Half-Life (years)			Year 0.044 mg/L MCL is Reached		
								Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Deep Wells (continued)													
0183	5/17/2000	4/18/2023	23	0.037	−0.45	0.003	Decreasing	Not applicable, concentrations less than remediation goal					
0189	5/10/2000	4/18/2023	23	0.011	−0.13	0.43	None	Not applicable, concentrations less than remediation goal					
0161	5/17/2000	4/19/2023	23	0.021	0.86	<0.001	Increasing	Not applicable, concentrations less than remediation goal					
Remaining Domestic Well Currently Sampled													
0667	4/30/2001	4/19/2023	23	0.0036	0.31	0.044	Increasing	Not applicable, concentrations less than remediation goal					

Notes:

Shaded cells denote recent uranium concentrations exceeding the 0.044 mg/L MCL.

[a] For each category, wells are listed in general order of increasing distance from the former mill site, consistent with the order and approach applied in Table 1; wells followed by an asterisk (*) are onsite wells. Data for former well 0012 and current colocated well 0012R were combined for the Mann-Kendall trend analysis and in Figure 9.

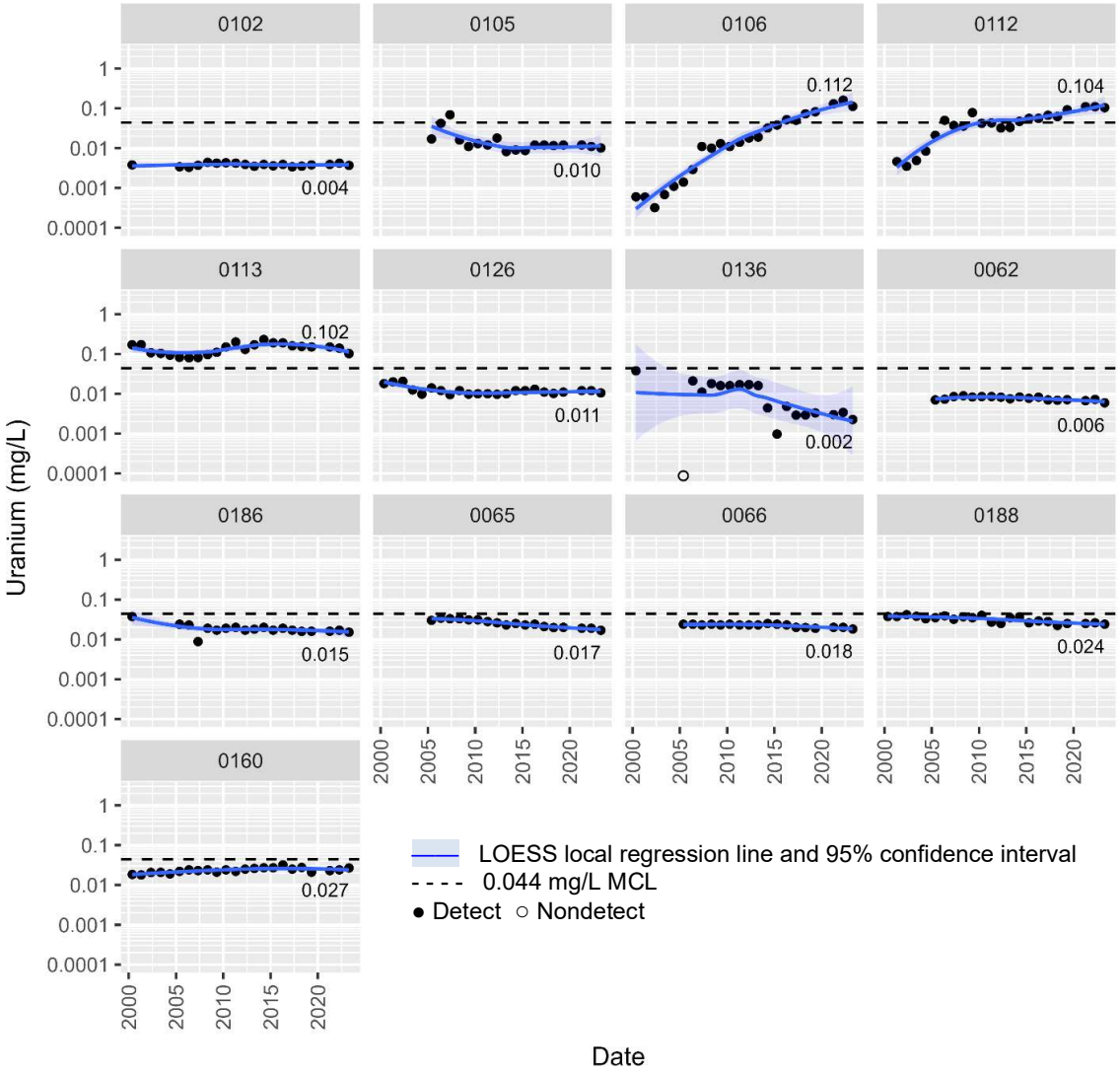
[b] Detection frequencies for uranium in site wells are 100% except for well 0136 with a single nondetect reported in 2005 (Figure 9).

[c] Results shown to three significant digits (corresponding geospatial figures show the raw unrounded result).

[d] The test statistic Kendall's tau is a measure of the strength of the association between two variables, with values always falling between −1 and +1. Trend analyses were conducted at the 0.05 significance (or alpha) level using a two-sided test.

Intermediate Monitoring Wells (Figure 9)

Uranium concentrations in intermediate monitoring wells are below the 0.044 mg/L MCL, except for onsite wells 0106 and 0112, which have statistically significant increasing trends, and offsite adjacent well 0113, which has no trend (Table 2). With the exception of upgradient well 0102 and offsite downgradient well 0126, both of which have no trend, statistically significant decreasing trends were identified for the remaining intermediate monitoring wells (Table 2).

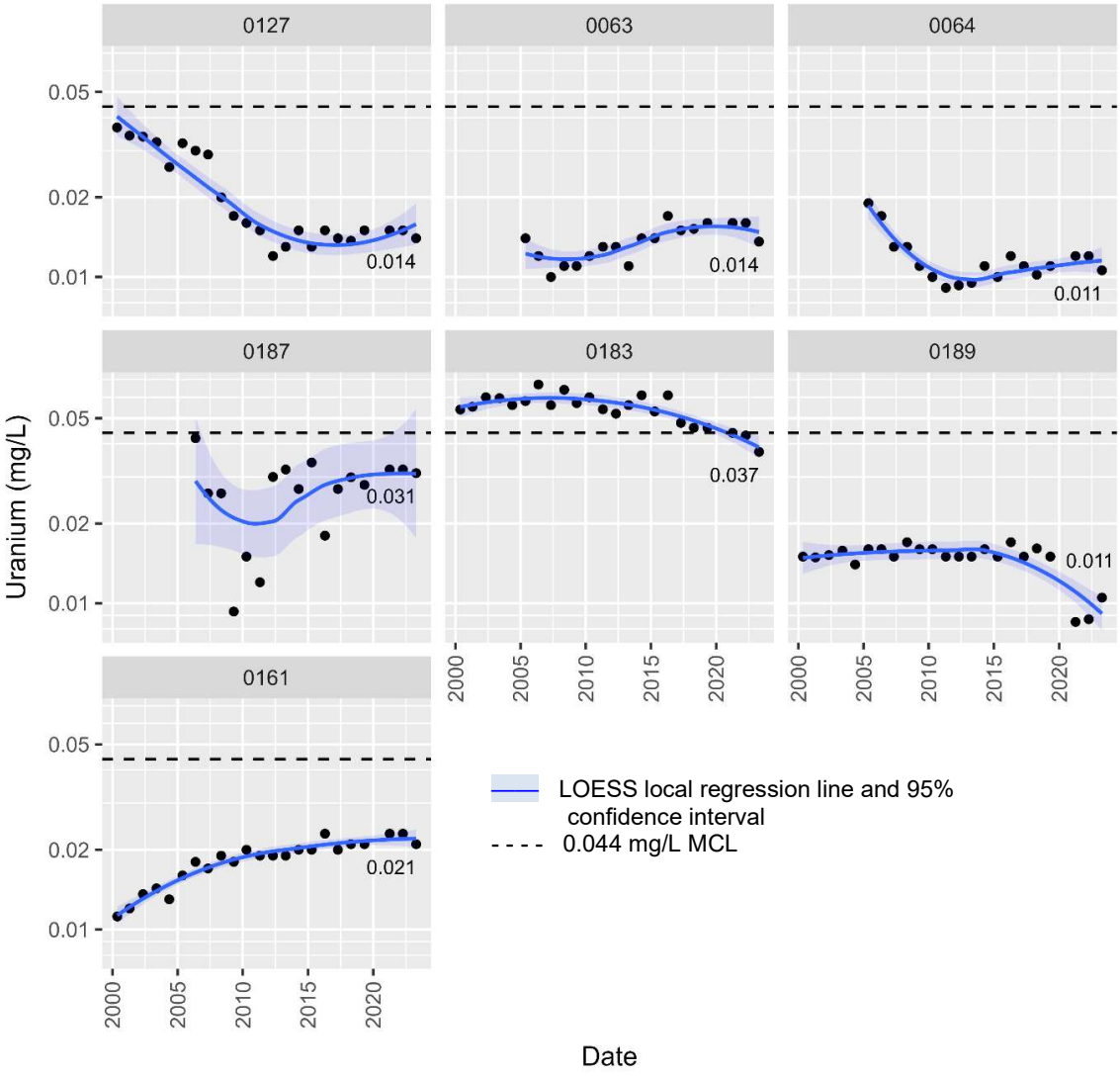


Notes:
The order of facet plots for intermediate monitoring wells is consistent with Table 1, in which wells are listed in general order of increasing distance from the former mill site (Figure 4).
Values shown in individual graphs are the most recent (2023) results, rounded to three decimal points.

Figure 9. Uranium Concentration Trends in Intermediate Monitoring Wells

Deep Monitoring Wells (Figure 10)

Consistent with 2022 sampling results (DOE 2023), uranium concentrations in the deep offsite monitoring wells were below the 0.044 mg/L MCL. There are no deep onsite monitoring wells. Statistically significant decreasing trends were found for well 0127 (uranium concentrations historically below the MCL) and well 0183, where uranium concentrations exceeded the MCL until 2021 (most recent result was 0.037 mg/L) (Table 2). Mann-Kendall trend analysis identified two deep wells as having statistically significant increasing trends: wells 0063 and 0161 (Table 2). Uranium concentrations in both wells have been below the MCL and appear to have stabilized since 2020.



Notes:
The order of facet plots for deep monitoring wells is consistent with Table 1, in which wells are listed in general order of increasing distance from the former mill site (Figure 4).
Values shown in individual graphs are the most recent (2023) results, rounded to three decimal points.

Figure 10. Uranium Concentration Trends in Deep Monitoring Wells

Monitoring Well Network (Data Plotted by Location and Aquifer Zone) (Figure 11)

Figure 11 is a compilation of the data previously shown in Figure 8 through Figure 10 for uranium concentrations in shallow, intermediate, and deep wells. In this figure, the data are plotted by general location (see Figure 4), with point symbols color-coded to represent the different screen depth intervals listed in Table 1. Using this approach, data for colocated wells (e.g., onsite wells 0005 and 0105) are plotted on the same graph. For most well pairs or clusters, uranium concentrations are similar across zones. An exception is onsite well pair 0006 and 0106, where uranium concentrations in intermediate well 0106 (screened 34–39 ft bgs) are increasing significantly (Table 2) and approaching current concentrations (0.342 mg/L) in shallow well 0006 (which shows a significantly decreasing trend). A similar but less exaggerated trend is apparent for onsite wells 0012R and 0112. Another exception is shallow and deep well pair 0181 and 0183. In this case, uranium concentrations in the deep zone (currently 0.037 mg/L but historically slightly above the MCL) have consistently exceeded those in the shallow well.

Notes:
Well pairs or clusters are arranged in general order of increasing distance from the site. Data for wells with no corresponding colocated well (wells 0064, 0065, and 0066) are shown individually.

Figure 11. Time-Concentration Plots of Uranium in Shallow, Intermediate, and Deep Monitoring Wells

Domestic Well 0667 (Figure 12)

At the time of completion of the Dos Rios water supply system in 1994, six residences, between the golf course and the Gunnison River (Table 1; Figure 4), chose not to connect to the system. In 2011, one of those residences connected to the water supply system, and sampling of the well on that residence (0479) was discontinued (DOE 2011). Four of the five remaining domestic wells (0476, 0477, 0478, and 0683) were sampled annually until August 2021, when those residences opted to connect to the water supply system. As demonstrated in the previous VMR (DOE 2023), uranium concentrations in those four wells were consistently below the 0.044 mg/L MCL (≤0.0041 mg/L). Currently, one residence, relying on well 0667 for domestic consumption, is not connected to the Dos Rios water supply system. Well 0667 continues to be sampled annually as shown in Figure 12. Uranium concentrations in this well, despite having an increasing trend (Table 2), are still an order of magnitude below the MCL and have also been below the 0.02 mg/L Colorado Department of Public Health and Environment (CDPHE) action level established in the 1996 buffer zone monitoring plan (DOE 1996a). This action level has been applied in the GCAP (DOE 2010) and subsequent VMRs (DOE 2011; DOE 2023) as a point of comparison for evaluating domestic well results.[3]

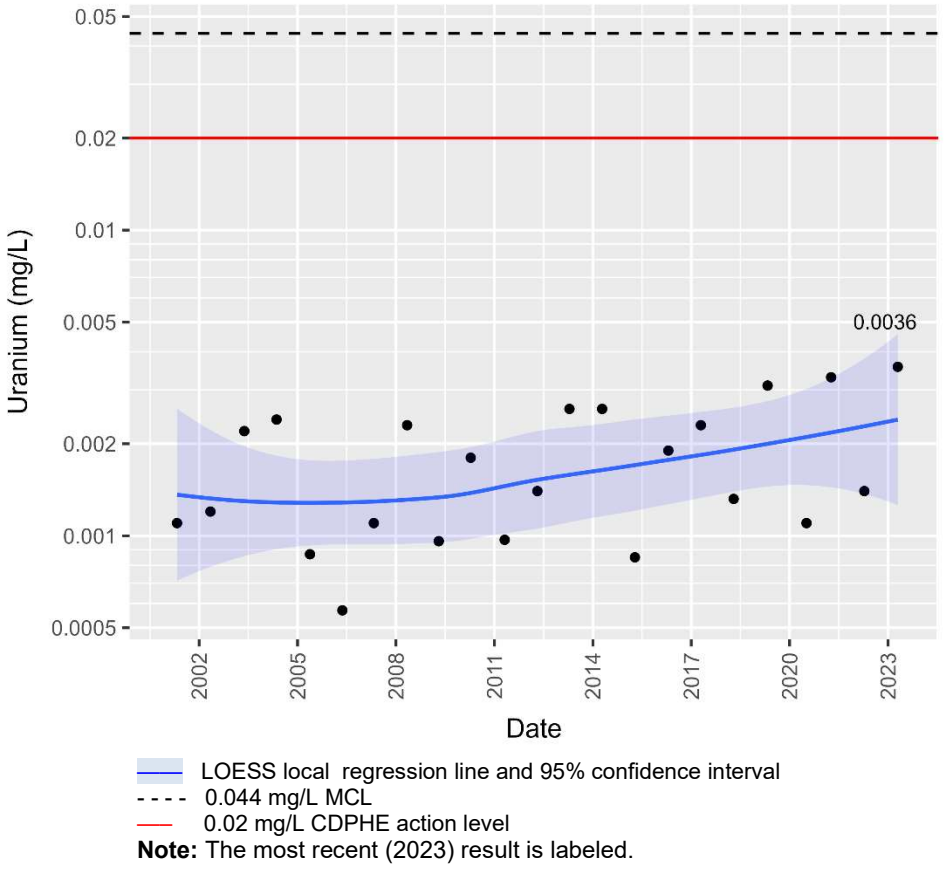


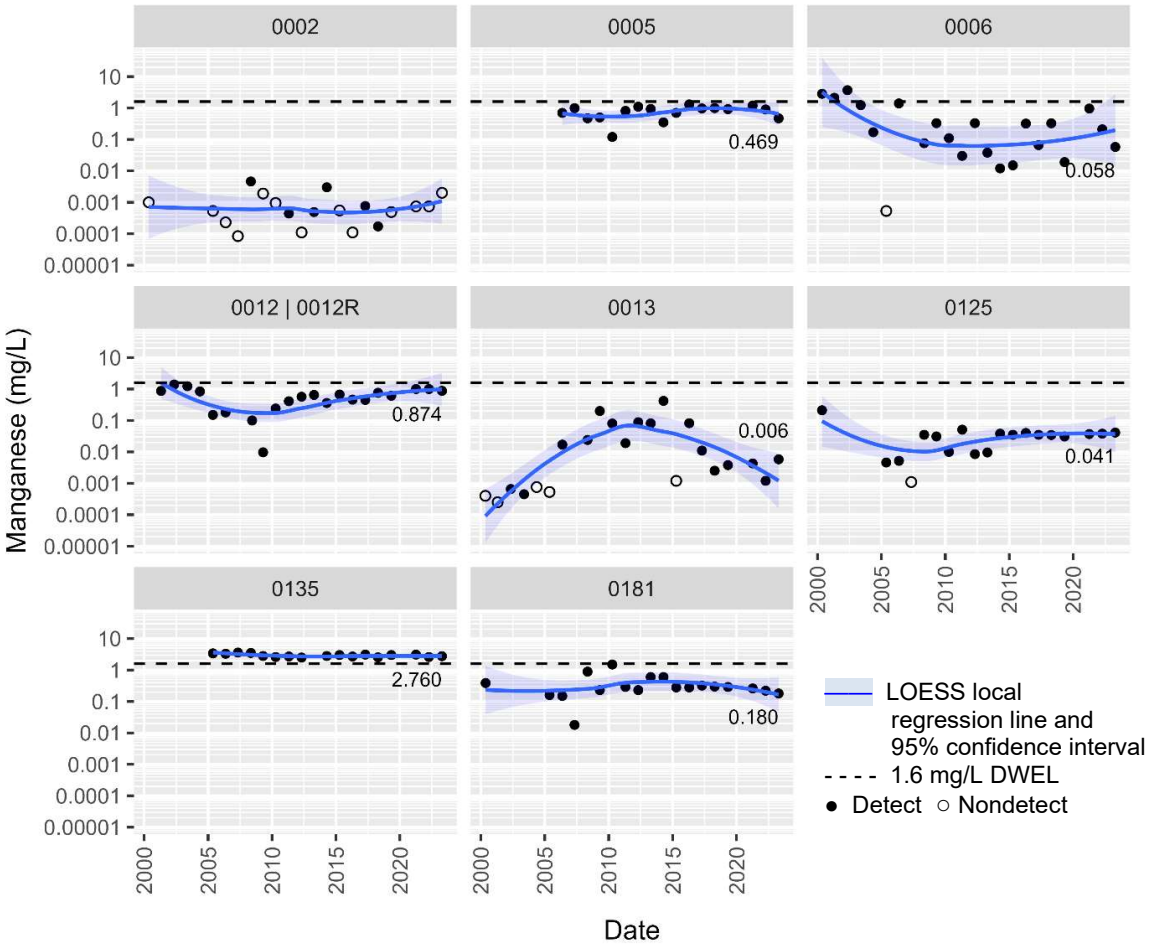
Figure 12. Uranium Concentration Trends in Domestic Well 0667

[3] Section 2.5 of the buffer zone monitoring plan (DOE 1996a) states the following: "The DOE will immediately notify CDPHE if the uranium concentration of any well in the buffer zone (Dos Rios subdivision, Unit 2) exceeds 0.020 milligrams per liter (mg/L)."

2.2.2 Manganese

Shallow Monitoring Wells (Figure 13)

With the exception of the early results for well 0006, manganese concentrations have been below the 1.6 mg/L DWEL in the shallow onsite monitoring wells. Manganese has been consistently detected above the DWEL in shallow downgradient well 0135, with results ranging from 2.5 to 3.6 mg/L. Manganese concentrations in remaining offsite wells have been at or below the DWEL. Apart from onsite well 0006, which has a statistically significant decreasing trend, the shallow monitoring wells were found to have no significant trends in manganese concentrations based on Mann-Kendall trend analysis (Table 3).



Notes:
The order of facet plots for shallow monitoring wells is consistent with Table 1, in which wells are listed in general order of increasing distance from the former mill site (Figure 4). Former onsite location 0012 (monitored 2001–2006) was replaced with well 0012R in 2008.
Values shown in individual graphs are the most recent (2023) results, rounded to three decimal points (applied only to results above the detection limit).

Figure 13. Manganese Concentration Trends in Shallow Monitoring Wells

Table 3. Manganese Concentration Trends in Alluvial Aquifer Monitoring Wells and Compliance Strategy Attainment Predictions

Well[a]	Initial Trend Analysis Date	Final Trend Analysis Date	No. of Detects/ No. of Samples	Most Recent Result (mg/L)[b]	Kendall's Tau[c]	p-value[c]	Mann-Kendall Concentration Trend	Half-Life (years)			Year 1.6 mg/L DWEL is Reached		
								Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Shallow Wells													
0002	5/10/2000	4/19/2023	6/19	<0.002	−0.012	0.97	None	Not applicable, concentrations less than DWEL					
0005*	5/15/2006	4/19/2023	17/17	0.469	0.17	0.36	None	Not applicable, concentrations less than DWEL					
0006*	5/10/2000	4/19/2023	21/22	0.058	−0.32	0.039	Decreasing	Not applicable, concentrations less than DWEL					
0012/ 0012R*	6/10/2008	4/19/2023	21/21	0.874	0.18	0.28	None	Not applicable, concentrations less than DWEL					
0013	5/9/2000	4/19/2023	17/22	0.006	0.23	0.15	None	Not applicable, concentrations less than DWEL					
0125	5/9/2000	4/17/2023	18/19	0.041	0.30	0.073	None	Not applicable, concentrations less than DWEL					
0135	5/18/2005	4/17/2023	17/17	2.76	−0.28	0.14	None	Not applicable, no trend					
0181	5/17/2000	4/18/2023	19/19	0.18	−0.07	0.73	None	Not applicable, concentrations less than DWEL					
Intermediate Wells													
0102	5/10/2000	4/19/2023	6/19	<0.002	0.11	0.50	None	Not applicable, concentrations less than DWEL					
0105*	5/20/2005	4/19/2023	18/18	2.64	0.07	0.73	None	Not applicable, no trend					
0106*	5/10/2000	4/19/2023	23/23	1.86	−0.96	<0.001	Decreasing	8.252	7.525	9.133	2026	2025	2028
0112*	4/26/2001	4/19/2023	22/22	3.91	−0.72	<0.001	Decreasing	13.874	10.255	21.441	2037	2030	2050
0113	5/9/2000	4/19/2023	23/23	1.58	−0.15	0.33	None	Not applicable, no trend					
0126	5/9/2000	4/17/2023	20/23	0.009	0.06	0.71	None	Not applicable, concentrations less than DWEL					
0136	5/10/2000	4/17/2023	18/19	2.74	0.54	0.001	Increasing	Not applicable, increasing concentrations					
0062	5/18/2005	4/17/2023	17/18	<0.002	−0.56	0.001	Decreasing	Not applicable, concentrations less than DWEL					
0186	5/10/2000	4/19/2023	7/19	<0.002	0.03	0.88	None	Not applicable, concentrations less than DWEL					
0065	5/17/2005	4/18/2023	18/18	0.0305	−0.35	0.049	Decreasing	Not applicable, concentrations less than DWEL					
0066	5/17/2005	4/18/2023	18/18	0.004	−0.36	0.041	Decreasing	Not applicable, concentrations less than DWEL					
0188	5/10/2000	4/18/2023	8/23	<0.002	0.02	0.91	None	Not applicable, concentrations less than DWEL					
0160	5/17/2000	4/19/2023	21/23	0.044	0.35	0.022	Increasing	Not applicable, concentrations less than DWEL					
Deep Wells													
0127	5/9/2000	4/17/2023	17/23	<0.002	0.06	0.73	None	Not applicable, concentrations less than DWEL					
0063	5/19/2005	4/17/2023	16/18	<0.002	−0.65	<0.001	Decreasing	Not applicable, concentrations less than DWEL					
0064	5/19/2005	4/17/2023	18/18	0.044	−0.03	0.88	None	Not applicable, concentrations less than DWEL					

Table 3. Manganese Concentration Trends in Alluvial Aquifer Monitoring Wells and Compliance Strategy Attainment Predictions (continued)

Well[a]	Initial Trend Analysis Date	Final Trend Analysis Date	No. of Detects/ No. of Samples	Most Recent Result (mg/L)[b]	Kendall's Tau[c]	p-value[c]	Mann-Kendall Concentration Trend	Half-Life (years)			Year 1.6 mg/L DWEL is Reached		
								Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Trend Line	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Deep Wells (continued)													
0187	5/17/2006	4/19/2023	17/17	0.541	−0.72	<0.001	Decreasing	Not applicable, concentrations less than DWEL					
0183	5/17/2000	4/18/2023	16/23	<0.002	−0.21	0.17	None	Not applicable, concentrations less than DWEL					
0189	5/10/2000	4/18/2023	23/23	0.747	−0.53	0.001	Decreasing	Not applicable, concentrations less than DWEL					
0161	5/17/2000	4/19/2023	23/23	0.011	−0.20	0.19	None	Not applicable, concentrations less than DWEL					
Remaining Domestic Well Currently Sampled													
0667	4/30/2001	4/19/2023	13/23	<0.002	0.05	0.75	None	Not applicable, concentrations less than DWEL					

Notes:

Shaded cells denote recent manganese concentrations exceeding the 1.6 mg/L DWEL.

[a] For each category, wells are listed in general order of increasing distance from the former mill site, consistently with the order and approach applied in Table 1; wells followed by an asterisk (*) are onsite wells. Data for former well 0012 and current colocated well 0012R were combined for the Mann-Kendall trend analysis and in Figure 13.

[b] Results shown to two or three significant figures, depending on the magnitude of the result. Corresponding geospatial figures show the raw unrounded result.

[c] The test statistic Kendall's tau is a measure of the strength of the association between two variables, with values always falling between −1 and +1. Trend analyses were conducted at the 0.05 significance (or alpha) level using a two-sided test.

Intermediate Monitoring Wells (Figure 14)

Manganese has been consistently detected at or above the 1.6 mg/L DWEL in four intermediate monitoring wells: onsite wells 0105, 0106, and 0112 and adjacent offsite monitoring well 0113. Mann-Kendall trend analysis continues to indicate no trends for wells 0105 and 0113 and significant decreasing trends for wells 0106 and 0112. If current decreasing trends continue, wells 0106 and 0112 are expected to attain the 1.6 mg/L DWEL between 2025 and 2028 and between 2030 and 2050, respectively (Table 3).

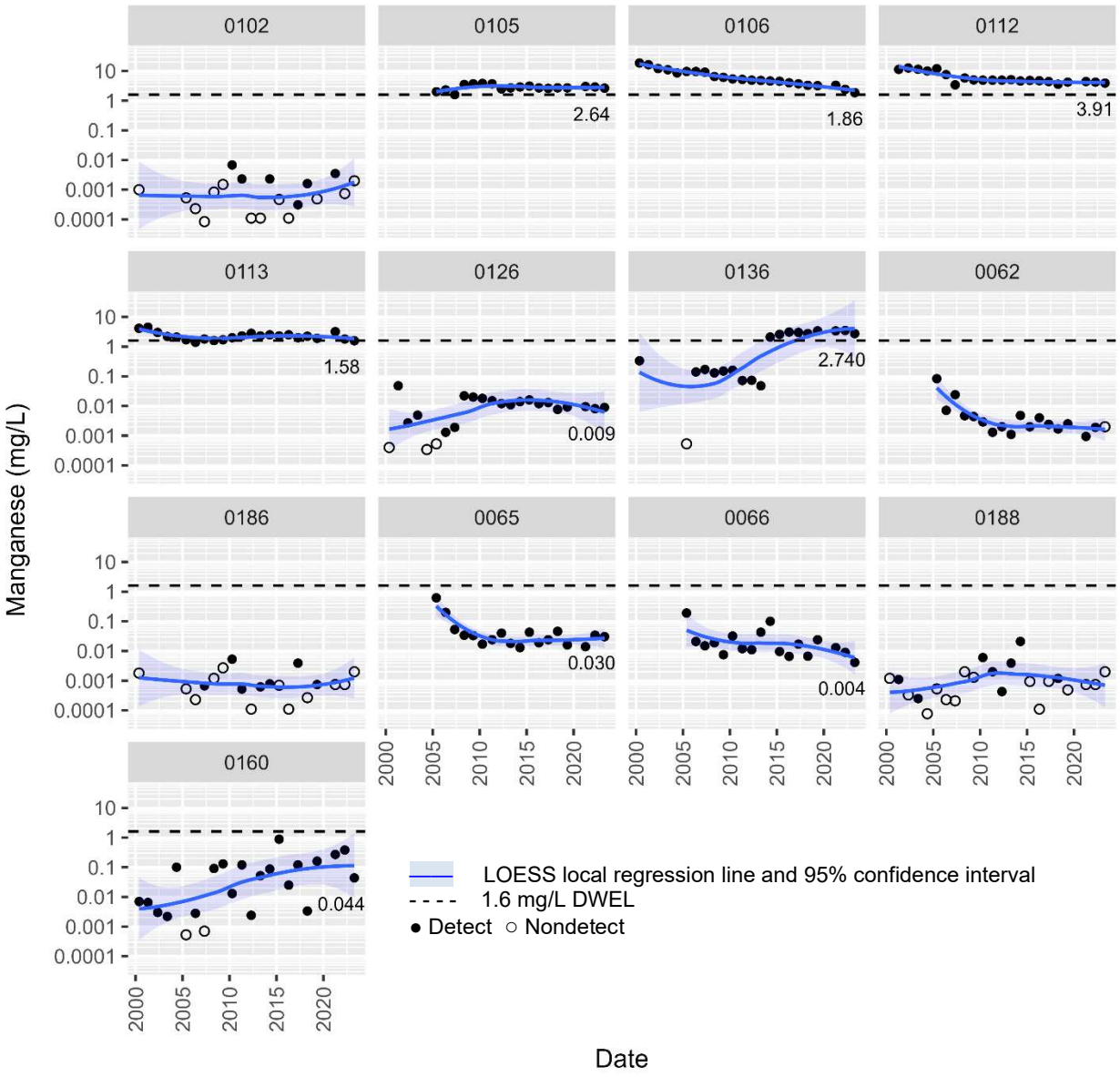
Manganese concentrations in offsite downgradient well 0136 have significantly increased (Table 3), reflecting the shift in 2013–2014, when the concentration increased from 0.048 to 2.1 mg/L; concentrations have remained above the DWEL since then. Although not shown in Figure 14 (only data from 2000–2023 are plotted), manganese concentrations in well 0136 between 1989 and 1992 also exceeded the DWEL (2.81–4.76 mg/L). Statistically significant increasing trends were also identified for well 0160, west of the Gunnison River, but results have been below the DWEL (Figure 14). Significant decreasing trends were identified for well 0062 and wells 0065 and 0066 in the golf course region near Tomichi Creek (Table 3). The remaining intermediate monitoring wells were found to have no statistically significant concentration trends.

Deep Monitoring Wells (Figure 15)

None of the deep monitoring wells have manganese concentrations exceeding the 1.6 mg/L DWEL. Consistent with the previous VMR (DOE 2023), Mann-Kendall trend analysis identified statistically significant decreasing trends for three deep wells: 0063, 0187, and 0189 (Table 3). Manganese concentrations in deep well 0187 previously exceeded the DWEL but are now below the 1.6 mg/L standard (the most recent result being 0.541 mg/L).

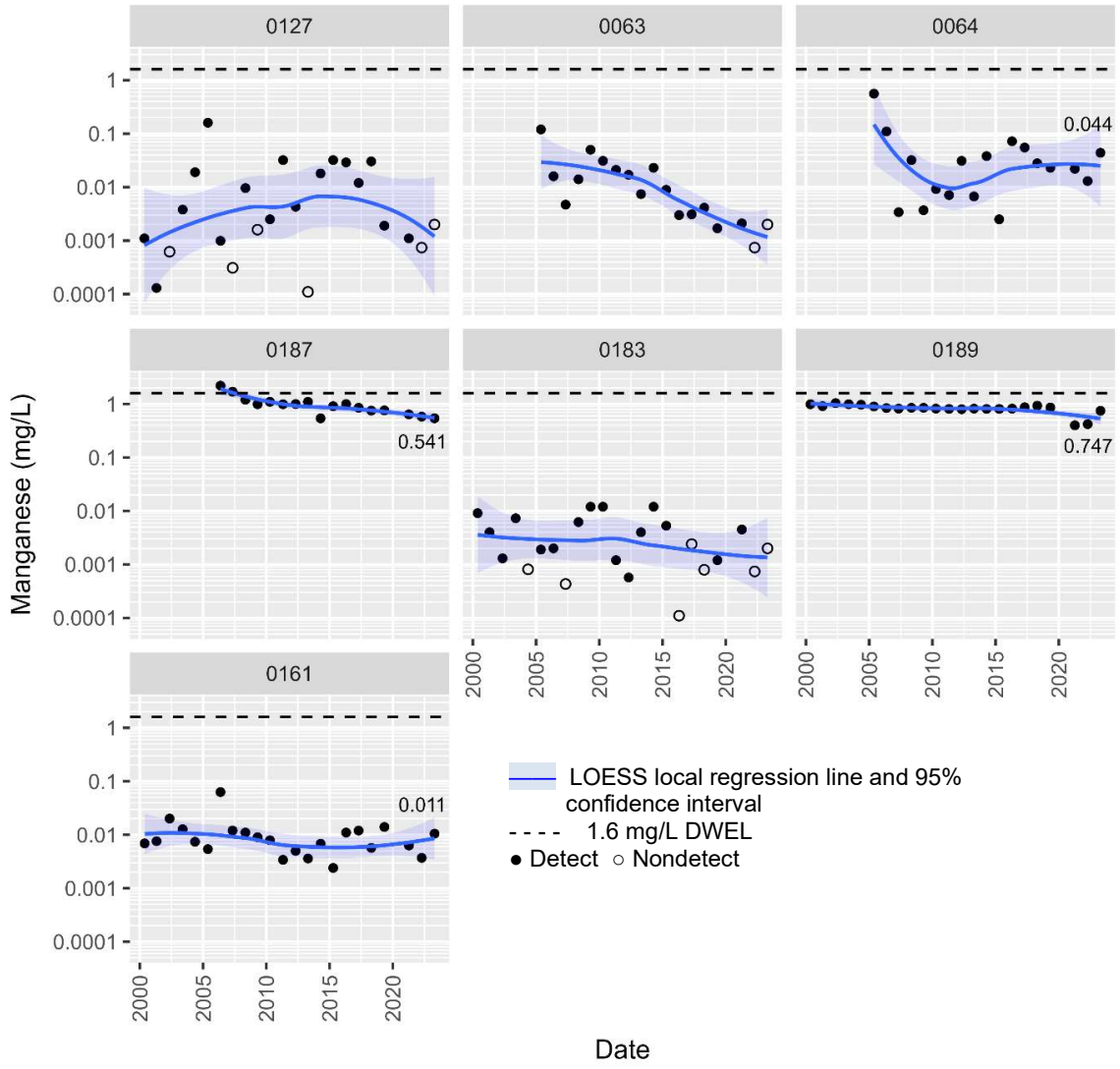
Monitoring Well Network (Data Plotted by Location and Aquifer Zone) (Figure 16)

Figure 16 is a compilation of the manganese data shown previously in Figure 13 through Figure 15. However, in this figure (as in Figure 11), the data are plotted by location, with point symbols color-coded to represent the different screen depth intervals listed in Table 1. In contrast to trends observed for uranium (Figure 11), this figure shows that, in about half of the 12 colocated well clusters, manganese concentrations are higher in the deeper intervals. The most striking examples of this are well pairs 0186/0187 and 0188/0189. In both of these well pairs, manganese concentrations in the shallow interval are predominantly below detection limits, while those in the corresponding deep interval are one to several orders of magnitude higher (about a 0.5–1 mg/L increase in both wells 0187 and 0189). A possible explanation for these findings is that more reducing conditions in deeper wells would promote dissolved manganese, while more oxidizing conditions in corresponding shallow intervals would promote precipitation of manganese oxide minerals.



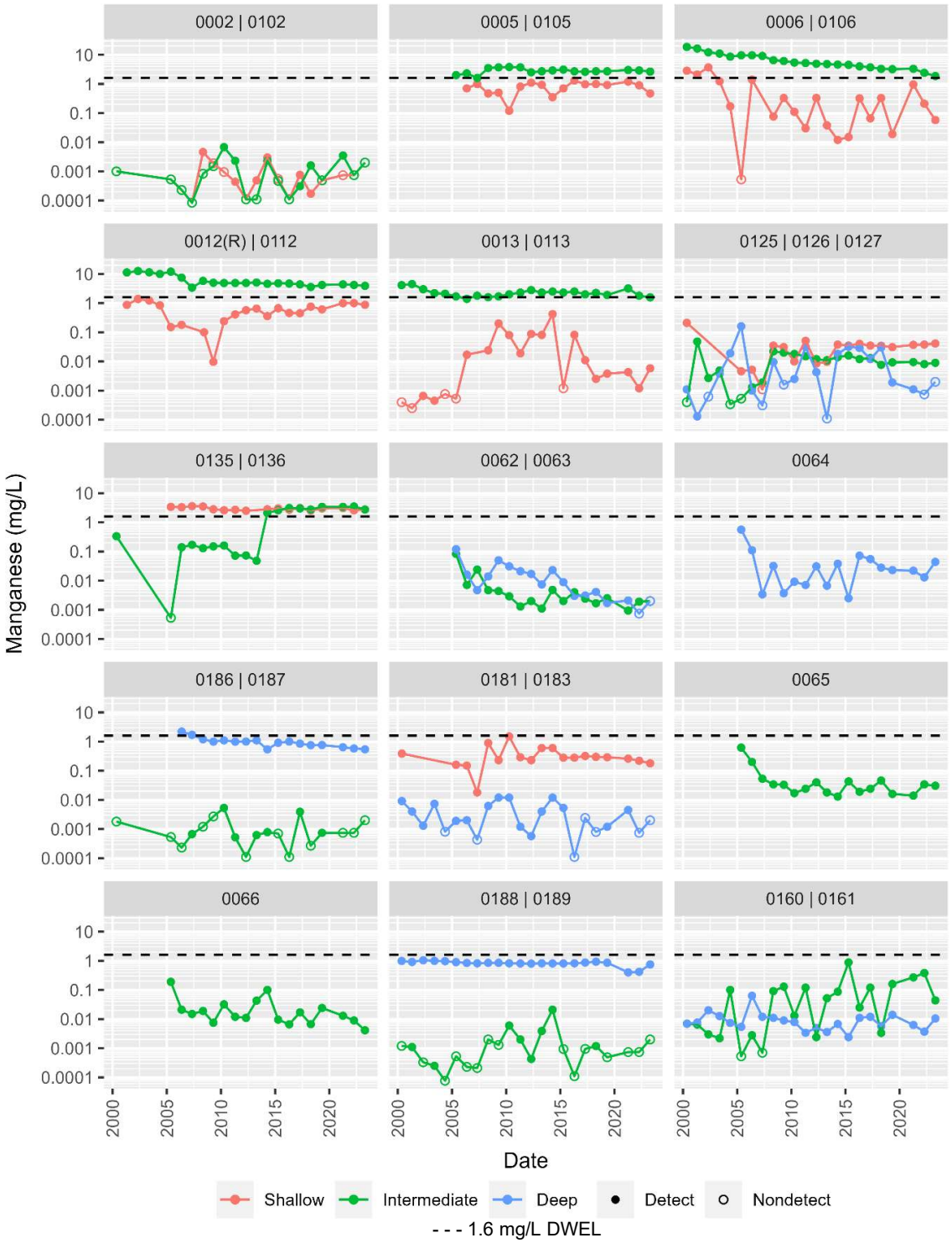
Notes:
The order of facet plots for intermediate monitoring wells is consistent with Table 1, in which wells are listed in general order of increasing distance from the former mill site (Figure 4).
Values shown in individual graphs are the most recent (2023) results, rounded to three decimal points (applied only to results above the detection limit).

Figure 14. Manganese Concentration Trends in Intermediate Monitoring Wells



Notes:
The order of facet plots for deep monitoring wells is consistent with Table 1, in which wells are listed in general order of increasing distance from the former mill site (Figure 4).
Values shown in individual graphs are the most recent (2023) results, rounded to three decimal points (applied only to results above the detection limit).

Figure 15. Manganese Concentration Trends in Deep Monitoring Wells



Notes:
Well pairs or clusters are arranged in general order of increasing distance from the site, beginning with the offsite pasture area wells, followed by the wells in the golf course region, and concluding with the wells installed west of the Gunnison River (Table 1; Figure 4). Data for locations with no corresponding colocated well (deep well 0064 and intermediate wells 0065 and 0066) are shown individually.

Figure 16. Time-Concentration Plots of Manganese in Shallow, Intermediate, and Deep Monitoring Wells

Domestic Well 0667 (Figure 17)

As described in Section 2.2.1 and in the previous VMR (DOE 2023), at the time of completion of the Dos Rios water supply system in 1994, six residences, between the golf course and the Gunnison River (Figure 4), chose not to connect to the system. One residence connected to the system in 2011, and four others (results documented in DOE 2023) connected to the system in August 2021. Currently, the one remaining domestic well (0667) is sampled annually. As shown in Figure 17, about half of the results have been below the detection limit, including the most recent (2023) result of <0.002 mg/L. Manganese concentrations in remaining samples from well 0667 have been two orders of magnitude below the DWEL.

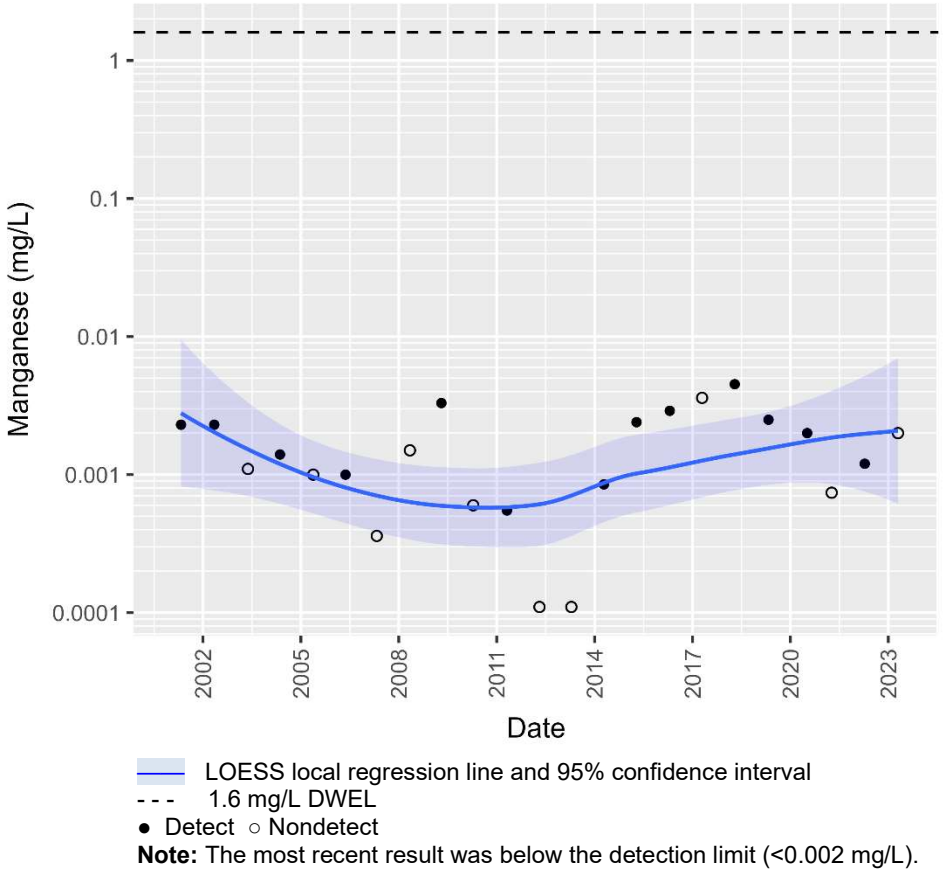


Figure 17. Manganese Concentration Trends in Domestic Well 0667

2.3 Alluvial Aquifer Plume Geometries and Concentrations

The 2010 and 2023 uranium and manganese plume geometries and concentrations were compared to evaluate aquifer restoration progress at the Gunnison site. During milling (1958–1962) and the subsequent postmilling period preceding the initiation of gravel mining (1963 to approximately 1972), ambient groundwater flow in the vicinity of the mill was to the southwest. Uranium and manganese plumes developed during this time and migrated with the ambient groundwater flow field. The beginning of gravel mining in the early 1970s changed the groundwater flow patterns in the vicinity of the mill site. Instead of flowing southwest, groundwater at the mill site flowed

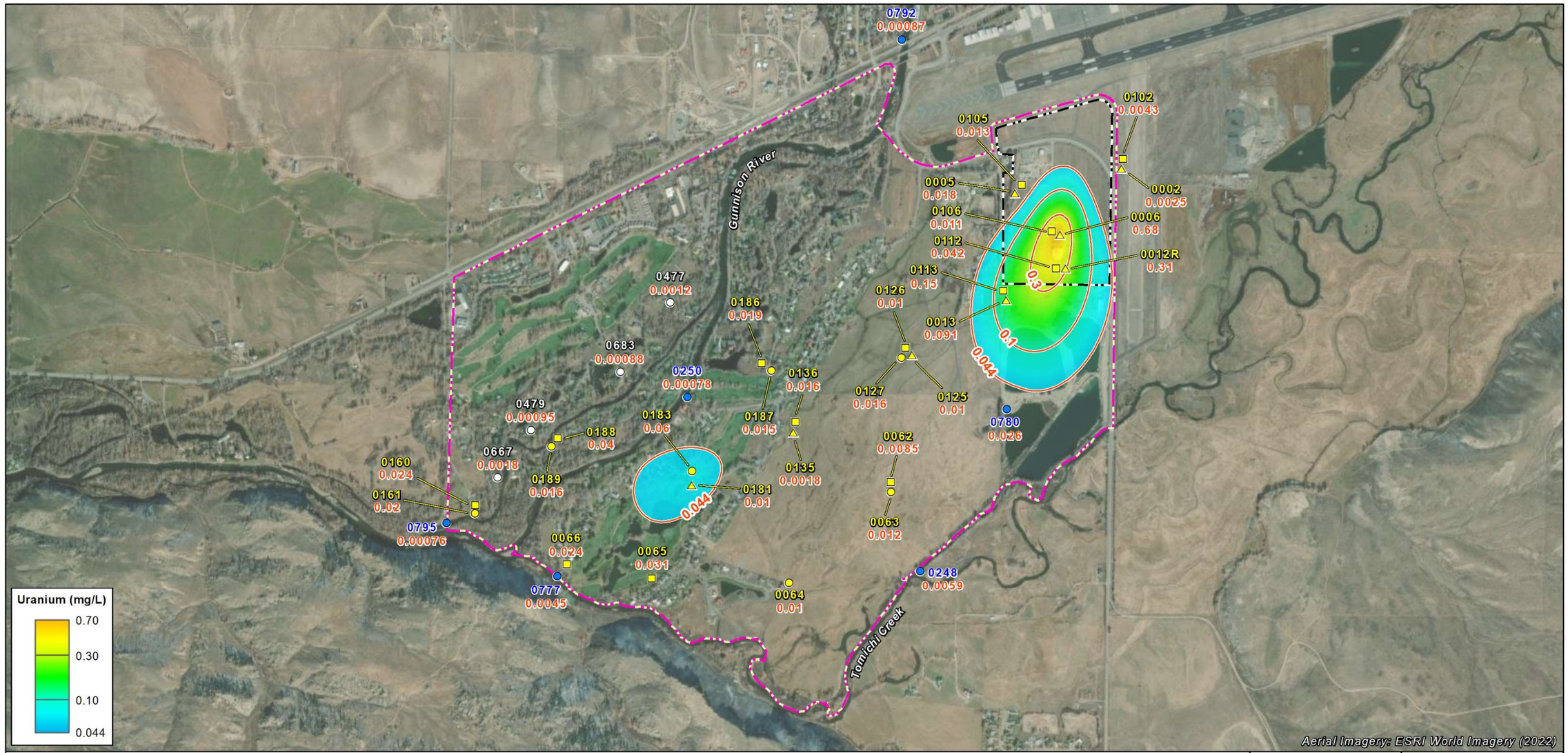
south towards the gravel mining operations. Groundwater outside the gravel mining influence (capture zone) continued to flow southwest. The portions of the uranium and manganese plumes outside the gravel mining capture zone continued to migrate downgradient to the southwest, and portions of the uranium and manganese plumes within the influence of mining operations migrated south into the gravel pits.

2.3.1 Uranium

The 2010 uranium plume consisted of two parts, one extending from the former mill site to the gravel pits, and another centered around deep monitoring well 0183 (Figure 18). In 2023, the downgradient portion of the uranium plume (Figure 19) is absent because uranium concentrations declined to levels below the 0.044 mg/L MCL in monitoring well 0183 (0.0373 mg/L) (Figure 10). The uranium plume extending from the former mill site to the gravel pits remains similar in geometry and concentrations to the 2010 plume, suggesting a continuing former mill site uranium source.

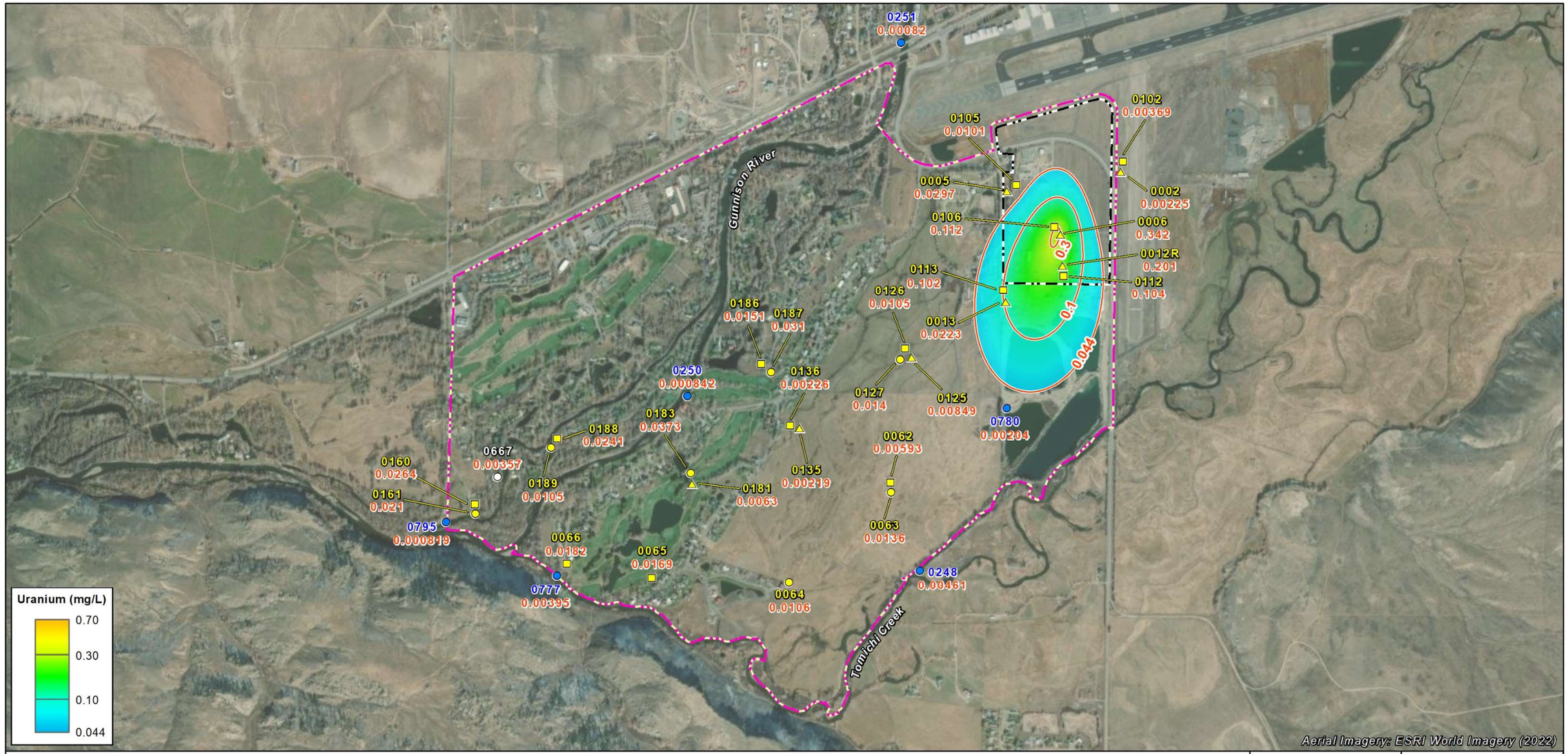
As discussed in the previous VMR (DOE 2023), the uranium present in well 0183 likely originated from the site before gravel pit operations started in 1972. Before gravel mining, a continuous plume likely extended from the mill site southwest in the direction of groundwater flow. A current hypothesis is that gravel pit mining changed the groundwater flow direction in the vicinity of the mill site from southwesterly to south (Figure 5 through Figure 7), in turn altering the plume geometry in a similar manner. In response to the change in flow direction, the plume emanating from the former mill site changed trajectory from southwest to south towards the gravel pits.

At the same time, portions of the existing plume (those downgradient of the site and outside the influence of the gravel mining operations) continued to migrate southwest. Eventually, a zone of clean water developed between the downgradient portion of the plume and the portion of the plume that discharges to the gravel pits, resulting in the isolated region of historically elevated uranium concentrations in the vicinity of well 0183. The isolated downgradient portion of the plume (which is currently below the MCL at well 0183) will continue to migrate southwesterly towards Tomichi Creek. To date, uranium has not been detected above the MCL in the remaining monitoring wells southwest of the gravel mining operations area (Figure 11).



Notes:
In this figure, symbols and labels are adjusted slightly at colocated wells (e.g., 0062 and 0063) to facilitate identification of zone of completion depths; refer to Figure 4 for precise locations.
Domestic well 0479 was sampled in April 2010; in 2011, the residence was connected to the municipal water supply. Because this well was sampled only once (in 2010), it is not listed in Table 1, nor is the location shown in Figure 4.

Figure 18. April 2010 Uranium Plume Configuration



Note: In this figure, symbols and labels are adjusted slightly at colocated wells (e.g., 0062 and 0063) to facilitate identification of zone of completion depths; refer to Figure 4 for precise locations.

Figure 19. April 2023 Uranium Plume Configuration

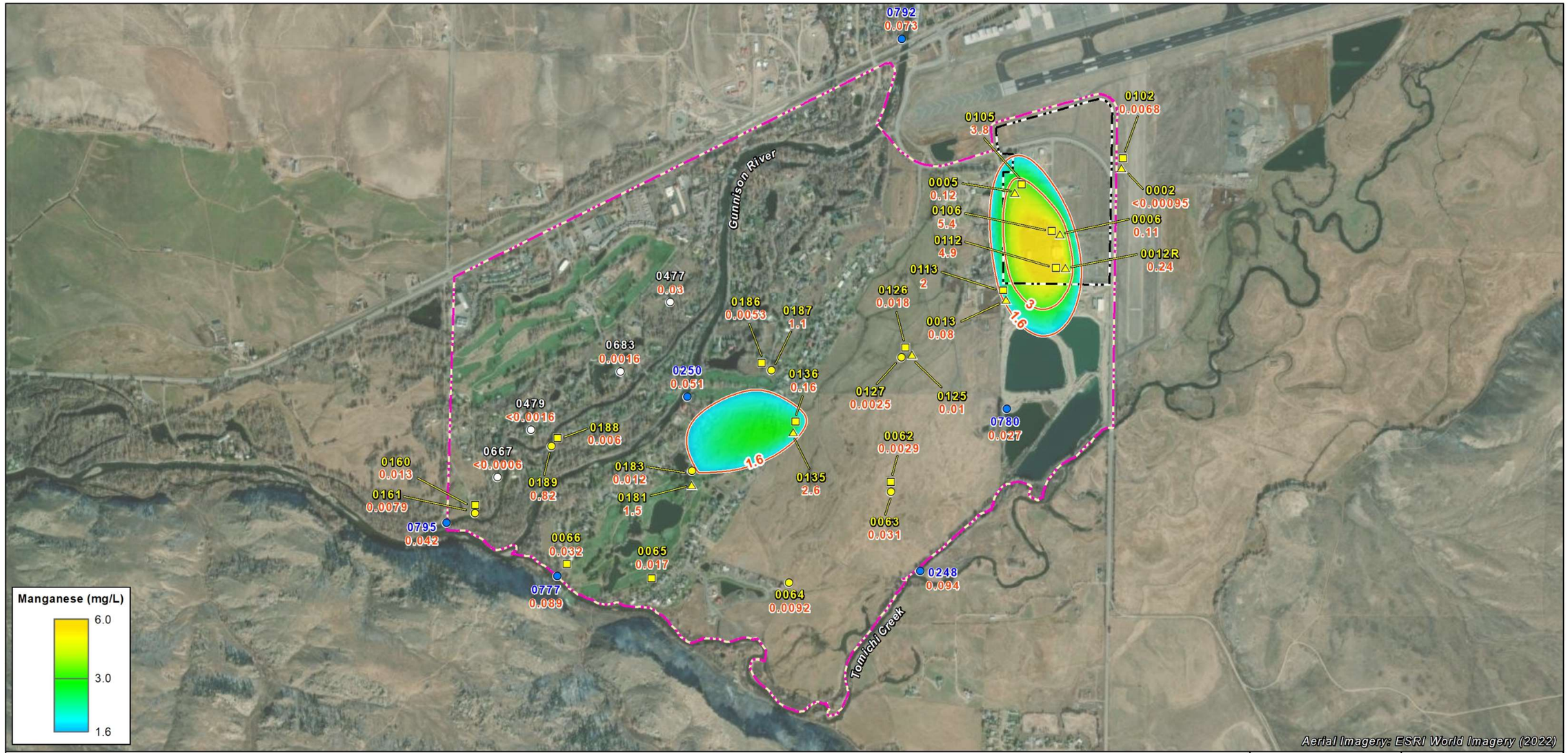
2.3.2 Manganese

The 2010 and 2023 manganese plumes consist of two parts, one extending from the former mill site to the gravel pits and the other centered around shallow and deep monitoring well pair 0135 and 0136 southwest of the former mill site (Figure 20 and Figure 21). The 2010 and 2023 plumes near the former mill site remain similar with respect to geometry and concentration distributions, suggesting a continuing manganese source from the former mill site. The elevated manganese present in wells 0135 and 0136 likely originated from the former mill site before gravel mining operations began in the early 1970s. At that time, a continuous manganese plume likely extended from the mill site southwest in the direction of groundwater flow. A likely explanation is that adjacent mining operations changed the groundwater flow direction in the vicinity of the mill site from southwesterly to south. In response to the change in flow direction, the manganese plume emanating from the former mill site changed trajectory from southwest to south towards the gravel pits.

Similar to the evolution of groundwater flow patterns described for uranium, portions of the existing manganese plume downgradient of the site and outside the capture zone continued to migrate southwest. Over time, a zone of clean water developed between the downgradient portion of the manganese plume and the portion of the plume that discharges to the gravel pits, resulting in the isolated manganese plume present today in the vicinity of wells 0135 and 0136. The downgradient portion of the plume will continue to migrate southwesterly towards Tomichi Creek. As was noted for uranium, these groundwater flow paths could change in response to gravel pit expansion and changing dewatering regimes. To date, manganese has not been detected above the 1.6 mg/L DWEL in other monitoring wells southwest of the gravel operations area.

2.4 Bulk Plume Metrics

Bulk plume metrics were calculated using EVS software. The calculation was performed by three-dimensional interpolation of well concentration data using kriging for each recorded sampling event since April 2010, the date after which a consistent set of wells was sampled annually. The DOE monitoring wells shown in Figure 4 were used for the interpolation. The interpolated plume volume was bounded on the bottom by the top of the bedrock surface (assumed to be at a depth of 130 ft bgs; few wells were drilled to bedrock) and bounded on the top by the water table (interpolated from groundwater elevation measurements for each sampling event). A porosity of 0.25 was assumed for pore volume and plume mass calculations. Between the bedrock and the water table, the plume extents were defined by the MCL for uranium and the DWEL for manganese. The resulting three-dimensional representations of the uranium and manganese plumes provide estimates of the plume footprint area, volume, average contaminant concentrations, and corresponding dissolved plume mass. These bulk plume metrics, shown in Figure 22 and Figure 23 for uranium and manganese (respectively), allow an assessment of groundwater restoration progress at the Gunnison site.



Legend

- △ 0002 Shallow Zone Monitoring Well and ID
- □ 0062 Intermediate Zone Monitoring Well and ID
- ○ 0063 Deep Zone Monitoring Well and ID
- ○ 0477 Domestic Well Location and ID
- ● 0248 Surface Water Sample Location and ID
- 0.0029 Manganese concentration in mg/L
- —1.6— Generalized 2010 Manganese Groundwater Contour (in mg/L)
- Institutional Control Boundary
- Gunnison Processing Site
- Former Mill Site

N

SCALE IN FEET
0 500 1,000

U.S. DEPARTMENT OF ENERGY
OFFICE OF LEGACY MANAGEMENT

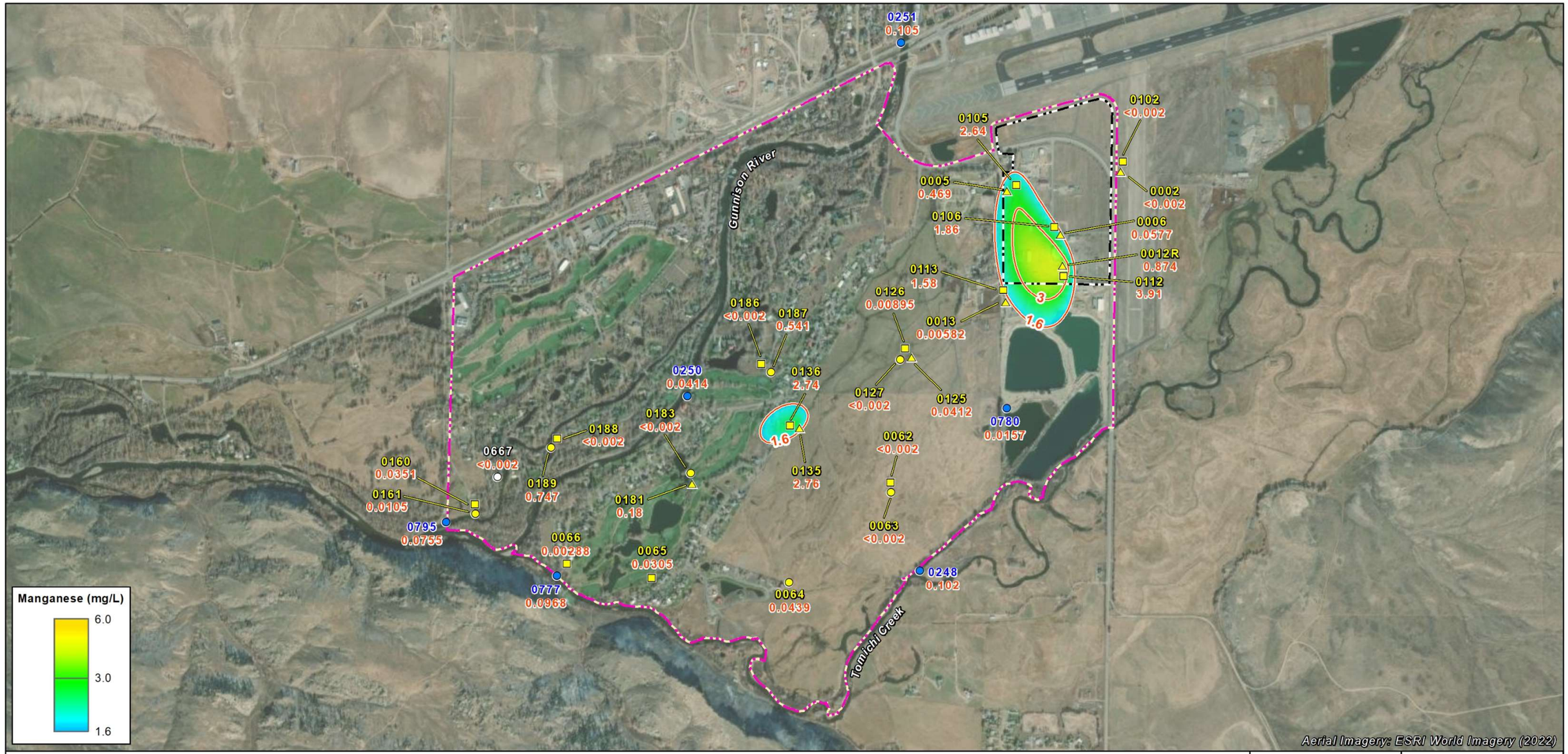
Work Performed by
RSI EnTech, LLC
Under DOE Contract 89303020DLM000001

Manganese Distribution
April 2010
Gunnison, CO, Processing Site

DATE PREPARED: September 25, 2023
FILE NAME: 044864-R01

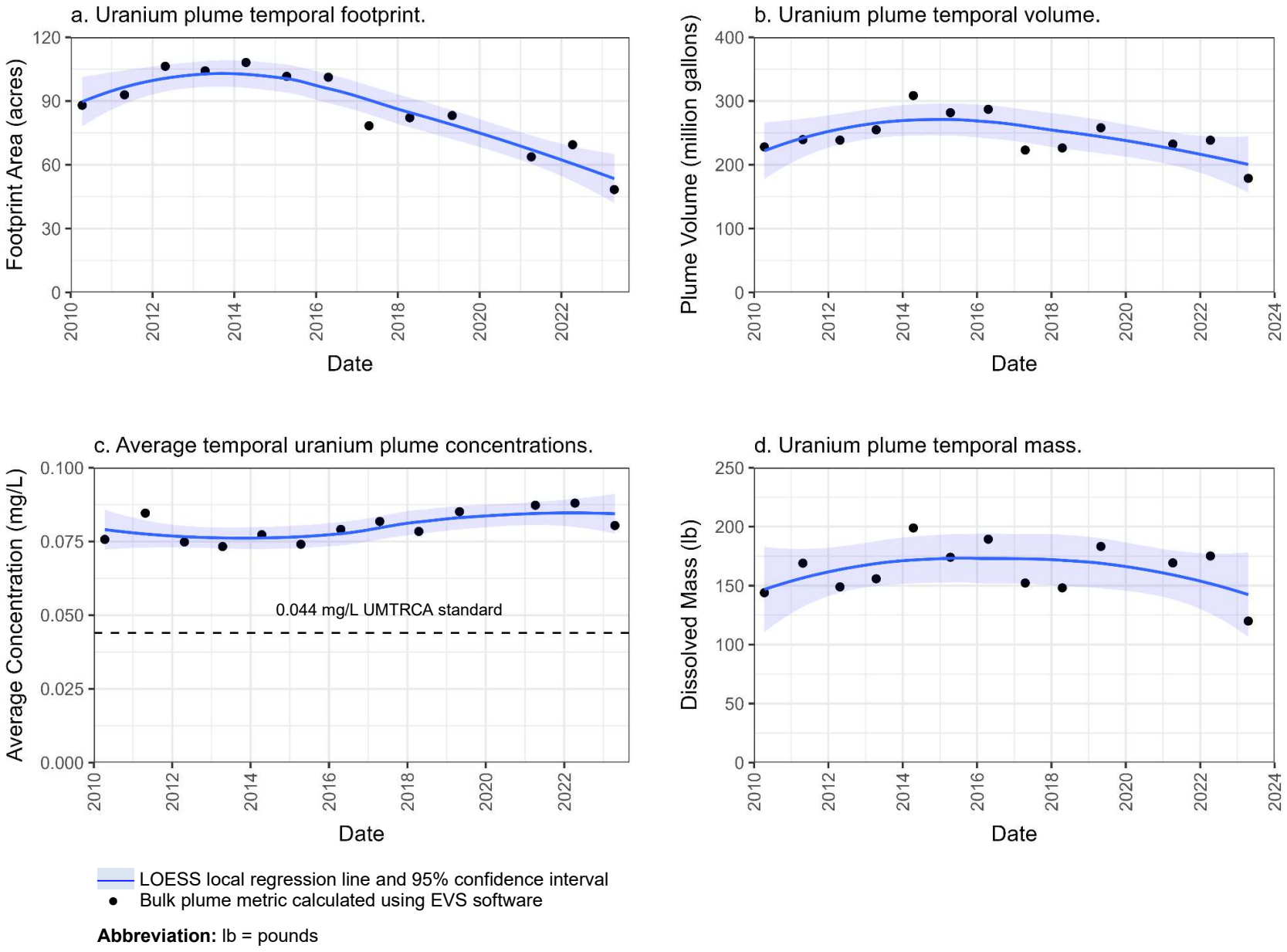
Notes:
In this figure, symbols and labels are adjusted slightly at colocated wells (e.g., 0062 and 0063) to facilitate identification of zone of completion depths; refer to Figure 4 for precise locations.
Domestic well 0479 was sampled in April 2010; in 2011, the residence was connected to the municipal water supply. Because this well was sampled only once (in 2010), it is not listed in Table 1, nor is the location shown in Figure 4.

Figure 20. April 2010 Manganese Plume Configuration



Note: In this figure, symbols and labels are adjusted slightly at colocated wells (e.g., 0062 and 0063) to facilitate identification of zone of completion depths; refer to Figure 4 for precise locations.

Figure 21. April 2023 Manganese Plume Configuration



Abbreviation: lb = pounds

Figure 22. Uranium Bulk Plume Metrics

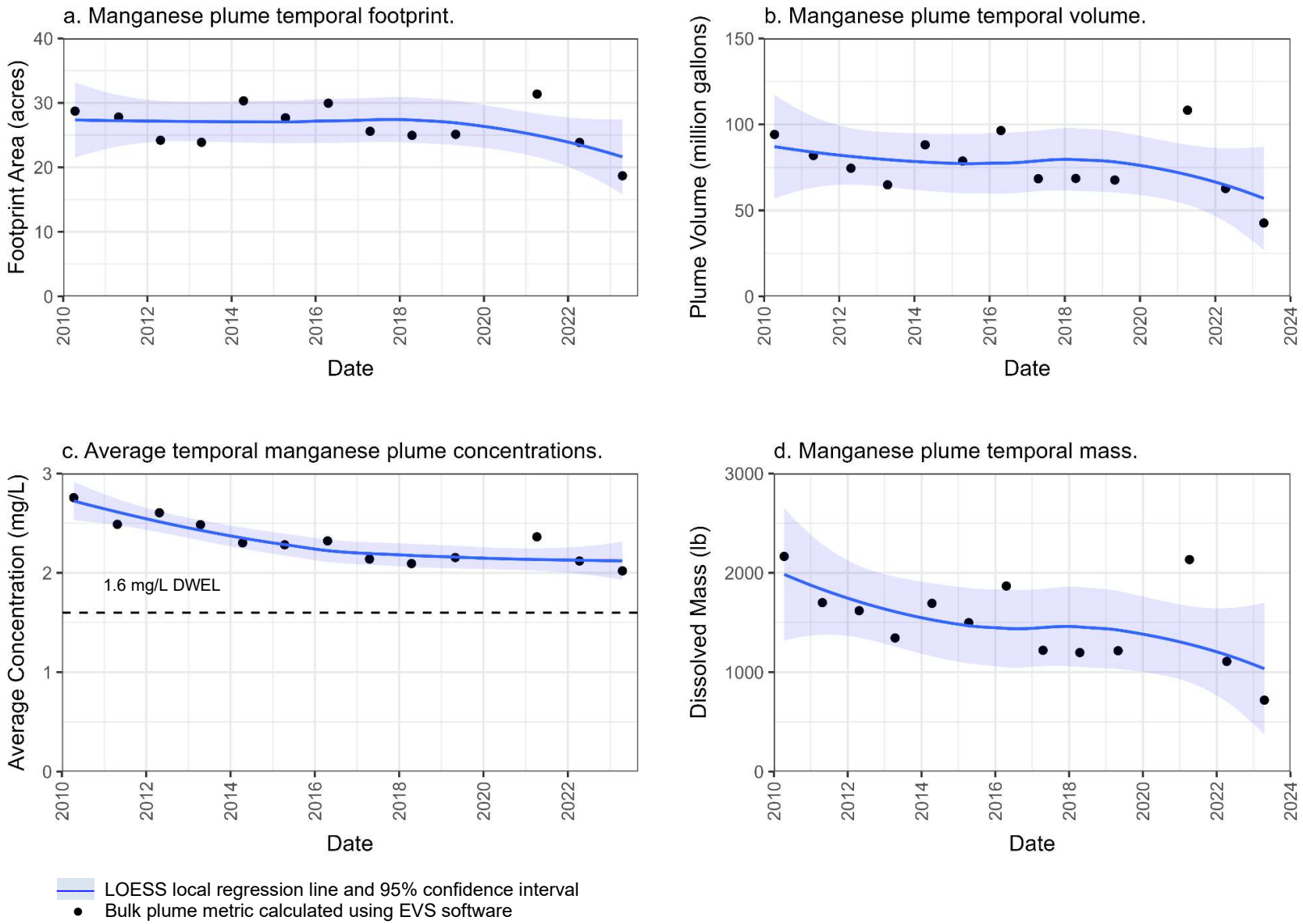


Figure 23. Manganese Bulk Plume Metrics

2.4.1 Uranium

The uranium plume footprint has declined since 2010 from a maximum of 108 acres in 2014 to approximately 50 acres in 2023 (Figure 22a). The decline is attributed to declines in uranium concentrations in offsite deep monitoring well 0183 (Figure 10), which, when contoured, result in a footprint reduction. The uranium plume volume reduced slightly from approximately 220 to 180 million gallons over the evaluation period (Figure 22b). The average uranium concentration has increased slightly from approximately 0.076 to 0.080 mg/L (Figure 22c). Although the dissolved uranium plume mass has remained relatively constant overall at approximately 160 pounds (lb), the calculated mass in 2023 (120 lb) was lower than all previous estimates (Figure 22d). Given relatively consistent average uranium concentrations and corresponding dissolved plume mass in the last 13 years, it is unlikely that the uranium plume will sufficiently attenuate to reach the 0.044 mg/L uranium MCL within the 100-year performance period.

2.4.2 Manganese

The manganese plume footprint has remained relatively constant since 2010 and currently occupies approximately 22 acres (Figure 23a). The plume volume reduced from approximately 90 to 60 million gallons over the evaluation period (Figure 23b). The average manganese concentration within the plume has declined just slightly from approximately 2.8 mg/L in 2010 to 2.1 mg/L in 2017 and has remained relatively stable since (Figure 23c). The dissolved plume mass has nearly halved, from approximately 2000 lb in 2010 to roughly 1000 lb in 2023 (Figure 23d). Given relatively consistent average manganese concentrations and corresponding dissolved plume mass in the last 13 years, it is unlikely that the manganese plume will sufficiently attenuate to reach the 1.6 mg/L DWEL within the 100-year performance period.

2.5 Surface Water Concentration Trends

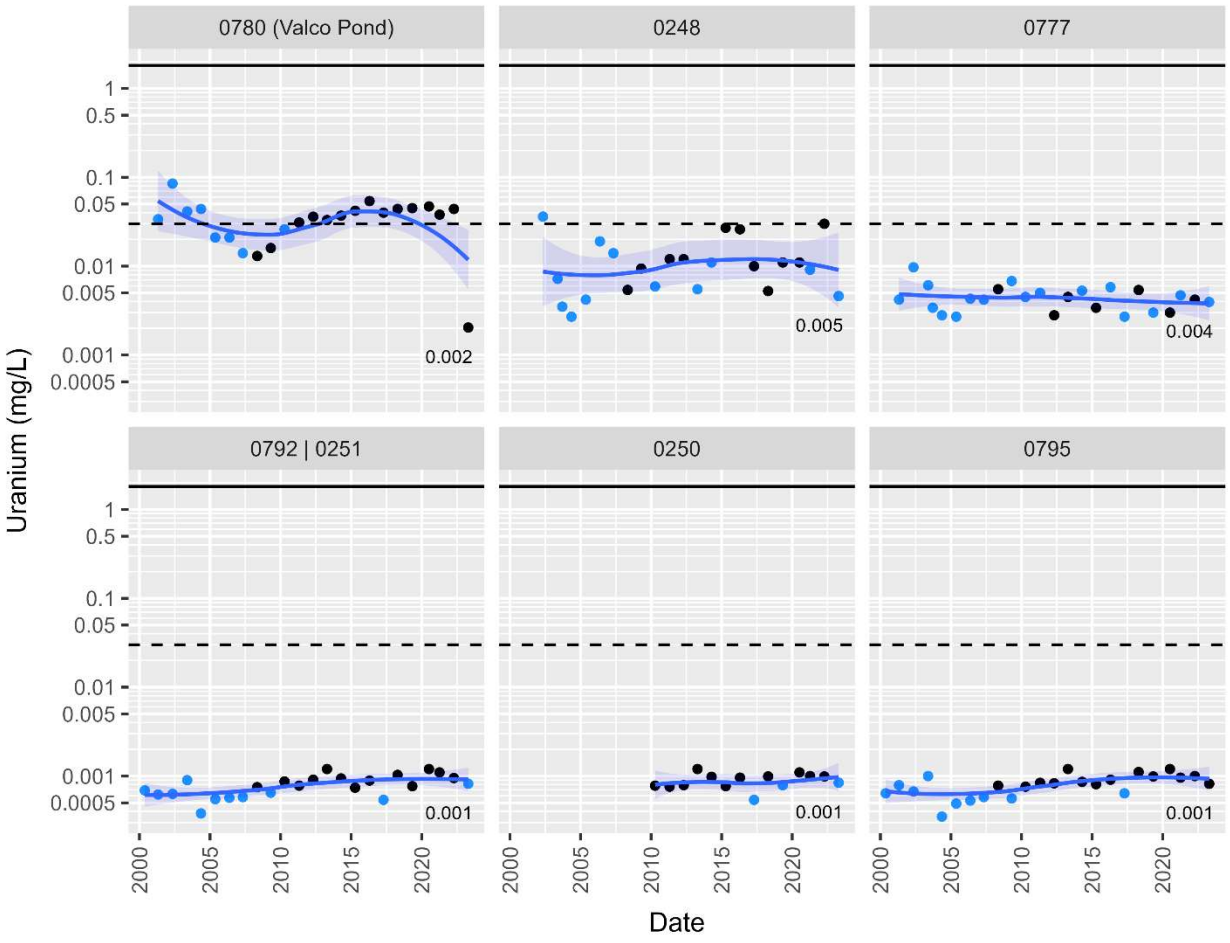
Six surface water samples are collected annually in the vicinity of the former mill site: one from the adjacent Valco Pond (Pit 1), two from Tomichi Creek, and three from the Gunnison River (Figure 4). Table 4 lists the corresponding CDPHE water quality criteria. Figure 24 and Figure 25 plot historical concentrations of uranium and manganese, respectively.

Table 4. State of Colorado Surface Water Regulations for Uranium and Manganese: Gunnison River and Tomichi Creek Watersheds

Parameter	TVS Basis[a,b,c]	TVS Aquatic Life Acute[a,b,c]	TVS Aquatic Life Chronic[a,b,c]	Agriculture (Chronic)[a]	Domestic Water Supply[a,b]
Uranium	Acute = $e^{(1.1021 \times \ln(\text{hardness}) + 2.7088)}$ Chronic = $e^{(1.1021 \times \ln(\text{hardness}) + 2.2382)}$	2.907	1.816	NA	0.0168–0.03[d] (Chronic)
Manganese	Acute = $e^{(0.3331 \times \ln(\text{hardness}) + 6.4676)}$ Chronic = $e^{(0.3331 \times \ln(\text{hardness}) + 5.8743)}$	3.159[e] (Dissolved) (Basis: Solberg et al. 2012)	1.745[e] (Dissolved) (Basis: Solberg et al. 2012)	0.2[f]	0.05[g] (Dissolved chronic)

Notes:
Values are in mg/L.
[a] 5 CCR 1002-31; refer to Table III, "Metal Parameters."
[b] 5 CCR 1002-35.
[c] For both uranium and manganese, CDPHE water quality standards apply only to the dissolved fraction and are dependent on (and directly related to) hardness (as $CaCO_3$), a parameter that has not been measured in site surface water samples. Hardness can be estimated using concentration values for calcium and magnesium, but these analytes have also not been analyzed in Gunnison site surface water samples. In 2012, USGS issued a report addressing water quality in the upper Gunnison Basin (Solberg et al. 2012). The authors reported median calcium and magnesium concentrations of 33.8 and 8.51 mg/L, respectively (see Table 19 of Solberg et al. 2012), corresponding to a hardness value of approximately 119 mg/L (as $CaCO_3$). According to CDPHE, hardness values to be used in equations shall be no greater than 400 mg/L. For consistency with Table IV of 5 CCR 1002-31, acute and chronic TVS values for uranium and manganese are rounded to four significant figures.
[d] The uranium standard is a range. The first number in the range (0.0168 mg/L) is a strictly health-based value, based on the CDPHE Water Quality Control Commission's established methodology for human-health-based standards. The second number in the range (0.03 mg/L) is the MCL defined in 5 CCR 1002-31. These standards apply to the total recoverable fraction.
[e] Acute and chronic TVS values for manganese were calculated using the TVS Basis equations listed above and the 119 mg/L hardness values referred to in note c. These values correspond very closely with the acute and chronic standards for manganese cited by USGS in Solberg et al. 2012: 3.159 and 1.745 mg/L (see Table 19 of Solberg et al. 2012). For this reason, the standards cited in Solberg et al. 2012 (3.159 mg/L [acute] and 1.745 mg/L [chronic]) are considered representative of appropriate TVS values for manganese.
[f] This standard applies to the total recoverable fraction. The agricultural standard cited for manganese is only appropriate where irrigation water is applied to soils with pH values lower than 6.0 (5 CCR 1002-31, Table III).
[g] Section 35.6 of 5 CCR 1002-35 states the following: "For all surface waters with a 'water supply' classification that are not in actual use as a water supply, no water supply standards are applied for iron, manganese, or sulfate, unless the Commission determines as the result of a site-specific rulemaking hearing that such standards are appropriate" (5 CCR 1002-35).

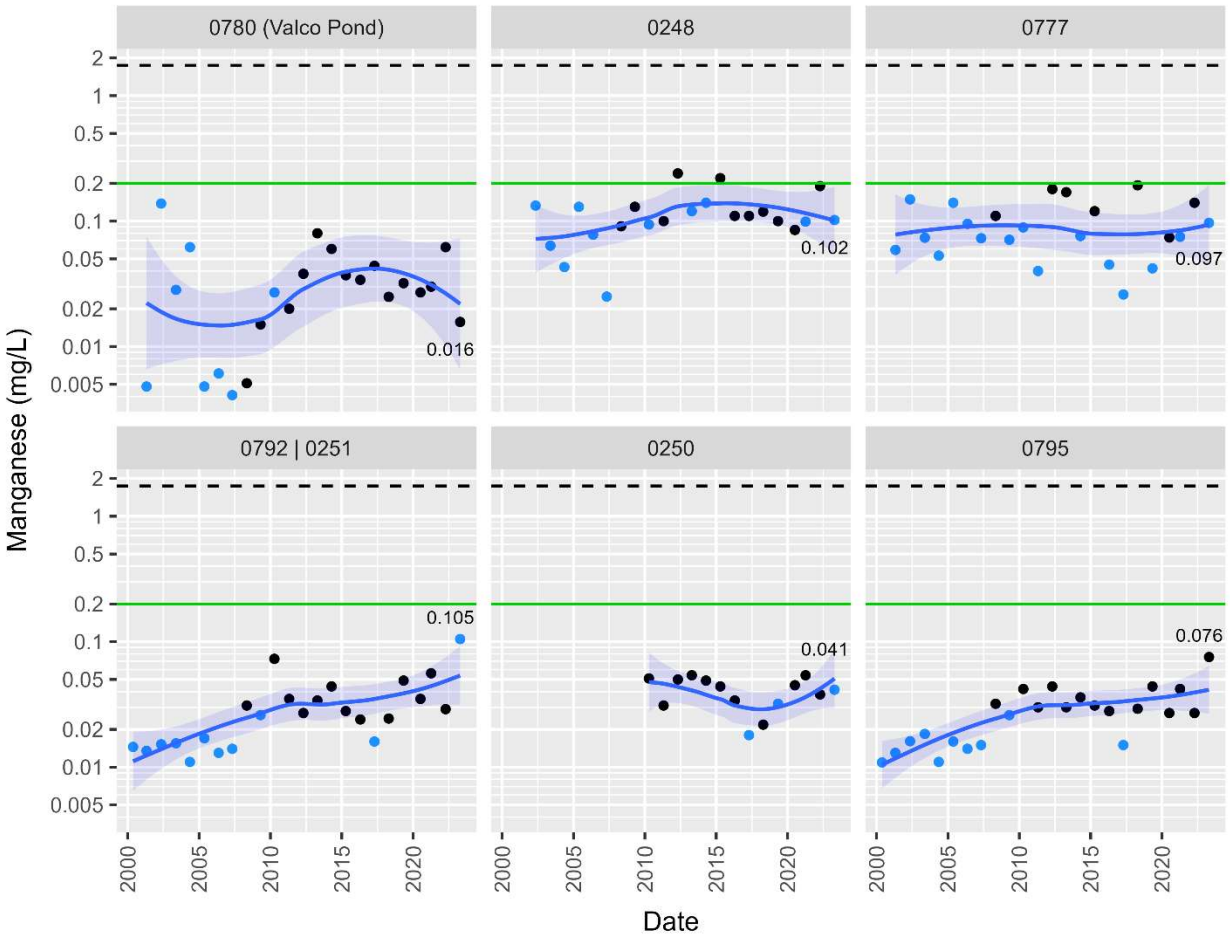
Abbreviations:
$CaCO_3$ = calcium carbonate
CCR = *Code of Colorado Regulations*
ln = natural logarithm
NA = not applicable or available
TVS = table value standard
USGS = U.S. Geological Survey



Fraction: ● Total ● Dissolved
LOESS local regression line and 95% confidence interval
- - - 0.03 mg/L CDPHE domestic use surface water standard (upper bound of range from Table 4)
— 1.816 mg/L chronic table value standard from Table 4 (acute criterion is 2.907 mg/L); applies only to dissolved (●) fraction

Notes:
The plots are ordered as follows: Valco Pond, Tomichi Creek locations, followed by the Gunnison River monitoring locations. Monitoring of current upgradient location 0251 began in April 2014 after sampling at location 0792 was discontinued due to access safety reasons. Data from previous background river location 0792 (monitored 1997–2013) are also plotted with location 0251.
Values shown in individual graphs are the most recent (2023) results.

Figure 24. Uranium Concentration Trends in Surface Water Samples



Notes:
Fraction: ● Total ● Dissolved
LOESS local regression line and 95% confidence interval
- - - 1.745 mg/L chronic table value standard from Table 4 (acute criterion is 3.159 mg/L); applies only to dissolved (●) fraction
0.2 mg/L CDPHE agricultural standard
The plots are ordered as follows: Valco Pond, Tomichi Creek locations, followed by the Gunnison River monitoring locations. Monitoring of current upgradient location 0251 began in April 2014 after sampling at location 0792 was discontinued due to access safety reasons. Data from previous background river location 0792 (monitored 1997–2013) are also plotted with location 0251.
Values shown in individual graphs are the most recent (2023) results.

Figure 25. Manganese Concentration Trends in Surface Water Samples

2.5.1 Uranium

The upper bound of the Gunnison Basin surface water quality standard for uranium, assuming domestic use, is 0.03 mg/L, according to Title 5 *Code of Colorado Regulations* Section 1002-31 (5 CCR 1002-31) and 5 CCR 1002-35. Before 2003, surface water sampling location 0780 (Valco Pond) had measured uranium concentrations above the standard in seven of 11 sampling events.[4] Between 2005 and approximately 2016, uranium concentrations measured at Valco Pond trended upward but then stabilized at about 0.03–0.04 mg/L through 2022. At times, these concentrations slightly exceeded the CDPHE domestic use surface water standard but were well below corresponding acute and chronic CDPHE table value standards (Figure 24; Table 4). The most recent (2023) Valco Pond sample result, 0.002 mg/L, deviates markedly from previous results. Although data validation eliminated laboratory error from consideration as a possible explanation for this result, it is considered an outlier with respect to previous measurements.[5] Uranium present in Valco Pond discharges to Tomichi Creek and is increasingly diluted as a function of downstream migration distance from the pond (Figure 24). Surface water sampling locations 0248 and 0777 are approximately 1500 and 6000 ft downstream of the pond discharge location, respectively, and show reduced uranium concentration with distance from the pond (Figure 24). In 2023, uranium concentrations measured at Tomichi Creek sample locations 0248 and 0777 were 0.005 and 0.004 mg/L, respectively. The fact that these results exceeded the corresponding Valco Pond result (0.002 mg/L) in 2023 is not typical nor is it considered representative of pond water quality conditions.

Uranium concentrations at the remaining four sampling locations, including the Gunnison River locations, have been consistently below 0.03 mg/L. Uranium concentrations at surface water sampling locations have been well below the CDPHE acute and chronic standards of 2.907 and 1.816 mg/L, respectively.

2.5.2 Manganese

With two exceptions, manganese concentrations in Gunnison site surface water samples have been consistently below the corresponding 0.2 mg/L CDPHE agricultural standard (Figure 25). The two exceptions apply to Tomichi Creek location 0248: the first in 2012 (0.24 mg/L) and the second in 2015 (0.22 mg/L). Both of these results are less than the acute (3.159 mg/L) and chronic (1.745 mg/L) Gunnison Basin table value standards (Table 4; Figure 25). An increasing manganese concentration trend is apparent for the upstream Gunnison River location (0251, formerly 0792). This observation may explain the increasing trend also found for the downstream (0795) Gunnison River location (Figure 25).

[4] Only two of the 11 results collected before 2003 are shown in Figure 24 because the time-concentration plots in this report are scaled consistently with the development of the Site Observational Work Plan (DOE 2001) and the site compliance strategy (beginning in 2000). Valco Pond was sampled nine times between 1990 and 1995, when uranium concentrations ranged from 0.011–0.075 mg/L and averaged 0.04 mg/L. The pond was not sampled again until 2001. The uranium concentration results for 2000 and 2001 (0.034 and 0.084 mg/L) are shown in Figure 24.

[5] Because of this anomalously low value, in July 2023, LM requested that the original April 2023 sample (GUN01-01.2304008-038) from location 0780 be reanalyzed for uranium. The concentration determined from the August 2023 reanalysis was 0.00239 mg/L, which is consistent with the original (0.00204 mg/L) result.

3.0 Compliance Remedy Performance Summary

Implemented in 2010, the current compliance strategy for the Gunnison site is natural flushing with ICs, whereby the site was anticipated to naturally flush to a condition in which groundwater cleanup objectives would be met within a 100-year time frame. Natural flushing relies on natural physical and chemical processes in soil and groundwater to reduce uranium and manganese mass in the subsurface. The only natural attenuation mechanisms available to reduce subsurface uranium and manganese concentrations are discharge to Tomichi Creek and the Gunnison River, dispersion along the plume flow path, strong to irreversible adsorption, and mineral precipitation due to changing geochemical conditions. Uranium has a long half-life (245,500 years for uranium-234 and 4.5 billion years for uranium-238); thus, radioactive decay, while it will occur, will not significantly reduce uranium concentrations within the 100-year performance period.

This evaluation examined uranium and manganese groundwater concentrations and corresponding bulk plume metrics to characterize attenuation progress (aquifer restoration) and determine whether there are physical and chemical processes that may impede the compliance remedy's efficiency. Lastly, relevant findings from this evaluation period were presented, and implications for aquifer restoration progress were discussed.

Gravel pit operations adjacent to the former mill site have been occurring since the early 1970s. Most of the contaminated groundwater deriving from the former mill site discharges to the adjacent gravel pits, whether pit dewatering is occurring or not, and is hypothesized to have been discharging to the gravel pits since the initial excavation extended below the water table and dewatering was initiated. In the absence of pit dewatering, the proximity of Tomichi Creek to the gravel pits, limited separation distances, and the presence of high-permeability material between the gravel pits and the adjacent creek result in the gravel pits and creek having similar water levels.

Site groundwater, having a higher elevation than the gravel-pit ponds, discharges to the gravel pits and then migrates through the gravel-pit ponds and surrounding aquifer material to the creek. While most of the contaminated groundwater originating from the former mill site discharges to the gravel pits, a portion likely migrates southwest towards Tomichi Creek and ultimately discharges there (Figure 5 and Figure 6). It is likely that the percentage of contaminated groundwater discharging to the gravel pits increased with time as more gravel was excavated and mining moved closer to the mill site. The flow path of site groundwater escaping capture by the gravel-pit ponds to downgradient Tomichi Creek could change with time in response to changing mining operations.

Consistent with conclusions drawn in the previous (2022) VMR (DOE 2023), comparison of the 2010 and 2023 uranium and manganese plumes (Figure 18 through Figure 21) shows that the higher concentrations of uranium and manganese extend from the former mill site to the gravel pits, confirming continuing migration of contamination from the site to the gravel pits. The consistent temporal uranium and manganese plume geometries and concentrations in the vicinity of the site and gravel pits suggest active former mill site uranium and manganese sources.

Trends for the uranium plume volume and mass have remained relatively constant from 2010 to 2023 (Figure 22). While trends for the uranium plume footprint decreased, the uranium plume's average concentration increased during the same period. The decrease is attributed to declining

uranium concentrations in offsite deep monitoring well 0183 (Figure 10), which, when contoured, result in footprint reduction. The uranium temporal plume mass being relatively stable from 2010 to 2023 suggests that attainment of the 0.044 mg/L MCL within the 100-year performance period is not likely. Trends for the manganese plume footprint and volume have remained relatively constant from 2010 to 2023, whereas the average concentration and plume mass have declined during this period (Figure 23).

In 2023, concentrations of uranium and manganese in surface water samples collected in the vicinity of the former mill site—including Valco Pond, the closest surface water monitoring location to the site typically having the highest uranium concentrations—were below corresponding CDPHE water quality standards.

4.0 References

5 CCR 1002-31. Colorado Department of Public Health and Environment Water Quality Control Commission, "Regulation No. 31 – The Basic Standards and Methodologies for Surface Water," *Code of Colorado Regulations*, 5 CCR 1002-31 (PDF), accessed July 25, 2023.

5 CCR 1002-35. Colorado Department of Public Health and Environment Water Quality Control Commission, "Regulation No. 35 – Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins," *Code of Colorado Regulations*, 5 CCR 1002-35 (PDF), accessed July 25, 2023.

40 CFR 192. U.S. Environmental Protection Agency, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," *Code of Federal Regulations*.

42 USC 300f. "Definitions," *United States Code*.

Dayvault, J., 2021. Jalena Dayvault, site manager, Office of Legacy Management, U.S. Department of Energy, letter (in response to U.S. Department of Energy Office of Legacy Management response to U.S. Nuclear Regulatory Commission letter dated October 30, 2019, pertaining to the *Draft Groundwater Compliance Action Plan for the Gunnison, Colorado, Processing Site*) to U.S. Nuclear Regulatory Commission Document Control Desk, March 2.

DOE (U.S. Department of Energy), 1996a. *Buffer Zone Monitoring Plan for the Dos Rios Subdivision, Gunnison, Colorado*, DOE/AL/62350-219, Rev. 0, Albuquerque, New Mexico, February. https://www.osti.gov/servlets/purl/196571

DOE (U.S. Department of Energy), 1996b. *Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project*, Vol. I, DOE/EIS-0198, Grand Junction Projects Office, Grand Junction, Colorado, October. https://www.energy.gov/sites/prod/files/EIS-0198-Final-Programmatic-EIS-for-the-Uranium-Mill-Tailings-Remedial-Action-Goundwater-Project.pdf

DOE (U.S. Department of Energy), 2001. *Final Site Observational Work Plan for the Gunnison, Colorado, UMTRA Project Site*, GJO-2001-214-TAR, Grand Junction Office, Grand Junction, Colorado, March. https://lmpublicsearch.lm.doe.gov/lmsites/1200-ugun00000209.pdf

DOE (U.S. Department of Energy), 2010. *Final Groundwater Compliance Action Plan for the Gunnison, Colorado, Processing Site*, LMS/GUP/S06004, Office of Legacy Management, April. https://lmpublicsearch.lm.doe.gov/lmsites/1243-s06004_gup_gcap.pdf

DOE (U.S. Department of Energy), 2011. *2011 Verification Monitoring Report for the Gunnison, Colorado, Processing Site*, LMS/GUP/S08005, Office of Legacy Management, December. https://lmpublicsearch.lm.doe.gov/lmsites/1211-s08005_vmr.pdf

DOE (U.S. Department of Energy), 2017. *Draft Groundwater Compliance Action Plan for the Gunnison, Colorado, Processing Site*, LMS/GUP/S06004, Office of Legacy Management, April. https://www.nrc.gov/docs/ML1712/ML17124A592.pdf

DOE (U.S. Department of Energy), 2021. *2020 Verification Monitoring Report for the Gunnison, Colorado, Processing Site*, LMS/GUP/S31483, Office of Legacy Management, January. https://lmpublicsearch.lm.doe.gov/lmsites/s31483_gup_2020_vmr.pdf

DOE (U.S. Department of Energy), 2023. *2022 Verification Monitoring Report for the Gunnison, Colorado, Processing Site*, LMS/GUP/41574, Office of Legacy Management, February.

EPA (U.S. Environmental Protection Agency), 2018. *2018 Edition of the Drinking Water Standards and Health Advisories*, EPA 822-F-18-001, Office of Water, March. https://semspub.epa.gov/work/HQ/100002014.pdf

Gregg, G., 1994. George Gregg, general manager, Valco Inc., Gunnison Concrete Division, letter (about Gunnison Pit [Permit #M-77-023] Technical Revision #1) to James Stevens, senior environmental protection specialist, State of Colorado Division of Minerals and Geology, May 5.

Merritt, R.C., 1971. *The Extractive Metallurgy of Uranium*, Colorado School of Mines Research Institute, Golden, Colorado.

Solberg, P.A., B. Moore, and T.D. Blacklock, 2012. *Comparison of 2008–2009 Water Years and Historical Water-Quality Data, Upper Gunnison River Basin, Colorado*, U.S. Geological Survey Data Series 687, https://pubs.usgs.gov/ds/687, accessed July 24, 2023.

Striz, E.A., 2019. Elise A. Striz, project manager, Uranium Recovery and Materials Decommissioning Branch, U.S. Nuclear Regulatory Commission, letter (about Gunnison, Colorado, Processing Site – Request for Additional Information RE: Draft Groundwater Compliance Action Plan) to Jalena Dayvault, site manager, Office of Legacy Management, U.S. Department of Energy, October 30.

USGS (U.S. Geological Survey), 2020. *LIDAR Quality Report from the National Geospatial Technical Operations Center in Support of the 3D Elevation Program*, CO WestCentral 2019, November 2.

Appendix A

Groundwater and Surface Water Quality Data for the Gunnison Site

Note: This appendix includes water quality data only for Gunnison site samples collected in 2023. Water quality data from previous years are available on the Geospatial Environmental Mapping System (GEMS) website at https://gems.lm.doe.gov/#site=GUP.

Groundwater Quality Data by Parameter for Site GUN01, 2023 Sampling
Gunnison, Colorado, Processing Site

Report Date: 7/24/2023

PARAMETER	LOCATION CODE	/ TYPE	SAMPLE DATE	FRACTION	SAMPLE TYPE	RESULT	UNIT	QUALIFIERS LAB	/ DATA	DETECTION LIMIT	QA
Manganese	0002	WL	4/19/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0005	WL	4/19/2023	T	F	0.469	mg/L		F	0.002	Y
Manganese	0006	WL	4/19/2023	T	F	0.0577	mg/L		F	0.002	Y
Manganese	0012R	WL	4/19/2023	T	F	0.874	mg/L		F	0.002	Y
Manganese	0013	WL	4/19/2023	T	F	0.00582	mg/L	B	F	0.002	Y
Manganese	0062	WL	4/17/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0063	WL	4/17/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0064	WL	4/17/2023	T	F	0.0439	mg/L		F	0.002	Y
Manganese	0065	WL	4/18/2023	T	F	0.0305	mg/L		F	0.002	Y
Manganese	0066	WL	4/18/2023	T	D	0.00413	mg/L	B	F	0.002	Y
Manganese	0066	WL	4/18/2023	T	F	0.00288	mg/L	B	F	0.002	Y
Manganese	0102	WL	4/19/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0105	WL	4/19/2023	T	F	2.64	mg/L		F	0.002	Y
Manganese	0106	WL	4/19/2023	T	F	1.86	mg/L		F	0.002	Y
Manganese	0112	WL	4/19/2023	T	F	3.91	mg/L		F	0.002	Y
Manganese	0113	WL	4/19/2023	T	F	1.58	mg/L		F	0.002	Y
Manganese	0125	WL	4/17/2023	T	F	0.0412	mg/L		F	0.002	Y
Manganese	0126	WL	4/17/2023	T	F	0.00895	mg/L	B	F	0.002	Y
Manganese	0127	WL	4/17/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0135	WL	4/17/2023	T	F	2.76	mg/L		F	0.002	Y
Manganese	0136	WL	4/17/2023	T	F	2.74	mg/L		F	0.002	Y
Manganese	0160	WL	4/19/2023	T	D	0.0438	mg/L		F	0.002	Y
Manganese	0160	WL	4/19/2023	T	F	0.0351	mg/L		F	0.002	Y
Manganese	0161	WL	4/19/2023	T	F	0.0105	mg/L		F	0.002	Y
Manganese	0181	WL	4/18/2023	T	F	0.18	mg/L		F	0.002	Y
Manganese	0183	WL	4/18/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0186	WL	4/19/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0187	WL	4/19/2023	T	F	0.541	mg/L		F	0.002	Y
Manganese	0188	WL	4/18/2023	T	F	0.002	mg/L	U	F	0.002	Y
Manganese	0189	WL	4/18/2023	T	F	0.747	mg/L		FQ	0.002	Y
Manganese	0667	WL	4/19/2023	T	F	0.002	mg/L	U		0.002	Y
Oxidation Reduction Potential	0002	WL	4/19/2023	N	F	106.1	mV		F		Y
Oxidation Reduction Potential	0005	WL	4/19/2023	N	F	40.1	mV		F		Y
Oxidation Reduction Potential	0006	WL	4/19/2023	N	F	107	mV		F		Y
Oxidation Reduction Potential	0012R	WL	4/19/2023	N	F	95.3	mV		F		Y
Oxidation Reduction Potential	0013	WL	4/19/2023	N	F	87.5	mV		F		Y
Oxidation Reduction Potential	0062	WL	4/17/2023	N	F	50.9	mV		F		Y
Oxidation Reduction Potential	0063	WL	4/17/2023	N	F	17.8	mV		F		Y
Oxidation Reduction Potential	0064	WL	4/17/2023	N	F	110.3	mV		F		Y
Oxidation Reduction Potential	0065	WL	4/18/2023	N	F	54.6	mV		F		Y
Oxidation Reduction Potential	0066	WL	4/18/2023	N	F	25.3	mV		F		Y
Oxidation Reduction Potential	0102	WL	4/19/2023	N	F	-9.9	mV		F		Y
Oxidation Reduction Potential	0105	WL	4/19/2023	N	F	0.7	mV		F		Y
Oxidation Reduction Potential	0106	WL	4/19/2023	N	F	47.3	mV		F		Y
Oxidation Reduction Potential	0112	WL	4/19/2023	N	F	-56	mV		F		Y
Oxidation Reduction Potential	0113	WL	4/19/2023	N	F	40.4	mV		F		Y
Oxidation Reduction Potential	0125	WL	4/17/2023	N	F	63.6	mV		F		Y
Oxidation Reduction Potential	0126	WL	4/17/2023	N	F	46.2	mV		F		Y
Oxidation Reduction Potential	0127	WL	4/17/2023	N	F	-18	mV		F		Y
Oxidation Reduction Potential	0135	WL	4/17/2023	N	F	9.9	mV		F		Y
Oxidation Reduction Potential	0136	WL	4/17/2023	N	F	-42.4	mV		F		Y
Oxidation Reduction Potential	0160	WL	4/19/2023	N	F	47.5	mV		F		Y
Oxidation Reduction Potential	0161	WL	4/19/2023	N	F	94	mV		F		Y
Oxidation Reduction Potential	0181	WL	4/18/2023	N	F	93.9	mV		F		Y
Oxidation Reduction Potential	0183	WL	4/18/2023	N	F	-27.8	mV		F		Y
Oxidation Reduction Potential	0186	WL	4/19/2023	N	F	59.5	mV		F		Y
Oxidation Reduction Potential	0187	WL	4/19/2023	N	F	-25.6	mV		F		Y
Oxidation Reduction Potential	0188	WL	4/18/2023	N	F	122.1	mV		F		Y
Oxidation Reduction Potential	0189	WL	4/18/2023	N	F	-52.8	mV		FQ		Y
Oxidation Reduction Potential	0667	WL	4/19/2023	N	F	101.4	mV				Y

Groundwater Quality Data by Parameter for Site GUN01, 2023 Sampling
Gunnison, Colorado, Processing Site

Report Date: 7/24/2023

PARAMETER	LOCATION CODE	/ TYPE	SAMPLE DATE	FRACTION	SAMPLE TYPE	RESULT	UNIT	QUALIFIERS LAB	/ DATA	DETECTION LIMIT	QA
pH	0002	WL	4/19/2023	N	F	7.23	s.u.		F		Y
pH	0005	WL	4/19/2023	N	F	7.28	s.u.		F		Y
pH	0006	WL	4/19/2023	N	F	7.08	s.u.		F		Y
pH	0012R	WL	4/19/2023	N	F	7.01	s.u.		F		Y
pH	0013	WL	4/19/2023	N	F	7.34	s.u.		F		Y
pH	0062	WL	4/17/2023	N	F	7.36	s.u.		F		Y
pH	0063	WL	4/17/2023	N	F	7.41	s.u.		F		Y
pH	0064	WL	4/17/2023	N	F	7.27	s.u.		F		Y
pH	0065	WL	4/18/2023	N	F	7.35	s.u.		F		Y
pH	0066	WL	4/18/2023	N	F	7.26	s.u.		F		Y
pH	0102	WL	4/19/2023	N	F	7.31	s.u.		F		Y
pH	0105	WL	4/19/2023	N	F	6.86	s.u.		F		Y
pH	0106	WL	4/19/2023	N	F	6.18	s.u.		F		Y
pH	0112	WL	4/19/2023	N	F	6.36	s.u.		F		Y
pH	0113	WL	4/19/2023	N	F	6.97	s.u.		F		Y
pH	0125	WL	4/17/2023	N	F	7.21	s.u.		F		Y
pH	0126	WL	4/17/2023	N	F	7.19	s.u.		F		Y
pH	0127	WL	4/17/2023	N	F	7.31	s.u.		F		Y
pH	0135	WL	4/17/2023	N	F	6.67	s.u.		F		Y
pH	0136	WL	4/17/2023	N	F	6.72	s.u.		F		Y
pH	0160	WL	4/19/2023	N	F	6.63	s.u.		F		Y
pH	0161	WL	4/19/2023	N	F	6.64	s.u.		F		Y
pH	0181	WL	4/18/2023	N	F	6.95	s.u.		F		Y
pH	0183	WL	4/18/2023	N	F	6.73	s.u.		F		Y
pH	0186	WL	4/19/2023	N	F	7.63	s.u.		F		Y
pH	0187	WL	4/19/2023	N	F	6.45	s.u.		F		Y
pH	0188	WL	4/18/2023	N	F	7.18	s.u.		F		Y
pH	0189	WL	4/18/2023	N	F	6.49	s.u.		FQ		Y
pH	0667	WL	4/19/2023	N	F	7.35	s.u.				Y
Specific Conductance	0002	WL	4/19/2023	N	F	495	umhos/cm		F		Y
Specific Conductance	0005	WL	4/19/2023	N	F	481	umhos/cm		F		Y
Specific Conductance	0006	WL	4/19/2023	N	F	1724	umhos/cm		F		Y
Specific Conductance	0012R	WL	4/19/2023	N	F	808	umhos/cm		F		Y
Specific Conductance	0013	WL	4/19/2023	N	F	619	umhos/cm		F		Y
Specific Conductance	0062	WL	4/17/2023	N	F	488	umhos/cm		F		Y
Specific Conductance	0063	WL	4/17/2023	N	F	534	umhos/cm		F		Y
Specific Conductance	0064	WL	4/17/2023	N	F	486	umhos/cm		F		Y
Specific Conductance	0065	WL	4/18/2023	N	F	591	umhos/cm		F		Y
Specific Conductance	0066	WL	4/18/2023	N	F	590	umhos/cm		F		Y
Specific Conductance	0102	WL	4/19/2023	N	F	516	umhos/cm		F		Y
Specific Conductance	0105	WL	4/19/2023	N	F	467	umhos/cm		F		Y
Specific Conductance	0106	WL	4/19/2023	N	F	1191	umhos/cm		F		Y
Specific Conductance	0112	WL	4/19/2023	N	F	1023	umhos/cm		F		Y
Specific Conductance	0113	WL	4/19/2023	N	F	571	umhos/cm		F		Y
Specific Conductance	0125	WL	4/17/2023	N	F	498	umhos/cm		F		Y
Specific Conductance	0126	WL	4/17/2023	N	F	661	umhos/cm		F		Y
Specific Conductance	0127	WL	4/17/2023	N	F	764	umhos/cm		F		Y
Specific Conductance	0135	WL	4/17/2023	N	F	448	umhos/cm		F		Y
Specific Conductance	0136	WL	4/17/2023	N	F	465	umhos/cm		F		Y
Specific Conductance	0160	WL	4/19/2023	N	F	872	umhos/cm		F		Y
Specific Conductance	0161	WL	4/19/2023	N	F	893	umhos/cm		F		Y
Specific Conductance	0181	WL	4/18/2023	N	F	436	umhos/cm		F		Y
Specific Conductance	0183	WL	4/18/2023	N	F	919	umhos/cm		F		Y
Specific Conductance	0186	WL	4/19/2023	N	F	659	umhos/cm		F		Y
Specific Conductance	0187	WL	4/19/2023	N	F	1224	umhos/cm		F		Y
Specific Conductance	0188	WL	4/18/2023	N	F	658	umhos/cm		F		Y
Specific Conductance	0189	WL	4/18/2023	N	F	1774	umhos/cm		FQ		Y
Specific Conductance	0667	WL	4/19/2023	N	F	235	umhos/cm				Y
Temperature	0002	WL	4/19/2023	N	F	7.21	C		F		Y
Temperature	0005	WL	4/19/2023	N	F	8.25	C		F		Y

Groundwater Quality Data by Parameter for Site GUN01, 2023 Sampling
Gunnison, Colorado, Processing Site

Report Date: 7/24/2023

PARAMETER	LOCATION CODE	TYPE	SAMPLE DATE	FRACTION	SAMPLE TYPE	RESULT	UNIT	QUALIFIERS LAB	QUALIFIERS DATA	DETECTION LIMIT	QA
Temperature	0006	WL	4/19/2023	N	F	5.88	C		F		Y
Temperature	0012R	WL	4/19/2023	N	F	7.86	C		F		Y
Temperature	0013	WL	4/19/2023	N	F	7.19	C		F		Y
Temperature	0062	WL	4/17/2023	N	F	10.18	C		F		Y
Temperature	0063	WL	4/17/2023	N	F	10.62	C		F		Y
Temperature	0064	WL	4/17/2023	N	F	8.32	C		F		Y
Temperature	0065	WL	4/18/2023	N	F	8.67	C		F		Y
Temperature	0066	WL	4/18/2023	N	F	8.56	C		F		Y
Temperature	0102	WL	4/19/2023	N	F	9.55	C		F		Y
Temperature	0105	WL	4/19/2023	N	F	9.8	C		F		Y
Temperature	0106	WL	4/19/2023	N	F	9.31	C		F		Y
Temperature	0112	WL	4/19/2023	N	F	10.03	C		F		Y
Temperature	0113	WL	4/19/2023	N	F	10.38	C		F		Y
Temperature	0125	WL	4/17/2023	N	F	6.99	C		F		Y
Temperature	0126	WL	4/17/2023	N	F	8.74	C		F		Y
Temperature	0127	WL	4/17/2023	N	F	8.75	C		F		Y
Temperature	0135	WL	4/17/2023	N	F	6.49	C		F		Y
Temperature	0136	WL	4/17/2023	N	F	5.06	C		F		Y
Temperature	0160	WL	4/19/2023	N	F	7.21	C		F		Y
Temperature	0161	WL	4/19/2023	N	F	7.5	C		F		Y
Temperature	0181	WL	4/18/2023	N	F	6.58	C		F		Y
Temperature	0183	WL	4/18/2023	N	F	7.87	C		F		Y
Temperature	0186	WL	4/19/2023	N	F	7.82	C		F		Y
Temperature	0187	WL	4/19/2023	N	F	7.23	C		F		Y
Temperature	0188	WL	4/18/2023	N	F	6.62	C		F		Y
Temperature	0189	WL	4/18/2023	N	F	6.28	C		FQ		Y
Temperature	0667	WL	4/19/2023	N	F	10.26	C				Y
Turbidity	0002	WL	4/19/2023	N	F	0.8	NTU		F		Y
Turbidity	0005	WL	4/19/2023	N	F	1.53	NTU		F		Y
Turbidity	0006	WL	4/19/2023	N	F	1.6	NTU		F		Y
Turbidity	0012R	WL	4/19/2023	N	F	8.57	NTU		F		Y
Turbidity	0013	WL	4/19/2023	N	F	1.29	NTU		F		Y
Turbidity	0062	WL	4/17/2023	N	F	1.59	NTU		F		Y
Turbidity	0063	WL	4/17/2023	N	F	1.13	NTU		F		Y
Turbidity	0064	WL	4/17/2023	N	F	5.74	NTU		F		Y
Turbidity	0065	WL	4/18/2023	N	F	1.7	NTU		F		Y
Turbidity	0066	WL	4/18/2023	N	F	1.63	NTU		F		Y
Turbidity	0102	WL	4/19/2023	N	F	0.7	NTU		F		Y
Turbidity	0105	WL	4/19/2023	N	F	2.47	NTU		F		Y
Turbidity	0106	WL	4/19/2023	N	F	1.16	NTU		F		Y
Turbidity	0112	WL	4/19/2023	N	F	9.31	NTU		F		Y
Turbidity	0113	WL	4/19/2023	N	F	6.1	NTU		F		Y
Turbidity	0125	WL	4/17/2023	N	F	0.86	NTU		F		Y
Turbidity	0126	WL	4/17/2023	N	F	0.52	NTU		F		Y
Turbidity	0127	WL	4/17/2023	N	F	1.01	NTU		F		Y
Turbidity	0135	WL	4/17/2023	N	F	6.52	NTU		F		Y
Turbidity	0136	WL	4/17/2023	N	F	9.36	NTU		F		Y
Turbidity	0160	WL	4/19/2023	N	F	2.25	NTU		F		Y
Turbidity	0161	WL	4/19/2023	N	F	0.93	NTU		F		Y
Turbidity	0181	WL	4/18/2023	N	F	2.36	NTU		F		Y
Turbidity	0183	WL	4/18/2023	N	F	0.82	NTU		F		Y
Turbidity	0186	WL	4/19/2023	N	F	0.36	NTU		F		Y
Turbidity	0187	WL	4/19/2023	N	F	0.44	NTU		F		Y
Turbidity	0188	WL	4/18/2023	N	F	0.83	NTU		F		Y
Turbidity	0189	WL	4/18/2023	N	F	3.32	NTU		FQ		Y
Turbidity	0667	WL	4/19/2023	N	F	1.4	NTU				Y
Uranium	0002	WL	4/19/2023	T	F	0.00225	mg/L		F	0.000067	Y
Uranium	0005	WL	4/19/2023	T	F	0.0297	mg/L		F	0.000067	Y
Uranium	0006	WL	4/19/2023	T	F	0.342	mg/L		F	0.000067	Y
Uranium	0012R	WL	4/19/2023	T	F	0.201	mg/L		F	0.000067	Y

Groundwater Quality Data by Parameter for Site GUN01, 2023 Sampling
Gunnison, Colorado, Processing Site

Report Date: 7/24/2023

PARAMETER	LOCATION CODE	/ TYPE	SAMPLE DATE	FRACTION	SAMPLE TYPE	RESULT	UNIT	QUALIFIERS LAB	/ DATA	DETECTION LIMIT	QA
Uranium	0013	WL	4/19/2023	T	F	0.0223	mg/L		F	0.000067	Y
Uranium	0062	WL	4/17/2023	T	F	0.00593	mg/L		F	0.000067	Y
Uranium	0063	WL	4/17/2023	T	F	0.0136	mg/L		F	0.000067	Y
Uranium	0064	WL	4/17/2023	T	F	0.0106	mg/L		F	0.000067	Y
Uranium	0065	WL	4/18/2023	T	F	0.0169	mg/L		F	0.000067	Y
Uranium	0066	WL	4/18/2023	T	D	0.0177	mg/L		F	0.000067	Y
Uranium	0066	WL	4/18/2023	T	F	0.0182	mg/L		F	0.000067	Y
Uranium	0102	WL	4/19/2023	T	F	0.00369	mg/L		F	0.000067	Y
Uranium	0105	WL	4/19/2023	T	F	0.0101	mg/L		F	0.000067	Y
Uranium	0106	WL	4/19/2023	T	F	0.112	mg/L		F	0.000067	Y
Uranium	0112	WL	4/19/2023	T	F	0.104	mg/L		F	0.000067	Y
Uranium	0113	WL	4/19/2023	T	F	0.102	mg/L		F	0.000067	Y
Uranium	0125	WL	4/17/2023	T	F	0.00849	mg/L		F	0.000067	Y
Uranium	0126	WL	4/17/2023	T	F	0.0105	mg/L		F	0.000067	Y
Uranium	0127	WL	4/17/2023	T	F	0.014	mg/L		F	0.000067	Y
Uranium	0135	WL	4/17/2023	T	F	0.00219	mg/L		F	0.000067	Y
Uranium	0136	WL	4/17/2023	T	F	0.00226	mg/L		F	0.000067	Y
Uranium	0160	WL	4/19/2023	T	D	0.0268	mg/L		F	0.000067	Y
Uranium	0160	WL	4/19/2023	T	F	0.0264	mg/L		F	0.000067	Y
Uranium	0161	WL	4/19/2023	T	F	0.021	mg/L		F	0.000067	Y
Uranium	0181	WL	4/18/2023	T	F	0.0063	mg/L		F	0.000067	Y
Uranium	0183	WL	4/18/2023	T	F	0.0373	mg/L		F	0.000067	Y
Uranium	0186	WL	4/19/2023	T	F	0.0151	mg/L		F	0.000067	Y
Uranium	0187	WL	4/19/2023	T	F	0.031	mg/L		F	0.000067	Y
Uranium	0188	WL	4/18/2023	T	F	0.0241	mg/L		F	0.000067	Y
Uranium	0189	WL	4/18/2023	T	F	0.0105	mg/L		FQ	0.000067	Y
Uranium	0667	WL	4/19/2023	T	F	0.00357	mg/L			0.000067	Y

Location Type

WL	Well

Sample Type

F	Field Sample
D	Duplicate

Fraction

T	Total (for metal concentrations)
N	Organic (or other) constituents for which neither total nor dissolved is applicable

Data Qualifiers

F	Low flow sampling method used. Estimated
J	Estimated value
Q	Qualitative result due to sampling technique

Lab Qualifiers

B	Blank contamination. The recorded result is associated with a contaminated blank.
J	Estimated value
U	Parameter analyzed for but was not detected.

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

Surface Water Quality Data by Parameter for Site GUN01, 2023 Sampling
Gunnison, Colorado, Processing Site

Report Date: 7/24/2023

PARAMETER	LOCATION CODE	TYPE	SAMPLE DATE	FRACTION	SAMPLE TYPE	RESULT	UNIT	QUALIFIERS LAB	QUALIFIERS DATA	DETECTION LIMIT	QA
Manganese	0248	SL	4/17/2023	D	F	0.102	mg/L			0.002	Y
Manganese	0250	SL	4/18/2023	D	F	0.0414	mg/L			0.002	Y
Manganese	0251	SL	4/19/2023	D	F	0.105	mg/L			0.002	Y
Manganese	0777	SL	4/18/2023	D	F	0.0968	mg/L			0.002	Y
Manganese	0780	SL	4/19/2023	T	F	0.0157	mg/L			0.002	Y
Manganese	0795	SL	4/19/2023	T	F	0.0755	mg/L			0.002	Y
Oxidation Reduction Potential	0248	SL	4/17/2023	N	F	69.1	mV				Y
Oxidation Reduction Potential	0250	SL	4/18/2023	N	F	4.5	mV				Y
Oxidation Reduction Potential	0251	SL	4/19/2023	N	F	50.2	mV				Y
Oxidation Reduction Potential	0777	SL	4/18/2023	N	F	41.7	mV				Y
Oxidation Reduction Potential	0780	SL	4/19/2023	N	F	47.8	mV				Y
Oxidation Reduction Potential	0795	SL	4/19/2023	N	F	51.9	mV				Y
pH	0248	SL	4/17/2023	N	F	8.06	s.u.				Y
pH	0250	SL	4/18/2023	N	F	8.39	s.u.				Y
pH	0251	SL	4/19/2023	N	F	8.11	s.u.				Y
pH	0777	SL	4/18/2023	N	F	7.94	s.u.				Y
pH	0780	SL	4/19/2023	N	F	8.87	s.u.				Y
pH	0795	SL	4/19/2023	N	F	8.46	s.u.				Y
Specific Conductance	0248	SL	4/17/2023	N	F	230	umhos/cm				Y
Specific Conductance	0250	SL	4/18/2023	N	F	203	umhos/cm				Y
Specific Conductance	0251	SL	4/19/2023	N	F	211	umhos/cm				Y
Specific Conductance	0777	SL	4/18/2023	N	F	232	umhos/cm				Y
Specific Conductance	0795	SL	4/19/2023	N	F	207	umhos/cm				Y
Temperature	0248	SL	4/17/2023	N	F	10.16	C				Y
Temperature	0250	SL	4/18/2023	N	F	9.31	C				Y
Temperature	0251	SL	4/19/2023	N	F	4.26	C				Y
Temperature	0777	SL	4/18/2023	N	F	10.62	C				Y
Temperature	0780	SL	4/19/2023	N	F	3.2	C				Y
Temperature	0795	SL	4/19/2023	N	F	6.57	C				Y
Turbidity	0248	SL	4/17/2023	N	F	24.7	NTU				Y
Turbidity	0250	SL	4/18/2023	N	F	10.1	NTU				Y
Turbidity	0251	SL	4/19/2023	N	F	14	NTU				Y
Turbidity	0777	SL	4/18/2023	N	F	23.3	NTU				Y
Turbidity	0780	SL	4/19/2023	N	F	1.38	NTU				Y
Turbidity	0795	SL	4/19/2023	N	F	9.73	NTU				Y
Uranium	0248	SL	4/17/2023	D	F	0.00461	mg/L			0.000067	Y
Uranium	0250	SL	4/18/2023	D	F	0.000842	mg/L			0.000067	Y
Uranium	0251	SL	4/19/2023	D	F	0.00082	mg/L			0.000067	Y
Uranium	0777	SL	4/18/2023	D	F	0.00395	mg/L			0.000067	Y
Uranium	0780	SL	4/19/2023	T	F	0.00204	mg/L			0.000067	Y
Uranium	0795	SL	4/19/2023	T	F	0.000819	mg/L			0.000067	Y

Location Type

SL	Surface Location

Sample Type

F	Field Sample
D	Duplicate

Fraction

T	Total (for metal concentrations)
N	Organic (or other) constituents for which neither total nor dissolved is applicable

Data Qualifiers

F	Low flow sampling method used. Estimated
J	Estimated value
Q	Qualitative result due to sampling technique

Lab Qualifiers

B	Blank contamination. The recorded result is associated with a contaminated blank.
J	Estimated value
U	Parameter analyzed for but was not detected.

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

Appendix B

Static Water Level Data for the Gunnison Site

Note: This appendix includes static water level data for the period (1999–2023) addressed in this report. Historical water level measurements are also accessible via the Geospatial Environmental Mapping System (GEMS).

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0002	5/27/1999	12:21	7654.25	8.93	7645.32
0002	10/12/1999	9:42	7654.25	7.41	7646.84
0002	5/10/2000	9:53	7654.25	9.88	7644.37
0002	5/19/2005	11:06	7654.25	9.60	7644.65
0002	5/16/2006	16:03	7651.74	6.73	7645.01
0002	5/2/2007	13:25	7651.74	10.75	7640.99
0002	5/6/2008	0:00	7651.74	3.20	7648.54
0002	4/21/2009	10:50	7651.74	5.40	7646.34
0002	4/13/2010	8:50	7651.74	5.90	7645.84
0002	4/27/2011	15:25	7651.74	5.43	7646.31
0002	4/25/2012	9:50	7651.74	6.30	7645.44
0002	4/15/2013	14:15	7651.74	3.95	7647.79
0002	4/15/2014	9:00	7651.74	4.74	7647.00
0002	4/14/2015	13:30	7651.74	5.46	7646.28
0002	4/20/2016	15:03	7651.74	5.82	7645.92
0002	4/17/2017	14:10	7651.74	3.63	7648.11
0002	4/18/2018	8:20	7651.74	6.36	7645.38
0002	5/1/2019	7:38	7651.74	4.10	7647.64
0002	4/7/2021	8:25	7651.74	5.89	7645.85
0002	4/12/2022	8:45	7651.74	6.75	7644.99
0002	4/19/2023	8:35	7651.74	4.03	7647.71
0005	5/15/2006	15:39	7649.65	7.02	7642.63
0005	5/3/2007	8:07	7649.65	10.30	7639.35
0005	5/7/2008	0:00	7649.65	4.70	7644.95
0005	4/21/2009	17:00	7649.65	6.91	7642.74
0005	4/14/2010	9:20	7649.65	7.17	7642.48
0005	4/26/2011	16:10	7649.65	6.48	7643.17
0005	4/24/2012	11:30	7649.65	6.56	7643.09
0005	4/16/2013	14:55	7649.65	3.91	7645.74
0005	4/14/2014	18:00	7649.65	5.56	7644.09
0005	4/15/2015	14:20	7649.65	6.25	7643.40
0005	4/20/2016	17:28	7649.65	6.35	7643.30
0005	4/18/2017	13:40	7649.65	4.38	7645.27
0005	4/17/2018	15:30	7649.65	6.22	7643.43
0005	5/1/2019	12:55	7649.65	4.69	7644.96
0005	4/6/2021	18:40	7649.65	6.65	7643.00
0005	4/12/2022	11:04	7649.65	7.74	7641.91
0005	4/19/2023	10:54	7649.65	4.48	7645.17
0006	5/25/1999	9:13	7652.18	11.12	7641.06
0006	6/1/1999	16:51	7652.18	11.07	7641.11
0006	10/6/1999	14:33	7652.18	11.22	7640.96
0006	5/10/2000	14:24	7652.18	11.35	7640.83
0006	4/26/2001	11:26	7652.18	12.23	7639.95
0006	5/6/2002	16:38	7652.18	12.57	7639.61
0006	5/20/2003	16:02	7652.18	13.25	7638.93
0006	9/17/2003	13:19	7652.18	11.05	7641.13
0006	5/13/2004	13:15	7652.18	12.46	7639.72
0006	5/20/2005	7:43	7652.18	15.92	7636.26
0006	5/15/2006	16:49	7652.18	14.84	7637.34
0006	5/7/2008	0:00	7652.22	9.32	7642.90
0006	4/21/2009	17:30	7652.22	11.84	7640.38
0006	4/14/2010	10:15	7652.22	11.63	7640.59
0006	4/26/2011	15:25	7652.22	11.28	7640.94
0006	4/24/2012	10:30	7652.22	11.55	7640.67
0006	4/16/2013	13:40	7652.22	9.65	7642.57
0006	4/14/2014	16:50	7652.22	10.52	7641.70
0006	4/15/2015	14:45	7652.22	11.18	7641.04
0006	4/20/2016	16:45	7652.22	11.36	7640.86
0006	4/18/2017	14:00	7652.22	9.51	7642.71

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0006	4/16/2018	16:45	7652.22	11.45	7640.77
0006	5/1/2019	13:34	7652.22	9.71	7642.51
0006	4/6/2021	17:22	7652.22	11.49	7640.73
0006	4/12/2022	11:27	7652.22	12.40	7639.82
0006	4/19/2023	11:17	7652.22	9.78	7642.44
0012	5/25/1999	9:37	7650.45	11.55	7638.90
0012	4/26/2001	10:32	7650.45	12.30	7638.15
0012	5/6/2002	15:16	7650.45	13.82	7636.63
0012	5/20/2003	17:19	7650.45	15.25	7635.20
0012	9/17/2003	13:47	7650.45	13.68	7636.77
0012	5/13/2004	12:24	7650.45	14.28	7636.17
0012	5/17/2005	16:23	7650.45	16.09	7634.36
0012	5/15/2006	18:47	7650.45	16.24	7634.21
0012R	6/10/2008	0:00	7650.94	10.14	7640.80
0012R	4/21/2009	13:45	7650.94	12.33	7638.61
0012R	4/14/2010	11:15	7650.94	12.13	7638.81
0012R	4/26/2011	14:40	7650.94	11.78	7639.16
0012R	4/24/2012	14:55	7650.94	12.09	7638.85
0012R	4/15/2013	15:50	7650.94	10.81	7640.13
0012R	4/14/2014	15:55	7650.94	11.26	7639.68
0012R	4/16/2015	9:00	7650.94	11.62	7639.32
0012R	4/19/2016	8:23	7650.94	12.12	7638.82
0012R	4/18/2017	15:15	7650.94	10.51	7640.43
0012R	4/17/2018	14:10	7650.94	12.20	7638.74
0012R	5/1/2019	10:30	7650.94	10.81	7640.13
0012R	4/7/2021	9:40	7650.94	12.12	7638.82
0012R	4/12/2022	13:52	7650.94	12.84	7638.10
0012R	4/19/2023	12:00	7650.94	10.92	7640.02
0013	5/25/1999	8:52	7648.75	10.55	7638.20
0013	5/26/1999	9:17	7648.75	10.69	7638.06
0013	10/5/1999	17:16	7648.75	13.43	7635.32
0013	5/9/2000	17:20	7648.75	9.09	7639.66
0013	4/25/2001	18:08	7648.75	12.73	7636.02
0013	5/6/2002	13:30	7648.75	13.89	7634.86
0013	5/21/2003	10:05	7648.75	13.51	7635.24
0013	5/13/2004	8:30	7648.75	14.04	7634.71
0013	5/16/2005	15:27	7648.75	17.79	7630.96
0013	5/18/2006	0:00	7648.75	22.77	7625.98
0013	5/6/2008	0:00	7648.75	10.57	7638.18
0013	4/22/2009	8:35	7648.75	12.69	7636.06
0013	4/13/2010	11:15	7648.75	12.41	7636.34
0013	4/26/2011	13:50	7648.75	12.18	7636.57
0013	4/24/2012	15:40	7648.75	10.98	7637.77
0013	4/16/2013	13:10	7648.75	10.83	7637.92
0013	4/15/2014	9:30	7648.75	11.59	7637.16
0013	4/15/2015	8:35	7648.75	12.08	7636.67
0013	4/20/2016	13:11	7648.75	11.80	7636.95
0013	4/18/2017	9:55	7648.75	10.98	7637.77
0013	4/17/2018	13:17	7648.75	10.49	7638.26
0013	5/1/2019	9:20	7648.75	11.10	7637.65
0013	4/7/2021	10:49	7648.75	12.00	7636.75
0013	4/12/2022	13:14	7648.75	12.70	7636.05
0013	4/19/2023	9:40	7648.75	10.68	7638.07
0062	5/18/2005	14:02	7635.65	9.79	7625.86
0062	5/18/2006	9:17	7635.65	9.85	7625.80
0062	5/2/2007	10:48	7635.65	11.47	7624.18
0062	5/6/2008	0:00	7635.65	6.74	7628.91
0062	4/20/2009	15:20	7635.65	7.20	7628.45
0062	4/15/2010	9:15	7635.65	6.48	7629.17

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0062	4/27/2011	17:20	7635.65	6.25	7629.40
0062	4/23/2012	15:10	7635.65	5.68	7629.97
0062	4/16/2013	9:15	7635.65	5.60	7630.05
0062	4/15/2014	10:25	7635.65	5.79	7629.86
0062	4/14/2015	10:15	7635.65	6.71	7628.94
0062	4/19/2016	17:58	7635.65	5.75	7629.90
0062	4/19/2017	13:20	7635.65	6.19	7629.46
0062	4/17/2018	8:20	7635.65	5.18	7630.47
0062	4/30/2019	17:10	7635.65	5.56	7630.09
0062	4/6/2021	14:40	7635.65	5.90	7629.75
0062	4/11/2022	15:17	7635.65	6.31	7629.34
0062	4/17/2023	14:13	7635.65	5.40	7630.25
0063	5/19/2005	8:13	7635.38	10.09	7625.29
0063	5/18/2006	8:38	7635.38	10.89	7624.49
0063	5/2/2007	11:10	7635.38	11.68	7623.70
0063	5/6/2008	0:00	7635.38	7.76	7627.62
0063	4/20/2009	15:45	7635.38	8.18	7627.20
0063	4/15/2010	10:35	7635.38	7.54	7627.84
0063	4/27/2011	16:55	7635.38	7.45	7627.93
0063	4/23/2012	15:35	7635.38	6.85	7628.53
0063	4/16/2013	9:00	7635.38	6.93	7628.45
0063	4/15/2014	11:05	7635.38	7.00	7628.38
0063	4/14/2015	10:35	7635.38	7.79	7627.59
0063	4/19/2016	17:38	7635.38	7.11	7628.27
0063	4/19/2017	13:45	7635.38	7.44	7627.94
0063	4/17/2018	7:55	7635.38	6.59	7628.79
0063	4/30/2019	16:50	7635.38	6.83	7628.55
0063	4/6/2021	14:25	7635.38	7.25	7628.13
0063	4/11/2022	14:53	7635.38	7.58	7627.80
0063	4/17/2023	14:41	7635.38	6.76	7628.62
0064	5/17/2006	18:12	7625.80	7.05	7618.75
0064	5/3/2007	10:08	7625.80	5.63	7620.17
0064	5/6/2008	0:00	7625.80	6.69	7619.11
0064	4/20/2009	14:50	7625.80	7.13	7618.67
0064	4/15/2010	11:40	7625.80	6.76	7619.04
0064	4/27/2011	18:10	7625.80	6.57	7619.23
0064	4/23/2012	16:35	7625.80	6.10	7619.70
0064	4/16/2013	10:05	7625.80	6.31	7619.49
0064	4/15/2014	12:25	7625.80	6.18	7619.62
0064	4/14/2015	9:35	7625.80	6.92	7618.88
0064	4/19/2016	16:36	7625.80	6.67	7619.13
0064	4/19/2017	12:50	7625.80	6.63	7619.17
0064	4/17/2018	9:15	7625.80	5.84	7619.96
0064	5/2/2019	14:50	7625.80	6.03	7619.77
0064	4/6/2021	13:30	7625.80	6.57	7619.23
0064	4/11/2022	16:20	7625.80	6.81	7618.99
0064	4/17/2023	15:27	7625.80	6.26	7619.54
0065	5/17/2005	13:15	7615.30	1.74	7613.56
0065	5/16/2006	17:02	7615.30	2.11	7613.19
0065	5/2/2007	17:40	7615.30	1.78	7613.52
0065	5/6/2008	0:00	7615.30	1.98	7613.32
0065	4/22/2009	7:50	7615.30	2.26	7613.04
0065	4/13/2010	17:15	7615.30	2.04	7613.26
0065	4/27/2011	11:00	7615.30	2.10	7613.20
0065	4/25/2012	14:00	7615.30	2.03	7613.27
0065	4/15/2013	18:00	7615.30	1.92	7613.38
0065	4/15/2014	13:30	7615.30	1.98	7613.32
0065	4/16/2015	10:00	7615.30	2.19	7613.11
0065	4/20/2016	9:55	7615.30	1.96	7613.34

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0065	4/19/2017	9:30	7615.30	1.97	7613.33
0065	4/18/2018	13:44	7615.30	2.10	7613.20
0065	5/2/2019	10:12	7615.30	1.63	7613.67
0065	4/7/2021	13:55	7615.30	2.11	7613.19
0065	4/12/2022	16:13	7615.30	2.38	7612.92
0065	4/18/2023	17:54	7615.30	1.87	7613.43
0066	5/17/2005	11:05	7611.24	1.75	7609.49
0066	5/16/2006	14:03	7611.24	1.46	7609.78
0066	5/2/2007	8:30	7611.24	1.72	7609.52
0066	5/5/2008	0:00	7611.24	1.48	7609.76
0066	4/21/2009	16:00	7611.24	1.81	7609.43
0066	4/12/2010	14:50	7611.24	2.01	7609.23
0066	4/25/2011	17:25	7611.24	2.07	7609.17
0066	4/25/2012	12:45	7611.24	2.60	7608.64
0066	4/15/2013	17:15	7611.24	2.23	7609.01
0066	4/15/2014	14:55	7611.24	1.78	7609.46
0066	4/13/2015	16:55	7611.24	2.29	7608.95
0066	4/20/2016	10:45	7611.24	2.09	7609.15
0066	4/19/2017	10:10	7611.24	1.20	7610.04
0066	4/18/2018	12:48	7611.24	2.55	7608.69
0066	5/2/2019	10:38	7611.24	0.93	7610.31
0066	4/7/2021	14:20	7611.24	2.21	7609.03
0066	4/12/2022	16:40	7611.24	2.42	7608.82
0066	4/18/2023	16:07	7611.24	1.75	7609.49
0102	5/27/1999	11:32	7654.20	8.90	7645.30
0102	10/12/1999	10:01	7654.20	7.58	7646.62
0102	5/10/2000	9:23	7654.20	9.72	7644.48
0102	5/19/2005	11:36	7654.20	9.96	7644.24
0102	5/16/2006	15:33	7652.29	7.80	7644.49
0102	5/2/2007	13:40	7652.29	11.50	7640.79
0102	5/6/2008	0:00	7652.29	4.08	7648.21
0102	4/21/2009	11:05	7652.29	6.15	7646.14
0102	4/13/2010	9:30	7652.29	6.64	7645.65
0102	4/27/2011	16:05	7652.29	6.05	7646.24
0102	4/25/2012	10:05	7652.29	6.87	7645.42
0102	4/15/2013	14:30	7652.29	4.68	7647.61
0102	4/15/2014	9:25	7652.29	5.50	7646.79
0102	4/14/2015	13:50	7652.29	6.19	7646.10
0102	4/20/2016	15:19	7652.29	6.44	7645.85
0102	4/17/2017	14:25	7652.29	4.40	7647.89
0102	4/18/2018	8:40	7652.29	6.90	7645.39
0102	5/1/2019	7:21	7652.29	4.82	7647.47
0102	4/7/2021	7:50	7652.29	6.44	7645.85
0102	4/12/2022	8:58	7652.29	7.30	7644.99
0102	4/19/2023	8:51	7652.29	4.75	7647.54
0105	5/25/1999	9:11	7651.10	7.86	7643.24
0105	5/20/2005	9:08	7651.10	9.65	7641.45
0105	5/15/2006	18:10	7651.10	9.48	7641.62
0105	5/3/2007	8:26	7651.10	10.51	7640.59
0105	5/7/2008	0:00	7651.10	6.84	7644.26
0105	4/21/2009	16:40	7651.10	8.95	7642.15
0105	4/14/2010	9:00	7651.10	9.18	7641.92
0105	4/26/2011	16:20	7651.10	5.43	7645.67
0105	4/24/2012	11:50	7651.10	8.39	7642.71
0105	4/16/2013	14:45	7651.10	6.06	7645.04
0105	4/15/2014	10:00	7651.10	7.71	7643.39
0105	4/15/2015	13:50	7651.10	8.30	7642.80
0105	4/20/2016	17:52	7651.10	8.90	7642.20
0105	4/18/2017	13:25	7651.10	7.23	7643.87

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0105	4/17/2018	15:45	7651.10	8.45	7642.65
0105	5/1/2019	13:35	7651.10	7.06	7644.04
0105	4/6/2021	18:15	7651.10	8.80	7642.30
0105	4/12/2022	10:45	7651.10	9.81	7641.29
0105	4/19/2023	10:30	7651.10	6.86	7644.24
0106	5/25/1999	9:11	7652.29	11.34	7640.95
0106	6/1/1999	17:21	7652.29	11.15	7641.14
0106	10/6/1999	15:10	7652.29	11.38	7640.91
0106	5/10/2000	14:44	7652.29	11.38	7640.91
0106	4/26/2001	11:46	7652.29	12.50	7639.79
0106	5/6/2002	17:32	7652.29	13.00	7639.29
0106	5/20/2003	15:34	7652.29	13.58	7638.71
0106	5/13/2004	13:44	7652.29	12.98	7639.31
0106	5/20/2005	8:05	7652.29	16.31	7635.98
0106	5/15/2006	16:19	7652.29	15.35	7636.94
0106	5/2/2007	16:23	7652.29	20.90	7631.39
0106	5/7/2008	0:00	7652.21	9.60	7642.61
0106	4/21/2009	17:50	7652.21	11.98	7640.23
0106	4/14/2010	9:55	7652.21	11.78	7640.43
0106	4/26/2011	15:40	7652.21	11.40	7640.81
0106	4/24/2012	10:50	7652.21	11.59	7640.62
0106	4/16/2013	14:00	7652.21	9.82	7642.39
0106	4/14/2014	17:15	7652.21	10.70	7641.51
0106	4/15/2015	15:05	7652.21	11.30	7640.91
0106	4/20/2016	13:11	7652.21	11.53	7640.68
0106	4/18/2017	14:25	7652.21	9.75	7642.46
0106	4/16/2018	17:20	7652.21	11.52	7640.69
0106	5/1/2019	13:53	7652.21	9.95	7642.26
0106	4/6/2021	17:50	7652.21	11.67	7640.54
0106	4/12/2022	12:01	7652.21	12.55	7639.66
0106	4/19/2023	11:30	7652.21	10.00	7642.21
0112	5/25/1999	9:38	7649.83	11.47	7638.36
0112	4/26/2001	10:48	7649.83	12.12	7637.71
0112	5/6/2002	16:00	7649.83	14.20	7635.63
0112	5/20/2003	16:49	7649.83	15.60	7634.23
0112	5/13/2004	12:50	7649.83	15.10	7634.73
0112	5/17/2005	17:00	7649.83	19.56	7630.27
0112	5/15/2006	19:12	7649.83	18.75	7631.08
0112	5/2/2007	17:05	7649.83	25.30	7624.53
0112	5/7/2008	0:00	7650.73	10.72	7640.01
0112	4/21/2009	13:20	7650.73	12.72	7638.01
0112	4/14/2010	10:55	7650.73	12.53	7638.20
0112	4/26/2011	14:55	7650.73	12.14	7638.59
0112	4/24/2012	12:20	7650.73	12.38	7638.35
0112	4/15/2013	16:20	7650.73	11.29	7639.44
0112	4/14/2014	16:15	7650.73	11.69	7639.04
0112	4/16/2015	9:25	7650.73	12.38	7638.35
0112	4/19/2016	8:43	7650.73	12.51	7638.22
0112	4/18/2017	16:40	7650.73	11.14	7639.59
0112	4/17/2018	14:46	7650.73	12.49	7638.24
0112	5/1/2019	10:55	7650.73	11.37	7639.36
0112	4/7/2021	9:55	7650.73	12.46	7638.27
0112	4/12/2022	14:20	7650.73	13.16	7637.57
0112	4/19/2023	12:13	7650.73	11.47	7639.26
0113	5/25/1999	8:51	7648.82	10.90	7637.92
0113	5/26/1999	10:36	7648.82	11.01	7637.81
0113	10/5/1999	16:30	7648.82	13.79	7635.03
0113	5/9/2000	17:37	7648.82	9.67	7639.15
0113	4/25/2001	17:41	7648.82	12.86	7635.96

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0113	5/6/2002	14:04	7648.82	14.21	7634.61
0113	5/21/2003	10:22	7648.82	14.17	7634.65
0113	5/13/2004	7:56	7648.82	14.83	7633.99
0113	5/16/2005	16:08	7648.82	20.20	7628.62
0113	5/18/2006	11:17	7648.82	18.87	7629.95
0113	4/30/2007	15:05	7648.82	26.43	7622.39
0113	5/6/2008	0:00	7648.82	10.79	7638.03
0113	4/22/2009	8:55	7648.82	12.78	7636.04
0113	4/13/2010	10:50	7648.82	12.50	7636.32
0113	4/26/2011	13:25	7648.82	12.25	7636.57
0113	4/24/2012	16:05	7648.82	11.18	7637.64
0113	4/16/2013	12:55	7648.82	10.99	7637.83
0113	4/15/2014	9:05	7648.82	11.65	7637.17
0113	4/15/2015	8:55	7648.82	12.17	7636.65
0113	4/20/2016	13:11	7648.82	11.92	7636.90
0113	4/18/2017	10:20	7648.82	11.17	7637.65
0113	4/17/2018	12:55	7648.82	10.82	7638.00
0113	5/1/2019	8:57	7648.82	11.22	7637.60
0113	4/7/2021	10:45	7648.82	12.03	7636.79
0113	4/12/2022	12:56	7648.82	12.73	7636.09
0113	4/19/2023	9:50	7648.82	10.98	7637.84
0125	5/25/1999	10:10	7638.55	2.40	7636.15
0125	6/2/1999	8:41	7638.55	2.45	7636.10
0125	10/6/1999	16:15	7638.55	7.95	7630.60
0125	5/9/2000	14:01	7638.55	2.51	7636.04
0125	5/18/2005	11:55	7638.55	4.02	7634.53
0125	5/17/2006	14:43	7638.55	8.20	7630.35
0125	5/3/2007	13:32	7638.55	3.56	7634.99
0125	5/6/2008	0:00	7638.55	6.15	7632.40
0125	4/20/2009	16:35	7638.55	6.95	7631.60
0125	4/14/2010	17:00	7638.55	6.51	7632.04
0125	4/28/2011	7:50	7638.55	6.41	7632.14
0125	4/25/2012	8:45	7638.55	2.68	7635.87
0125	4/16/2013	7:45	7638.55	5.54	7633.01
0125	4/14/2014	16:30	7638.55	6.27	7632.28
0125	4/14/2015	14:25	7638.55	6.66	7631.89
0125	4/19/2016	15:33	7638.55	6.30	7632.25
0125	4/19/2017	14:45	7638.55	6.52	7632.03
0125	4/17/2018	10:30	7638.55	2.92	7635.63
0125	4/30/2019	15:25	7638.55	6.19	7632.36
0125	4/6/2021	12:00	7638.55	6.30	7632.25
0125	4/11/2022	14:05	7638.55	6.83	7631.72
0125	4/17/2023	17:59	7638.55	5.60	7632.95
0126	5/25/1999	10:12	7639.17	3.37	7635.80
0126	6/2/1999	9:08	7639.17	3.25	7635.92
0126	10/6/1999	16:55	7639.17	6.82	7632.35
0126	5/9/2000	14:37	7639.17	5.45	7633.72
0126	4/25/2001	15:30	7639.17	7.67	7631.50
0126	5/7/2002	8:35	7639.17	7.17	7632.00
0126	5/21/2003	8:42	7639.17	4.00	7635.17
0126	5/13/2004	9:18	7639.17	5.00	7634.17
0126	5/18/2005	10:54	7639.17	11.17	7628.00
0126	5/17/2006	15:15	7639.17	145.56	7493.61
0126	5/3/2007	13:06	7639.17	15.73	7623.44
0126	5/6/2008	0:00	7639.17	6.51	7632.66
0126	4/20/2009	16:55	7639.17	7.25	7631.92
0126	4/14/2010	17:30	7639.17	6.65	7632.52
0126	4/28/2011	8:20	7639.17	6.51	7632.66
0126	4/25/2012	8:30	7639.17	4.88	7634.29

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0126	4/16/2013	8:05	7639.17	5.69	7633.48
0126	4/14/2014	16:10	7639.17	6.12	7633.05
0126	4/14/2015	14:45	7639.17	6.49	7632.68
0126	4/19/2016	15:15	7639.17	6.17	7633.00
0126	4/19/2017	15:05	7639.17	6.22	7632.95
0126	4/17/2018	10:10	7639.17	4.89	7634.28
0126	4/30/2019	15:44	7639.17	5.82	7633.35
0126	4/6/2021	11:41	7639.17	6.10	7633.07
0126	4/11/2022	13:06	7639.17	6.54	7632.63
0126	4/17/2023	17:41	7639.17	5.51	7633.66
0127	5/25/1999	10:14	7639.67	6.92	7632.75
0127	6/2/1999	9:50	7639.67	6.66	7633.01
0127	10/7/1999	8:22	7639.67	11.22	7628.45
0127	5/9/2000	15:15	7639.67	7.98	7631.69
0127	4/25/2001	16:01	7639.67	8.59	7631.08
0127	5/7/2002	9:10	7639.67	9.79	7629.88
0127	5/21/2003	9:00	7639.67	11.13	7628.54
0127	5/13/2004	9:36	7639.67	12.29	7627.38
0127	5/18/2005	11:24	7639.67	17.10	7622.57
0127	5/17/2006	15:47	7639.67	17.97	7621.70
0127	5/3/2007	12:40	7639.67	19.17	7620.50
0127	5/6/2008	0:00	7639.67	8.24	7631.43
0127	4/20/2009	17:25	7639.67	9.03	7630.64
0127	4/14/2010	18:00	7639.67	8.52	7631.15
0127	4/28/2011	8:40	7639.67	8.33	7631.34
0127	4/25/2012	8:15	7639.67	7.07	7632.60
0127	4/16/2013	8:25	7639.67	7.70	7631.97
0127	4/14/2014	15:50	7639.67	7.90	7631.77
0127	4/14/2015	15:15	7639.67	8.35	7631.32
0127	4/19/2016	14:52	7639.67	8.06	7631.61
0127	4/19/2017	15:45	7639.67	8.08	7631.59
0127	4/17/2018	9:50	7639.67	6.20	7633.47
0127	4/30/2019	16:10	7639.67	6.79	7632.88
0127	4/6/2021	11:20	7639.67	7.05	7632.62
0127	4/11/2022	13:36	7639.67	7.51	7632.16
0127	4/17/2023	17:20	7639.67	6.52	7633.15
0135	5/25/1999	10:51	7632.06	4.36	7627.70
0135	5/18/2005	17:08	7632.06	4.09	7627.97
0135	5/17/2006	16:37	7632.06	6.38	7625.68
0135	5/3/2007	11:18	7632.06	4.26	7627.80
0135	5/6/2008	0:00	7632.06	5.82	7626.24
0135	4/20/2009	14:15	7632.06	5.98	7626.08
0135	4/15/2010	12:45	7632.06	5.95	7626.11
0135	4/27/2011	9:15	7632.06	5.90	7626.16
0135	4/24/2012	18:10	7632.06	3.61	7628.45
0135	4/14/2014	17:40	7632.06	4.17	7627.89
0135	4/14/2015	8:35	7632.06	4.49	7627.57
0135	4/19/2016	14:04	7632.06	4.15	7627.91
0135	4/19/2017	16:40	7632.06	4.52	7627.54
0135	4/16/2018	15:25	7632.06	3.46	7628.60
0135	5/2/2019	13:58	7632.06	3.95	7628.11
0135	4/6/2021	12:54	7632.06	4.31	7627.75
0135	4/11/2022	16:57	7632.06	4.40	7627.66
0135	4/17/2023	16:05	7632.06	3.48	7628.58
0136	5/25/1999	11:00	7631.27	4.69	7626.58
0136	5/28/1999	11:24	7631.27	4.47	7626.80
0136	10/7/1999	9:26	7631.27	7.05	7624.22
0136	5/9/2000	8:20	7631.27	5.13	7626.14
0136	5/18/2005	16:34	7631.27	7.45	7623.82

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0136	5/17/2006	17:06	7631.27	14.63	7616.64
0136	5/3/2007	10:52	7631.27	51.30	7579.97
0136	5/6/2008	0:00	7631.27	5.87	7625.40
0136	4/20/2009	13:45	7631.27	6.03	7625.24
0136	4/15/2010	12:20	7631.27	5.63	7625.64
0136	4/27/2011	14:10	7631.27	5.32	7625.95
0136	4/24/2012	18:25	7631.27	4.34	7626.93
0136	4/16/2013	11:10	7631.27	4.61	7626.66
0136	4/14/2014	17:05	7631.27	3.19	7628.08
0136	4/14/2015	8:55	7631.27	3.69	7627.58
0136	4/19/2016	14:21	7631.27	3.30	7627.97
0136	4/19/2017	17:15	7631.27	3.79	7627.48
0136	4/16/2018	15:50	7631.27	2.57	7628.70
0136	5/2/2019	13:43	7631.27	3.15	7628.12
0136	4/6/2021	12:25	7631.27	3.46	7627.81
0136	4/11/2022	17:22	7631.27	3.55	7627.72
0136	4/17/2023	16:27	7631.27	2.83	7628.44
0160	5/25/1999	17:05	7609.40	3.65	7605.75
0160	5/26/1999	9:07	7609.40	3.65	7605.75
0160	10/13/1999	8:06	7609.40	5.42	7603.98
0160	5/17/2000	13:51	7609.40	4.36	7605.04
0160	4/24/2001	13:20	7609.40	5.44	7603.96
0160	5/8/2002	16:32	7609.40	4.95	7604.45
0160	5/19/2003	16:40	7609.40	4.15	7605.25
0160	5/11/2004	14:40	7609.40	4.10	7605.30
0160	5/17/2005	7:57	7609.40	4.49	7604.91
0160	5/16/2006	8:45	7609.40	3.99	7605.41
0160	5/1/2007	16:55	7609.40	4.37	7605.03
0160	5/5/2008	0:00	7609.40	4.81	7604.59
0160	4/22/2009	14:15	7609.40	4.92	7604.48
0160	4/14/2010	12:20	7609.40	5.69	7603.71
0160	4/26/2011	10:00	7609.40	5.35	7604.05
0160	4/24/2012	9:10	7609.40	5.71	7603.69
0160	4/16/2013	17:45	7609.40	6.12	7603.28
0160	4/16/2014	9:30	7609.40	5.40	7604.00
0160	4/14/2015	16:45	7609.40	5.20	7604.20
0160	4/21/2016	7:58	7609.40	5.52	7603.88
0160	4/17/2017	15:50	7609.40	4.65	7604.75
0160	4/18/2018	11:41	7609.40	5.70	7603.70
0160	5/2/2019	16:40	7609.40	4.56	7604.84
0160	4/8/2021	7:45	7609.40	5.76	7603.64
0160	4/12/2022	9:27	7609.40	5.94	7603.46
0160	4/19/2023	14:00	7609.40	5.28	7604.12
0161	5/25/1999	17:04	7610.64	5.04	7605.60
0161	5/26/1999	10:16	7610.64	5.04	7605.60
0161	10/13/1999	8:45	7610.64	6.94	7603.70
0161	5/17/2000	12:50	7610.64	5.71	7604.93
0161	4/26/2001	13:51	7610.64	6.93	7603.71
0161	5/8/2002	17:02	7610.64	6.42	7604.22
0161	5/19/2003	16:18	7610.64	5.55	7605.09
0161	5/11/2004	14:19	7610.64	5.49	7605.15
0161	5/17/2005	8:22	7610.64	5.99	7604.65
0161	5/16/2006	8:15	7610.64	5.38	7605.26
0161	5/1/2007	17:15	7610.64	5.83	7604.81
0161	5/5/2008	0:00	7610.64	6.25	7604.39
0161	4/22/2009	14:30	7610.64	6.41	7604.23
0161	4/14/2010	12:40	7610.64	7.17	7603.47
0161	4/26/2011	10:25	7610.64	6.72	7603.92
0161	4/24/2012	9:35	7610.64	7.16	7603.48

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0161	4/16/2013	18:00	7610.64	7.54	7603.10
0161	4/16/2014	9:50	7610.64	6.88	7603.76
0161	4/14/2015	17:05	7610.64	6.69	7603.95
0161	4/21/2016	8:25	7610.64	6.94	7603.70
0161	4/17/2017	16:10	7610.64	6.08	7604.56
0161	4/18/2018	11:48	7610.64	7.12	7603.52
0161	5/2/2019	16:19	7610.64	5.96	7604.68
0161	4/8/2021	8:18	7610.64	7.16	7603.48
0161	4/12/2022	9:47	7610.64	7.40	7603.24
0161	4/19/2023	13:36	7610.64	6.73	7603.91
0181	5/25/1999	14:15	7624.10	4.82	7619.28
0181	5/26/1999	15:01	7624.10	4.79	7619.31
0181	10/12/1999	16:45	7624.10	5.50	7618.60
0181	5/17/2000	9:37	7624.10	5.64	7618.46
0181	5/17/2005	14:01	7624.10	4.88	7619.22
0181	5/16/2006	12:49	7624.10	6.33	7617.77
0181	5/1/2007	16:05	7624.10	2.59	7621.51
0181	5/7/2008	0:00	7621.41	2.39	7619.02
0181	4/22/2009	16:30	7621.41	3.30	7618.11
0181	4/13/2010	14:30	7621.41	2.65	7618.76
0181	4/25/2011	16:40	7621.41	2.72	7618.69
0181	4/25/2012	11:20	7621.41	2.07	7619.34
0181	4/15/2013	15:20	7621.41	1.78	7619.63
0181	4/15/2014	15:30	7621.41	2.39	7619.02
0181	4/15/2015	16:00	7621.41	2.15	7619.26
0181	4/20/2016	9:00	7621.41	2.15	7619.26
0181	4/19/2017	8:45	7621.41	2.45	7618.96
0181	4/16/2018	14:40	7621.41	2.43	7618.98
0181	5/2/2019	9:48	7621.41	1.96	7619.45
0181	4/7/2021	13:38	7621.41	2.44	7618.97
0181	4/12/2022	17:30	7621.41	2.95	7618.46
0181	4/18/2023	16:48	7621.41	1.85	7619.56
0183	5/25/1999	14:31	7622.85	4.75	7618.10
0183	5/26/1999	13:54	7622.85	4.70	7618.15
0183	10/12/1999	17:06	7622.85	6.08	7616.77
0183	5/17/2000	9:56	7622.85	5.62	7617.23
0183	4/26/2001	9:26	7622.85	5.71	7617.14
0183	5/7/2002	13:00	7622.85	5.53	7617.32
0183	5/21/2003	11:07	7622.85	4.83	7618.02
0183	5/13/2004	10:45	7622.85	5.79	7617.06
0183	5/17/2005	14:28	7622.85	5.21	7617.64
0183	5/16/2006	13:20	7622.85	5.85	7617.00
0183	5/1/2007	15:15	7622.85	4.06	7618.79
0183	5/7/2008	0:00	7621.30	4.41	7616.89
0183	4/22/2009	16:10	7621.30	4.63	7616.67
0183	4/13/2010	16:40	7621.30	4.49	7616.81
0183	4/26/2011	19:40	7621.30	4.37	7616.93
0183	4/25/2012	11:10	7621.30	3.92	7617.38
0183	4/15/2013	15:05	7621.30	4.02	7617.28
0183	4/15/2014	15:10	7621.30	4.19	7617.11
0183	4/15/2015	15:45	7621.30	4.08	7617.22
0183	4/20/2016	9:00	7621.30	4.03	7617.27
0183	4/19/2017	8:25	7621.30	4.01	7617.29
0183	4/16/2018	14:35	7621.30	4.00	7617.30
0183	5/2/2019	9:24	7621.30	3.66	7617.64
0183	4/7/2021	13:20	7621.30	4.24	7617.06
0183	4/12/2022	17:14	7621.30	4.49	7616.81
0183	4/18/2023	17:08	7621.30	4.73	7616.57
0186	5/25/1999	15:03	7632.24	5.20	7627.04

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0186	5/27/1999	10:18	7632.24	5.11	7627.13
0186	10/12/1999	11:20	7632.24	7.29	7624.95
0186	5/10/2000	15:47	7632.24	5.67	7626.57
0186	5/19/2005	16:12	7632.24	7.08	7625.16
0186	5/17/2006	8:18	7632.24	7.81	7624.43
0186	5/2/2007	9:44	7632.24	7.91	7624.33
0186	5/5/2008	0:00	7632.24	6.12	7626.12
0186	4/22/2009	10:20	7632.24	6.52	7625.72
0186	4/12/2010	16:05	7632.24	6.34	7625.90
0186	4/26/2011	8:50	7632.24	5.78	7626.46
0186	4/25/2012	16:30	7632.24	5.15	7627.09
0186	4/16/2013	16:10	7632.24	5.32	7626.92
0186	4/15/2014	11:00	7632.24	5.73	7626.51
0186	4/13/2015	17:55	7632.24	5.59	7626.65
0186	4/21/2016	11:15	7632.24	5.96	7626.28
0186	4/18/2017	8:20	7632.24	5.74	7626.50
0186	4/17/2018	14:19	7632.24	5.42	7626.82
0186	5/1/2019	14:31	7632.24	5.39	7626.85
0186	4/6/2021	16:15	7632.24	6.10	7626.14
0186	4/11/2022	18:20	7632.24	6.23	7626.01
0186	4/19/2023	14:47	7632.24	5.45	7626.79
0187	5/25/1999	15:06	7632.04	4.27	7627.77
0187	5/17/2006	9:06	7630.94	7.19	7623.75
0187	5/2/2007	9:00	7630.94	7.42	7623.52
0187	5/5/2008	0:00	7630.94	5.61	7625.33
0187	4/22/2009	10:55	7630.94	5.98	7624.96
0187	4/12/2010	17:00	7630.94	5.93	7625.01
0187	4/26/2011	8:30	7630.94	5.36	7625.58
0187	4/25/2012	16:50	7630.94	4.74	7626.20
0187	4/16/2013	15:50	7630.94	5.05	7625.89
0187	4/15/2014	11:45	7630.94	5.37	7625.57
0187	4/13/2015	18:20	7630.94	5.22	7625.72
0187	4/21/2016	11:50	7630.94	5.25	7625.69
0187	4/18/2017	8:50	7630.94	5.13	7625.81
0187	4/17/2018	16:55	7630.94	4.70	7626.24
0187	5/1/2019	15:01	7630.94	4.64	7626.30
0187	4/6/2021	16:45	7630.94	5.42	7625.52
0187	4/11/2022	18:51	7630.94	5.61	7625.33
0187	4/19/2023	15:19	7630.94	4.84	7626.10
0188	5/25/1999	16:11	7618.67	4.55	7614.12
0188	5/27/1999	16:23	7618.67	4.79	7613.88
0188	10/8/1999	9:11	7618.67	6.41	7612.26
0188	5/10/2000	17:33	7618.67	5.25	7613.42
0188	4/26/2001	15:14	7618.67	6.03	7612.64
0188	5/8/2002	8:58	7618.67	6.05	7612.62
0188	5/21/2003	13:38	7618.67	5.00	7613.67
0188	5/12/2004	10:15	7618.67	5.11	7613.56
0188	5/19/2005	17:49	7618.67	5.23	7613.44
0188	5/16/2006	9:29	7618.67	4.97	7613.70
0188	5/2/2007	14:50	7618.67	5.25	7613.42
0188	5/5/2008	0:00	7618.67	5.57	7613.10
0188	4/22/2009	13:10	7618.67	5.77	7612.90
0188	4/14/2010	13:40	7618.67	6.80	7611.87
0188	4/26/2011	11:40	7618.67	6.02	7612.65
0188	4/25/2012	15:45	7618.67	6.10	7612.57
0188	4/16/2013	17:10	7618.67	7.00	7611.67
0188	4/15/2014	17:10	7618.67	6.45	7612.22
0188	4/16/2015	11:15	7618.67	5.78	7612.89
0188	4/21/2016	10:40	7618.67	6.13	7612.54

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.

STATIC WATER LEVELS FOR SITE GUN01, Gunnison Processing Site, 1999–2023

LOCATION	MEASUREMENT		REFERENCE ELEVATION	WATER LEVEL DEPTH	WATER ELEVATION
	DATE	TIME	(FT NAVD88)	(FT)	(FT NAVD88)
0188	4/19/2017	11:00	7618.67	5.35	7613.32
0188	4/18/2018	10:15	7618.67	6.13	7612.54
0188	5/1/2019	16:22	7618.67	5.09	7613.58
0188	4/7/2021	16:05	7618.67	6.61	7612.06
0188	4/12/2022	15:32	7618.67	6.82	7611.85
0188	4/18/2023	15:06	7618.67	6.20	7612.47
0189	5/25/1999	16:11	7618.58	4.82	7613.76
0189	5/27/1999	13:03	7618.58	5.65	7612.93
0189	10/8/1999	8:31	7618.58	7.23	7611.35
0189	5/10/2000	16:57	7618.58	6.11	7612.47
0189	4/26/2001	15:45	7618.58	7.08	7611.50
0189	5/8/2002	8:02	7618.58	5.43	7613.15
0189	5/21/2003	14:00	7618.58	5.30	7613.28
0189	5/12/2004	10:38	7618.58	5.35	7613.23
0189	5/19/2005	18:10	7618.58	5.60	7612.98
0189	5/16/2006	9:58	7618.58	5.32	7613.26
0189	5/2/2007	15:08	7618.58	6.05	7612.53
0189	5/5/2008	0:00	7618.58	6.20	7612.38
0189	4/22/2009	12:50	7618.58	6.50	7612.08
0189	4/14/2010	13:20	7618.58	7.75	7610.83
0189	4/26/2011	11:25	7618.58	6.51	7612.07
0189	4/25/2012	15:15	7618.58	6.44	7612.14
0189	4/16/2013	16:55	7618.58	7.84	7610.74
0189	4/15/2014	16:45	7618.58	7.13	7611.45
0189	4/16/2015	11:50	7618.58	6.26	7612.32
0189	4/21/2016	9:42	7618.58	6.49	7612.09
0189	4/19/2017	11:30	7618.58	6.05	7612.53
0189	4/18/2018	10:20	7618.58	6.41	7612.17
0189	5/1/2019	16:05	7618.58	5.50	7613.08
0189	4/7/2021	16:25	7618.58	6.92	7611.66
0189	4/12/2022	15:20	7618.58	7.22	7611.36
0189	4/18/2023	15:26	7618.58	6.65	7611.93

NAVD88 = North American Vertical Datum of 1988. Figure 7 uses National Geodetic Vertical Datum of 1929 (NGVD 29), = NAVD88 - 4.987 ft.