



GROUNDWATER AND SURFACE WATER MONITORING DATA RELEASE 2019 SAMPLING EVENT SHALLOW LAND DISPOSAL AREA FUSRAP SITE

U.S. Army Corps of Engineers
Building Strong®
Pittsburgh District

May 2020

Formerly Utilized Sites Remedial Action Program (FUSRAP)

FUSRAP was initiated in 1974 to identify, investigate, and if necessary, cleanup or control sites throughout the United States that were part of the Nation's early atomic weapons and energy programs during the 1940s, 1950s, and 1960s. When implementing FUSRAP, the United States Army Corps of Engineers (USACE) follows the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The USACE is the lead federal agency under FUSRAP remediating the Shallow Land Disposal Area (SLDA) site.

Site Description

The SLDA is located in Parks Township, Armstrong County, Pennsylvania, about 23 miles (37 kilometers) east-northeast of Pittsburgh, Pennsylvania (Figure 1). The 44-acre (18-hectare) site is predominantly an open field partially bordered by woodland. Ten (10) disposal trenches were excavated in the overburden soils and together encompass approximately 1.2 acres (0.49 hectares); the trenches are separated geographically into the Trench 1 through 9 area (or the upper trench area) and Trench 10 (the lower trench area). Site topography declines approximately 115 feet (35 meters) from the southeast to northwest, or from Trenches 1 through 9 toward Trench 10 (Figure 2). The depths of the upper trenches vary between 10 and 15 feet, whereas Trench 10 varies up to 20 feet in depth.

The upper trench area is underlain by up to 20 feet of native silty soils that blanket the following four groundwater-bearing bedrock zones:

- First Shallow Bedrock - averages 13 feet in thickness between elevation 881 and 894 feet,
- Second Shallow Bedrock - averages 14-feet in thickness between elevation 856 and 870 feet,
- Upper Freeport Coal – averages 4 feet in thickness between elevations 832 and 836 feet and was subjected to room and pillar mining (now exhibits open-channel flow), and
- Deep Bedrock Zone - averages about 36 feet in thickness between elevations 757 and 793 feet.

In the Trench 10 area, the Freeport coal seam was strip mined and the general area backfilled with approximately 22 feet of shale rock spoils. Figure 3 presents a generalized northwest to southeast geologic cross section through the site to depict these site entities and groundwater zones.

Groundwater under the upper trench area flows predominantly in the following directions in each layer:

- Northerly in the soil layer (Figure 4),
- North to northeasterly in the first shallow bedrock zone (Figure 5),
- Both the northeasterly and southwesterly in the second shallow bedrock zone (Figure 6) due to a flow divide under the site,
- Southerly and westerly in the Freeport Coal (Figure 7), and
- Southwesterly in the deep bedrock zone (Figure 8).

Groundwater surrounding Trench 10 appears to enter the Upper Freeport Coal seam, which generally drains to the south and west (Figure 7). These flow observations contrast from previous sampling events which groundwater in the Upper Freeport Coal Zone drained predominantly to the south.

The site is drained by a small ephemeral stream identified as Dry Run (Figure 2). A portion of the flow in Dry Run infiltrates into the coal mine spoils near Trench 10 and then the abandoned coal mines that underlie most of the site (see Figure 2-14 in USACE 2005). The balance of flow in Dry Run continues northwest into the Kiskiminetas River.

Land use surrounding the SLDA site consists of medium-sized residential communities and individual rural residences, small farms with croplands and pastures, idle farmland, forestlands, and light industrial areas. The closest community is Kiskimere, which is adjacent to and to the south of the SLDA; some residences are located within several hundred feet of the SLDA.

Previous Groundwater Monitoring Results

A series of non-USACE groundwater monitoring actions began in 1981 and led to a quarterly monitoring program that ceased in 2000; the USACE initiated site activities in 2002. The historical and USACE-generated data are summarized in the Remedial Investigation (RI) performed by the USACE (USACE 2005).

Groundwater sampling conducted by the USACE during the RI included the following radionuclides:

- Radium-228
- Uranium-234, -235, -238
- Thorium-228, -232
- Plutonium-239,-241
- Americium-241

In addition, 10% of the RI samples were analyzed for cesium-137, cobalt-60, thorium-230, radium-226, plutonium-238, -240, -242, and gross alpha and beta. The RI sampling of groundwater indicated that FUSRAP-related constituents were not a threat to human health and the environment (USACE 2005).

From April to December 2011 (during the initial remedial action), groundwater was sampled monthly at 14 locations for the following constituents: isotopic uranium (U-234, -235, -238), isotopic thorium (Th-228, -232), radium-228, plutonium-239 and -241, americium-241, total uranium, target analyte list (TAL) metals (plus molybdenum), anions, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total organic carbon, and total dissolved solids. The radiological and metals analyses include both unfiltered and filtered samples. These sampling

results were consistent with the RI sampling (i.e., FUSRAP-related radiologic constituents are not a risk to groundwater at the SLDA). This monitoring effort was suspended in 2012 due to a remediation hiatus and will re-initiate once remediation recommences; the 2011 data are presented in the 2013 groundwater sampling report (USACE 2014).

Annual Sampling Program Purpose

The groundwater monitoring plan that was developed in 2013 is used to guide annual sampling activities through the completion of the remedial action (USACE 2013). The overarching objective of the sampling effort is to ensure the protection of human health and the environment from FUSRAP-related constituents of concern at the SLDA site. The USACE plan delineated an optimal monitoring program to detect the potential for off-site migration, specifically towards the Kiskimere community.

The goals of the groundwater monitoring program include:

- Specify analytical parameters for collected samples (Table 1)
- Identify the locations to be sampled (Table 2)
- Identify the frequency of sampling (i.e., annual sampling)

This sampling program was developed in consultation with the U.S. Environmental Protection Agency (USEPA), who independently sampled on-site and nearby wells through 2017; the agency ceased sampling since the USEPA and USACE data are comparable.

Sampling Scope

Annual groundwater monitoring for 2019 at the SLDA was conducted between July 23 and July 25, 2019. Twenty-one (21) groundwater locations were sampled and generally lie between the 10 trenches and the neighboring residences (Figure 9). Two (2) on-site surface-water locations were also sampled to verify the protection of human health and the environment. Seven (7) wells planned for sampling were either dry or did not yield adequate sampling volumes, which were then substituted with three (3) other wells to maximize the sampling program. Table 1 lists the constituents analyzed and Table 2 lists the planned locations, along with well substitutions. The constituents listed in Table 1 are a subset of the analytes sampled during the RI and remedial action; this annual sampling program focuses on site contaminants specifically listed in the record of decision (ROD) (USACE 2007).

Static water levels from all site wells were recorded synchronously to the nearest 0.01 foot to determine whether adequate volumes were available for sampling and to confirm groundwater flow directions. These measurements are listed in Table 3; wells omitted from this list were either decommissioned during remedial action or previously damaged (unreliable). Figures 4 through 8 graphically present the groundwater elevation data and inferred flow directions for the five water bearing zones underlying the SLDA.

Low-flow sampling techniques consistent with USEPA guidance (Puls and Barcelona 1996) and the Department of Defense (DoD) (DoD 2013) were utilized for the groundwater sampling. Prior to sampling, wells were purged until the following field parameters stabilized according to the sampling plan: temperature, pH, specific conductance, oxidation-reduction potential (ORP), turbidity, and dissolved oxygen. These data are listed in Table 4.

Both unfiltered (total fraction) and field-filtered (dissolved fraction) groundwater samples were obtained where well yield allowed; MW-03 did not yield enough water to collect metals and filtered radionuclides samples and MW-45 did not yield enough water to collect a filtered radionuclides sample. Filtered samples were collected by utilizing a

disposable 0.45 micron in-line filter. Field duplicates provided quality control samples, which were collected at a rate of approximately one duplicate for every ten regular samples.

Samples were packaged according to standard practices and shipped to DoD Environmental Laboratory Accreditation Program (ELAP) accredited laboratories. Laboratory data were reviewed and qualified per laboratory performance quality indicators, the applicable laboratory and method criteria, and the DoD Quality Systems Manual.

The sampling task produced investigation derived waste (IDW) that consisted of solids and liquids. The solid IDW generated from groundwater sampling and decontamination activities (i.e., personal protective equipment, sample tubing, etc.) was assessed for radioactivity and either disposed of as general trash or retained on site for disposition. The liquid IDW consisted of purge water that was containerized on site for future disposition.

Sampling Results

Figure 9 highlights the wells that were sampled in 2019; Tables 5 and 6 list the unfiltered (total) and filtered (dissolved phase) analytical results for all groundwater sampling events for comparison. Table 7 presents a summary of all groundwater sampling results (2003-2019), comparative drinking water standards, and up-gradient values for radionuclides derived during the USACE RI. The 2019 analytical results are consistent with past sampling and select wells exhibit unique values for some analytes relative to the overall dataset; these are discussed below.

Metals Data:

The site-wide ranges of the 2019 data generally fall within the historical site ranges. The following metals exceeded their respective water quality standards in 2019 (Table 5):

- Aluminum
- Arsenic
- Iron
- Lead
- Manganese

The site-wide average values for aluminum, iron, and manganese exceed the primary or secondary drinking water standards (Table 7) due to the naturally low-oxygen or reducing conditions in the coal mine and deep groundwater zones below the coal mine. Arsenic in MW-22 (deep zone) exceeded the MCL in 2019 and reflects previous values seen in these wells. The reducing conditions in these groundwater zones commonly solubilize such metals from natural minerals, which are persistent in the historic data ranges. The lead MCL was exceeded only in well MW-13 and the site-wide average falls below the drinking water standard (Table 7). Though there is no defined MCL, increased sodium results were exhibited in MW-13 and MW-44.

Radionuclides:

The ranges of radionuclide results for 2019 sampling event are generally consistent with past sampling data. No radionuclides exceed the drinking water standards, as listed in Tables 6 and 7. Table 7 shows the 2019 data generally reflect natural background ranges or are well below the drinking water standards. However, well MW-45 exhibited an increased result (see total uranium) that is derived from the highly turbid (cloudy) samples obtained from that well, as noted by the turbidity value for MW-45 listed on Table 4. Additionally, MW-45 did not yield enough water to collect a filtered sample. The uranium increase occurs when cloudy samples are placed in acid-preserved laboratory containers, where natural metals are dissolved from the soil particles and liberated into solution (the analyzed water). This well will be sampled for both unfiltered and filtered radionuclides in 2020 to verify whether the observed result is a turbidity artifact or reflect changes in groundwater conditions.

Conclusions

The 2019 USACE sampling shows that radionuclides are present in site groundwater at concentrations indicative of background and well below USEPA MCLs or dose-based drinking water standards. Sampling results for metals show select constituents are above drinking water standards, primarily in the coal mine and deeper water-bearing zones. Other exceptions for metals vary throughout the hydrogeologic zones at the site and do not indicate a contiguously contaminated zone. The overall sampling results are consistent with past USACE findings that indicate no FUSRAP-related radionuclides exceed the USEPA MCLs or dose-based drinking water standards.

References

Department of Defense (DoD), 2013. DoD Environmental Field Sampling Handbook, Revision 1.0, DoD Environmental Data Quality Workgroup, April 2013.

Puls, R. and M. Barcelona, 1996. Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, EPA Issue Paper (EPA/540/S-95/04), April 1996.

U.S. Army Corps of Engineers (USACE), 2005. Shallow Land Disposal Area Remedial Investigation Report, U.S. Army Corps of Engineers, October 2005.

U.S. Army Corps of Engineers (USACE), 2007. Record of Decision for the Shallow Land Disposal Area, U.S. Army Corps of Engineers, August 2007.

U.S. Army Corps of Engineers (USACE), 2013. Groundwater and Surface Water Data Release, U.S. Army Corps of Engineers, December 2013.

U.S. Environmental Protection Agency (USEPA), 2001. Directive number 9283.1-14, Memorandum: Use of Uranium Drinking Water Standards under 40 CFR 141 and 40 CFR 192 as Remediation Goals for Groundwater at CERCLA sites.

U.S. ARMY CORPS OF ENGINEERS – PITTSBURGH DISTRICT
2200 WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE, PITTSBURGH, P.A. 15222-4186
Phone: 412-395-7500

Email: celrp-pa@usace.army.mil

Website: <http://www.lrp.usace.army.mil/Missions/Planning,ProgramsProjectManagement/HotProjects/ShallowLandDisposalArea.aspx>

TABLES

Table 1. Site Monitoring Program and Analytical Methods

Analyte	Fraction	Method
Target Analyte List (TAL) Metals	Filtered and Unfiltered	EPA 6020, Inductively Coupled Plasma Mass-Spectrometry (ICPMS)
Total Uranium	Filtered and Unfiltered	ASTM D5174, Trace Uranium by Pulsed-Laser Phosphorimetry
Thorium-228 Thorium-230 Thorium-232 Plutonium-238 Plutonium-239/240 Americium-241	Filtered and Unfiltered	Alpha Spectrometry
Plutonium-241	Filtered and Unfiltered	Liquid Scintillation

Table 2. Shallow Land Disposal Area FUSRAP Site Groundwater Monitoring Well Summary (2019)

Well/Location	Top of Casing Elevation (ft AMSL)	Zone	Up (U) or Down (D) Gradient from Disposal Areas	Monitoring Activity			Rationale
				Water Level	Unfiltered GW	Filtered GW	
02U11	925.99	OB	D	X			Water Levels
02U13	923.45	OB	D	X			Water Levels
03U05	924.1	OB	D	X			Water Levels
05U07	935.1	OB	U	X			Water Levels
06U05	941.26	OB	D	X			Water Levels
08U04	938.94	OB	D	X			Water Levels
08U05	940.93	OB	D	X			Water Levels
09U07	927.69	OB	D	X			Water Levels
10L31	859.84	UF	U	X	X	X	Trench Containment Verification
10L32	848.69	UF	U	X			Water Levels
MW-01	845.79	UF	U	X	X	X	Water Levels
MW-02	884.22	DB	U	X			Water Levels
MW-02A	885.43	UF	D	X	X	X	Trench Containment Verification
MW-03	890.5	UF	D	X	X	NS	Trench Containment Verification
MW-04	NA	UF	D	X			Water Levels
MW-05	865.49	UF	U	X	X	X	Trench Containment Verification
MW-07	921.52	1S	U/cross gradient	X	X	X	Trench Containment Verification
MW-08	931.77	1S	U	X	X	X	Trench Containment Verification
MW-09A	945.45	1S	U	X	X	X	Trench Containment Verification
MW-11D	909.8	2S	D	X			Water Levels
MW-11S	909.27	OB	D	X			Water Levels
MW-12D	919.31	1S	D	X			Water Levels
MW-13	948.68	1S	U	X	X	X	Trench Containment Verification
MW-14	947.33	1S	U	X	X	X	Trench Containment Verification
MW-15	940.31	1S	U	X	X	X	Trench Containment Verification
MW-17	913.71	2S	D	X			Water Levels
MW-19	861.45	DB	U	X			Water Levels
MW-20	889.87	UF	D	X	NS	NS	Trench Containment Verification
MW-21	888.32	UF	D	X	NS	NS	Trench Containment Verification
MW-22	893.41	DB	D	X	X	X	Trench Containment Verification
MW-25	910.07	1S	D	X			Water Levels
MW-26	919.56	1S	D	X			Water Levels
MW-27	929.99	1S	D	X			Water Levels
MW-29	912.53	1S	D	X			Water Levels
MW-32	925.89	1S	U	X	NS	NS	Trench Containment Verification
MW-33	940.76	2S	U	X	X	X	Trench Containment Verification
MW-34A	926.84	DB	D	X	NS	NS	Trench Containment Verification
MW-35	913.68	DB	U	X			Water Levels
MW-37	926.58	2S	D	X			Water Levels

Well/Location	Top of Casing Elevation (ft AMSL)	Zone	Up (U) or Down (D) Gradient from Disposal Areas	Monitoring Activity			Rationale
				Water Level	Unfiltered GW	Filtered GW	
MW-38	943.81	1S	U	X			Water Levels
MW-39	891.99	UF	D	X	NS	NS	Trench Containment Verification
MW-40	939.63	DB	D	X	X	X	Trench Containment Verification
MW-41	912.86	1S	D	X			Water Levels
MW-42	916.5	1S	D	X			Water Levels
MW-43	916.32	2S	D	X			Water Levels
MW-44	930.98	1S	D	X	Ø	Ø	Water Levels
MW-45	929.9	2S	U	X	X	NS	Trench Containment Verification
MW-46	924.18	UF	D	X	NS	NS	Trench Containment Verification
MW-47	925.18	OB	U	X	X	X	Trench Containment Verification
MW-50	902.02	1S	D	X			Water Levels
MW-51	925.43	1S	D	X			Water Levels
MW-52	924.73	2S	U	X	X	X	Trench Containment Verification
MW-53	925.34	2S	D	X			Water Levels
MW-58	838.93	DB	U	X			Water Levels
MW-59	932.45	OB	U	X	Ø	Ø	Water Levels
MW-61	932.49	2S	U	X	NS	NS	Trench Containment Verification
MW-62	926.22	UF	D	X			Water Levels
MW-64	946.5	OB	U	X			Water Levels
MW-69	947.43	OB	U	X			Water Levels
MW-74	925.3	OB	U	X			Water Levels
MW-80	916.07	1S	D	X			Water Levels
MW-81	898.22	1S	D	X			Water Levels
MW-82	921.22	1S	D	X			Water Levels
MW-83	916.03	OB	D	X			Water Levels
MW-84	923.36	1S	D	X			Water Levels
MW-86	928.02	1S	D	X			Water Levels
NWS-01A	931.57	Varies	Varies	--			FLUTe Well – Not Measured
NWS-02	946.35	Varies	Varies	--			FLUTe Well – Not Measured
NWS-03	946.87	Varies	Varies	--			FLUTe Well – Not Measured
NWS-04	925.25	Varies	Varies	--			FLUTe Well – Not Measured
NWS-05	914.28	Varies	Varies	--			FLUTe Well – Not Measured
PZ-01	907.53	OB	D	X	Ø	Ø	Water Levels
PZ-02	913.49	OB	D	X			Water Levels
PZ-03A	920.72	OB	D	X			Water Levels
PZ-04	920.85	OB	D	X			Water Levels
PZ-05	929.78	OB	D	X			Water Levels
PZ-06A	943.23	OB	D	X			Water Levels
PZ-07	942.67	OB	U	X			Water Levels
PZ-08	933.31	OB	U	X			Water Levels
PZ-09	938.49	OB	U	X	X	X	Trench Containment Verification

Well/Location	Top of Casing Elevation (ft AMSL)	Zone	Up (U) or Down (D) Gradient from Disposal Areas	Monitoring Activity			Rationale
				Water Level	Unfiltered GW	Filtered GW	
TPZ-01	924.3	1S	U	X			Water Levels
TPZ-02	926.38	1S	U	X			Water Levels
TPZ-03	895.5	1S	D	X			Water Levels
TPZ-04	914.09	1S	D	X			Water Levels
TPZ-05	916.51	1S	D	X			Water Levels
TPZ-06	907.77	OB	D	X			Water Levels
TPZ-07	917.35	OB	D	X			Water Levels
TPZ-08	924.45	OB	D	X			Water Levels

Notes:

ft AMSL	feet above mean sea level	UF	Upper Freeport Coal
GW	Groundwater	DB	Deep Bedrock Zone
OB	Overburden	NA	Data Not Available
1S	First Shallow Bedrock Zone	NS	Not Sampled (Dry/Non-producing Well)
2S	Second Shallow Bedrock Zone		
◇	Water-level Well Sampled as a Replacement for Dry or Non-producing Trench Containment Well		

Note: The five (5) FLUTE Wells (NWS-01A, NWS-02, NWS-03, NWS-04, and NWS-05) were decommissioned in 2020.

Table 3. 2019 SLDA Groundwater Levels

Well ID	Date	Depth to Water	Depth to Bottom from TOC	New Remarks
01U17	7/22/2019	9.88	16.18	
03U05	7/22/2019	--	11.41	
06U05	7/22/2019	--	17.33	
08U04	7/24/2019	--	17.33	1" PVC snapped off at surface, unable to locate hole
10L31	7/24/2019	22.41	25.00	No cap
10L32	7/24/2019	10.62	12.20	
MW-01	7/24/2019	7.54	20.00	
MW-02	7/24/2019	77.16	92.00	
MW-02A	7/24/2019	47.40	51.30	
MW-03	7/24/2019	52.42	53.20	
MW-04	7/24/2019	--	--	Can't locate
MW-05	7/24/2019	24.91	27.33	
MW-07	7/22/2019	31.41	35.44	
MW-08	7/22/2019	11.76	35.88	
MW-09A	7/22/2019	19.25	37.21	
MW-11D	7/22/2019	Dry	42.90	Dry at 40.48
MW-11S	7/22/2019	11.76	11.90	
MW-13	7/22/2019	22.43	38.65	
MW-14	7/22/2019	13.32	32.20	
MW-15	7/22/2019	11.3	31.23	
MW-17	7/22/2019	42.25	79.00	
MW-19	7/22/2019	56.49	109.20	
MW-20	7/24/2019	51.82	55.00	
MW-21	7/24/2019	Dry	50.50	
MW-22	7/24/2019	88.47	113.70	
MW-25	7/22/2019	17.07	38.65	
MW-26	7/22/2019	28.52	28.22	Needs scraped, primed, paint, label, lock, inner cap
MW-27	7/22/2019	33.91	38.61	No inner riser cap
MW-29	7/22/2019	17.72	39.16	
MW-32	7/22/2019	Dry	26.15	Dry at 26.43
MW-33	7/22/2019	56.29	83.75	
MW-34A	7/22/2019	100.49	100.60	
MW-35	7/22/2019	107.46	167.70	
MW-37	7/22/2019	Dry	69.20	Dry at 70.30, lock needs lube
MW-38	7/22/2019	4.32	63.30	
MW-39	7/22/2019	55.3	58.35	
MW-40	7/22/2019	122.69	191.80	
MW-41	7/22/2019	20.05	36.70	
MW-42	7/22/2019	--	41.70	
MW-43	7/22/2019	41.3	46.81	
MW-44	7/22/2019	41	54.65	Needs paint, tag, bar and lock, inner cap
MW-45	7/24/2019	65.83	67.25	
MW-46	7/24/2019	Dry	39.47	
MW-47	7/22/2019	16.27	20.95	
MW-50	7/22/2019	38.6	35.10	
MW-51	7/22/2019	35.54	36.24	Cap and riser damaged, requires repair

Well ID	Date	Depth to Water	Depth to Bottom from TOC	New Remarks
MW-52	7/22/2019	34.88	44.29	
MW-53	7/22/2019	53.55	62.11	
MW-58	7/24/2019	5.41	36.75	
MW-59	7/22/2019	5.31	14.14	
MW-61	7/22/2019	67.27	68.00	
MW-62	7/22/2019	87.47	90.70	
MW-64	7/22/2019	13.36	21.95	
MW-69	7/22/2019	14.26	22.54	
MW-74	7/22/2019	--	15.24	
MW-80	7/22/2019	26.36	39.42	
MW-81	7/22/2019	7.85	15.10	
MW-82	7/22/2019	29.58	38.31	
MW-83	7/22/2019	48.57	74.60	
MW-84	7/22/2019	34.25	39.56	
MW-86	7/24/2019	38.1	38.09	
PZ-01	7/22/2019	12.86	18.60	
PZ-02	7/22/2019	16.1	19.80	
PZ-05	7/22/2019	19.71	19.74	No conductor casing cap
PZ-06A	7/22/2019	6.13	17.31	
PZ-07	7/22/2019	6.22	19.80	
PZ-08	7/22/2019	8.8	19.88	Needs scraped, primed, paint, label, lock, inner cap
PZ-09	7/22/2019	7.48	19.28	
TPZ-01	7/22/2019	--	--	Not measured - Off-site Location
TPZ-02	7/22/2019	--	--	Not measured - Off-site Location
TPZ-03	7/22/2019	9.26	13.90	
TPZ-04	7/22/2019	19.7	27.66	

Table 4. Groundwater Sampling Field Data (2019)

Well ID	Collect Date	Temperature (F)	pH (standard unit)	ORP (mV)	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Purge Rate (mL/min)	Comments
10L31	23-Jul-19	69.9	6.48	26	0.449	0.0	2.81	100	Negligible drawdown (<0.1 foot)
MW-01	23-Jul-19	61.8	6.19	194	0.334	0.0	1.32	140	Negligible drawdown (<0.1 foot)
MW-02A	24-Jul-19	70.5	7.25	91	0.258	0.0	5.22	--	~ 2.0 feet of groundwater in well, purged to collect samples
MW-03	25-Jul-19	--	--	--	--	--	--	--	Bailed to obtain samples (only enough volume for total/unfiltered rad).
MW-05	23-Jul-19	66.5	5.95	202	0.468	0.0	2.45	100	Negligible drawdown (<0.3 foot)
MW-07	23-Jul-19	61.2	6.86	159	0.385	0.0	3.08	120	Negligible drawdown (<0.1 foot)
MW-08	23-Jul-19	59.0	7.88	-65	0.270	0.0	0.29	150	1.1 feet of drawdown
MW-09A	23-Jul-19	69.7	8.19	134	0.255	0.0	0.46	130	1.2 feet of drawdown. Visible particulate began to appear in first unfiltered container.
MW-13	23-Jul-19	66.2	7.07	-15	0.318	46.6	1.33	150	Negligible drawdown (<0.3 foot)
MW-14	23-Jul-19	67.0	6.24	15	0.260	0.0	3.00	125	Slight drawdown (<1.0 foot). Unsure why, sudden drop off in ORP.
MW-15	23-Jul-19	66.8	5.63	92	0.220	56.4	1.54	130	1.2 feet of drawdown
MW-22	24-Jul-19	57.9	6.68	-72	1.160	284.0	0.56	120	Negligible drawdown (<0.1 foot)
MW-33	23-Jul-19	73.5	6.85	108	0.426	0.0	1.44	300	1.6 feet of drawdown
MW-40	23-Jul-19	67.9	8.36	-133	0.858	0.0	1.70	350	2.65 feet of drawdown
MW-44	24-Jul-19	76.9	7.19	-60	0.390	65.2	2.13	250	Negligible drawdown (<0.2 foot)
MW-45	24-Jul-19	68.7	7.08	210	1.280	296.0	16.01	150	Well went dry. After well recharged, only sufficient volume for unfiltered rad samples.
MW-47	23-Jul-19	62.3	4.60	352	0.188	152.0	4.09	110	2.45 feet of drawdown
MW-52	24-Jul-19	--	--	--	--	--	--	--	Unable to fit submersible pump into well. Purged ~ 3 L from well with bailer and collected samples.
MW-53	23-Jul-19	63.9	6.68	147	0.682	295	3.16	350	Abandoned purge before sampling due to very poor recharge of water.
MW-59	23-Jul-19	77.6	4.66	262	0.133	41.0	0.95	250	4.3 feet of drawdown
PZ-01	23-Jul-19	64.1	5.57	265	0.171	21.3	2.15	250	Slight drawdown (<0.8 foot)
PZ-09	23-Jul-19	64.3	4.96	250	0.128	17.4	1.92	150	Slight drawdown (<0.5 foot)
SP-DR-01	24-Jul-19	80.7	6.64	23	0.139	13.8	5.27	--	On-site groundwater seep near Trenches 4 and 5.
WS-CR-06	24-Jul-19	69.1	7.03	201	0.243	0.0	7.52	--	Off-site Carnahan Run outlet at Kiski River. Only unfiltered samples were collected.
Maximum		80.7	8.4	352	1.280	296.0	16.0	350.0	
Minimum		57.9	4.6	-133	0.128	0.0	0.3	100.0	
Average		67.5	6.5	108	0.410	58.6	3.1	180.3	
Geometric Mean		67.3	6.5	--	0.329	--	2.1	165.0	

NOTES:

Temperature (F) - Degrees Fahrenheit

Specific Conductance (mS/cm) - millisiemens per centimeter

ORP (mV) - Oxidation Reduction Potential in millivolts

Turbidity (NTU) - Nephelometric Turbidity Units

Purge Rate (mL/min) - milliliters per minute ("Pump Max" reflects maximum peristaltic rate of approximately 0.4 gallons [1.5 liters] per minute)

Table 5. Comprehensive Metals Sampling Results at SLDA

Well	Year	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM, TOTAL	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
10L31	2013	0.01 J	0.00052 U	0.00061 U	0.039	0.00061 U	0.00027 U	79	0.0013 J	0.00036 J	0.0008 J	0.29	0.00024 U	42	0.046	0.000086 J	0.0042 J	3.1	0.0015 U	0.00018 U	9	0.00016 U	0.00054 J	0.016 J
	2014	0.0038 J	0.001 U	0.001 U	0.043	0.0005 U	0.0005 U	67	0.0028 J	0.0005 U	0.00035 J	0.26	0.0005 U	36	0.013	0.0001 U	0.002 J	2.7	0.003 J	0.0005 U	6.8	0.0005 U	0.0005 U	0.0031 J
	2015	0.0084 J	0.001 U	0.001 U	0.06	0.0005 U	0.0005 U	54	0.00061 J	0.0005 U	0.0005 U	0.15 J	0.0005 U	27	0.0057	0.0001 U	0.0013 J	2.8	0.0025 U	0.0005 U	5.1	0.0005 U	0.0005 U	0.0018 U
	2016	0.015 J	0.00075 U	0.001 U	0.078	0.0005 U	0.0005 U	54	0.00062 J	0.00016 J	0.00073 J	0.62 U	0.0005 U	32	0.0015 J	0.0001 U	0.0039 J	2.3 J	0.0016 J	0.0005 U	1.9 J	0.0005 U	0.0005 U	0.0054 J
	2017	0.13	0.0011 J	0.001 U	0.082	0.0005 U	0.0005 U	53	0.00044 J	0.00034 J	0.00089 J	0.66	0.00036 J	30	0.013	0.0001 U	0.0029 J	2.5	0.0021 J	0.0005 U	2	0.0005 U	0.0005 U	0.003 J
	2018	0.012 J	0.00075 U	0.001 U	0.11	0.0005 U	0.00028 J	48	0.0006 J	0.00015 J	0.00024 J	0.46	0.0005 U	25	0.0029	0.0001 U	0.0029 J	2.3	0.0025 U	0.0005 U	1.2	0.0005 U	0.0005 U	0.011 J
	2019	0.03 U	0.00074 U	0.001 U	0.15	0.0003 U	0.00037 U	54.8	0.0011 J	0.00019 U	0.00074 U	0.33	0.00019 U	12.1	0.091	0.00016 U	0.0019 U	2.1	0.0019 U	0.00074 U	3.9	0.00037 U	0.00074 U	0.0065 J
	2013	0.0099 J	0.00052 U	0.00061 U	0.03	0.00025 U	0.00027 U	65	0.0016 J	0.00018 J	0.00088 J	0.098 J	0.00024 U	32	0.037	0.00012 J	0.0037 J	2.5	0.0017 J	0.00028 J	7	0.00016 U	0.00049 U	0.013 J
2014	0.0025 U	0.001 U	0.001 U	0.038	0.00034 J	0.0005 U	0.001 U	65	0.0018 J	0.00022 J	0.00015 J	0.47	0.0005 U	33	0.013	0.0001 U	0.0017 J	2.6	0.0025 U	0.0005 U	6.2	0.0005 U	0.00094 J	0.0035 J
2015	0.0027 J	0.00062 J	0.001 U	0.054	0.0005 U	0.0005 U	0.0005 U	54	0.002 J	0.00026 J	0.0005 U	0.16 J	0.0005 U	29	0.00093 J	0.0001 U	0.0014 J	2.8	0.0016 J	0.0005 U	5.5	0.0005 U	0.00054 J	0.0027 J
2016	0.38	0.00075 U	0.001 U	0.075	0.0005 U	0.0005 U	0.0005 U	52	0.00071 J	0.00013 J	0.0005 U	0.62 U	0.0005 U	29	0.0005 U	0.0001 U	0.0023 J	2.3 J	0.0022 J	0.0005 U	1.9 J	0.0005 U	0.0005 U	0.004 J
2017	0.005 U	0.00075 U	0.001 U	0.076	0.0005 U	0.0005 U	0.0004 J	32	0.00093 U	0.00022 J	0.00096 J	0.47	0.0005 U	28	0.00036 J	0.0001 U	0.0032 J	2.4	0.002 J	0.0005 U	2	0.0005 U	0.0005 U	0.005 U
2018	0.0054 J	0.00075 U	0.001 U	0.11	0.0005 U	0.0004 J	50	0.00044 J	0.00043 J	0.00093 J	0.47	0.0005 U	27	0.022	0.0001 U	0.0026 J	2.3	0.0026 J	0.0005 U	1.1	0.0005 U	0.0005 U	0.009 J	
2019	0.03 U	0.00074 U	0.0017 J	0.42	0.00037 U	0.00037 U	36.2	0.0018 J	0.0003 J	0.0019 U	11.4	0.00074 U	37	0.4	0.00003 U	0.0047 J	0.97	0.0019 U	0.00074 U	3.7	0.00037 U	0.00074 U	0.0092	
2013	0.012 J	0.00052 U	0.00061 U	0.048	0.0005 U	0.00027 U	46	0.00092 J	0.00022 J	0.0008 J	0.19 J	0.0003 J	23	0.014	0.000031 J	0.0034 J	1.8	0.0022 J	0.00018 U	4.8	0.0002 J	0.00049 U	0.0067 J	
2014	0.0043 U	0.00076 J	0.001 U	0.046	0.0005 U	0.00076 J	37	0.00066 J	0.0005 U	0.00046 U	0.12 U	0.0005 U	19	0.0015 J	0.0001 U	0.0014 J	1.5	0.0019 J	0.0005 U	3.2	0.0005 U	0.0005 U	0.0061 J	
2015	0.027 J	0.001 U	0.0032	0.07	0.0005 U	0.0005 U	0.0005 U	26	0.0005 U	0.00013 J	0.00024 U	4.2	0.0005 U	17	0.011	0.0001 U	0.001 J	1.5	0.0025 U	0.0005 U	2.1	0.0005 U	0.0005 U	0.0018 U
2016	0.012 J	0.00075 U	0.001 U	0.048	0.0005 U	0.00075 U	0.0005 U	29	0.00054 J	0.0005 U	0.00055 J	0.62 U	0.0005 U	18	0.00042 J	0.0001 U	0.0016 J	1.5 J	0.0023 J	0.0005 U	3.7	0.0005 U	0.0005 U	0.0058 J
2017	0.0032 U	0.00075 U	0.001 U	0.053	0.0005 U	0.0005 U	0.0005 U	31	0.00038 J	0.0005 U	0.00057 J	0.19 J	0.0005 U	19	0.001 U	0.0001 U	0.0021 J	1.7	0.0025 U	0.0005 U	3.7	0.0005 U	0.0005 U	0.0037 J
2018	0.008 J	0.00075 U	0.001 U	0.047	0.0005 U	0.00027 J	30	0.0007 J	0.0005 U	0.0006 J	0.28	0.0005 U	17	0.0012 J	0.0001 U	0.002 J	1.7	0.0015 J	0.0005 U	4.3	0.0005 U	0.0005 U	0.011 J	
2019	0.03 U	0.00074 U	0.001 U	0.032	0.0003 U	0.00037 U	20.1	0.00074 U	0.0019 U	0.0019 U	0.26	0.00074 U	3.1	0.55	0.00016 U	0.0019 U	1	0.0019 U	0.00074 U	1.3	0.00037 U	0.00074 U	0.0028 J	
2013	0.0017 J	0.00052 U	0.00061 U	0.043	0.00025 U	0.00027 U	44	0.00031 J	0.00012 U	0.0004 J	0.048 U	0.00024 U	21	0.00086 J	0.000085 J	0.0032 J	1.7	0.0018 J	0.00018 U	4.5	0.00016 U	0.00049 U	0.0027 J	
2014	0.0025 U	0.001 U	0.001 U	0.047	0.0005 U	0.0005 U	0.0005 U	33	0.00078 J	0.0005 U	0.0003 J	0.12 U	0.0005 U	17	0.00061 J	0.0001 U	0.0012 J	1.3	0.0024 J	0.0005 U	3	0.0005 U	0.0005 U	0.0022 J
2015	0.0044 J	0.001 U	0.001 U	0.054	0.0005 U	0.0005 U	0.0005 U	26	0.0012 J	0.00057 J	0.0005 U	0.31	0.0005 U	13	0.012	0.0001 U	0.00098 J	1.7	0.0022 J	0.0005 U	2.4	0.0005 U	0.0005 U	0.0027 J
2016	0.46	0.00075 U	0.001 U	0.048	0.0005 U	0.0005 U	0.0005 U	32	0.00041 J	0.0005 U	0.00041 J	0.62 U	0.0005 U	13	0.0005 U	0.0001 U	0.0016 J	1.6 J	0.0019 J	0.0005 U	3.7	0.0005 U	0.0005 U	0.0055 J
2017	0.005 U	0.00075 U	0.001 U	0.054	0.0005 U	0.0005 U	0.0005 U	32	0.0005 U	0.0005 U	0.0015 U	0.31	0.0005 U	18	0.001 U	0.0001 U	0.0023 J	1.7	0.002 J	0.0005 U	3.7	0.0005 U	0.0005 U	0.005 U
2018	0.0052 J	0.00075 U	0.001 U	0.046	0.0005 U	0.00075 U	0.0005 U	30	0.00057 J	0.0005 U	0.001 J	0.28	0.0005 U	17	0.0005 U	0.0019 J	0.0019 J	1.7	0.0025 U	0.0005 U	4			

Well	Year	ALUMINUM mg/L	ANTIMONY mg/L	ARSENIC mg/L	BARIUM mg/L	BERYLLIUM mg/L	CADMIUM mg/L	CALCIUM mg/L	CHROMIUM, TOTAL mg/L	COBALT mg/L	COPPER mg/L	IRON mg/L	LEAD mg/L	MAGNESIUM mg/L	MANGANESE mg/L	MERCURY mg/L	NICKEL mg/L	POTASSIUM mg/L	SELENIUM mg/L	SILVER mg/L	SODIUM mg/L	THALLIUM mg/L	VANADIUM mg/L	ZINC mg/L
MW-14	2013	0.006 J	0.00052 U	0.0019	0.36		0.00027 U	34	0.00061 J	0.0038 J	0.00027 J	10	0.00038 J	6	0.41	0.000086 J	0.005 J	0.96	0.0015 U	0.00018 U	3.7	0.00017 J	0.00049 U	0.018 J
	2014	0.0027 J	0.001 U	0.36	0.0005 U		0.00046 J	29	0.0005 U	0.0042 J	0.0005 U	7.7	0.0005 U	5	0.43	0.0005 U	0.0063 J	0.0005 U	0.0025 U	0.0005 U	3	0.0005 U	0.00049 U	0.0055 J
	2015	0.13	0.0039 J	0.12	1.6		0.0044	35	0.0035 J	0.0046 J	0.001 U	190	0.00081 J	3.6	0.48	0.0001 U	0.0071 J	0.55 J	0.0025 U	0.00052 J	1.7	0.0005 U	0.001 U	0.05 J
	2016	0.013 J	0.00075 U	0.0036	0.37		0.00025 U	27	0.0025 U	0.0005 U	0.0005 J	12	0.00032 J	5.4	0.0056 J	0.0001 U	0.0056 J	0.0005 U	0.0005 U	0.0005 U	3.1	0.001 J	0.0005 U	0.01 J
	2017	0.0072 U	0.00075 U	0.0013 J	0.38		0.0005 U	30	0.0011 J	0.004 J	0.0015 U	9.1	0.0005 U	6	0.46	0.0001 U	0.0059 J	0.77	0.0025 U	0.0005 U	3.1	0.0005 U	0.0025 U	0.012 J
	2018	0.0049 J	0.00075 U	0.0018	0.36		0.0005 U	30	0.0034 J	0.0032 J	0.00072 J	11	0.0005 U	5.9	0.38	0.0001 U	0.0048 J	0.0007	0.0025 U	0.0005 U	3	0.0005 U	0.0025 U	0.012 J
	2019	0.03 U	0.00074 U	0.001 U	0.16		0.0003 U	59.5	0.00074 U	0.0019 U	0.0019 U	0.14	0.00074 U	27.7	0.17	0.00016 U	0.0034 J	2.4	0.0019 U	0.00074 U	1.2	0.0003 U	0.00074 U	0.0035 J
	2020	0.0092 J	0.00081 J	0.00061 U	0.3		0.00025 U	28	0.00076 J	0.003	0.00076 J	7.5	0.00024 U	4.9	0.33	0.00011 J	0.0043 J	0.77	0.0015 U	0.00082 J	3	0.00016 U	0.00049 U	0.017 J
MW-14 (Filtered)	2014	0.0025 U	0.001 U	0.33	0.0005 U		0.0005 U	28	0.0005 U	0.0003 J	0.0005 U	6.5	0.0005 U	4.7	0.039	0.0005 U	0.0046 J	0.79	0.0025 U	0.0005 U	3	0.0005 U	0.00049 U	0.0051 J
	2015	0.0025 U	0.001 U	0.39	0.0005 U		0.0005 U	31	0.00063 J	0.0031	0.0005 U	7.1	0.0005 U	5.2	0.38	0.0001 U	0.0037 J	0.51	0.0025 U	0.0005 U	2.9	0.0005 U	0.0005 U	0.0024 J
	2016	0.13 J	0.00075 U	0.0012 J	0.35		0.0005 U	29	0.0005 U	0.003	0.00074 J	6.1	0.0005 U	5.4	0.36	0.0001 U	0.0049 J	0.71	0.0025 U	0.0005 U	3.2	0.0005 U	0.0005 U	0.0058 J
	2017	0.005 U	0.00075 U	0.0011 J	0.39		0.0005 U	30	0.00072 J	0.0042	0.0005 U	8.4	0.0005 U	5.6	0.47	0.0001 U	0.0059 J	0.82	0.0025 U	0.0005 U	3.2	0.0005 U	0.0025 U	0.0058 J
	2018	0.023 J	0.001 U	0.36	0.002 U		0.001 U	29	0.001 U	0.001 U	0.0027 J	8.8	0.001 U	6.2 J	0.45	0.0001 U	0.0048 J	2.5 U	0.005 U	0.0005 U	3.5 J	0.001 U	0.0005 U	0.0057 J
	2019	0.03 U	0.00074 U	0.0015 J	0.4		0.00037 U	36	0.00074 U	0.0034 J	0.0019 U	7.6	0.00074 U	6.2	0.39	0.00003 U	0.0042 J	0.91	0.0019 U	0.00074 U	3.5	0.00037 U	0.00074 U	0.012
	2020	0.0092 J	0.00081 J	0.00061 U	0.3		0.00025 U	28	0.00076 J	0.003	0.00076 J	7.5	0.00024 U	4.9	0.33	0.00011 J	0.0043 J	0.77	0.0015 U	0.00082 J	3	0.00016 U	0.00049 U	0.017 J
	2021	0.0025 U	0.001 U	0.33	0.0005 U		0.0005 U	28	0.0005 U	0.0003 J	0.0005 U	6.5	0.0005 U	4.7	0.039	0.0005 U	0.0046 J	0.79	0.0025 U	0.0005 U	3	0.0005 U	0.00049 U	0.0051 J
MW-15	2015	0.0058 J	0.001 U	0.00063 J	0.25		0.0005 U	17	0.0005 U	0.0015 J	0.0005 U	6.2	0.0005 U	4.1	1.4	0.0001 U	0.0022 J	0.71	0.0025 U	0.0005 U	4	0.00018 J	0.0005 U	0.0025 U
	2016	0.018 J	0.00075 U	0.001 U	0.27		0.0005 U	22	0.0025 U	0.002 J	0.009	3.8	0.0005 U	3.8	1.3	0.0001 U	0.0028 J	0.9 J	0.0025 U	0.0005 U	4.5	0.0005 U	0.0025 U	0.0056 J
	2017	0.018 U	0.00075 U	0.001 U	0.25		0.0005 U	18	0.0016 J	0.0016 J	0.0007 J	9.2	0.0005 U	5.1	1.3	0.0001 U	0.003 J	0.96	0.0025 U	0.0005 U	4.3	0.0005 U	0.0025 U	0.0059 J
	2018	1.2	0.00075 U	0.00075 J	0.43		0.0013	34	0.0047 J	0.0039 J	0.0035 J	5.7	0.0019	6.1	0.041 J	0.0001 U	0.0041 J	1.9	0.0025 U	0.0005 U	3.7	0.0005 U	0.0026 J	0.0098 J
	2019	0.03 U	0.00074 U	0.001 U	0.38		0.0003 U	44.3	0.0012 J	0.0019 U	0.0019 U	0.28	0.00074 U	9.1	0.21	0.00016 U	0.0019 U	1.7	0.0019 U	0.00074 U	3.3	0.0003 U	0.00074 U	0.0055 J
	2020	0.011 J	0.00052 U	0.000061 U	0.19		0.00025 U	18	0.00078 J	0.00026 J	0.00086 J	0.14 J	0.00078 J	4.4	0.14	0.000093 J	0.0017 J	1.1	0.0015 U	0.0005 J	3.8	0.00016 U	0.00049 U	0.012 J
	2021	0.0025 U	0.001 U	0.33	0.0005 U		0.0005 U	28	0.0005 U	0.00029 J	0.0005 U	0.088 J	0.0005 U	4.2	0.16	0.0001 U	0.00096 J	0.97	0.0025 U	0.0005 U	4.1	0.0005 U	0.00049 J	0.002 J
	2022	0.0025 U	0.0006 J	0.0005 U	0.26		0.0005 U	18	0.0007 J	0.0014 J	0.0005 U	0.43	0.0005 U	4.5	1.4	0.0001 U	0.0024 J	0.72	0.0025 U	0.0005 U	4.5	0.0005 U	0.0005 U	0.0031 J
MW-15 (Filtered)	2016	0.62	0.00075 U	0.001 U	0.27		0.0005 U	23	0.0005 U	0.00088 J	0.085	0.48 J	0.0005 U	5.4	1	0.0001 U	0.0022 J	0.87 J	0.0025 U	0.0005 U	4.4	0.0005 U	0.0005 U	0.0079 J
	2017	0.005 U	0.00075 U	0.001 U	0.27		0.0005 U	21	0.00067 J	0.0012 J	0.00068 J	0.52	0.0005 U	5.1	1.1	0.0001 U	0.0027 J	1	0.0025 U	0.0005 U	4.4	0.0005 U	0.0025 U	0.0028 J
	2018	0.005 U	0.00075 U	0.001 U	0.37		0.0005 U	35	0.0005 U	0.00058 J	0.00074 U	0.51	0.0005 U	5.8	1.1	0.0001 U	0.0021 J	1.1	0.0025 U	0.0005 U	3.7	0.0005 U	0.0025 U	0.0044 J
	2019	7.4	0.00074 U	0.00068	0.18		0.00068	15.8	0.0012	0.0077	0.0058	10.1	0.0015	16.1	0.21	0.00003 U	0.0031 J	5.4	0.0029 J	0.00074 U	11	0.00037 U	0.00074 U	0.0059 J
	20																							

Well	Units	Year	ALUMINUM mg/L	ANTIMONY mg/L	ARSENIC mg/L	BARIUM mg/L	BERYLLIUM mg/L	CADMIUM mg/L	CALCIUM mg/L	CHROMIUM, TOTAL mg/L	COBALT mg/L	COPPER mg/L	IRON mg/L	LEAD mg/L	MAGNESIUM mg/L	MANGANESE mg/L	MERCURY mg/L	NICKEL mg/L	POTASSIUM mg/L	SELENIUM mg/L	SILVER mg/L	SODIUM mg/L	THALLIUM mg/L	VANADIUM mg/L	ZINC mg/Lg/L
MW-52 (Filtered)		2013	0.011 J	0.00052 U	0.00061 U	0.24	0.00052 U	0.00027 U	84	0.0023 J	0.0011 J	0.0015 J	0.95	0.00024 U	13	0.18	0.00012 J	0.0053 J	2.1	0.0017 J	0.00056 J	3.3	0.00016 U	0.00049 U	0.004 J
		2014	0.0025 U	0.001 U	0.001 U	0.25	0.0005 U	0.0005 U	84	0.002 J	0.00031 J	0.0005 U	0.95	0.0005 U	13	0.22	0.0001 U	0.0022 J	2	0.0025 U	0.0005 U	3.4	0.0005 U	0.00085 J	0.0025 U
		2015	0.0025 U	0.001 U	0.001 U	0.28	0.0005 U	0.0005 U	86	0.0031 J	0.00031 J	0.0005 U	1.1	0.0005 U	13	0.23	0.0001 U	0.0025 U	2	0.0025 U	0.0005 U	3.4	0.0005 U	0.00077 J	0.0025 U
		2018	0.006 J	0.00075 U	0.001 U	0.33	0.0005 U	0.00023 J	78	0.00082 J	0.00015 U	0.0005 U	1.1	0.0005 U	14	0.15	0.0001 U	0.0039 J	1.9	0.0025 U	0.0005 U	3.3	0.0005 U	0.00025 U	0.0079 J
		2019	0.035 J	0.00074 U	0.0011 U	0.11	0.00037 U	0.00037 U	18.9	0.0011 J	0.0019 U	0.0019 U	1.7	0.00074 U	6.5	0.017	0.00003 U	0.0019 U	0.56	0.0019 U	0.00074 U	7.8	0.00037 U	0.00074 U	0.0038 J
MW-53		2014	0.27	0.001 U	0.0032	0.17	0.0005 U	0.0005 U	27	0.0047 J	0.0012 J	0.0059	0.99	0.0012	10	0.037	0.0001 U	0.011	51	0.0025 U	0.0005 U	110	0.0005 U	0.0015 J	0.025 J
		2015	0.21 J	0.0011 J	0.00083 J	0.45	0.0005 U	0.0005 U	83	0.003 J	0.00092 J	0.0038 J	0.7	0.00049 J	28	0.072	0.0001 U	0.0058 J	26	0.014	0.00018 U	80	0.0003 J	0.0011 J	0.023 J
		2016	0.27	0.00088 J	0.002 U	0.46	0.001 U	0.001 U	97	0.0059 J	0.00087 J	0.0043 J	0.21 J	0.001 U	30	0.1	0.0001 U	0.0078 J	21	0.008 J	0.0005 U	77	0.001 U	0.001 U	0.015 J
		2017	0.19	0.00076 J	0.001 U	0.38	0.0005 U	0.0014 J	110	0.0013 J	0.0018 J	0.0018 J	1	0.00036 J	34	0.23	0.0001 U	0.0084 J	21	0.0054	0.0005 U	81	0.0005 U	0.00025 U	0.013 J
		2018	18	0.00066 J	0.0082	0.74	0.00049 J	0.00043 J	110	0.13	0.016	0.016	30	0.027	36	0.69	0.0001 U	0.086	24	0.0099	0.0005 U	55	0.0027	0.0005 U	0.091
MW-53 (Filtered)		2014	0.15	0.0012 J	0.0042	0.12	0.0005 U	0.00097 U	12	0.0097 J	0.001 J	0.014	0.17 J	0.00045 J	10	0.012	0.0001 U	0.014	80	0.0025 U	0.00021 J	120	0.0005 U	0.0005	0.0077 J
		2015	0.0025 U	0.001 J	0.001 U	0.46	0.0005 U	0.001 U	95	0.0005 U	0.0011 J	0.0015 J	0.24	0.0005 U	29	0.056	0.0001 U	0.0052 J	30	0.012	0.0005 U	86	0.0005 U	0.00014 J	0.021 J
		2016	0.049 J	0.0012 J	0.001 U	0.41	0.0016	0.0023	91	0.0005 U	0.0029	0.0062	0.62 U	0.0011	31	0.047	0.0001 U	0.016	25	0.012	0.0005 U	71	0.0017 J	0.0005 U	0.042 J
		2017	0.0064 J	0.0025 J	0.00052 J	0.37	0.00052 J	0.00052 J	92	0.0012 J	0.001 J	0.0016 J	0.72 J	0.00047 J	30	0.18	0.0001 U	0.0067 J	13 J	0.0028 J	0.0005 U	91	0.0005 U	0.00025 U	0.029 J
		2018	2.3	0.00075 U	0.0035	0.42	0.00046 J	0.0005 U	97	0.014	0.0077	0.012	11	0.014	30	0.44	0.0001 U	0.018	19	0.0087	0.0005 U	53	0.0005 U	0.00071	0.044 J
MW-59		2013	0.2	0.00058 J	0.00061 U	0.056	0.00038 J	0.00038 J	9	0.0098 J	0.018	0.0019 J	1.2	0.00052 J	8	0.73	0.0001 J	0.032	1.2	0.0015 U	0.00018 U	7.1	0.0002 J	0.00049 U	0.044 J
		2014	0.91	0.001 U	0.001 U	0.039	0.00064 J	0.0005 U	12	0.0012 J	0.014	0.0035 J	3.8	0.0005 U	9.4	0.033	0.0001 U	0.033	0.002 J	0.0005 U	6.1	0.0005 U	0.0005 U	0.056	
		2015	0.77	0.001 U	0.001 U	0.047	0.0003 J	0.0003 J	9.3	0.0066 J	0.012	0.00024 U	1.6	0.00032 J	8.6	0.6	0.0001 U	0.022	0.0025 U	0.00018 U	4.8	0.00021 J	0.00098 J	0.027 J	
		2016	0.12 J	0.00084 J	0.0002 U	0.0088	0.000039 J	0.000039 J	6	0.0001 U	0.0018	0.00023 J	0.62 U	0.0001 U	6.2	0.0001 U	0.00054	0.0005 U	0.0005 U	0.0005 U	8.3	0.0001 U	0.00001 U	0.0092 J	
		2017	0.2	0.0064	0.00052 J	0.052	0.0005 J	0.00035 J	7	0.0011 J	0.0012 J	0.006	0.05	0.00036 J	7.9	0.38	0.0001 U	0.03	0.0025 U	0.00077 J	6.4	0.0005 U	0.00025 U	0.045 J	
MW-59 (Filtered)		2018	0.087	0.00075 U	0.001 U	0.044	0.00053 J	0.0005 J	5.2	0.0009 J	0.0056	0.0012 J	0.085 J	0.0005 U	5.4	0.59	0.0001 U	0.029	0.0025 U	0.0005 U	8.6	0.0005 U	0.00025 U	0.045 J	
		2019	0.03 U	0.00074 U	0.001 U	0.065	0.0003 U	0.00037 U	33.3	0.00074 U	0.0019 U	0.0036 J	0.00074 U	0.0019 U	18.5	0.0019 U	0.00018 U	0.0019 U	1.9	0.0019 U	0.00074 U	3.6	0.0003 U	0.00074 U	0.0034 J
		2013	0.066	0.00064 J	0.00061 U	0.053	0.00025 U	0.00027 U	9.3	0.0003 U	0.016	0.0013 J	0.84	0.00024 U	7.2	0.61	0.00015 J	0.028	1.1	0.0015 U	0.00018 U	5.9	0.00016 U	0.00049 U	0.049 J
		2014	0.1	0.001 J	0.001 U	0.038	0.00048 J	0.0005 U	8.9	0.00041 J	0.011	0.00074 J	2.1	0.0005 U	7.7	0.51	0.0001 U	0.02	0.88	0.0025 U	0.0005 U	5.4	0.0005 U	0.0005 U	0.024 J
		2015	0.04 J	0.0006 J	0.001 U	0.043	0.00032 J	0.0005 U	9.4	0.00089 J	0.012	0.00027 J	1.7	0.0005 U	8.7	0.62	0.0001 U	0.022	0.68	0.0025 U	0.0005 U	4.8	0.0005 U	0.0005 U	0.028 J
MW-81		2016	0.13 J	0.00075 U	0.001 U	0.046	0.00056 J	0.00032 J	6.4	0.0005 U	0.0097	0.0015 J	0.62 U	0.0005 U	6.2	0.0025 U	0.0001 U	0.028	0.0025 U	0.0005 U	7.5	0.0005 U	0.0005 U	0.054	
		2017	0.056	0.00075 U	0.001 U	0.052	0.00034 J	0.0005 U	7.2	0.00068 J	0.0047	0.00088 J	0.068 J	0.0005 U	7.5	0.33	0.0001 U	0.028	0.0025 U	0.0005 U	5.7	0.0005 U	0.00025 U	0.037 J	
		2018	0.072	0.00075 U	0.00045 J	0.046	0.00045 J	0.0005 J	5.8	0.0014 J	0.0053	0.0017 J	0.07 J	0.0005 U	6.1	0.55	0.0001 U	0.021	0.92	0.0025 U	0.0005 U	7.5	0.0005 U	0.00025 U	0.045 J
		2019	0.03 U	0.00074 U	0.0011 U	0.37	0.00037 U	0.00037 U	38.9	0.00084 J	0.0019 U	0.0019 U	1.1	0.00074 U	9.3	0.35	0.00003 U	0.0019 U	1.6	0.0019 U	0.00074 U	3.2	0.00037 U	0.00074 U	0.0068
		2013	0.0097 J	0.00052 U	0.00061 U	0.098	0.00037 U	0.00027 U	30	0.00076 J	0.00025 J	0.00069 J	0.17 J	0.0003 J	6	0.014	0.0001 J	0.0017 J	1.1	0.0015 U	0.00018 U	4.8	0.00022 J	0.00049 U	0.011 J
MW-81 (Filtered)		2013	0.0029 J	0.00052 U	0.00061 U	0.085	0.00025 U	0.00027 U	28	0.00032 J	0.00012 U	0.00054 J	0.048 U	0.00024 U	5.3	0.011	0.00009 J	0.0016 J	0.99	0.0015 U	0.00018 U	4	0.00016 U	0.00049 U	0.019 J
		2015	0.022 J	0.001 U	0.001 U	0.11	0.0005 U	0.0005 U	24	0.00032 J	0.0004 J	0.0005 U	0.17 J	0.0005 U	7.7	0.12	0.0001 U	0.0013 J	0.52	0.0025 U	0.0005 U	7.1	0.0005 U	0.0005 U	0.0025 U
		2016	0.017 J	0.00075 U	0.001 U	0.091	0.00025 U	0.0005 U	20	0.00025 U	0.0025 U	0.004 J	0.62 U	0.0005 U	6.8	0.0072 J	0.0001 U	0.0022 J	0.63 J	0.0025 U	0.0005 U	5	0.0005 U	0.00025 U	0.0054 J
		2017	0.01 U	0.00075 U	0.001 U	0.11	0.0005 U	0.0005 U	22	0.00044 J	0.0005 U	0.0015 U	0.3	0.0005 U	7.3	0.015	0.0001 U	0.0016 J	0.64	0.0025 U	0.0005 U	6.5	0.0005 U	0.00025 U	0.0046 J
		2018	0.018 J	0.00075 U	0.001 U	0.11	0.0005 U	0.0005 U	23	0.0005 U	0.0005 U	0.003 U	0.27	0.0005 U	7.3	0.0036	0.0001 U	0.0018 J	0.71	0.0025 U	0.0005 U	7.6	0.00018 J	0.00025 U	0.021 J
PZ-01		2019	0.03 U	0.00074 U	0.001 U	0.33	0.0003 U	0.00037 U	106	0.00074 U	0.0019 U	0.0019 U	0.64	0.00074 U	20.2	0.36	0.00016 U	0.0019 U	2.4	0.0019 U	0.00074 U	4.3	0.0003 U	0.00074 U	0.018
		2015	0.0033 J	0.00059 J	0.001 U	0.11	0.0005 U	0.00034 J	24	0.0014 J	0.0005 U	0													

Table 6. Comprehensive Radionuclide Sampling Results at SLDA

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
10L31	2013	0.109 J	0.168	0.066 U	-1.23 U	0.524 U	-0.059 U	-0.007 U	0.431
	2014	0.05 U	0.057 U	0.021 U	-0.637 U	0.026 U	-0.024 U	0 U	0.312 J
	2015	0.005 U	0.15 J	0.046 J	-1.28 U	0.054 U	-0.031 U	-0.041 U	0.362
	2016	0.093	0.093 U	-0.063 U	-9.35 U	0.513 J	-0.014 U	0 U	0.374
	2017	0.002 U	0.089 U	0.029 U	3.28 U	0.374 J	-0.005 U	-0.003 U	0.416
	2018	0.015 U	0.154 U	0.035 U	0.834 U	0.058 U	-0.009 U	0 U	0.399
	2019	-0.011 U	0.012 U	0.007 U	4.8 U	0.021 U	0.026 U	-0.003 U	0.3
10L31 (Filtered)	2013	0.099 J	0.159 J	0.006 U	-1.74 U	0.576 U	-0.065 U	-0.03 U	0.402
	2014	0.053 J	0.08 U	0.027 U	-0.29 U	0.005 U	0.009 U	0 U	0.31 J
	2015	0.03 U	0.089 J	-0.01 U	-0.739 U	-0.027 U	0.011 U	0 U	0.407
	2016	-0.034 U	0.07 U	-0.023 U	-6.5 U	0.372 U	-0.079 U	-0.001 U	0.392
	2017	0.037 U	0.141 U	0.06 U	4.73 U	0.346 J	-0.015 U	0 U	0.345 J
	2018	0.027 U	0.102 U	0.104 J	-0.055 U	0.106 U	0.025 U	0 U	0.424
	2019	-0.021 U	0.023 U	0.006 U	-2.4 U	0.043 U	0.045 U	0.016 U	0.304
MW-01	2004	0.834 U		0.683 U	13.5 U			0.379 J	
	2013	0.027 U	0.204 J	0.019 U	3.62 U	0.442 U	-0.04 U	-0.216 U	0.162 J
	2014	0.089 J	0.05 U	0.025 U	1.66 U	-0.151 U	-0.006 U	-0.027 U	0.065 J
	2015	0.026 U	0.203	0.056 U	0.78 U	-0.035 U	-0.009 U	-0.009 U	0.07 U
	2016	0 U	0.097 U	0.065 J	-4.3 U	0.618 J	0.027 U	-0.012 U	0.058 U
	2017	0.013 U	0.11 U	-0.009 U	4.25 U	0.419 J	-0.04 U	-0.004 U	0.075 J
	2018	0.036 U	0.155 J	0.026 U	2.98 J	0.152 J	-0.015 U	0 U	0.179 J
MW-01 (Filtered)	2013	-0.017 U	0.032 U	0.021 U	2 U	-0.099 U	-0.01 U	0 U	0.021 U
	2014	0.066 U	0.186 J	0.022 U	8.18 J	0.422 U	-0.005 U	-0.022 U	0.163 J
	2015	-0.053 U	0.051 U	-0.032 U	1.8 U	0.014 U	-0.006 U	-0.026 U	0.067 J
	2016	-0.008 U	0.099 J	0.034 U	-3.62 U	-0.048 U	-0.004 U	0 U	0.076 U
	2017	0.01 U	0.095 U	0.002 U	-3.39 U	0.429 U	-0.071 U	0.021 J	0.068 J
	2018	0.072 J	0.112 U	0.023 U	2.83 U	0.344 J	-0.03 U	0 U	0.06 U
	2019	-0.008 U	0.332 J	0.109 J	-0.824 U	0.039 U	0.012 U	0.012 U	0.18 J
MW-02	2004	0.503 U		0.529 U	15.7 U			0.429 U	
	2004	R		0.326 U	11.9 U			0.298 J	
MW-02A	2004	1.46 J		R	11.2 U			0.471 J	
	2013	0.047 U	0.221 J	0.091 J	1.04 U	0.571 J	-0.125 U	-0.021 U	0.102 J
	2015	0.014 U	0.101 J	0.071 J	0.764 U	-0.025 U	0.056 J	-0.036 U	-0.004 U
	2016	0.025 U	0.08 U	0.065	1.14 U	0.275 U	0.013 U	0.022 U	0.067 U
	2017	0.047 U	0.127 U	0.013 U	-2.09 U	0.345 J	-0.05 U	0 U	0.072 U
	2018	0.023 U	0.046 U	0.05 J	3.8 J	0.057 U	-0.007 U	-0.005 U	0.118 U
	2019	-0.021 U	0.003 U	0.034 U	2.8 U	0.035 U	-0.008 U	0.005 U	0.078 J
MW-02A (Filtered)	2013	-0.048 U	0.049 U	0.038 J	-0.092 U	0.41 U	-0.153 U	-0.048 U	0.093 J
	2015	0.032 U	0.144 J	0.057 J	1.22 U	-0.088 U	0.061 J	0.01 U	0.02 U
	2016	-0.006 U	0.138 J	-0.043 U	-1.14 U	0.544 J	-0.121 U	0 U	0.062 U
	2017	0.181 J	0.233 U	0.015 U	2.89 U	0.404 J	0.018 U	-0.004 U	0.067 U
	2018	-0.01 U	0.285 J	0.028 J	2.25 U	0.114 U	-0.008 U	-0.004 U	0.129 U
	2019	-0.02 U	0.011 U	0.002 U	2.4 U	-0.005 U	0.042 U	0.013 U	0.033 U
MW-03	2013	0.042 U	0.164 J	0.01 U	-0.122 U	2.42 J	0.056 U	0.369 J	3.81
	2014	0.163 J	0.146 U	0 U	10.8 J	1.18	0.054 U	0.181 J	1.98
	2015	0.071 J	0 U	0.056 U	5.21 U	0.433	0.138	0.124	1.91
	2016	0.06 J	0.09 U	0.045 J	-0.282 U	0.604 J	0.014 U	0.076 J	1.18
	2018	0.013 U	0.175 J	0.027 J	1.22 U	0.064 U	0.034 J	0.053 J	0.986
	2019	-0.027 U	0 U	0.02 U	10.6 U	0.015 U	0.027 U	0.005 U	0.153 J
MW-03 (Filtered)	2015	0.005 U	0.086 U	0.224	2.35 U	0.591	0.138	0.073	1.86
	2016	0.023 U	0.114 U	-0.065 U	3.02 U	0.437 J	-0.014 U	-0.006 U	1.29

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
MW-05	2004	1.19 J		0.191 U	12.2 U			0.592 J	
	2014	0.069 J	0.152 J	0.062 J	-0.781 U	-0.058 U	0.033 U	-0.041 U	0.127 U
	2015	0.018 U	0.196	0.041 J	3.51 U	-0.121 U	0.088 J	0.044 U	0.161 J
	2016	0.015 U	0.092 U	0.005 U	-4.8 U	0.53 J	-0.03 U	0.019 U	0.037 U
	2017	-0.005 U	0.084 U	0.028 U	3.41 U	0.565 J	-0.027 U	-0.004 U	0.101 J
	2018	0.072 J	0.161 U	0.022 U	0.111 U	0.034 U	-0.008 U	-0.007 U	0.132 J
	2019	-0.011 U	0.031 U	0.011 U	-2.3 U	-0.037 U	0.073 U	0 U	0.102 J
MW-05 (Filtered)	2014	0.008 U	0 U	0.04 U	3.04 U	0.012 U	-0.016 U	0.019 U	0.105 U
	2015	0.012 U	0.057 U	0.029 J	1.1 U	-0.157 U	-0.025 U	0.013 J	0.153 J
	2016	-0.006 U	0.046 U	-0.013 U	-6.31 U	0.406 U	-0.126 U	-0.016 U	0.079 J
	2017	0.04 U	0.135 U	0.017 U	3.35 U	0.31 J	-0.029 U	0 U	0.112 J
	2018	0.038 U	0.305 U	0.116 J	0.995 U	0.155 J	0.043 J	-0.005 U	0.097 J
	2019	-0.008 U	0.042	0.003 U	-0.5 U	-0.078 U	0.053 U	0.016	0.06 J
MW-06	2004	0.822 U		R	8.91 U			0.5 J	
MW-07	2004	0.86 U		0.395 U	11.4 U			0.236 J	
	2013	0.103 J	0.094 J	0.017 U	-4.6 U	0.374 U	-0.008 U	0 U	0.241 J
	2014	0.005 U	0.014 U	0.034 U	3.62 U	-0.021 U	-0.022 U	0 U	0.224 J
	2015	0.053 U	0.117 J	0.002 U	-0.802 U	0.156 J	-0.022 U	0 U	0.176 J
	2017	0.061 J	0.1 J	-0.013 U	-0.147 U	0.37 U	-0.003 U	0 U	0.192 J
	2018	0.043 U	0.23 J	0.053 U	-1.32 U	0.109 U	0.01 U	-0.006 U	0.252 J
	2019	-0.007 U	0.014 U	-0.012 U	11.2	0.071 U	0.034 U	0.007 U	0.107 J
MW-07 (Filtered)	2013	0.102 J	0.151 J	0.018 U	-2.3 U	0.819 J	-0.039 U	0 U	0.239 J
	2014	0.026 J	0.119 U	0.009 U	7.88 J	-0.012 U	-0.04 U	0 U	0.205 J
	2015	-0.02 U	0.104 J	0.051 U	2.89 U	0 U	0.037 U	0.012 U	0.18 J
	2017	0.001 U	0.097 J	-0.006 U	1.87 U	0.411 U	-0.007 U	-0.004 U	0.172 J
	2018	0.022 U	0.34 J	0.132 J	-0.897 U	0.085 U	0.008 U	0 U	0.245 J
	2019	-0.005 U	-0.013 U	0.008 U	4.7 U	0.012 U	0.03 U	-0.012 U	0.077 J
MW-08	2004	0.667 U		0.125 U	11.6 U			0.557 J	
	2013	-0.028 U	0.184 J	-0.009 U	1.28 U	0.67 J	0.011 U	-0.007 U	0.103 J
	2014	-0.007 U	0.058 U	0.048 U	2.71 U	-0.177 U	-0.088 U	-0.07 U	0.058 J
	2015	0.07 J	0.103 J	0.007 U	-0.21 U	0.012 U	-0.016 U	-0.018 U	0.078 U
	2016	0.012 U	0.106 J	-0.011 U	1.24 U	0.384 J	-0.129 U	0 U	0.06 U
	2017	0.116 J	0.159 U	0.04 U	2.09 U	-0.01 U	0.017 U	0.041 J	0.077 J
	2018	0.006 U	0.227 J	0.096 U	1.16 U	0.153 J	0.02 U	-0.004 U	0.151 J
	2019	-0.016 U	-0.012 U	0.003 U	3.4 U	0.031 U	0.005 U	0.003 U	0.038 J
MW-08 (Filtered)	2013	-0.003 U	0.043 U	0.026 U	-1.74 U	0.15 U	-0.015 U	-0.008 U	0.107 J
	2014	0.003 U	0.068 U	0.059 U	3.81 U	-0.08 U	0.028 U	-0.062 U	0.06 J
	2015	-0.01 U	0.015 U	0.023 U	-0.495 U	0.063 U	-0.029 U	0 U	0.098 U
	2016	0.026 J	0.128 J	0.006 U	0.772 U	0.527 J	-0.011 U	0.018 U	0.08 U
	2017	0.071 J	0.053 U	0.004 U	3.05 U	0.387 J	0.008 U	0.02 J	0.081 J
	2018	0.035 U	0.366 J	0.054 U	-0.514 U	0.15 J	-0.008 U	-0.004 U	0.133 J
	2019	-0.023 U	0.034 U	0.007 U	3.6 U	0 U	0.019 U	0.006 U	0.075 J
MW-09A	2004	0.716 U		0.0386 U	9.78 U			0.459 J	
	2013	0.109 U	0.051 U	-0.041 U	5.58 J	0.283 U	-0.027 U	0.037 J	0.154 J
	2014	0.017 U	0.01 U	0.079	0.413 U	-0.159 U	-0.177 U	-0.118 U	0.111 J
	2015	0 U	-0.041 U	0 U	-1.89 U	0.081 U	0.015 U	-0.01 U	0.145 J
	2016	0.081 J	0.128 J	0.013 U	-4.11 U	0.475 J	0.054 U	-0.007 U	0.129 J
	2017	0.002 U	0.111 U	0.012 U	2.85 U	0.385 J	-0.005 U	-0.003 U	0.43
	2018	0.01 U	0.465 J	0.053 U	1.23 U	0.222 J	0.034 J	0 U	0.21 J
MW-09A (Filtered)	2019	-0.018 U	0.027 U	0.013 U	9.2 U	0.199	0.023 U	-0.003 U	0.188 J
	2013	0.141 J	0.205 J	-0.028 U	2.99 U	0.505 U	-0.02 U	0 U	0.174 J
	2014	0.016 U	0.08 J	0.03 U	-0.108 U	-0.004 U	-0.009 U	0.012 U	0.116 J
	2015	0.061 J	0.108 J	0.049 J	-2.36 U	-0.042 U	-0.023 U	0 U	0.168 J
	2016	0.047 J	0.121 U	-0.094 U	-4.74 U	0.323 U	-0.011 U	-0.006 U	0.144 J
	2017	0.072 J	0.106 U	0.045 U	6.4 J	0.445 J	0.006 U	0 U	0.415
	2018	0.03 U	0.329 U	0.104 J	2.33 U	0.19 J	0.015 U	-0.004 U	0.231 J
MW-12D	2019	-0.013 U	0.017 U	0.021 U	2.4 U	0 U	0.085	0.027 U	0.14 J
	2004	0.593 U		0.595 U	10.2 U			0.774 J	

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
MW-13	2004	0.612 U		0.715 U	11.7 U			0.328 J	
	2013	0.068 J	0.033 U	0.027 U	-0.274 U	0.252 U	-0.037 U	-0.019 U	0.137 J
	2014	0.013 U	0.08 U	-0.017 U	-2.35 U	-0.019 U	-0.028 U	0 U	0.123 U
	2015	0.021 U	0.167	0.071 J	4.29 U	0.147 J	0.026 U	-0.013 U	0.085 J
	2016	0.01 U	0.038 U	-0.039 U	0.492 U	0.591 J	-0.011 U	0 U	0.081 U
	2017	-0.002 U	0.213 J	0.013 U	2.62 U	0.333 J	-0.028 U	0 U	0.067 U
	2018	-0.024 U	0.323 U	0.143 J	-0.884 U	0.123 U	0.01 U	0.018 J	0.129 J
	2019	-0.011 U	0.007 U	0.033 J	3.6 U	-0.034 U	0.096 U	0.008 U	0.033 U
MW-13 (Filtered)	2013	0.02 U	0.156 J	0.053 U	-4.75 U	0.457 U	0.06 J	-0.005 U	0.156 J
	2014	-0.012 U	0.153 J	0.03 U	2.33 U	0.017 U	0.008 U	-0.014 U	0.111 U
	2015	0.064 J	0.031 U	0.029 J	3.08 U	-0.039 U	0.012 U	0.062 J	0.082 J
	2016	-0.007 U	0.034 U	0.024 U	3.43 U	0.327 U	-0.082 U	-0.001 U	0.089 U
	2017	0.026 U	0.135 U	0.037 U	5.1 U	0.273 J	-0.004 U	-0.004 U	0.07 U
	2018	0.028 U	0.541 J	0.183 J	1.6 U	0.043 U	-0.008 U	0 U	0.126 J
	2019	0.013 U	0 U	0 U	-1.9 U	0.02 U	0.07 U	-0.002 U	0.028 U
MW-14	2004	0.675 U		0.494 U	10.7 U			0.341 J	
	2013	0.057 U	0.1 J	0.1 U	-0.698 U	0.828 J	-0.027 U	0 U	0.098 J
	2014	0.034 J	-0.011 U	0.043 U	0.602 U	0.128 J	-0.017 U	-0.017 U	0.032 U
	2015	-0.099 U	0.388 J	0.053 U	0.847 U	4.15	0.051 U	0.051	1.06
	2016	-0.005 U	-0.012 U	-0.058 U	-0.654 U	0.635 J	0.038 J	-0.006 U	0.088 U
	2017	-0.012 U	0.234 J	0.046 U	0.232 U	0.411 U	0.018 J	-0.004 U	0.029 U
	2018	0.038 U	0.421 J	0.058 U	-0.58 U	0.123 U	0.041 J	0.011 U	0.124 J
	2019	-0.023 U	0.037 U	0.003 U	-1.5 U	-0.017 U	0.036 U	0.014 U	0.184 J
MW-14 (Filtered)	2013	0.108 J	0.035 U	0.124 J	-3.51 U	0.886 J	-0.022 U	0 U	0.099 J
	2014	-0.031 U	0.103 U	0.056 J	2.05 U	-0.098 U	-0.072 U	-0.045 U	0.031 U
	2015	-0.031 U	0.081 J	0.052 U	-0.301 U	-0.018 U	0.034 U	-0.025 U	0.076 U
	2016	0.007 U	0.091 J	-0.024 U	-3.38 U	0.345 J	0.01 U	-0.006 U	0.069 U
	2017	0.096 J	0.122 J	0.054 U	-2.68 U	0.339 U	0.014 U	0.015 J	0.028 U
	2018	0.04 U	0.218 J	0.071 U	0.319 U	0.171 J	0.035 J	-0.005 U	0.123 J
	2019	-0.03 U	-0.012 U	0.011 U	7.6 U	0.059 U	-0.034 U	0.004 U	0.163 J
MW-15	2004	0.776 U		0.107 U	12.7 U			0.487 J	
	2013	0.061 U	0.008 U	-0.017 U	4.42 J	0.283 U	0.08 J	-0.035 U	0.263 J
	2014	0.182 J	0.137 U	-0.107 UJ	-2.97 U	0.17	0.036 J	0 U	0.064 U
	2015	0.049 J	0.022 U	0.006 U	5.19 J	0.013 U	0.039 U	-0.065 U	0.053 U
	2016	0.02 U	0.045 U	0 U	-5.09 U	0.571 J	-0.078 U	-0.001 U	0.085 U
	2017	0.042 U	0.162 J	0.035 U	1.86 U	0.008 U	0.015 U	0.04 J	0.086 J
	2018	-0.003 U	0.117 U	0.068 U	-0.166 U	0.262 J	0.094 J	-0.005 U	0.245 J
	2019	-0.007 U	0.032 U	0.001 U	11 U	-0.005 U	0.025 U	-0.021 U	0.025 U
MW-15 (Filtered)	2013	0.05 U	0.023 U	0 U	0.708 U	0.557 J	0.032 U	0.023 U	0.061 U
	2014	-0.055 U	-0.024 U	0 U	1.82 U	-0.045 U	-0.011 U	0 U	0.051 U
	2015	0.047 U	0.104	0.02 U	0.37 U	0.095 U	0.026 U	0 U	0.086 J
	2016	0.04 J	0.042 U	0.012 U	-3.35 U	0.628 J	0.002 U	-0.005 U	0.063 U
	2017	0.073 J	0.381 J	0.084 J	-0.204 U	0.267 U	-0.003 U	0 U	0.068 U
	2018	0.006 U	0.216 U	0.117 J	-1.26 U	0.142 J	-0.018 U	0 U	0.107 J
	2019	-0.018 U	0.028 U	0.017 U	9.8 U	0.025 U	-0.001 U	-0.012 U	0.069 J
MW-16BC	2004	0.564 U		0.035 J	12 U			0.468 J	
MW-19	2004	R		R	R			0.459 J	
MW-20	2013	0.026 U	0.16 J	0.006 U	3.32 U	2.41 J	0.413	0.492	2.47
	2014	-0.017 U	0.029 U	0.011 J	-1.93 U	4.23	1.32	0.66	1.61
	2015	-0.014 U	0.116 J	0.012 U	0.741 U	1.62	0.334	0.193 J	2.35
MW-20 (Filtered)	2015	0.025 U	0.117 J	0.073 J	9.13 J	1.42	0.298	0.184	1.49

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
MW-22	2004	0.458 U		0.532 U	10.6 U			0.478 J	
	2013	0.106 J	0.152 J	0.093	-0.47 U	0.489 J	-0.055 U	0.003 U	0.282 J
	2014	0.007 U	0.034 U	0.051 J	1.98 U	0.226 J	0.067 J	0.084	0.292
	2015	0.015 U	0.171	0.043 U	-1.15 U	-0.051 U	-0.012 U	0 U	0.116 J
	2016	0.011 U	0.016 U	-0.041 U	0.272 U	0.467 J	0.093 J	0.06 J	0.265 J
	2017	0.046 U	0.037 U	0.054 U	1.1 U	0.364 J	0.029 U	0.018 J	0.459
	2018	0.014 U	0.121 U	0.067 U	-0.367 U	0.178 J	0.006 U	0.019 J	0.193 J
	2019	-0.02 U	-0.009 U	0.051 U	12.5	0.48	0.36	0.373	0.771
MW-22 (Filtered)	2013	0.026 U	0.075 U	0.031 U	0.184 U	0.643 J	-0.039 U	0 U	0.157 J
	2014	0.197	0.025 U	0.025 U	0.484 U	-0.037 U	-0.025 U	-0.007 U	0.059 J
	2015	0.044 U	-0.009 U	0.017 U	8.2 J	0.073 U	-0.035 U	0.012 U	0.095 J
	2016	0.059 J	0.123 J	0 U	-0.187 U	0.663 J	-0.144 U	0.01 U	0.034 U
	2017	-0.003 U	0.119 U	0.088 J	-1.33 U	0.348 J	-0.024 U	0 U	0.103 J
	2018	0.088 J	0.255 U	0.067 U	-0.837 U	0.138 J	0.017 J	-0.004 U	0.105 J
	2019	-0.011 U	0.043 U	0.027 U	10.4 U	-0.016 U	0.012 U	0.021	0.114 J
MW-23	2004	0.635 J		0.255 U	R			0.561 J	
MW-24	2004	0.632 U		0.496 U	10.6 U			0.555 J	
MW-25	2004	1.07 J		0.06 U	11.9 U			R	
MW-26	2004	0.732 U	0.815 U	0.537 U	13 U		0.345 U	0.455 J	
MW-29	2004	0.397 U	0.744 U	0.506 U	11.3 U		0.446 U	0.215 U	
MW-30A	2004	0.912 U		0.383 U	R			0.726 J	
MW-31	2004	0.558 U		0.323 U	12 U			0.502 J	
MW-32	2004	R		0.084 U	12.3 U			0.207 U	
MW-33	2004	0.488 U	0.619 U	0.448 U	11.8 U		0.323 U	0.323 J	
	2013	-0.012 U	-0.055 U	-0.016 U	1.79 U	0.817 J	-0.028 U	0.024 U	0.448
	2014	0.064 U	0.119 U	0.03 U	1.69 U	0.022 U	0.077 J	-0.009 U	0.213 J
	2015	0.053 U	0.103	0.007 U	-0.646 U	0.084 U	0.081 U	0.271	0.513 J
	2016	0.018 U	0.094 U	0.037 J	0.82 U	0.329 J	-0.025 U	0.022 J	0.663
	2017	0.017 U	0.077 U	0.041 U	1.27 U	0.33 U	-0.009 U	0 U	0.221 J
	2018	0.027 U	0.033 U	0.043 U	0.373 U	0.128 U	0.008 U	-0.004 U	0.383 J
	2019	-0.014 U	0.01 U	0.006 U	10.4	0 U	0.033 U	0.021	0.187 J
MW-33 (Filtered)	2013	0.038 U	0.124 U	0.083 J	0.087 U	0.478 U	0.031 J	0 U	0.295 J
	2014	0.021 U	0.094 U	0.028 U	3.09 U	-0.011 U	-0.031 U	-0.008 U	0.2 J
	2015	0.023 U	-0.039 U	0.057 U	-0.468 U	0.06 U	-0.035 U	-0.012 U	0.259 J
	2016	0.003 U	0.073 U	0.035 J	3.3 U	0.326 J	-0.052 U	-0.005 U	0.28
	2017	0.013 U	0.152 J	0.092 J	-1.3 U	0.269 U	-0.048 U	0 U	0.159 J
	2018	0.062 J	0.144 U	0.053 U	-1.9 U	0.109 U	-0.009 U	-0.004 U	0.361 J
	2019	-0.014 U	0.021 U	0.012 U	11.6 U	0.008 U	0.034 U	0.017 U	0.172 J
MW-35	2004	0.882 U		0.101 U	11 U			0.206 J	
MW-36	2004	0.59 U		R	R			0.368 J	
MW-38	2004	R		0.0625 U	12.1 U			0.509 J	
	2017	0.028 U	0.062 U	0.013 U	0.644 U	0.352 J	0.02 U	-0.004 U	0.171 J
MW-38 (Filtered)	2017	0.068 J	0.261 U	0.065 U	-2.7 U	0.301 U	-0.024 U	-0.004 U	0.134 J
MW-39	2004	0.482 U	0.814 U	0.467 U	13.9 U		0.527 J	0.175 U	
	2013	0.003 U	0.074 U	0.012 U	-3.83 U	0.366 U	0.004 U	0 U	0.408
	2014	0.02 U	0.069 U	0.026 U	2.28 U	0.039 U	-0.079 U	-0.049 U	0.143 J
	2015	-0.029 U	0.061 U	0.061	6.9 J	0.415	0.024 U	0.182	0.458
	2016	0.015 U	0.023 U	0.033 J	0 U	0.511 J	-0.248 U	0.011 U	0.504 J
	2017	0.034 U	0.058 U	-0.017 U	1.9 U	0.518 J	0.04 U	0 U	0.903
	2018	0.06 J	0.125 U	0.101 J	1.47 U	0.161 J	-0.007 U	0.02 J	0.173 J
MW-39 (Filtered)	2013	-0.02 U	0.235	0.051 U	-2.47 U	0.309 U	-0.041 U	0 U	0.46
	2014	0.002 U	0.037 U	0.009 U	-1.79 U	0.003 U	0.088 J	0.049 U	0.181 J
	2015	0.018 U	0 U	0.048 J	5.7 J	-0.092 U	0.011 U	-0.011 U	0.103 J
	2016	-0.006 U	0.096 J	-0.04 U	-3.5 U	0.542 J	-0.011 U	0.019 U	0.438 J
	2017	-0.014 U	0.051 U	-0.003 U	-2.15 U	0.372 U	0.022 J	-0.005 U	0.514 J
	2018	-0.015 U	0.08 U	0.079 J	0.61 U	0.142 J	0.014 U	0 U	0.202 J

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
MW-40	2004	0.681 U		0.185 U	10.3 U			0.245 J	
	2013	0.101 U	-0.016 U	0.107 J	1.18 U	0.791 J	-0.003 U	0.036 J	0.11 J
	2014	-0.005 U	0.023 U	0 U	6.82 J	0.094 J	0.021 U	0 U	0.042 U
	2015	0.056 U	0.057 U	0.023 U	-0.234 U	0.048 U	-0.007 U	0 U	0.096 J
	2016	0.034 U	0.099 U	0.006 U	-6.79 U	0.466 U	-0.061 U	-0.006 U	0.051 U
	2017	0.041 U	0.137 J	0.016 U	7.35 J	0.322 U	-0.027 U	0 U	0.08 J
	2019	-0.01 U	-0.005 U	0.012 U	3.2 U	-0.008 U	0.092 U	0.015 U	0.071 J
MW-40 (Filtered)	2013	0.066 U	0.074 U	0.046 U	4.84 J	0.502 U	0.004 U	0 U	0.099 J
	2014	0.043 U	0.13 U	0.044 U	7.37 J	-0.085 U	-0.027 U	0 U	0.038 U
	2015	-0.034 U	-0.1 U	0.02 U	0.562 U	0.033 U	-0.074 U	0 U	0.111 J
	2016	0.048 J	0.155 J	-0.057 U	-8.26 U	0.453 U	-0.031 U	-0.006 U	0.044 U
	2017	0.045 J	0.187 J	0.011 U	-4.39 U	0.291 U	0.013 U	-0.004 U	0.052 U
	2019	-0.014 U	0 U	0.017 U	1 U	0.055 U	0.031 U	0.011 U	0.042 J
MW-41	2004	0.646 U		0.376 U	11.3 U			0.481 J	
MW-43	2004	0.691 U		0.0715 U	10.7 U			0.228 J	
MW-44	2015	-0.042 U	0.183 J	0.043 J	6.32 U	0.027 U	0.039	0 U	0.375
	2016	0.094 J	0.009 U	0.031 J	4.16 U	0.369 J	-0.049 U	-0.005 U	1.06
	2017	0.161 J	0.15 J	0.003 U	2.93 U	0.434 U	-0.005 U	0.01 J	0.567 J
	2018	-0.011 U	0.121 U	0.016 U	0.164 U	0.649 J	0.32	0.453	17.7
	2019	0.01 U	-0.005 U	0.01 U	12.4 U	0.63	0.4	0.419	1.7
MW-44 (Filtered)	2015	0.096 J	0.148 J	0.053 J	1.44 U	-0.129 U	0.014 U	-0.028 U	0.369
	2016	0.029 J	0.102 U	0.021 U	-9.23 U	0.465 U	-0.095 U	0 U	1.23
	2017	0.025 U	0.169 J	0.001 U	1.2 U	0.381 U	-0.032 U	-0.005 U	0.387 J
	2018	0.037 U	0.091 U	0.056 J	1.69 U	0.051 U	0.016 J	0.016 U	0.326 J
	2019	-0.009 U	0.004 U	-0.003 U	3.7 U	0.045 U	0.004 U	0.007 U	0.521
MW-45	2019	-0.016 U	0.01 U	0.038 U	4.1 U	1.37	1.1	0.8	9.36
MW-45 (Filtered)	2015	0.008 U	0.149 J	0.054 J	1.4 U	0.03 U	0 U	0.015 U	5.91
MW-47	2017	0.007 U	0.088 U	0.05 U	2.29 U	0.531 J	0.084 J	0.058	1.05
	2018	0.073 J	0.035 U	0.07 U	-0.308 U	0.141 J	0.019 U	0.018 J	0.533 J
	2019	-0.017 U	0.026 U	0.036 U	-4.2 U	0.078	0.053 U	0.063	0.853
MW-47 (Filtered)	2017	0.021 U	0.093 U	0.027 U	4.58 U	0.379 J	-0.004 U	-0.004 U	0.249 J
	2018	0.046 U	0.092 U	0.036 U	-0.246 U	0.106 U	0.008 U	0.015 J	0.229 J
	2019	0.002 U	-0.009 U	0.124	5.3 U	0.008 U	0.02 U	-0.013 U	0.255 J
MW-50	2016	0.088	0.1 U	0.024 J	2.44 U	0.392 J	0.007 U	0 U	1.46
	2017	0.033 U	0.085 J	0.004 U	3.73 U	0.281 U	0.03 U	0.024 J	0.393 J
MW-50 (Filtered)	2016	0.051 J	0.031 U	0.003 U	1.31 U	0.352 J	-0.081 U	-0.001 U	0.811
	2017	0.057 U	0.133 J	0.041 J	2.57 U	0.75 J	-0.004 U	0 U	0.547 J
MW-51	2004	1.01 J		0.0843 U	10.7 U			0.335 J	
	2014	0.03 U	0.104 U	0.016 U	9.72 J	-0.055 U	-0.047 U	0.022 U	0.247 J
	2015	0.046 U	0.077 U	0.029 J	-5.33 U	-0.071 U	0.055 U	0.014 U	0.356
	2016	-0.007 U	0.056 U	0.019 U	0.205 U	0.091 U	-0.143 U	-0.015 U	0.231
	2017	0.022 U	0.177 U	0.03 U	0.881 U	-0.013 U	0.029 U	0.017 J	0.305 J
	2018	0.031 U	0.164 J	0.044 J	-0.504 U	0.463 J	0.012 U	0.093 J	9.48
MW-51 (Filtered)	2014	0.032 U	0.153 U	0.029 U	3.89 U	-0.051 U	-0.075 U	0 U	0.234 J
	2015	0.076	0.145 J	0.022 U	-0.83 U	-0.015 U	-0.015 U	-0.015 U	0.362
	2016	-0.034 U	0.001 U	0.012 U	2.71 U	0.49 J	-0.285 U	-0.012 U	0.239
	2017	0.036 U	0.297 J	0.101 J	-1.54 U	0.167 U	-0.003 U	0 U	0.294 J
MW-52	2004	0.901 U		0.2 U	11 U			0.487 J	
	2013	0.041 U	0.155 J	0.026 U	-0.098 U	0.437 U	-0.027 U	-0.007 U	0.233 J
	2014	0.088 J	0.028 U	0.033 U	2.3 U	0.033 U	-0.011 U	0.027 J	0.216 J
	2015	0.075 J	0.115	-0.042 U	3.45 U	-0.069 U	-0.027 U	0.04 J	0.506 J
	2018	0.042 U	0.092 U	0.059 J	2.84 J	0.008 U	-0.007 U	0 U	0.47 J
	2019	0.016 U	-0.004 U	0.003 U	9.5 U	0.125	0.067 U	0.051	0.458
MW-52 (Filtered)	2013	0.088 J	0.136 J	0.035 U	-2.56 U	0.314 U	-0.015 U	-0.007 U	0.258 J
	2014	0.189 J	0.085 U	-0.003 U	4.09 U	-0.066 U	-0.072 U	0.007 U	0.191 J
	2015	0.077 J	-0.018 U	0.065 U	-6.87 U	0.176 J	0.073 U	0.012 U	0.426 J
	2018	-0.014 U	0.171 J	0.021 U	3.37 J	0.07 U	-0.008 U	-0.004 U	0.41 J
	2019	-0.011 U	0.006 U	0.032 U	14.9	0.024 U	0.005 U	0.003 U	0.339 J

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
MW-53	2014	-0.031 U	0.152	-0.012 U	-0.76 U	0.178 J	-0.039 U	0.052 J	7.24
	2015	0.043 J	0.174 J	0.084 J	3.13 U	0.081 U	0.087 J	0 U	3.58
	2016	-0.015 U	0.033 U	0.031 U	5.43 U	0.338 J	0.001 U	-0.006 U	3.29
	2017	-0.041 U	0.079 U	0.007 U	0 U	0.372 J	-0.026 U	-0.004 U	2.84
	2018	0.038 U	0.039 U	0.091 J	0.524 U	1.11 J	0.692	0.647	4.71
MW-53 (Filtered)	2014	0.041 U	0.084 J	0.017 U	0 U	0.047 U	-0.024 U	0 U	6.63
	2015	0.09 J	0.174	0.02 U	-2.62 U	-0.112 U	0.015 U	0.092 J	3.99
	2016	0.021 U	0.003 U	-0.051 U	3.18 U	0.351 J	-0.117 U	0 U	3.37
	2017	0.042 U	0.099 U	0.035 U	-1.24 U	0.368 J	-0.014 U	0 U	2.42
	2018	0.083 J	0.226 J	0.015 U	2.4 U	0.433 J	0.145 J	0.184	5.79
MW-56	2004	0.742 U		0.418 U	R			0.411 J	
MW-58	2004	0.498 J	0.634 DL	0.193 U	13.8 DL		0.352 U	0.2 J	
MW-59	2004	0.485 U		0.351 U	10.4 U			0.391 J	
	2013	0.097 U	0.26 J	0.097	4.07 U	0.714 J	-0.004 U	-0.02 U	0.199 J
	2014	-0.012 U	0.091 U	0.038 U	6.26 J	-0.003 U	-0.046 U	0 U	0.176 J
	2015	0.045 U	0.086 J	0.058	4.73 U	-0.051 U	-0.037 U	0 U	0.168 J
	2016	-0.013 U	0.044 U	-0.05 U	2.59 U	0.256 U	-0.005 U	-0.006 U	0.044 U
	2017	0.064 J	0.055 U	0.001 U	-1.46 U	0.398 U	-0.003 U	-0.004 U	0.108 J
	2018	0.038 U	0.138 U	0.043 U	-2.32 U	0.141 J	-0.007 U	0 U	0.159 J
	2019	-0.023 U	-0.001 U	-0.008 U	4.5 U	0.023 U	0.016 U	0.003 U	0.027 U
MW-59 (Filtered)	2013	0.037 U	0.17 J	0.069 J	2.63 U	0.46 U	0.067 U	-0.028 U	0.191 J
	2014	0.03 U	0.018 U	0.007 U	4.57 J	-0.034 U	-0.023 U	-0.006 U	0.057 J
	2015	0.028 U	0.071 U	0.041 J	0.193 U	-0.081 U	-0.039 U	0.013 U	0.164 J
	2016	0.012 U	0.089 U	-0.031 U	2.96 U	0.388 J	-0.005 U	-0.006 U	0.042 U
	2017	-0.025 U	0.144 J	0.045 U	-2.07 U	0.312 U	0.028 U	0.018 J	0.089 J
	2018	-0.01 U	0.211 J	0.111 J	-1.14 U	0.083 U	-0.008 U	-0.004 U	0.151 J
	2019	-0.006 U	0.025 U	0.018 U	8.6 U	0.061 U	0.017 U	0.014 U	0.028 U
MW-64	2004	0.61 U		0.22 U	11.1 U			R	
MW-69	2004	R		0.39 U	11.5 U			0.552 J	
MW-81	2013	0.182 J	0.13 U	0.036 J	-4.34 U	0.053 U	-0.043 U	-0.115 U	0.645
MW-81 (Filtered)	2013	0.072 J	0.014 U	0.041 J	-2.73 U	0.554 J	-0.054 U	-0.017 U	0.67
NWS-01A-02	2004	0.362 U		0.123 U	12.7 U			0.215 J	
NWS-01A-03	2004	0.745 U		0.14 U	12.4 U			0.462 J	
NWS-01A-04	2004	0.826 J		0.11 U	11.7 U			0.161 U	
NWS-03-03	2004	0.623 U		0.0745 U	10.8 U			0.313 J	
NWS-05-04	2004	0.763 U		R	12.4 U			0.483 J	
P2-01	2015	0.046 J	0.181	0.052 J	-0.699 U	0.027 U	-0.053 U	-0.026 U	0.326 J
	2016	0.102 J	0.118 U	-0.043 U	-0.359 U	0.353 J	-0.046 U	0.023 U	0.112 J
	2017	0.054 J	0.226 J	0.046 U	4.39 J	0.334 U	-0.014 U	0.02 J	0.081 J
	2018	0.042 U	0.122 U	0.016 U	6.15 J	-0.033 U	-0.007 U	0 U	0.058 U
	2019	-0.014 U	0 U	0 U	-0.2 U	0.047 U	-0.028 U	0.003 U	0.058 J
P2-01 (Filtered)	2015	-0.036 U	0.016 U	0.049 J	3.28 U	-0.052 U	0 U	0.013 J	0.291 J
	2016	0.017 U	0.062 U	-0.083 U	-2.91 U	0.108 U	-0.037 U	0.017 U	0.098 J
	2017	0.012 U	0.046 U	0.042 U	2.88 U	-0.005 U	0.035 U	0.016 J	0.077 J
	2018	-0.014 U	0.147 J	0.038 J	7.75	-0.001 U	-0.008 U	0.017 U	3.25
	2019	-0.002 U	0.029 U	-0.001 U	1.4 U	0.031 U	0.026 U	0.007 U	0.02 U
P2-08	2017	0.027 U	0.024 U	0.051 U	1.56 U	0.343 J	0.036 U	0.08	0.497
P2-08 (Filtered)	2017	0.109 J	-0.005 U	0.102 J	5.78 U	0.37 J	0.014 U	0.016 U	0.184 J
P2-09	2013	0.104 U	0.123 U	0.088 J	2.9 U	0.54 J	-0.015 U	-0.006 U	0.126 J
	2014	0.178 J	0.144 U	0.082 U	5.46 U	0.014 U	0.026 U	0.025 J	0.167 J
	2015	0.025 U	0.167 J	0.047 U	1.6 U	0.041 U	0.006 U	0 U	0.099 U
	2016	0.017 U	0.003 U	0.053 J	-10.9 U	0.542 J	-0.074 U	-0.001 U	0.036 U
	2017	-0.015 U	0.041 U	0.019 U	1.68 U	0.246 U	0.02 J	-0.004 U	0.06 U
	2018	0.042 U	0.288 U	0.073 U	2.73 U	0.255 J	-0.006 U	-0.006 U	0.128 J
	2019	-0.023 U	0.032	0.011 U	2.9 U	-0.086 U	0.036 U	0.006 U	0.053 J

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
PZ-09 (Filtered)	2013	0.017 U	0.135 U	0.063 J	0.974 U	0.515 U	0 U	0 U	0.127 J
	2014	0.166	0.053 U	0.004 U	3.03 U	0.034 U	-0.005 U	-0.007 U	0.035 U
	2015	0.014 U	0.07 J	0.056 U	1.16 U	-0.012 U	0.022 U	-0.01 U	0.087 U
	2016	0.039 J	0.175 J	-0.012 U	-3.51 U	0.517 J	-0.024 U	-0.005 U	0.032 U
	2017	-0.005 U	0.069 U	0.062 U	1.74 U	0.331 U	-0.023 U	-0.004 U	0.052 U
	2018	-0.017 U	0.134 U	0.071 U	-0.587 U	0.073 U	-0.008 U	0 U	0.121 J
	2019	-0.019 U	0.031 U	-0.013 U	-2.9 U	0.031 U	0.005 U	0 U	0.029 U

Table 7. Groundwater Sampling Summary of Detections (2003-2019)

Metal	Number of Samples	Number of Detections	Minimum	Maximum	Average	USEPA or PADEP Primary or Secondary Drinking Water Standard (1)	SLDA-specific Upgradient Average
	n	n	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	329	262	1.4	55000	1758.85	200.0	NC
ANTIMONY	328	62	0.2	6.4	1.15	6.0	NC
ARSENIC	329	73	0.62	120	9.03	10.0	NC
BARIUM	329	328	3.5	1600	217.36	2000.0	NC
BERYLLIUM	309	69	0.1	33	3.61	4.0	NC
CADMIUM	329	53	0.059	8.2	1.01	5.0	NC
CALCIUM	329	328	3400	430000	47793.60	NA	NC
CHROMIUM, TOTAL	329	266	0.31	250	6.69	100.0	NC
COBALT	329	240	0.12	180	7.38	NA	NC
COPPER	329	224	0.23	150	7.98	1000.0	NC
IRON	329	292	36	310000	8444.32	300.0	NC
LEAD	329	96	0.26	39	2.71	15.0	NC
MAGNESIUM	329	328	590	100000	13764.70	NA	NC
MANGANESE	329	321	0.28	4500	269.76	50.0	NC
MERCURY	329	38	0.047	0.15	0.09	2.0	NC
NICKEL	329	310	0.22	680	22.03	100.0	NC
POTASSIUM	329	325	500	80000	3232.55	NA	NC
SELENIUM	329	67	1.5	14	3.02	50.0	NC
SILVER	328	30	0.18	1.2	0.48	100.0	NC
SODIUM	329	327	1100	240000	17846.79	NA	NC
THALLIUM	329	37	0.16	1.7	0.38	2.0	NC
VANADIUM	329	61	0.49	27	2.76	NA	NC
ZINC	329	279	1.8	2400	57.97	5000.0	NC
TOTAL URANIUM	337	283	0.036	17.7	0.63	30	0.9
Radionuclide	n	n	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L
AMERICIUM-241	455	75	0.026	0.197	0.09	15	ND
PLUTONIUM-238	357	134	0.032	0.585	0.16	15	ND
PLUTONIUM-239/240	441	86	0.011	0.224	0.07	300 (2)	ND
PLUTONIUM-241	443	32	2.84	14.9	7.00	15	ND
THORIUM-228	337	139	0.078	4.23	0.52	15	ND
THORIUM-230	351	48	0.016	1.32	0.21	15	0.74
THORIUM-232	441	70	0.01	10.7	0.47	15	0.39

NOTES:

(1) - USEPA Maximum Contaminant Levels (MCLs), Secondary MCLs, or Pennsylvania DEP MCLs

(2) - USEPA, Directive #9283.1-14, Use of Uranium Drinking Water Standards under 40 CFR 141 and 40 CFR 192.

(3) - Based on 40 CFR 9, 141, 142, Federal Register, 7 Dec. 2000, Assumes a U234:U238 ratio of 1.6:1.

NA - No Standard Available

Average exceeds water quality standard.

NC - Not Calculated for non-FUSRAP constituents of concern

ND - Not Detected

FIGURES

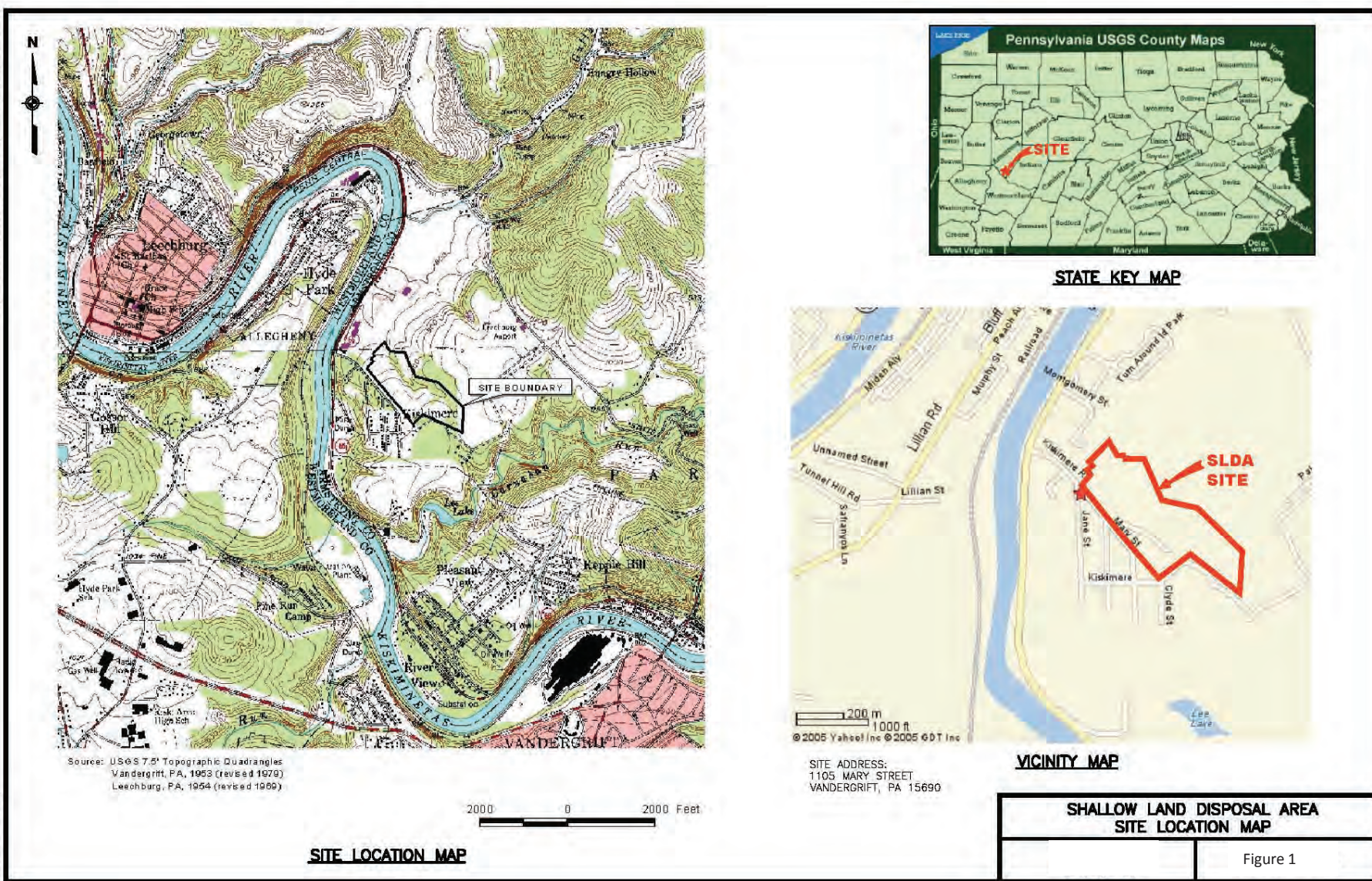


Figure 1. Shallow Land Disposal Area (SLDA) Site Location

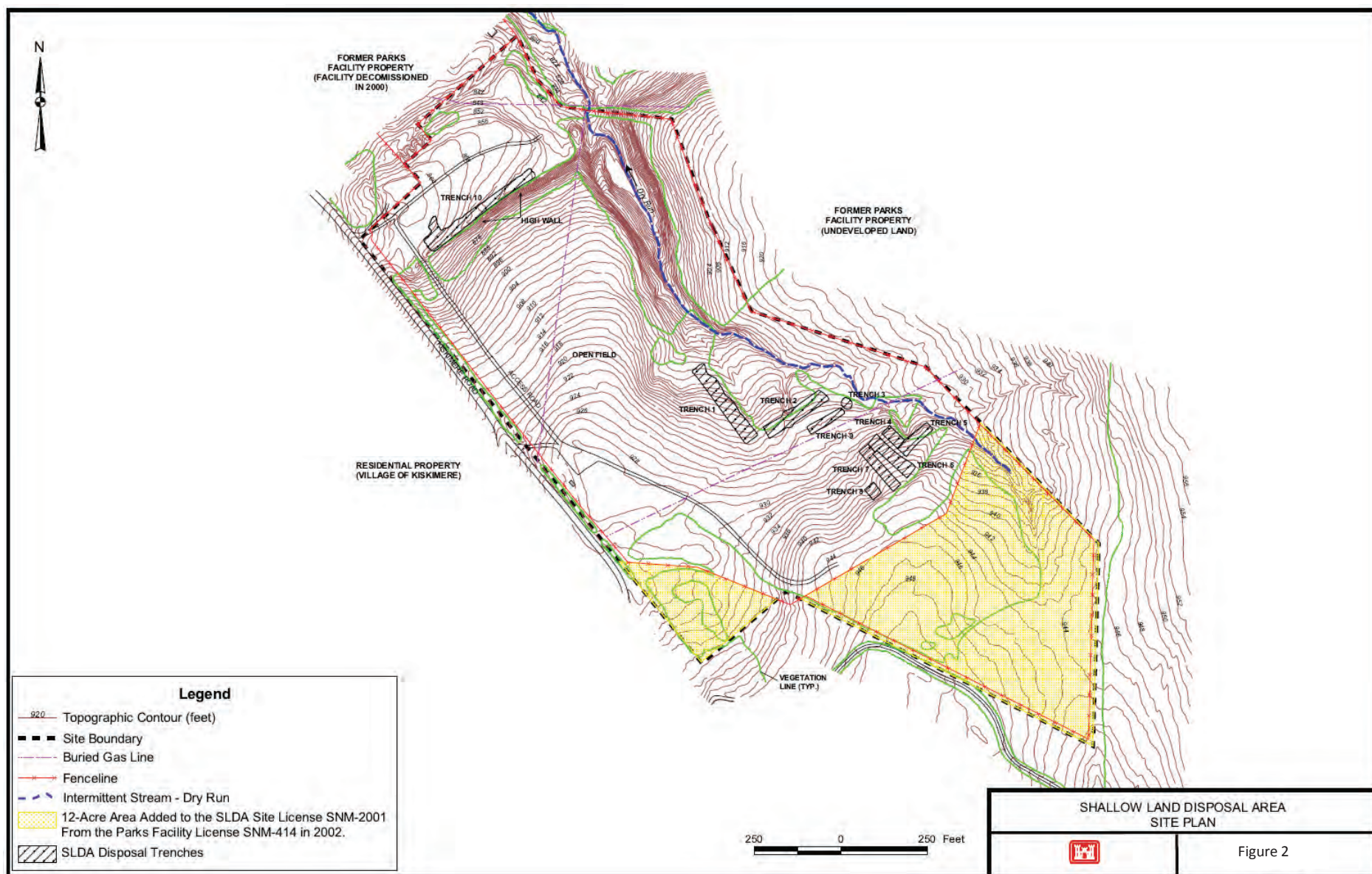


Figure 2. Shallow Land Disposal Area Site Plan

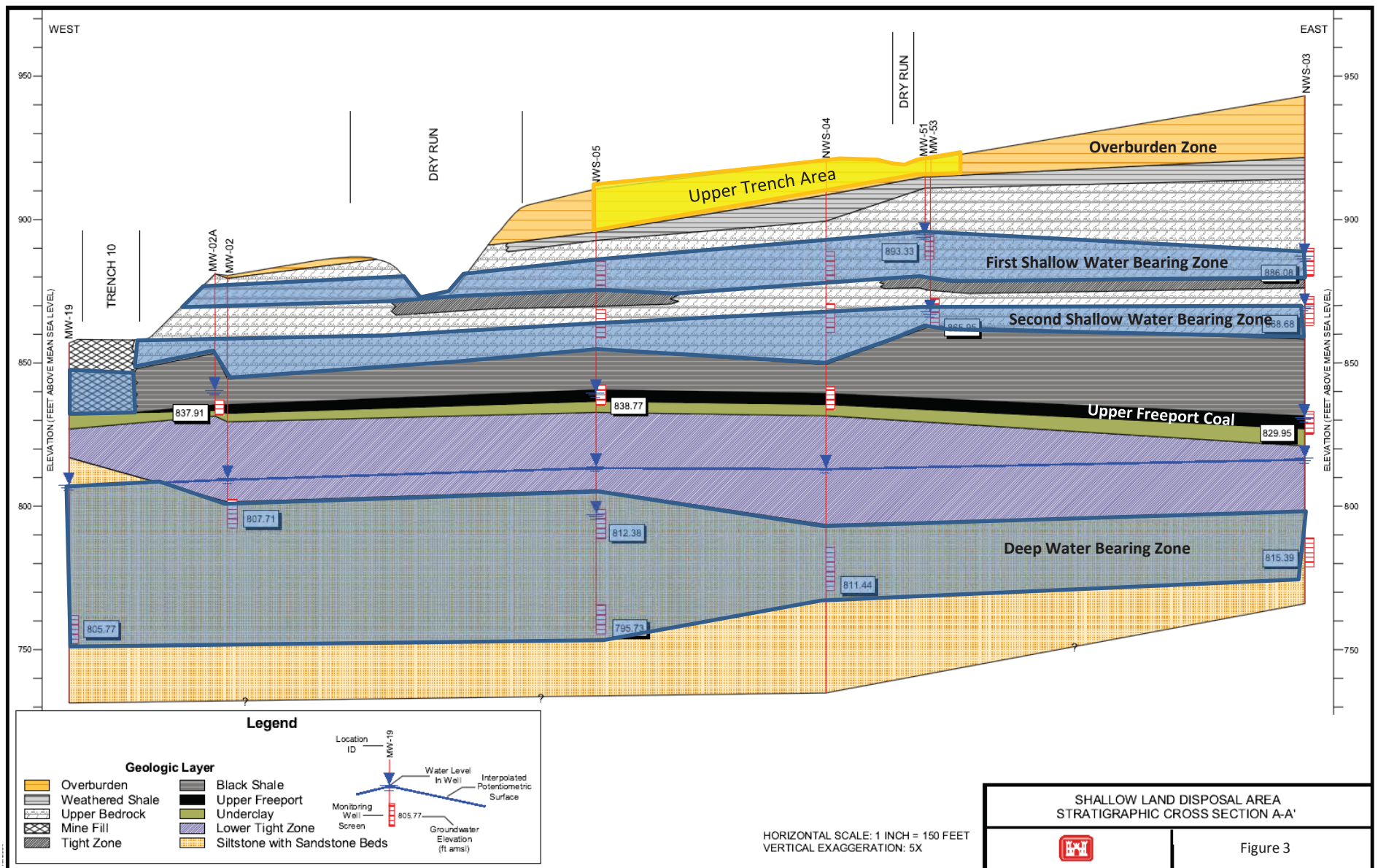
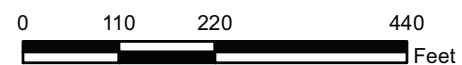


Figure 3. Northwest to Southeast Geologic Cross Section Through SLDA



Legend

- | | |
|---|--|
|  Monitoring Well |  Groundwater Flow Direction |
|  Piezometer |  Trench |
|  Temporary Piezometer |  Fenceline |
|  Groundwater Elevation Contour (ft amsl) |  Site Boundary |



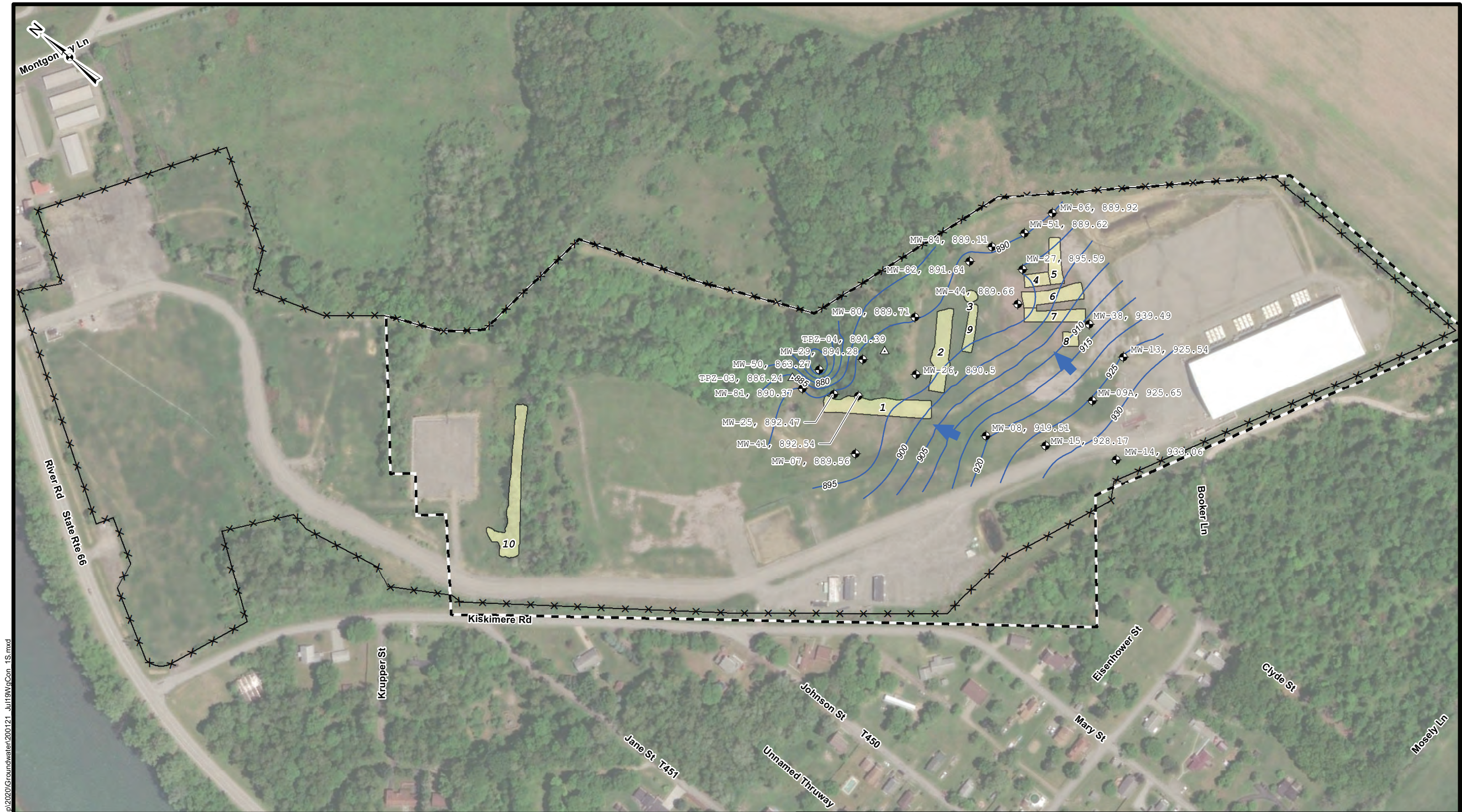
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
US Army Corps of Engineers
Buffalo District
BUFFALO, NY

Document Name: 200121_Jul19WgCon_SS.mxd
Drawn By: H5TDESPM
Date Saved: 22 Jan 2020
Time Saved: 2:15:26 PM

GROUNDWATER ELEVATION CONTOUR MAP
OVERBURDEN - JULY 2019

SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 4



Document Path: K:\SLDA\GIS\ArcMap\2020\Groundwater\200121_Jul19WgCon_1S.mxd

Legend - Monitoring Well - Piezometer - Temporary Piezometer - Groundwater Elevation Contour (ft amsl) - Groundwater Flow Direction - Trench - Fenceline - Site Boundary	Note: MW-38 was not used to generate the potentiometric surface due to possible anomalous readings. 0 110 220 440 Feet	U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS BUFFALO, NY Document Name: 200121_Jul19WgCon_1S.mxd Drawn By: H5TDESPM Date Saved: 22 Jan 2020 Time Saved: 2:22:52 PM	GROUNDWATER ELEVATION CONTOUR MAP FIRST SHALLOW BEDROCK ZONE - JULY 2019 SHALLOW LAND DISPOSAL AREA PARKS TOWNSHIP, PENNSYLVANIA	FIGURE 5
--	--	--	--	-----------------



Document Path: K:\SLDA\GIS\ArcMap2020\Groundwater\200121_Jul19WgCon_2S.mxd

Legend - Monitoring Well - Piezometer - Temporary Piezometer - Groundwater Elevation Contour (ft amsl) - Groundwater Flow Direction - Trench - Fenceline - Site Boundary		 U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS BUFFALO, NY Document Name: 200121_Jul19WgCon_2S.mxd Drawn By: H5TDESPM Date Saved: 22 Jan 2020 Time Saved: 2:17:31 PM	GROUNDWATER ELEVATION CONTOUR MAP SECOND SHALLOW BEDROCK ZONE - JULY 2019	
			SHALLOW LAND DISPOSAL AREA PARKS TOWNSHIP, PENNSYLVANIA	FIGURE 6



Document Path: K:\SLDA\GIS\ArcMap2020\Groundwater\200121_Jul19WgCon_UF.mxd

Legend Monitoring Well Piezometer Temporary Piezometer Groundwater Elevation Contour (ft amsl) Groundwater Flow Direction Trench Fenceline Site Boundary		 U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS BUFFALO, NY Document Name: 200121_Jul19WgCon_UF.mxd Drawn By: H5TDESPM Date Saved: 22 Jan 2020 Time Saved: 2:13:23 PM	GROUNDWATER ELEVATION CONTOUR MAP UPPER FREEPORT COAL ZONE - JULY 2019	
		SHALLOW LAND DISPOSAL AREA PARKS TOWNSHIP, PENNSYLVANIA		FIGURE 7

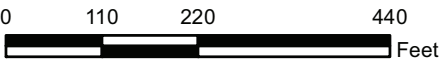


Document Path: K:\SLDA\GIS\ArcMap2020\Groundwater\200121_Jul19WgCon_DB.mxd

- Legend**

 - Monitoring Well
 - Piezometer
 - Temporary Piezometer
 - Groundwater Elevation Contour (ft amsl)
- Groundwater Flow Direction
 - Trench
 - Fenceline
 - Site Boundary

Note: MW-34A was not used to generate the potentiometric surface due to possible anomalous readings.



U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
BUFFALO, NY

Document Name: 200121_Jul19WgCon_DB.mxd
Drawn By: H5TDESPM
Date Saved: 22 Jan 2020
Time Saved: 2:16:28 PM

GROUNDWATER ELEVATION CONTOUR MAP
DEEP BEDROCK ZONE - JULY 2019

SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 8

