



GROUNDWATER AND SURFACE WATER
MONITORING DATA RELEASE
2014 SAMPLING EVENT
SHALLOW LAND DISPOSAL AREA FUSRAP SITE

U.S. Army Corps of Engineers
Pittsburgh District

Building Strong®

April 2015

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 surrounding the upper trench area flows dominantly to the north in the soil layer (Figure 4), to the north-northeast in both the first and second shallow bedrock zones (Figures 5 and 6), to the south in the Freeport Coal (Figure 7), and to the west in the deep bedrock zone (Figure 8). Groundwater surrounding Trench 10 appears to enter the Upper Freeport Coal seam, which drains in a westerly to southerly direction (Figure 7).

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 a subset of the groundwater well inventory shown on Figure 9; these wells were sampled for 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 remedial action), groundwater was sampled monthly at 14 locations to determine if the site excavation activities were affecting groundwater (Figure 10). This program sampled for 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.

This sampling produced results 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:

- Identify the locations to be sampled (Figure 11)
- Identify the frequency of sampling (i.e., annual sampling)
- Specify analytical parameters for collected samples (Table 1)

This sampling program has been developed in consultation with the U.S. Environmental Protection Agency (USEPA); the USEPA also samples groundwater at the SLDA and presents the findings under separate cover (see: www.EPA.gov).

Sampling Scope

Annual groundwater monitoring for 2014 at the SLDA was conducted from March 25th to 27th, 2014. Twenty-one (21) locations were sampled and generally lie between the 10 trenches and the neighboring residences (Figure 12). Eight (8) wells in the sampling plan either had minimal groundwater (i.e., extremely poor yield) or were dry. Alternatively, four (4) wells and one (1) surface-water location were substituted to best ensure the protection of human health and the environment. Table 1 lists the constituents analyzed and Table 2 lists the planned locations (and noted changes). The constituents listed in Table 1 are a subset of the analytes sampled during the RI and remedial action; this annual sampling program is focused 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. 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. Well MW-20 was sampled over a two-day period using a disposable bailer due to poor production; this unfiltered sample represents a time-composited sample.

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 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

Tables 5 and 6 list the unfiltered (total) and filtered (dissolved phase) analytical results for the 2014 monitoring event. Filtered data have a “-F” after the location name in the table. Table 7 presents a summary of the results, comparative drinking water standards, and up-gradient values for radionuclides derived during the USACE RI. 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:

Average values for aluminum, iron, and manganese exceed the primary or secondary drinking water standards due to the naturally low-oxygen or reducing conditions in the coal mine and deep zones.

- MW-39 is screened in the coal-mine near Trench 10 and exhibits distinct aluminum, beryllium, cobalt, iron, manganese, and zinc results, along with a sulfuric odor.
- MW-22 is screened in the deep groundwater zone and exhibits high arsenic, manganese, and iron due to geochemically reductive conditions at this location.
- MW-40 is screened in the deep groundwater zone and exhibits high sodium.

Figure 13 shows the locations of these wells.

Radionuclides:

- Plutonium-241 (Pu-241), thorium-228 (Th-228 as a surrogate for radium-228), uranium-234 (U-234), uranium-238 (U-238), and total elemental uranium (Total U) were detected at levels above average background at several locations throughout the site (Figure 14).
- No radionuclides exceed the USEPA drinking water standards of 30 µg/L for uranium, 15 picoCuries per liter (pCi/L) for total alpha emitters, and 4 millirem per year (mrem/yr) dose limit for beta emitters (e.g., Pu-241 limit of 300 pCi/L). The radionuclide-specific standards for the beta-emitter dose threshold are listed in Table 7 and explained in the USEPA (2001) reference.
- The radiologic detections above average background concentrations are summarized below:
 - o *Pu-241: Estimated (or “J” qualified) detections up to 14.7 pCi/L were seen in MW-03, MW-07, MW-40, MW-51, and SP-DR-01; the maximum detection was observed at SP-DR-01 and is approximately 5% of the drinking water standard of 300 pCi/L for Pu-241 (Table 7). Several of these results show inconsistencies between filtered and unfiltered samples, such as a mix of estimated detections and non-detections irrespective of filtering. This disparity was evident during the RI, 2011, and 2013 sampling by both the USACE and USEPA. The Pu-241 detections averaged 8.06 pCi/L in 2014 and appear suspect since the radionuclide has a relatively short half life (14.4 years) and its daughter product, Am-241, is not detected at similar values (i.e., Am-241 has a maximum detection of 0.2 pCi/L). Annual sampling will include Pu-241 for verification purposes.*
 - o *Th-228: Well MW-20 produced an estimated detection of 4.23 pCi/L in an unfiltered sample that was highly turbid due to manual bailing of the poorly producing well. This causes natural Th-228 on soil particles to transfer to water in the sample container due acidic preservation. All Th-228 detections averaged 0.8 pCi/L.*
 - o *Total U: Concentrations up to 7.24 µg/L were detected in MW-53 and at surface-water point SP-DR-01 near Trenches 4 and 5; all total U detections averaged 0.9 µg/L.*
 - o *U-234: Concentrations up to 7.25 pCi/L were detected at surface-water point SP-DR-01 near Trenches 4 and 5; U-234 detections averaged 0.95 pCi/L.*
 - o *U-238: A maximum concentration of 2.0 pCi/L was detected in MW-53 and SP-DR-01; U-238 detections averaged 0.44 pCi/L.*

Conclusions

The 2014 USACE and USEPA sampling show that radionuclides are present in site groundwater at concentrations well below USEPA MCLs or dose-based drinking water standards. Data exceptions (above-background values) vary throughout the five hydrogeologic zones at the site and do not indicate a contiguously contaminated zone. These results are consistent with past USACE findings that also showed no FUSRAP-related radionuclides exceed the USEPA MCLs or dose-based drinking water standards. The USACE plans to perform annual groundwater sampling during the summer of 2015.

References

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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.

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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 Uranium-234 Uranium-235 Uranium-238 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

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	◇	◇	Substituted Well Sampled
MW-02	884.22	DB	U	X			Water Levels
MW-02A	885.43	UF	D	X			Water Levels
MW-03	890.5	UF	D	X	x	x	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	X	X	Trench Containment Verification
MW-21	888.32	UF	D	X			Water Levels
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			Water Levels
MW-33	940.76	2S	U	X	X	X	Trench Containment Verification
MW-34A	926.84	DB	D	X			Water Levels
MW-35	913.68	DB	U	X			Water Levels
MW-37	926.58	2S	D	X			Water Levels
MW-39	891.99	UF	D	X	X	X	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			Water Levels
MW-45	929.9	2S	U	X			Water Levels
MW-46	924.18	UF	D	X			Water Levels
MW-47	925.18	OB	U	X			Water Levels
MW-50	902.02	1S	D	X			Water Levels
MW-51	925.43	1S	D	X	◇	◇	Substituted Well Sampled
MW-52	924.73	2S	U	X	X	X	Trench Containment Verification
MW-53	925.34	2S	D	X	◇	◇	Substituted Well Sampled
MW-58	838.93	DB	U	X			Water Levels
MW-59	932.45	OB	U	X	◇	◇	Substituted Well Sampled
MW-61	932.49	2S	U	X			Water Levels
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	X			FLUTe Well – Not Measured
NWS-02	946.35	Varies	Varies	X			FLUTe Well – Not Measured
NWS-03	946.87	Varies	Varies	X			FLUTe Well – Not Measured
NWS-04	925.25	Varies	Varies	X			FLUTe Well – Not Measured
NWS-05	914.28	Varies	Varies	X			FLUTe Well – Not Measured
PZ-01	907.53	OB	D	X			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
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

GW

Groundwater

OB

Overburden

1S

First shallow bedrock zone

2S

Second shallow bedrock zone

◇

Substituted Well – Normally Water Levels

UF

Upper Freeport Coal

DB

Deep Bedrock Zone

NA

Data Not Available

Table 3. 2014 SLDA Groundwater Level Record Sheet
MAY 2014 Inventory

Well ID	Date	Depth to Water	Depth to Bottom from TOC	New Remarks
01U17	3/24/2014	10.11	16.18	Extended 5-ft stickup
03U05	3/24/2014	9.2	11.41	
06U05	3/24/2014	10.63	17.33	Tall 5.5-ft stickup
10L31	3/24/2014	22.58	25	
10L32	3/24/2014	10.64	12.2	
MW-01	3/24/2014	7.66	20	Soft sediment at bottom
MW-02	3/24/2014	77.57	92	Soft sediment at bottom
MW-02A	3/24/2014	Dry	51.3	Soft 51.30, wet sediment
MW-03	3/24/2014	52.4	53.2	Soft sediment at bottom
MW-05	3/24/2014	26.04	27.33	
MW-07	3/24/2014	32	35.44	
MW-08	3/24/2014	12.6	35.88	
MW-09A	3/24/2014	20.15	37.21	
MW-11D	3/24/2014	41.3	42.9	
MW-11S	3/24/2014	7.96	11.9	
MW-13	3/24/2014	23.8	38.65	
MW-14	3/24/2014	13.44	32.2	
MW-15	3/24/2014	11.75	31.23	
MW-17	3/24/2014	43.28	53.91	
MW-19	3/24/2014	57.24	109.2	
MW-20	3/24/2014	51.88	55	Soft bottom
MW-21	3/24/2014	Dry	50.5	Dry at 50.5
MW-22	3/24/2014	89.24	113.7	
MW-25	3/24/2014	15.98	38.65	Soft bottom
MW-26	3/24/2014	24.06	28.22	
MW-27	3/24/2014	35.3	38.61	
MW-29	3/24/2014	17.62	39.16	
MW-32	3/24/2014	Dry	26.15	Soft sediment at bottom
MW-33	3/24/2014	56.13	83.75	
MW-34A	3/24/2014	Dry	100.6	
MW-35	3/24/2014	113.76	167.7	
MW-37	3/24/2014	68.19	69.2	Wet and feels collapsed
MW-38	3/24/2014	41.49	63.3	Soft sediment at bottom
MW-39	3/24/2014	55.23	58.35	Soft sediment at bottom
MW-40	3/24/2014	120.41	191.8	
MW-41	3/24/2014	18.86	36.7	
MW-42	3/24/2014	26.8	41.7	
MW-43	3/24/2014	41.47	46.81	
MW-44	3/24/2014	40.27	54.65	
MW-45	3/24/2014	65.5	67.25	
MW-46	3/24/2014	39.45	39.47	Dry
MW-47	3/24/2014	19.22	20.95	
MW-50	3/24/2014	36.3	37.57	Soft bottom
MW-51	3/24/2014	31.82	36.24	36.24 little water
MW-52	3/24/2014	35.35	44.29	
MW-53	3/24/2014	51.12	62.11	
MW-58	3/24/2014	6.05	36.75	Possible clog at 36.75 ft
MW-59	3/24/2014	5.71	14.14	
MW-61	3/24/2014	67.55	68	
MW-62	3/24/2014	89.22	90.7	
MW-64	3/28/2014	13.46	21.95	
MW-69	3/28/2014	14.57	22.54	
MW-74	3/24/2014	Dry	15.24	Dry
MW-80	3/24/2014	27.12	39.42	
MW-81	3/24/2014	8.00	15.10	
MW-82	3/24/2014	28.5	38.31	
MW-83	3/24/2014	48.71	74.3	
MW-84	3/24/2014	33.46	39.56	
MW-86	3/24/2014	37.71	38.09	
PZ-01	3/24/2014	11.75	18.6	
PZ-02	3/24/2014	17.38	19.8	
PZ-05	3/24/2014	19.67	19.74	
PZ-06A	3/24/2014	6.97	17.31	
PZ-07	3/24/2014	7.34	19.8	
PZ-08	3/24/2014	8.45	19.88	
PZ-09	3/24/2014	7.6	19.28	
TPZ-03	3/24/2014	9.62	13.9	
TPZ-04	3/24/2014	19.87	27.66	
TPZ-05	3/24/2014	22.54	32.26	
TPZ-06	3/24/2014	7.08	7.55	Bent casing at 4 ft
TWSP 01-01	3/24/2014	6.94	13.03	
TWSP 01-02	3/24/2014	6.52	13.05	
TWSP 01-03	3/24/2014	6.52	13.09	
TWSP 01-04	3/24/2014	4.91	13.05	
TWSP 01-05	3/24/2014	9.68	12.55	
TWSP 01-07	3/24/2014	3.88	13.12	
TWSP 01-08	3/24/2014	3.78	13.03	
TWSP 01-09	3/24/2014	3.78	12.6	
TWSP 01-10	3/24/2014	4.91	10.65	
TWSP 03-01	3/24/2014	10.85	11.38	
TWSP 04-01	3/24/2014	Dry	3.2	Solid at 3.20-ft deep
TWSP 04-02	3/24/2014	5.4	18.58	
TWSP 05-01	3/24/2014	7.00	15.80	
TWSP 05-02	3/24/2014	3.6	10.4	Flush mount
TWSP 05-03	3/24/2014	3.37	14.17	Broken 18" above grade
TWSP 05-04	3/24/2014	5.89	13.89	
TWSP 05-05	3/24/2014	6.53	17.12	Soft sediment at bottom
TWSP 06-01	3/24/2014	4.91	14.85	Soft sediment at bottom
TWSP 06-02	3/24/2014	7.1	16.5	
TWSP 06-03	3/24/2014	6.87	18.15	Soft sediment at bottom
TWSP 06-04	3/24/2014	7.37	18.55	Soft sediment at bottom
TWSP 07-01	3/24/2014	6.86	13.4	
TWSP 07-02	3/24/2014	6.94	12.4	
TWSP 07-03	3/24/2014	7.3	19.68	
TWSP 07-04	3/24/2014	5.42	16.3	
TWSP 07-05	3/24/2014	6.5	--	Bottom not measured
TWSP 07-06	3/24/2014	8.71	17.1	
TWSP 08-01	3/24/2014	Dry	--	Bottom not measured
TWSP 08-02	3/24/2014	8.7	17.3	
TWSP 10-01	3/24/2014	15.44	17.93	
TWSP 10-02	3/24/2014	16.73	16.73	
TWSP 10-05	3/24/2014	20.2	20.45	
TWSP 10-06	3/24/2014	21.13	21.13	
TWSP 10-08	3/24/2014	2.95	--	Casing filled with sediment
TWSP 10-09	3/24/2014	Dry	15.44	
TWSP 10-10	3/24/2014	19.2	19.6	
TWSP 10-11	3/24/2014	20.26	20.38	
TWSP 10-12	3/24/2014	21.69	21.69	Dry

Table 4. Groundwater Sampling Field Data

Well ID	Collect Date	Temperature (F)	Specific Conductance (mS/cm)	pH (standard unit)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Purge Rate (mL/min)	Comments
10L31	25-Mar-14	47.80	0.59	6.10	229	2.21	0.0	110	Negligible drawdown
10L32	27-Mar-14	41.00	0.34	6.12	76	2.07	226.0	130	Dry During Purge - 15-20mL obtained
MW-01	27-Mar-14	43.30	0.33	6.45	200	4.27	0.0	290	0.1 feet of drawdown
MW-02A	26-Mar-14	45.60	3.13	2.66	441	10.81	140.0	--	Not Sampled (Dry After Purge)
MW-05	25-Mar-14	53.00	0.71	5.88	141	2.06	148.0	100	0.3 feet of drawdown
MW-07	27-Mar-14	53.70	0.57	6.70	143	1.60	0.0	750	0.3 feet of drawdown
MW-08	25-Mar-14	53.00	0.24	7.23	49	0.81	8.0	150	1.0 feet of drawdown
MW-09A	25-Mar-14	51.90	0.23	7.02	78	2.90	2.7	110	1.5 feet of drawdown
MW-13	26-Mar-14	51.60	0.23	7.78	-74	0.97	0.0	155	0.2 feet of drawdown
MW-14	25-Mar-14	54.00	0.20	6.30	20	0.93	95.0	165	0.5 feet of drawdown
MW-15	26-Mar-14	47.60	0.21	5.89	123	1.13	118.0	120	0.9 feet of drawdown
MW-20	26-Mar-14	47.20	0.70	2.65	441	7.77	277.0	300	Pumped dry, multi-day composite
MW-22	25-Mar-14	51.70	1.18	6.07	-79	7.34	21.4	450	Negligible drawdown
MW-33	26-Mar-14	50.30	0.44	7.26	-10	1.01	17.1	250	Level dropped below top of pump
MW-39	25-Mar-14	53.30	0.53	4.46	192	7.08	8.8	850	Negligible drawdown
MW-40	26-Mar-14	49.00	0.84	8.70	-106	5.19	0.0	280	5.3 feet of drawdown
MW-47	26-Mar-14	48.30	0.36	4.72	214	8.67	100.0	150	Not Sampled (Dry After Purge)
MW-51	27-Mar-14	53.20	0.39	6.81	-38	0.91	17.9	520	0.1 feet of drawdown
MW-52	26-Mar-14	53.10	0.50	7.30	-78	1.12	7.5	480	0.3 feet of drawdown
MW-53	27-Mar-14	54.50	0.90	9.63	51	2.39	206.0	300	3.1 feet of drawdown
MW-59	27-Mar-14	45.70	0.17	5.34	133	5.28	0.0	170	3.0 feet of drawdown
PZ-09	26-Mar-14	46.70	0.21	4.51	304	1.75	16.3	150	0.5 feet of drawdown
SP-DR-01	27-Mar-14	38.40	0.23	6.59	90	24.73	698.0	--	Groundwater seep near Trench 4-5

Maximum	54.5	3.130	9.63	441	24.73	698	850
Minimum	38.4	0.173	2.65	-106	0.81	0	100
Average	49.3	0.575	6.18	110	4.48	92	285
Geometric Mean	49.1	0.431	5.93	--	2.79	--	229

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

Table 5. 2014 Groundwater Monitoring Results for Metals

Metals Table Definitions:
J - Estimated value below minimum Level of Detectability (LOD)
U - Undetectable below Achieved Detection Limit
µg/L - micrograms per liter

Metals Data											
Sample Location	Parameter	Result	Units	Qualifier	Detection Limit	Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
10L31	Aluminum	3.8 µg/L	J		1.4	MW-39	Aluminum	2,300 µg/L			1.4
10L31	Antimony	ND µg/L	U		0.52	MW-39	Antimony	ND µg/L	U		0.52
10L31	Arsenic	ND µg/L	U		0.61	MW-39	Arsenic	ND µg/L	U		0.61
10L31	Barium	43 µg/L			0.18	MW-39	Barium	36 µg/L			0.18
10L31	Beryllium	ND µg/L	U		0.25	MW-39	Beryllium	2.1 µg/L			0.25
10L31	Cadmium	ND µg/L	U		0.27	MW-39	Cadmium	ND µg/L	U		0.27
10L31	Calcium	67,000 µg/L			90	MW-39	Calcium	37,000 µg/L			90
10L31	Chromium	2.8 µg/L	J		0.30	MW-39	Chromium	1.3 µg/L	J		0.30
10L31	Cobalt	ND µg/L	U		0.12	MW-39	Cobalt	18 µg/L			0.12
10L31	Copper	0.35 µg/L	J		0.24	MW-39	Copper	5.4 µg/L			0.24
10L31	Iron	260 µg/L			48	MW-39	Iron	12,000 µg/L			48
10L31	Lead	ND µg/L	U		0.24	MW-39	Lead	0.27 µg/L	J		0.24
10L31	Magnesium	36,000 µg/L			41	MW-39	Magnesium	17,000 µg/L			41
10L31	Manganese	13 µg/L			0.26	MW-39	Manganese	120 µg/L			0.26
10L31	Mercury	ND µg/L	U		0.056	MW-39	Mercury	ND µg/L	U		0.056
10L31	Nickel	2 µg/L	J		0.20	MW-39	Nickel	50 µg/L			0.20
10L31	Potassium	2,700 µg/L			110	MW-39	Potassium	2,600 µg/L			110
10L31	Selenium	3 µg/L	J		1.5	MW-39	Selenium	1.6 µg/L	U		1.5
10L31	Silver	ND µg/L	U		0.18	MW-39	Silver	ND µg/L	U		0.18
10L31	Sodium	6,800 µg/L			58	MW-39	Sodium	14,000 µg/L			58
10L31	Thallium	ND µg/L	U		0.16	MW-39	Thallium	ND µg/L	U		0.16
10L31	Vanadium	ND µg/L	U		0.49	MW-39	Vanadium	ND µg/L	U		0.49
10L31	Zinc	3.1 µg/L	J		1.8	MW-39	Zinc	96 µg/L			1.8
10L31-F	Aluminum, dissolved	ND µg/L	U		1.4	MW-39-DUP	Aluminum	4,400 µg/L			14
10L31-F	Antimony, dissolved	ND µg/L	U		0.52	MW-39-DUP	Antimony	ND µg/L	U		0.52
10L31-F	Arsenic, dissolved	ND µg/L	U		0.61	MW-39-DUP	Arsenic	ND µg/L	U		0.61
10L31-F	Barium, dissolved	38 µg/L			0.18	MW-39-DUP	Barium	38 µg/L			0.18
10L31-F	Beryllium, dissolved	0.34 µg/L	J		0.25	MW-39-DUP	Beryllium	3.2 µg/L			0.25
10L31-F	Cadmium, dissolved	ND µg/L	U		0.27	MW-39-DUP	Cadmium	ND µg/L	U		0.27
10L31-F	Calcium, dissolved	65,000 µg/L			90	MW-39-DUP	Calcium	47,000 µg/L			900
10L31-F	Chromium, dissolved	1.8 µg/L	J		0.30	MW-39-DUP	Chromium	0.68 µg/L	J		0.30
10L31-F	Cobalt, dissolved	0.22 µg/L	J		0.12	MW-39-DUP	Cobalt	24 µg/L			0.12
10L31-F	Copper, dissolved	1.5 µg/L	J		0.24	MW-39-DUP	Copper	8.1 µg/L			0.24
10L31-F	Iron, dissolved	470 µg/L			48	MW-39-DUP	Iron	9,500 µg/L			48
10L31-F	Lead, dissolved	ND µg/L	U		0.24	MW-39-DUP	Lead	0.46 µg/L	J		0.24
10L31-F	Magnesium, dissolved	33,000 µg/L			41	MW-39-DUP	Magnesium	20,000 µg/L			41
10L31-F	Manganese, dissolved	13 µg/L			0.26	MW-39-DUP	Manganese	160 µg/L			0.26
10L31-F	Mercury	ND µg/L	U		0.056	MW-39-DUP	Mercury	ND µg/L	U		0.056
10L31-F	Nickel, dissolved	1.7 µg/L	J		0.20	MW-39-DUP	Nickel	63 µg/L			0.20
10L31-F	Potassium, dissolved	2,600 µg/L			110	MW-39-DUP	Potassium	3,000 µg/L			110
10L31-F	Selenium, dissolved	ND µg/L	U		1.5	MW-39-DUP	Selenium	ND µg/L	U		1.5
10L31-F	Silver, dissolved	ND µg/L	U		0.18	MW-39-DUP	Silver	ND µg/L	U		0.18
10L31-F	Sodium, dissolved	6,200 µg/L			58	MW-39-DUP	Sodium	16,000 µg/L			58
10L31-F	Thallium, dissolved	ND µg/L	U		0.16	MW-39-DUP	Thallium	ND µg/L	U		0.16
10L31-F	Vanadium, dissolved	0.94 µg/L	J		0.49	MW-39-DUP	Vanadium	ND µg/L	U		0.49
10L31-F	Zinc, dissolved	3.5 µg/L	J		1.8	MW-39-DUP	Zinc	130 µg/L			1.8
MW-01	Aluminum	4.3 µg/L	U		1.4	MW-39-DUP-F	Aluminum, dissolved	5,500 µg/L			14
MW-01	Antimony	0.76 µg/L	J		0.52	MW-39-DUP-F	Antimony, dissolved	1.8 µg/L	J		0.52
MW-01	Arsenic	ND µg/L	U		0.61	MW-39-DUP-F	Arsenic, dissolved	ND µg/L	U		0.61
MW-01	Barium	46 µg/L			0.18	MW-39-DUP-F	Barium, dissolved	33 µg/L			0.18
MW-01	Beryllium	ND µg/L	U		0.25	MW-39-DUP-F	Beryllium, dissolved	5.8 µg/L			0.25
MW-01	Cadmium	ND µg/L	U		0.27	MW-39-DUP-F	Cadmium, dissolved	ND µg/L	U		0.27
MW-01	Calcium	37,000 µg/L			90	MW-39-DUP-F	Calcium, dissolved	47,000 µg/L			900
MW-01	Chromium	0.66 µg/L	J		0.30	MW-39-DUP-F	Chromium, dissolved	1 µg/L	J		0.30
MW-01	Cobalt	ND µg/L	U		0.12	MW-39-DUP-F	Cobalt, dissolved	35 µg/L			0.12
MW-01	Copper	0.46 µg/L	U		0.24	MW-39-DUP-F	Copper, dissolved	13 µg/L			0.24
MW-01	Iron	ND µg/L	U		48	MW-39-DUP-F	Iron, dissolved	34,000 µg/L			480
MW-01	Lead	ND µg/L	U		0.24	MW-39-DUP-F	Lead, dissolved	0.63 µg/L	J		0.24
MW-01	Magnesium	19,000 µg/L			41	MW-39-DUP-F	Magnesium, dissolved	20,000 µg/L			41
MW-01	Manganese	1.5 µg/L	J		0.26	MW-39-DUP-F	Manganese, dissolved	210 µg/L			0.26
MW-01	Mercury	ND µg/L	U		0.056	MW-39-DUP-F	Mercury	ND µg/L	U		0.056
MW-01	Nickel	1.4 µg/L	J		0.20	MW-39-DUP-F	Nickel, dissolved	92 µg/L			0.20
MW-01	Potassium	1,500 µg/L			110	MW-39-DUP-F	Potassium, dissolved	3,200 µg/L			110
MW-01	Selenium	1.9 µg/L	J		1.5	MW-39-DUP-F	Selenium, dissolved	2 µg/L	J		1.5
MW-01	Silver	ND µg/L	U		0.18	MW-39-DUP-F	Silver, dissolved	0.24 µg/L	J		0.18
MW-01	Sodium	3,200 µg/L			58	MW-39-DUP-F	Sodium, dissolved	14,000 µg/L			58
MW-01	Thallium	ND µg/L	U		0.16	MW-39-DUP-F	Thallium, dissolved	ND µg/L	U		0.16
MW-01	Vanadium	ND µg/L	U		0.49	MW-39-DUP-F	Vanadium, dissolved	0.57 µg/L	J		0.49
MW-01	Zinc	6.1 µg/L	J		1.8	MW-39-DUP-F	Zinc, dissolved	190 µg/L			1.8
MW-01-F	Aluminum, dissolved	ND µg/L	U		1.4	MW-39-F	Aluminum, dissolved	2,400 µg/L			1.4
MW-01-F	Antimony, dissolved	ND µg/L	U		0.52	MW-39-F	Antimony, dissolved	ND µg/L	U		0.52
MW-01-F	Arsenic, dissolved	ND µg/L	U		0.61	MW-39-F	Arsenic, dissolved	ND µg/L	U		0.61
MW-01-F	Barium, dissolved	47 µg/L			0.18	MW-39-F	Barium, dissolved	34 µg/L			0.18
MW-01-F	Beryllium, dissolved	ND µg/L	U		0.25	MW-39-F	Beryllium, dissolved	2.5 µg/L			0.25
MW-01-F	Cadmium, dissolved	ND µg/L	U		0.27	MW-39-F	Cadmium, dissolved	ND µg/L	U		0.27
MW-01-F	Calcium, dissolved	33,000 µg/L			90	MW-39-F	Calcium, dissolved	39,000 µg/L			90
MW-01-F	Chromium, dissolved	0.78 µg/L	J		0.30	MW-39-F	Chromium, dissolved	0.62 µg/L	J		0.30
MW-01-F	Cobalt, dissolved	ND µg/L	U		0.12	MW-39-F	Cobalt, dissolved	20 µg/L			0.12
MW-01-F	Copper, dissolved	0.3 µg/L	J		0.24	MW-39-F	Copper, dissolved	8.5 µg/L			0.24
MW-01-F	Iron, dissolved	ND µg/L	U		48	MW-39-F	Iron, dissolved	11,000 µg/L			48
MW-01-F	Lead, dissolved	ND µg/L	U		0.24	MW-39-F	Lead, dissolved	0.39 µg/L	J		0.24
MW-01-F	Magnesium, dissolved	17,000 µg/L			41	MW-39-F	Magnesium, dissolved	17,000 µg/L			41
MW-01-F	Manganese, dissolved	0.61 µg/L	J		0.26	MW-39-F	Manganese, dissolved	130 µg/L			0.26
MW-01-F	Mercury	ND µg/L	U		0.056	MW-39-F	Mercury	ND µg/L	U		0.056
MW-01-F	Nickel, dissolved	1.2 µg/L	J		0.20	MW-39-F	Nickel, dissolved	55 µg/L			0.20
MW-01-F	Potassium, dissolved	1,300 µg/L			110	MW-39-F	Potassium, dissolved	2,500 µg/L			110
MW-01-F	Selenium, dissolved	2.4 µg/L	J		1.5	MW-39-F	Selenium, dissolved	1.9 µg/L	J		1.5
MW-01-F	Silver, dissolved	ND µg/L	U		0.18	MW-39-F	Silver, dissolved	ND µg/L	U		0.18
MW-01-F	Sodium, dissolved	3,000 µg/L			58	MW-39-F	Sodium, dissolved	14,000 µg/L			58
MW-01-F	Thallium, dissolved	ND µg/L	U		0.16	MW-39-F	Thallium, dissolved	ND µg/L	U		0.16
MW-01-F	Vanadium, dissolved	0.68 µg/L	J		0.49	MW-39-F	Vanadium, dissolved	ND µg/L	U		0.49
MW-01-F	Zinc, dissolved	2.2 µg/L	J		1.8	MW-39-F	Zinc, dissolved	110 µg/L			1.8
MW-03	Aluminum	55,000 µg/L			140	MW-40	Aluminum	8.3 µg/L	J		1.4
MW-03	Antimony	0.55 µg/L	J		0.52	MW-40	Antimony	ND µg/L	U		0.52
MW-03	Arsenic	11 µg/L			0.61	MW-40	Arsenic	ND µg/L	U		0.61
MW-03	Barium	25 µg/L	J		0.18	MW-40	Barium	320 µg/L			0.18
MW-03	Beryllium	33 µg/L			1.0	MW-40	Beryllium	0.42 µg/L	J		0.25
MW-03	Cadmium	4.4 µg/L			0.27	MW-40	Cadmium	ND µg/L	U		0.27
MW-03	Calcium	200,000 µg/L			900	MW-40	Calcium	4,500 µg/L			90
MW-03	Chromium	51 µg/L			0.30	MW-40	Chromium	5.2 µg/L	J		0.30
MW-03	Cobalt	180 µg/L			0.12	MW-40	Cobalt	ND µg/L	U		0.12
MW-03	Copper	150 µg/L			0.24	MW-40	Copper	2.6 µg/L	J		0.24
MW-03	Iron	99,000 µg/L			48	MW-40	Iron	87 µg/L	J		48
MW-03	Lead	1.4 µg/L			0.24	MW-40	Lead	ND µg/L	U		0.24
MW-03	Magnesium	69,000 µg/L			41	MW-40	Magnesium	800 µg/L			41
MW-03	Manganese	2,000 µg/L			0.26	MW-40	Manganese	9.3 µg/L			0.26
MW-03	Mercury	ND µg/L	U		0.056	MW-40	Mercury	ND µg/L	U		0.056
MW-03	Nickel	680 µg/L			0.20	MW-40	Nickel	7 µg/L	J		0.20

Metals Data

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
MW-03	Potassium	1,600	µg/L		110
MW-03	Selenium	ND	µg/L	U	1.5
MW-03	Silver	ND	µg/L	U	0.18
MW-03	Sodium	7,100	µg/L		58
MW-03	Thallium	0.6	µg/L	J	0.16
MW-03	Vanadium	ND	µg/L	U	0.49
MW-03	Zinc	2,200	µg/L		1.8
MW-05	Aluminum	35	µg/L	J	1.4
MW-05	Antimony	ND	µg/L	U	0.52
MW-05	Arsenic	ND	µg/L	U	0.61
MW-05	Barium	38	µg/L		0.18
MW-05	Beryllium	0.5	µg/L	J	0.25
MW-05	Cadmium	ND	µg/L	U	0.27
MW-05	Calcium	45,000	µg/L		90
MW-05	Chromium	250	µg/L		0.30
MW-05	Cobalt	8	µg/L		0.12
MW-05	Copper	2.8	µg/L	J	0.24
MW-05	Iron	1,300	µg/L		48
MW-05	Lead	ND	µg/L	U	0.24
MW-05	Magnesium	25,000	µg/L		41
MW-05	Manganese	600	µg/L		0.26
MW-05	Mercury	ND	µg/L	U	0.056
MW-05	Nickel	340	µg/L		0.20
MW-05	Potassium	2,200	µg/L		110
MW-05	Selenium	ND	µg/L	U	1.5
MW-05	Silver	ND	µg/L	U	0.18
MW-05	Sodium	17,000	µg/L		58
MW-05	Thallium	ND	µg/L	U	0.16
MW-05	Vanadium	ND	µg/L	U	0.49
MW-05	Zinc	8.6	µg/L	J	1.8
MW-05-F	Aluminum, dissolved	18	µg/L	J	1.4
MW-05-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-05-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-05-F	Barium, dissolved	27	µg/L		0.18
MW-05-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-05-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-05-F	Calcium, dissolved	44,000	µg/L		90
MW-05-F	Chromium, dissolved	6.2	µg/L	J	0.30
MW-05-F	Cobalt, dissolved	4.3	µg/L		0.12
MW-05-F	Copper, dissolved	2	µg/L	J	0.24
MW-05-F	Iron, dissolved	95	µg/L	J	48
MW-05-F	Lead, dissolved	ND	µg/L	U	0.24
MW-05-F	Magnesium, dissolved	23,000	µg/L		41
MW-05-F	Manganese, dissolved	950	µg/L		0.26
MW-05-F	Mercury	ND	µg/L	U	0.056
MW-05-F	Nickel, dissolved	160	µg/L		0.20
MW-05-F	Potassium, dissolved	2,100	µg/L		110
MW-05-F	Selenium, dissolved	2.1	µg/L	J	1.5
MW-05-F	Silver, dissolved	ND	µg/L	U	0.18
MW-05-F	Sodium, dissolved	17,000	µg/L		58
MW-05-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-05-F	Vanadium, dissolved	0.64	µg/L	J	0.49
MW-05-F	Zinc, dissolved	11	µg/L	J	1.8
MW-07	Aluminum	24	µg/L	J	1.4
MW-07	Antimony	ND	µg/L	U	0.52
MW-07	Arsenic	ND	µg/L	U	0.61
MW-07	Barium	240	µg/L		0.18
MW-07	Beryllium	0.34	µg/L	J	0.25
MW-07	Cadmium	ND	µg/L	U	0.27
MW-07	Calcium	59,000	µg/L		90
MW-07	Chromium	3.7	µg/L	J	0.30
MW-07	Cobalt	0.3	µg/L	J	0.12
MW-07	Copper	7	µg/L		0.24
MW-07	Iron	150	µg/L	J	48
MW-07	Lead	0.36	µg/L	J	0.24
MW-07	Magnesium	11,000	µg/L		41
MW-07	Manganese	890	µg/L		0.26
MW-07	Mercury	ND	µg/L	U	0.056
MW-07	Nickel	6	µg/L	J	0.20
MW-07	Potassium	3,200	µg/L		110
MW-07	Selenium	2.3	µg/L	J	1.5
MW-07	Silver	ND	µg/L	U	0.18
MW-07	Sodium	4,900	µg/L		58
MW-07	Thallium	ND	µg/L	U	0.16
MW-07	Vanadium	ND	µg/L	U	0.49
MW-07	Zinc	5.9	µg/L	J	1.8
MW-07-F	Aluminum, dissolved	ND	µg/L	U	1.4
MW-07-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-07-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-07-F	Barium, dissolved	210	µg/L		0.18
MW-07-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-07-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-07-F	Calcium, dissolved	57,000	µg/L		90
MW-07-F	Chromium, dissolved	0.78	µg/L	J	0.30
MW-07-F	Cobalt, dissolved	0.24	µg/L	J	0.12
MW-07-F	Copper, dissolved	0.98	µg/L	J	0.24
MW-07-F	Iron, dissolved	ND	µg/L	U	48
MW-07-F	Lead, dissolved	ND	µg/L	U	0.24
MW-07-F	Magnesium, dissolved	10,000	µg/L		41
MW-07-F	Manganese, dissolved	810	µg/L		0.26
MW-07-F	Mercury	ND	µg/L	U	0.056
MW-07-F	Nickel, dissolved	3.2	µg/L	J	0.20
MW-07-F	Potassium, dissolved	2,100	µg/L		110
MW-07-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-07-F	Silver, dissolved	0.34	µg/L	J	0.18
MW-07-F	Sodium, dissolved	4,600	µg/L		58
MW-07-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-07-F	Vanadium, dissolved	ND	µg/L	U	0.49
MW-07-F	Zinc, dissolved	2.3	µg/L	J	1.8
MW-08	Aluminum	2.8	µg/L	J	1.4
MW-08	Antimony	ND	µg/L	U	0.52
MW-08	Arsenic	ND	µg/L	U	0.61
MW-08	Barium	350	µg/L		0.18
MW-08	Beryllium	ND	µg/L	U	0.25
MW-08	Cadmium	ND	µg/L	U	0.27
MW-08	Calcium	40,000	µg/L		90
MW-08	Chromium	3.6	µg/L	J	0.30
MW-08	Cobalt	0.12	µg/L	J	0.12
MW-08	Copper	ND	µg/L	U	0.24
MW-08	Iron	420	µg/L		48
MW-08	Lead	ND	µg/L	U	0.24
MW-08	Magnesium	8,500	µg/L		41
MW-08	Manganese	120	µg/L		0.26
MW-08	Mercury	ND	µg/L	U	0.056
MW-08	Nickel	3	µg/L	J	0.20
MW-08	Potassium	1,500	µg/L		110
MW-08	Selenium	ND	µg/L	U	1.5
MW-08	Silver	ND	µg/L	U	0.18
MW-08	Sodium	3,100	µg/L		58

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
MW-40	Potassium	1,300	µg/L		110
MW-40	Selenium	3	µg/L	J	1.5
MW-40	Silver	ND	µg/L	U	0.18
MW-40	Sodium	210,000	µg/L		580
MW-40	Thallium	ND	µg/L	U	0.16
MW-40	Vanadium	ND	µg/L	U	0.49
MW-40	Zinc	1.8	µg/L	J	1.8
MW-40-DUP	Aluminum	7.5	µg/L	J	1.4
MW-40-DUP	Antimony	ND	µg/L	U	0.52
MW-40-DUP	Arsenic	ND	µg/L	U	0.61
MW-40-DUP	Barium	310	µg/L		0.18
MW-40-DUP	Beryllium	ND	µg/L	U	0.25
MW-40-DUP	Cadmium	ND	µg/L	U	0.27
MW-40-DUP	Calcium	3,700	µg/L		90
MW-40-DUP	Chromium	2.8	µg/L	J	0.30
MW-40-DUP	Cobalt	ND	µg/L	U	0.12
MW-40-DUP	Copper	2.7	µg/L	J	0.24
MW-40-DUP	Iron	ND	µg/L	U	48
MW-40-DUP	Lead	ND	µg/L	U	0.24
MW-40-DUP	Magnesium	680	µg/L		41
MW-40-DUP	Manganese	7	µg/L		0.26
MW-40-DUP	Mercury	ND	µg/L	U	0.056
MW-40-DUP	Nickel	1.5	µg/L	J	0.20
MW-40-DUP	Potassium	1,300	µg/L		110
MW-40-DUP	Selenium	3	µg/L	J	1.5
MW-40-DUP	Silver	ND	µg/L	U	0.18
MW-40-DUP	Sodium	200,000	µg/L		580
MW-40-DUP	Thallium	ND	µg/L	U	0.16
MW-40-DUP	Vanadium	ND	µg/L	U	0.49
MW-40-DUP	Zinc	2.2	µg/L	J	1.8
MW-40-DUP-F	Aluminum, dissolved	5	µg/L	J	1.4
MW-40-DUP-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-40-DUP-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-40-DUP-F	Barium, dissolved	310	µg/L		0.18
MW-40-DUP-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-40-DUP-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-40-DUP-F	Calcium, dissolved	3,800	µg/L		90
MW-40-DUP-F	Chromium, dissolved	2.9	µg/L	J	0.30
MW-40-DUP-F	Cobalt, dissolved	ND	µg/L	U	0.12
MW-40-DUP-F	Copper, dissolved	2	µg/L	J	0.24
MW-40-DUP-F	Iron, dissolved	ND	µg/L	U	48
MW-40-DUP-F	Lead, dissolved	ND	µg/L	U	0.24
MW-40-DUP-F	Magnesium, dissolved	650	µg/L		41
MW-40-DUP-F	Manganese, dissolved	7.1	µg/L		0.26
MW-40-DUP-F	Mercury	ND	µg/L	U	0.056
MW-40-DUP-F	Nickel, dissolved	7.8	µg/L	J	0.20
MW-40-DUP-F	Potassium, dissolved	1,300	µg/L		110
MW-40-DUP-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-40-DUP-F	Silver, dissolved	ND	µg/L	U	0.18
MW-40-DUP-F	Sodium, dissolved	160,000	µg/L		230
MW-40-DUP-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-40-DUP-F	Vanadium, dissolved	1	µg/L	J	0.49
MW-40-DUP-F	Zinc, dissolved	ND	µg/L	U	1.8
MW-40-F	Aluminum, dissolved	4.7	µg/L	J	1.4
MW-40-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-40-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-40-F	Barium, dissolved	310	µg/L		0.18
MW-40-F	Beryllium, dissolved	0.26	µg/L	J	0.25
MW-40-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-40-F	Calcium, dissolved	4,400	µg/L		90
MW-40-F	Chromium, dissolved	2.7	µg/L	J	0.30
MW-40-F	Cobalt, dissolved	ND	µg/L	U	0.12
MW-40-F	Copper, dissolved	1.9	µg/L	J	0.24
MW-40-F	Iron, dissolved	ND	µg/L	U	48
MW-40-F	Lead, dissolved	ND	µg/L	U	0.24
MW-40-F	Magnesium, dissolved	750	µg/L		41
MW-40-F	Manganese, dissolved	8.4	µg/L		0.26
MW-40-F	Mercury	ND	µg/L	U	0.056
MW-40-F	Nickel, dissolved	3.2	µg/L	J	0.20
MW-40-F	Potassium, dissolved	1,300	µg/L		110
MW-40-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-40-F	Silver, dissolved	ND	µg/L	U	0.18
MW-40-F	Sodium, dissolved	160,000	µg/L		230
MW-40-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-40-F	Vanadium, dissolved	1.3	µg/L	J	0.49
MW-40-F	Zinc, dissolved	ND	µg/L	U	1.8
MW-51	Aluminum	87	µg/L		1.4
MW-51	Antimony	ND	µg/L	U	0.52
MW-51	Arsenic	ND	µg/L	U	0.61
MW-51	Barium	290	µg/L		0.18
MW-51	Beryllium	0.44	µg/L	J	0.25
MW-51	Cadmium	ND	µg/L	U	0.27
MW-51	Calcium	57,000	µg/L		90
MW-51	Chromium	1.3	µg/L	J	0.30
MW-51	Cobalt	0.53	µg/L	J	0.12
MW-51	Copper	3.2	µg/L	J	0.24
MW-51	Iron	1,100	µg/L		48
MW-51	Lead	0.59	µg/L	J	0.24
MW-51	Magnesium	12,000	µg/L		41
MW-51	Manganese	130	µg/L		0.26
MW-51	Mercury	ND	µg/L	U	0.056
MW-51	Nickel	2.8	µg/L	J	0.20
MW-51	Potassium	2,200	µg/L		110
MW-51	Selenium	1.9	µg/L	J	1.5
MW-51	Silver	ND	µg/L	U	0.18
MW-51	Sodium	7,800	µg/L		58
MW-51	Thallium	0.18	µg/L	J	0.16
MW-51	Vanadium	0.78	µg/L	J	0.49
MW-51	Zinc	7.6	µg/L	J	1.8
MW-51-F	Aluminum, dissolved	1.6	µg/L	J	1.4
MW-51-F	Antimony, dissolved	1.2	µg/L	J	0.52
MW-51-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-51-F	Barium, dissolved	270	µg/L		0.18
MW-51-F	Beryllium, dissolved	0.36	µg/L	J	0.25
MW-51-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-51-F	Calcium, dissolved	54,000	µg/L		90
MW-51-F	Chromium, dissolved	0.82	µg/L	J	0.30
MW-51-F	Cobalt, dissolved	0.34	µg/L	J	0.12
MW-51-F	Copper, dissolved	0.48	µg/L	J	0.24
MW-51-F	Iron, dissolved	280	µg/L		48
MW-51-F	Lead, dissolved	ND	µg/L	U	0.24
MW-51-F	Magnesium, dissolved	11,000	µg/L		41
MW-51-F	Manganese, dissolved	110	µg/L		0.26
MW-51-F	Mercury	ND	µg/L	U	0.056
MW-51-F	Nickel, dissolved	2	µg/L	J	0.20
MW-51-F	Potassium, dissolved	2,200	µg/L		110
MW-51-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-51-F	Silver, dissolved	0.55	µg/L	J	0.18
MW-51-F	Sodium, dissolved	7,500	µg/L		58

Metals Data

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
MW-08	Thallium	ND	µg/L	U	0.16
MW-08	Vanadium	ND	µg/L	U	0.49
MW-08	Zinc	1.9	µg/L	J	1.8
MW-08-F	Aluminum, dissolved	ND	µg/L	U	1.4
MW-08-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-08-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-08-F	Barium, dissolved	330	µg/L		0.18
MW-08-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-08-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-08-F	Calcium, dissolved	38,000	µg/L		90
MW-08-F	Chromium, dissolved	0.66	µg/L	J	0.30
MW-08-F	Cobalt, dissolved	ND	µg/L	U	0.12
MW-08-F	Copper, dissolved	0.49	µg/L	J	0.24
MW-08-F	Iron, dissolved	110	µg/L	J	48
MW-08-F	Lead, dissolved	ND	µg/L	U	0.24
MW-08-F	Magnesium, dissolved	7,700	µg/L		41
MW-08-F	Manganese, dissolved	51	µg/L		0.26
MW-08-F	Mercury	ND	µg/L	U	0.056
MW-08-F	Nickel, dissolved	2.3	µg/L	J	0.20
MW-08-F	Potassium, dissolved	1,500	µg/L		110
MW-08-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-08-F	Silver, dissolved	ND	µg/L	U	0.18
MW-08-F	Sodium, dissolved	2,900	µg/L		58
MW-08-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-08-F	Vanadium, dissolved	0.62	µg/L	J	0.49
MW-08-F	Zinc, dissolved	1.8	µg/L	J	1.8
MW-09A	Aluminum	3.2	µg/L	J	1.4
MW-09A	Antimony	ND	µg/L	U	0.52
MW-09A	Arsenic	ND	µg/L	U	0.61
MW-09A	Barium	430	µg/L		0.18
MW-09A	Beryllium	ND	µg/L	U	0.25
MW-09A	Cadmium	ND	µg/L	U	0.27
MW-09A	Calcium	26,000	µg/L		90
MW-09A	Chromium	4.5	µg/L	J	0.30
MW-09A	Cobalt	ND	µg/L	U	0.12
MW-09A	Copper	0.29	µg/L	J	0.24
MW-09A	Iron	220	µg/L		48
MW-09A	Lead	ND	µg/L	U	0.24
MW-09A	Magnesium	5,400	µg/L		41
MW-09A	Manganese	21	µg/L		0.26
MW-09A	Mercury	ND	µg/L	U	0.056
MW-09A	Nickel	1.4	µg/L	J	0.20
MW-09A	Potassium	11,000	µg/L		110
MW-09A	Selenium	ND	µg/L	U	1.5
MW-09A	Silver	ND	µg/L	U	0.18
MW-09A	Sodium	11,000	µg/L		58
MW-09A	Thallium	ND	µg/L	U	0.16
MW-09A	Vanadium	ND	µg/L	U	0.49
MW-09A	Zinc	1.9	µg/L	J	1.8
MW-09A-F	Aluminum, dissolved	ND	µg/L	U	1.4
MW-09A-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-09A-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-09A-F	Barium, dissolved	400	µg/L		0.18
MW-09A-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-09A-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-09A-F	Calcium, dissolved	25,000	µg/L		90
MW-09A-F	Chromium, dissolved	2.4	µg/L	J	0.30
MW-09A-F	Cobalt, dissolved	ND	µg/L	U	0.12
MW-09A-F	Copper, dissolved	0.25	µg/L	J	0.24
MW-09A-F	Iron, dissolved	ND	µg/L	U	48
MW-09A-F	Lead, dissolved	ND	µg/L	U	0.24
MW-09A-F	Magnesium, dissolved	5,300	µg/L		41
MW-09A-F	Manganese, dissolved	8.4	µg/L		0.26
MW-09A-F	Mercury	ND	µg/L	U	0.056
MW-09A-F	Nickel, dissolved	1.9	µg/L	J	0.20
MW-09A-F	Potassium, dissolved	11,000	µg/L		110
MW-09A-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-09A-F	Silver, dissolved	ND	µg/L	U	0.18
MW-09A-F	Sodium, dissolved	10,000	µg/L		58
MW-09A-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-09A-F	Vanadium, dissolved	0.5	µg/L	J	0.49
MW-09A-F	Zinc, dissolved	4	µg/L	J	1.8
MW-13	Aluminum	1.7	µg/L	J	1.4
MW-13	Antimony	ND	µg/L	U	0.52
MW-13	Arsenic	ND	µg/L	U	0.61
MW-13	Barium	470	µg/L		0.18
MW-13	Beryllium	ND	µg/L	U	0.25
MW-13	Cadmium	ND	µg/L	U	0.27
MW-13	Calcium	33,000	µg/L		90
MW-13	Chromium	0.38	µg/L	J	0.30
MW-13	Cobalt	ND	µg/L	U	0.12
MW-13	Copper	ND	µg/L	U	0.24
MW-13	Iron	640	µg/L		48
MW-13	Lead	ND	µg/L	U	0.24
MW-13	Magnesium	6,800	µg/L		41
MW-13	Manganese	56	µg/L		0.26
MW-13	Mercury	ND	µg/L	U	0.056
MW-13	Nickel	0.79	µg/L	J	0.20
MW-13	Potassium	1,200	µg/L		110
MW-13	Selenium	2.6	µg/L	J	1.5
MW-13	Silver	ND	µg/L	U	0.18
MW-13	Sodium	2,700	µg/L		58
MW-13	Thallium	ND	µg/L	U	0.16
MW-13	Vanadium	ND	µg/L	U	0.49
MW-13	Zinc	ND	µg/L	U	1.8
MW-13-F	Aluminum, dissolved	3.9	µg/L	J	1.4
MW-13-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-13-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-13-F	Barium, dissolved	450	µg/L		0.18
MW-13-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-13-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-13-F	Calcium, dissolved	33,000	µg/L		90
MW-13-F	Chromium, dissolved	0.34	µg/L	J	0.30
MW-13-F	Cobalt, dissolved	ND	µg/L	U	0.12
MW-13-F	Copper, dissolved	ND	µg/L	U	0.24
MW-13-F	Iron, dissolved	590	µg/L		48
MW-13-F	Lead, dissolved	0.48	µg/L	J	0.24
MW-13-F	Magnesium, dissolved	6,500	µg/L		41
MW-13-F	Manganese, dissolved	54	µg/L		0.26
MW-13-F	Mercury	ND	µg/L	U	0.056
MW-13-F	Nickel, dissolved	0.95	µg/L	J	0.20
MW-13-F	Potassium, dissolved	1,200	µg/L		110
MW-13-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-13-F	Silver, dissolved	ND	µg/L	U	0.18
MW-13-F	Sodium, dissolved	3,200	µg/L		58
MW-13-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-13-F	Vanadium, dissolved	0.54	µg/L	J	0.49
MW-13-F	Zinc, dissolved	ND	µg/L	U	1.8
MW-14	Aluminum	2.7	µg/L	J	1.4

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
MW-51-F	Thallium, dissolved	0.2	µg/L	J	0.16
MW-51-F	Vanadium, dissolved	0.74	µg/L	J	0.49
MW-51-F	Zinc, dissolved	ND	µg/L	U	1.8
MW-52	Aluminum	16	µg/L	J	1.4
MW-52	Antimony	ND	µg/L	U	0.52
MW-52	Arsenic	ND	µg/L	U	0.61
MW-52	Barium	260	µg/L		0.18
MW-52	Beryllium	ND	µg/L	U	0.25
MW-52	Cadmium	ND	µg/L	U	0.27
MW-52	Calcium	86,000	µg/L		90
MW-52	Chromium	0.74	µg/L	J	0.30
MW-52	Cobalt	0.29	µg/L	J	0.12
MW-52	Copper	0.41	µg/L	J	0.24
MW-52	Iron	1,100	µg/L		48
MW-52	Lead	ND	µg/L	U	0.24
MW-52	Magnesium	14,000	µg/L		41
MW-52	Manganese	230	µg/L		0.26
MW-52	Mercury	ND	µg/L	U	0.056
MW-52	Nickel	2.7	µg/L	J	0.20
MW-52	Potassium	2,000	µg/L		110
MW-52	Selenium	ND	µg/L	U	1.5
MW-52	Silver	ND	µg/L	U	0.18
MW-52	Sodium	3,400	µg/L		58
MW-52	Thallium	ND	µg/L	U	0.16
MW-52	Vanadium	ND	µg/L	U	0.49
MW-52	Zinc	8.7	µg/L	J	1.8
MW-52-F	Aluminum, dissolved	ND	µg/L	U	1.4
MW-52-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-52-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-52-F	Barium, dissolved	250	µg/L		0.18
MW-52-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-52-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-52-F	Calcium, dissolved	84,000	µg/L		90
MW-52-F	Chromium, dissolved	2	µg/L	J	0.30
MW-52-F	Cobalt, dissolved	0.31	µg/L	J	0.12
MW-52-F	Copper, dissolved	ND	µg/L	U	0.24
MW-52-F	Iron, dissolved	950	µg/L		48
MW-52-F	Lead, dissolved	ND	µg/L	U	0.24
MW-52-F	Magnesium, dissolved	13,000	µg/L		41
MW-52-F	Manganese, dissolved	220	µg/L		0.26
MW-52-F	Mercury	ND	µg/L	U	0.056
MW-52-F	Nickel, dissolved	2.2	µg/L	J	0.20
MW-52-F	Potassium, dissolved	2,000	µg/L		110
MW-52-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-52-F	Silver, dissolved	ND	µg/L	U	0.18
MW-52-F	Sodium, dissolved	3,400	µg/L		58
MW-52-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-52-F	Vanadium, dissolved	0.85	µg/L	J	0.49
MW-52-F	Zinc, dissolved	ND	µg/L	U	1.8
MW-53	Aluminum	270	µg/L		1.4
MW-53	Antimony	ND	µg/L	U	0.52
MW-53	Arsenic	3.2	µg/L		0.61
MW-53	Barium	170	µg/L		0.18
MW-53	Beryllium	ND	µg/L	U	0.25
MW-53	Cadmium	ND	µg/L	U	0.27
MW-53	Calcium	27,000	µg/L		90
MW-53	Chromium	4.7	µg/L	J	0.30
MW-53	Cobalt	1.2	µg/L	J	0.12
MW-53	Copper	5.9	µg/L		0.24
MW-53	Iron	990	µg/L		48
MW-53	Lead	1.2	µg/L		0.24
MW-53	Magnesium	10,000	µg/L		41
MW-53	Manganese	37	µg/L		0.26
MW-53	Mercury	ND	µg/L	U	0.056
MW-53	Nickel	11	µg/L		0.20
MW-53	Potassium	51,000	µg/L		110
MW-53	Selenium	ND	µg/L	U	1.5
MW-53	Silver	ND	µg/L	U	0.18
MW-53	Sodium	110,000	µg/L		58
MW-53	Thallium	ND	µg/L	U	0.16
MW-53	Vanadium	1.5	µg/L	J	0.49
MW-53	Zinc	25	µg/L	J	1.8
MW-53-F	Aluminum, dissolved	150	µg/L		1.4
MW-53-F	Antimony, dissolved	1.2	µg/L	J	0.52
MW-53-F	Arsenic, dissolved	4.2	µg/L		0.61
MW-53-F	Barium, dissolved	120	µg/L		0.18
MW-53-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-53-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-53-F	Calcium, dissolved	12,000	µg/L		90
MW-53-F	Chromium, dissolved	9.7	µg/L	J	0.30
MW-53-F	Cobalt, dissolved	1	µg/L	J	0.12
MW-53-F	Copper, dissolved	14	µg/L		0.24
MW-53-F	Iron, dissolved	170	µg/L	J	48
MW-53-F	Lead, dissolved	0.45	µg/L	J	0.24
MW-53-F	Magnesium, dissolved	10,000	µg/L		41
MW-53-F	Manganese, dissolved	12	µg/L		0.26
MW-53-F	Mercury	ND	µg/L	U	0.056
MW-53-F	Nickel, dissolved	14	µg/L		0.20
MW-53-F	Potassium, dissolved	80,000	µg/L		110
MW-53-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-53-F	Silver, dissolved	0.21	µg/L	J	0.18
MW-53-F	Sodium, dissolved	120,000	µg/L		58
MW-53-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-53-F	Vanadium, dissolved	5.5	µg/L		0.49
MW-53-F	Zinc, dissolved	7.7	µg/L	J	1.8
MW-59	Aluminum	910	µg/L		1.4
MW-59	Antimony	ND	µg/L	U	0.52
MW-59	Arsenic	ND	µg/L	U	0.61
MW-59	Barium	39	µg/L		0.18
MW-59	Beryllium	0.64	µg/L	J	0.25
MW-59	Cadmium	ND	µg/L	U	0.27
MW-59	Calcium	12,000	µg/L		90
MW-59	Chromium	1.2	µg/L	J	0.30
MW-59	Cobalt	14	µg/L		0.12
MW-59	Copper	3.5	µg/L	J	0.24
MW-59	Iron	3,800	µg/L		48
MW-59	Lead	ND	µg/L	U	0.24
MW-59	Magnesium	9,400	µg/L		41
MW-59	Manganese	570	µg/L		0.26
MW-59	Mercury	ND	µg/L	U	0.056
MW-59	Nickel	33	µg/L		0.20
MW-59	Potassium	940	µg/L		110
MW-59	Selenium	2	µg/L	J	1.5
MW-59	Silver	ND	µg/L	U	0.18
MW-59	Sodium	6,100	µg/L		58
MW-59	Thallium	ND	µg/L	U	0.16
MW-59	Vanadium	ND	µg/L	U	0.49
MW-59	Zinc	56	µg/L		1.8
MW-59-F	Aluminum, dissolved	100	µg/L		1.4

Metals Data

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
MW-14	Antimony	ND	µg/L	U	0.52
MW-14	Arsenic	1.4	µg/L	J	0.61
MW-14	Barium	360	µg/L		0.18
MW-14	Beryllium	0.46	µg/L	J	0.25
MW-14	Cadmium	ND	µg/L	U	0.27
MW-14	Calcium	29,000	µg/L		90
MW-14	Chromium	ND	µg/L	U	0.30
MW-14	Cobalt	4.2	µg/L	J	0.12
MW-14	Copper	ND	µg/L	U	0.24
MW-14	Iron	7,700	µg/L		48
MW-14	Lead	ND	µg/L	U	0.24
MW-14	Magnesium	5,000	µg/L		41
MW-14	Manganese	430	µg/L		0.26
MW-14	Mercury	ND	µg/L	U	0.056
MW-14	Nickel	6.3	µg/L	J	0.20
MW-14	Potassium	780	µg/L		110
MW-14	Selenium	ND	µg/L	U	1.5
MW-14	Silver	ND	µg/L	U	0.18
MW-14	Sodium	3,000	µg/L		58
MW-14	Thallium	ND	µg/L	U	0.16
MW-14	Vanadium	ND	µg/L	U	0.49
MW-14	Zinc	5.5	µg/L	J	1.8
MW-14-F	Aluminum, dissolved	ND	µg/L	U	1.4
MW-14-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-14-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-14-F	Barium, dissolved	330	µg/L		0.18
MW-14-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-14-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-14-F	Calcium, dissolved	28,000	µg/L		90
MW-14-F	Chromium, dissolved	ND	µg/L	U	0.30
MW-14-F	Cobalt, dissolved	3.9	µg/L		0.12
MW-14-F	Copper, dissolved	0.3	µg/L	J	0.24
MW-14-F	Iron, dissolved	6,500	µg/L		48
MW-14-F	Lead, dissolved	ND	µg/L	U	0.24
MW-14-F	Magnesium, dissolved	4,700	µg/L		41
MW-14-F	Manganese, dissolved	400	µg/L		0.26
MW-14-F	Mercury	ND	µg/L	U	0.056
MW-14-F	Nickel, dissolved	4.6	µg/L	J	0.20
MW-14-F	Potassium, dissolved	790	µg/L		110
MW-14-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-14-F	Silver, dissolved	ND	µg/L	U	0.18
MW-14-F	Sodium, dissolved	3,000	µg/L		58
MW-14-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-14-F	Vanadium, dissolved	ND	µg/L	U	0.49
MW-14-F	Zinc, dissolved	5.1	µg/L	J	1.8
MW-15	Aluminum	7	µg/L	J	1.4
MW-15	Antimony	ND	µg/L	U	0.52
MW-15	Arsenic	ND	µg/L	U	0.61
MW-15	Barium	200	µg/L		0.18
MW-15	Beryllium	0.34	µg/L	J	0.25
MW-15	Cadmium	ND	µg/L	U	0.27
MW-15	Calcium	16,000	µg/L		90
MW-15	Chromium	ND	µg/L	U	0.30
MW-15	Cobalt	0.64	µg/L	J	0.12
MW-15	Copper	0.29	µg/L	J	0.24
MW-15	Iron	4,700	µg/L		48
MW-15	Lead	ND	µg/L	U	0.24
MW-15	Magnesium	4,000	µg/L		41
MW-15	Manganese	280	µg/L		0.26
MW-15	Mercury	ND	µg/L	U	0.056
MW-15	Nickel	1.3	µg/L	J	0.20
MW-15	Potassium	930	µg/L		110
MW-15	Selenium	ND	µg/L	U	1.5
MW-15	Silver	ND	µg/L	U	0.18
MW-15	Sodium	4,100	µg/L		58
MW-15	Thallium	ND	µg/L	U	0.16
MW-15	Vanadium	ND	µg/L	U	0.49
MW-15	Zinc	5.5	µg/L	J	1.8
MW-15-F	Aluminum, dissolved	ND	µg/L	U	1.4
MW-15-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-15-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-15-F	Barium, dissolved	200	µg/L		0.18
MW-15-F	Beryllium, dissolved	ND	µg/L	U	0.25
MW-15-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-15-F	Calcium, dissolved	18,000	µg/L		90
MW-15-F	Chromium, dissolved	ND	µg/L	U	0.30
MW-15-F	Cobalt, dissolved	0.29	µg/L	J	0.12
MW-15-F	Copper, dissolved	ND	µg/L	U	0.24
MW-15-F	Iron, dissolved	88	µg/L	J	48
MW-15-F	Lead, dissolved	ND	µg/L	U	0.24
MW-15-F	Magnesium, dissolved	4,200	µg/L		41
MW-15-F	Manganese, dissolved	160	µg/L		0.26
MW-15-F	Mercury	ND	µg/L	U	0.056
MW-15-F	Nickel, dissolved	0.96	µg/L	J	0.20
MW-15-F	Potassium, dissolved	970	µg/L		110
MW-15-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-15-F	Silver, dissolved	ND	µg/L	U	0.18
MW-15-F	Sodium, dissolved	4,100	µg/L		58
MW-15-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-15-F	Vanadium, dissolved	0.49	µg/L	J	0.49
MW-15-F	Zinc, dissolved	2	µg/L	J	1.8
MW-22	Aluminum	75	µg/L		1.4
MW-22	Antimony	0.56	µg/L	J	0.52
MW-22	Arsenic	14	µg/L		0.61
MW-22	Barium	27	µg/L		0.18
MW-22	Beryllium	ND	µg/L	U	0.25
MW-22	Cadmium	ND	µg/L	U	0.27
MW-22	Calcium	170,000	µg/L		90
MW-22	Chromium	2.4	µg/L	J	0.30
MW-22	Cobalt	0.52	µg/L	J	0.12
MW-22	Copper	3.1	µg/L	J	0.24
MW-22	Iron	28,000	µg/L		48
MW-22	Lead	0.42	µg/L	J	0.24
MW-22	Magnesium	38,000	µg/L		41
MW-22	Manganese	540	µg/L		0.26
MW-22	Mercury	ND	µg/L	U	0.056
MW-22	Nickel	5.7	µg/L	J	0.20
MW-22	Potassium	4,300	µg/L		110
MW-22	Selenium	2.4	µg/L	J	1.5
MW-22	Silver	ND	µg/L	U	0.18
MW-22	Sodium	10,000	µg/L		58
MW-22	Thallium	ND	µg/L	U	0.16
MW-22	Vanadium	ND	µg/L	U	0.49
MW-22	Zinc	6	µg/L	J	1.8
MW-22-F	Aluminum, dissolved	2.6	µg/L	J	1.4
MW-22-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-22-F	Arsenic, dissolved	15	µg/L		0.61
MW-22-F	Barium, dissolved	23	µg/L	J	0.18
MW-22-F	Beryllium, dissolved	0.29	µg/L	J	0.25

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
MW-59-F	Antimony, dissolved	1	µg/L	J	0.52
MW-59-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-59-F	Barium, dissolved	38	µg/L		0.18
MW-59-F	Beryllium, dissolved	0.48	µg/L	J	0.25
MW-59-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-59-F	Calcium, dissolved	8,900	µg/L		90
MW-59-F	Chromium, dissolved	0.41	µg/L	J	0.30
MW-59-F	Cobalt, dissolved	11	µg/L		0.12
MW-59-F	Copper, dissolved	0.74	µg/L	J	0.24
MW-59-F	Iron, dissolved	2,100	µg/L		48
MW-59-F	Lead, dissolved	ND	µg/L	U	0.24
MW-59-F	Magnesium, dissolved	7,700	µg/L		41
MW-59-F	Manganese, dissolved	510	µg/L		0.26
MW-59-F	Mercury	ND	µg/L	U	0.056
MW-59-F	Nickel, dissolved	20	µg/L		0.20
MW-59-F	Potassium, dissolved	880	µg/L		110
MW-59-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-59-F	Silver, dissolved	ND	µg/L	U	0.18
MW-59-F	Sodium, dissolved	5,400	µg/L		58
MW-59-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-59-F	Vanadium, dissolved	ND	µg/L	U	0.49
MW-59-F	Zinc, dissolved	24	µg/L	J	1.8
PZ-09	Aluminum	530	µg/L		1.4
PZ-09	Antimony	ND	µg/L	U	0.52
PZ-09	Arsenic	ND	µg/L	U	0.61
PZ-09	Barium	250	µg/L		0.18
PZ-09	Beryllium	0.83	µg/L	J	0.25
PZ-09	Cadmium	ND	µg/L	U	0.27
PZ-09	Calcium	15,000	µg/L		90
PZ-09	Chromium	4	µg/L	J	0.30
PZ-09	Cobalt	1.2	µg/L	J	0.12
PZ-09	Copper	1.5	µg/L	J	0.24
PZ-09	Iron	1,500	µg/L		48
PZ-09	Lead	1.7	µg/L		0.24
PZ-09	Magnesium	9,000	µg/L		41
PZ-09	Manganese	36	µg/L		0.26
PZ-09	Mercury	ND	µg/L	U	0.056
PZ-09	Nickel	26	µg/L		0.20
PZ-09	Potassium	1,200	µg/L		110
PZ-09	Selenium	3.3	µg/L	J	1.5
PZ-09	Silver	ND	µg/L	U	0.18
PZ-09	Sodium	6,000	µg/L		58
PZ-09	Thallium	ND	µg/L	U	0.16
PZ-09	Vanadium	0.74	µg/L	J	0.49
PZ-09	Zinc	17	µg/L	J	1.8
PZ-09-DUP	Aluminum	290	µg/L		1.4
PZ-09-DUP	Antimony	0.54	µg/L	J	0.52
PZ-09-DUP	Arsenic	ND	µg/L	U	0.61
PZ-09-DUP	Barium	230	µg/L		0.18
PZ-09-DUP	Beryllium	ND	µg/L	U	0.25
PZ-09-DUP	Cadmium	ND	µg/L	U	0.27
PZ-09-DUP	Calcium	14,000	µg/L		90
PZ-09-DUP	Chromium	1.8	µg/L	J	0.30
PZ-09-DUP	Cobalt	0.78	µg/L	J	0.12
PZ-09-DUP	Copper	0.86	µg/L	J	0.24
PZ-09-DUP	Iron	590	µg/L		48
PZ-09-DUP	Lead	0.72	µg/L	J	0.24
PZ-09-DUP	Magnesium	8,600	µg/L		41
PZ-09-DUP	Manganese	45	µg/L		0.26
PZ-09-DUP	Mercury	ND	µg/L	U	0.056
PZ-09-DUP	Nickel	24	µg/L		0.20
PZ-09-DUP	Potassium	1,100	µg/L		110
PZ-09-DUP	Selenium	1.7	µg/L	U	1.5
PZ-09-DUP	Silver	ND	µg/L	U	0.18
PZ-09-DUP	Sodium	5,700	µg/L		58
PZ-09-DUP	Thallium	ND	µg/L	U	0.16
PZ-09-DUP	Vanadium	0.66	µg/L	J	0.49
PZ-09-DUP	Zinc	13	µg/L	J	1.8
PZ-09-DUP-F	Aluminum, dissolved	35	µg/L	J	1.4
PZ-09-DUP-F	Antimony, dissolved	ND	µg/L	U	0.52
PZ-09-DUP-F	Arsenic, dissolved	ND	µg/L	U	0.61
PZ-09-DUP-F	Barium, dissolved	200	µg/L		0.18
PZ-09-DUP-F	Beryllium, dissolved	3.6	µg/L		0.25
PZ-09-DUP-F	Cadmium, dissolved	ND	µg/L	U	0.27
PZ-09-DUP-F	Calcium, dissolved	14,000	µg/L		90
PZ-09-DUP-F	Chromium, dissolved	1.2	µg/L	J	0.30
PZ-09-DUP-F	Cobalt, dissolved	1.1	µg/L	J	0.12
PZ-09-DUP-F	Copper, dissolved	150	µg/L		0.24
PZ-09-DUP-F	Iron, dissolved	ND	µg/L	U	48
PZ-09-DUP-F	Lead, dissolved	2.9	µg/L		0.24
PZ-09-DUP-F	Magnesium, dissolved	8,000	µg/L		41
PZ-09-DUP-F	Manganese, dissolved	58	µg/L		0.26
PZ-09-DUP-F	Mercury	ND	µg/L	U	0.056
PZ-09-DUP-F	Nickel, dissolved	26	µg/L		0.20
PZ-09-DUP-F	Potassium, dissolved	1,100	µg/L		110
PZ-09-DUP-F	Selenium, dissolved	ND	µg/L	U	1.5
PZ-09-DUP-F	Silver, dissolved	0.23	µg/L	J	0.18
PZ-09-DUP-F	Sodium, dissolved	5,500	µg/L		58
PZ-09-DUP-F	Thallium, dissolved	ND	µg/L	U	0.16
PZ-09-DUP-F	Vanadium, dissolved	ND	µg/L	U	0.49
PZ-09-DUP-F	Zinc, dissolved	11	µg/L	J	1.8
PZ-09-F	Aluminum, dissolved	35	µg/L	J	1.4
PZ-09-F	Antimony, dissolved	ND	µg/L	U	0.52
PZ-09-F	Arsenic, dissolved	ND	µg/L	U	0.61
PZ-09-F	Barium, dissolved	210	µg/L		0.18
PZ-09-F	Beryllium, dissolved	0.27	µg/L	J	0.25
PZ-09-F	Cadmium, dissolved	ND	µg/L	U	0.27
PZ-09-F	Calcium, dissolved	14,000	µg/L		90
PZ-09-F	Chromium, dissolved	1.3	µg/L	J	0.30
PZ-09-F	Cobalt, dissolved	0.36	µg/L	J	0.12
PZ-09-F	Copper, dissolved	1.7	µg/L	J	0.24
PZ-09-F	Iron, dissolved	ND	µg/L	U	48
PZ-09-F	Lead, dissolved	ND	µg/L	U	0.24
PZ-09-F	Magnesium, dissolved	8,300	µg/L		41
PZ-09-F	Manganese, dissolved	18	µg/L		0.26
PZ-09-F	Mercury	ND	µg/L	U	0.056
PZ-09-F	Nickel, dissolved	25	µg/L		0.20
PZ-09-F	Potassium, dissolved	1,100	µg/L		110
PZ-09-F	Selenium, dissolved	ND	µg/L	U	1.5
PZ-09-F	Silver, dissolved	ND	µg/L	U	0.18
PZ-09-F	Sodium, dissolved	5,700	µg/L		58
PZ-09-F	Thallium, dissolved	ND	µg/L	U	0.16
PZ-09-F	Vanadium, dissolved	0.76	µg/L	J	0.49
PZ-09-F	Zinc, dissolved	11	µg/L	J	1.8
SP-DR-01	Aluminum	1,600	µg/L		1.4
SP-DR-01	Antimony	1.1	µg/L	J	0.52
SP-DR-01	Arsenic	2.6	µg/L		0.61
SP-DR-01	Barium	180	µg/L		0.18
SP-DR-01	Beryllium	2.7	µg/L		0.25

Metals Data

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
MW-22-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-22-F	Calcium, dissolved	170,000	µg/L		90
MW-22-F	Chromium, dissolved	0.6	µg/L	J	0.30
MW-22-F	Cobalt, dissolved	0.5	µg/L	J	0.12
MW-22-F	Copper, dissolved	6.1	µg/L		0.24
MW-22-F	Iron, dissolved	30,000	µg/L		48
MW-22-F	Lead, dissolved	ND	µg/L	U	0.24
MW-22-F	Magnesium, dissolved	37,000	µg/L		41
MW-22-F	Manganese, dissolved	550	µg/L		0.26
MW-22-F	Mercury	ND	µg/L	U	0.056
MW-22-F	Nickel, dissolved	4.2	µg/L	J	0.20
MW-22-F	Potassium, dissolved	4,300	µg/L		110
MW-22-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-22-F	Silver, dissolved	ND	µg/L	U	0.18
MW-22-F	Sodium, dissolved	10,000	µg/L		58
MW-22-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-22-F	Vanadium, dissolved	ND	µg/L	U	0.49
MW-22-F	Zinc, dissolved	3	µg/L	J	1.8
MW-33	Aluminum	38	µg/L	J	1.4
MW-33	Antimony	ND	µg/L	U	0.52
MW-33	Arsenic	ND	µg/L	U	0.61
MW-33	Barium	640	µg/L		0.18
MW-33	Beryllium	ND	µg/L	U	0.25
MW-33	Cadmium	ND	µg/L	U	0.27
MW-33	Calcium	48,000	µg/L		90
MW-33	Chromium	1.4	µg/L	J	0.30
MW-33	Cobalt	0.18	µg/L	J	0.12
MW-33	Copper	1.3	µg/L	J	0.24
MW-33	Iron	710	µg/L		48
MW-33	Lead	0.29	µg/L	J	0.24
MW-33	Magnesium	9,500	µg/L		41
MW-33	Manganese	69	µg/L		0.26
MW-33	Mercury	ND	µg/L	U	0.056
MW-33	Nickel	2.2	µg/L	J	0.20
MW-33	Potassium	2,500	µg/L		110
MW-33	Selenium	ND	µg/L	U	1.5
MW-33	Silver	ND	µg/L	U	0.18
MW-33	Sodium	38,000	µg/L		58
MW-33	Thallium	ND	µg/L	U	0.16
MW-33	Vanadium	ND	µg/L	U	0.49
MW-33	Zinc	4.3	µg/L	J	1.8
MW-33-F	Aluminum, dissolved	3.7	µg/L	J	1.4
MW-33-F	Antimony, dissolved	ND	µg/L	U	0.52
MW-33-F	Arsenic, dissolved	ND	µg/L	U	0.61
MW-33-F	Barium, dissolved	610	µg/L		0.18
MW-33-F	Beryllium, dissolved	0.4	µg/L	J	0.25
MW-33-F	Cadmium, dissolved	ND	µg/L	U	0.27
MW-33-F	Calcium, dissolved	46,000	µg/L		90
MW-33-F	Chromium, dissolved	1.1	µg/L	J	0.30
MW-33-F	Cobalt, dissolved	0.16	µg/L	J	0.12
MW-33-F	Copper, dissolved	0.66	µg/L	J	0.24
MW-33-F	Iron, dissolved	350	µg/L		48
MW-33-F	Lead, dissolved	ND	µg/L	U	0.24
MW-33-F	Magnesium, dissolved	8,800	µg/L		41
MW-33-F	Manganese, dissolved	54	µg/L		0.26
MW-33-F	Mercury	ND	µg/L	U	0.056
MW-33-F	Nickel, dissolved	1.8	µg/L	J	0.20
MW-33-F	Potassium, dissolved	2,400	µg/L		110
MW-33-F	Selenium, dissolved	ND	µg/L	U	1.5
MW-33-F	Silver, dissolved	ND	µg/L	U	0.18
MW-33-F	Sodium, dissolved	34,000	µg/L		58
MW-33-F	Thallium, dissolved	ND	µg/L	U	0.16
MW-33-F	Vanadium, dissolved	ND	µg/L	U	0.49
MW-33-F	Zinc, dissolved	1.9	µg/L	J	1.8
MW-39	Aluminum	2,300	µg/L		1.4
MW-39	Antimony	ND	µg/L	U	0.52
MW-39	Arsenic	ND	µg/L	U	0.61
MW-39	Barium	36	µg/L		0.18
MW-39	Beryllium	2.1	µg/L		0.25
MW-39	Cadmium	ND	µg/L	U	0.27
MW-39	Calcium	37,000	µg/L		90
MW-39	Chromium	1.3	µg/L	J	0.30
MW-39	Cobalt	18	µg/L		0.12
MW-39	Copper	5.4	µg/L		0.24
MW-39	Iron	12,000	µg/L		48
MW-39	Lead	0.27	µg/L	J	0.24
MW-39	Magnesium	17,000	µg/L		41
MW-39	Manganese	120	µg/L		0.26
MW-39	Mercury	ND	µg/L	U	0.056
MW-39	Nickel	50	µg/L		0.20
MW-39	Potassium	2,600	µg/L		110
MW-39	Selenium	1.6	µg/L	U	1.5
MW-39	Silver	ND	µg/L	U	0.18
MW-39	Sodium	14,000	µg/L		58
MW-39	Thallium	ND	µg/L	U	0.16
MW-39	Vanadium	ND	µg/L	U	0.49
MW-39	Zinc	96	µg/L		1.8

Sample Location	Parameter	Result	Units	Qualifier	Detection Limit
SP-DR-01	Cadmium	3	µg/L		0.27
SP-DR-01	Calcium	21,000	µg/L		90
SP-DR-01	Chromium	2	µg/L	J	0.30
SP-DR-01	Cobalt	17	µg/L		0.12
SP-DR-01	Copper	8.2	µg/L		0.24
SP-DR-01	Iron	14,000	µg/L		48
SP-DR-01	Lead	12	µg/L		0.24
SP-DR-01	Magnesium	9,700	µg/L		41
SP-DR-01	Manganese	3,000	µg/L		0.26
SP-DR-01	Mercury	ND	µg/L	U	0.056
SP-DR-01	Nickel	16	µg/L		0.20
SP-DR-01	Potassium	1,700	µg/L		110
SP-DR-01	Selenium	2.9	µg/L	J	1.5
SP-DR-01	Silver	ND	µg/L	U	0.18
SP-DR-01	Sodium	4,800	µg/L		58
SP-DR-01	Thallium	ND	µg/L	U	0.16
SP-DR-01	Vanadium	5.8	µg/L		0.49
SP-DR-01	Zinc	31	µg/L	J	1.8
SP-DR-01-F	Aluminum, dissolved	130	µg/L		1.4
SP-DR-01-F	Antimony, dissolved	ND	µg/L	U	0.52
SP-DR-01-F	Arsenic, dissolved	1	µg/L	J	0.61
SP-DR-01-F	Barium, dissolved	100	µg/L		0.18
SP-DR-01-F	Beryllium, dissolved	0.72	µg/L	J	0.25
SP-DR-01-F	Cadmium, dissolved	ND	µg/L	U	0.27
SP-DR-01-F	Calcium, dissolved	20,000	µg/L		90
SP-DR-01-F	Chromium, dissolved	1	µg/L	J	0.30
SP-DR-01-F	Cobalt, dissolved	14	µg/L		0.12
SP-DR-01-F	Copper, dissolved	1.4	µg/L	J	0.24
SP-DR-01-F	Iron, dissolved	3,400	µg/L		48
SP-DR-01-F	Lead, dissolved	0.26	µg/L	J	0.24
SP-DR-01-F	Magnesium, dissolved	9,300	µg/L		41
SP-DR-01-F	Manganese, dissolved	3,000	µg/L		0.26
SP-DR-01-F	Mercury	ND	µg/L	U	0.056
SP-DR-01-F	Nickel, dissolved	9.9	µg/L	J	0.20
SP-DR-01-F	Potassium, dissolved	1,600	µg/L		110
SP-DR-01-F	Selenium, dissolved	ND	µg/L	U	1.5
SP-DR-01-F	Silver, dissolved	ND	µg/L	U	0.18
SP-DR-01-F	Sodium, dissolved	4,500	µg/L		58
SP-DR-01-F	Thallium, dissolved	ND	µg/L	U	0.16
SP-DR-01-F	Vanadium, dissolved	0.85	µg/L	J	0.49
SP-DR-01-F	Zinc, dissolved	9.7	µg/L	J	1.8

Table 6. 2014 Groundwater Monitoring Results for Radionuclides

Radiologic Table Definitions:
J - Estimated value below minimum Level of Detectability (LOD)
U - Undetectable below Achieved Detection Limit
pCi/L - picoCuries per liter

Radiologic Data

Sample Location	Isotope	Result	Units	Qualifier	Uncertainty
10L31	Americium-241	0.05	pCi/L	U	0.101
10L31	Plutonium-238	0.057	pCi/L	U	0.081
10L31	Plutonium-241	-0.637	pCi/L	U	4.72
10L31	Pu-239/240	0.021	pCi/L	U	0.049
10L31	Thorium-228	0.026	pCi/L	U	0.107
10L31	Thorium-230	-0.024	pCi/L	U	0.055
10L31	Thorium-232	0	pCi/L	U	0.055
10L31	Total Uranium	0.312	ug/L	J	0.006
10L31	Uranium-234	1.23	pCi/L		0.374
10L31	Uranium-235	0.092	pCi/L	J	0.104
10L31	Uranium-238	0.091	pCi/L	J	0.095
10L31-F	Americium-241	0.053	pCi/L	J	0.078
10L31-F	Plutonium-238	0.08	pCi/L	U	0.094
10L31-F	Plutonium-241	-0.29	pCi/L	U	4.32
10L31-F	Pu-239/240	0.027	pCi/L	U	0.046
10L31-F	Thorium-228	0.005	pCi/L	U	0.071
10L31-F	Thorium-230	0.009	pCi/L	U	0.061
10L31-F	Thorium-232	0	pCi/L	U	0.061
10L31-F	Total Uranium	0.31	ug/L	J	0.006
10L31-F	Uranium-234	0.907	pCi/L		0.309
10L31-F	Uranium-235	0	pCi/L	U	0.099
10L31-F	Uranium-238	0.096	pCi/L	J	0.095
MW-01	Americium-241	0.089	pCi/L	J	0.115
MW-01	Plutonium-238	0.05	pCi/L	U	0.061
MW-01	Plutonium-241	1.66	pCi/L	U	4.95
MW-01	Pu-239/240	0.025	pCi/L	U	0.049
MW-01	Thorium-228	-0.151	pCi/L	U	0.196
MW-01	Thorium-230	-0.006	pCi/L	U	0.145
MW-01	Thorium-232	-0.027	pCi/L	U	0.145
MW-01	Total Uranium	0.065	ug/L	J	0.002
MW-01	Uranium-234	0.045	pCi/L	U	0.152
MW-01	Uranium-235	0	pCi/L	U	0.195
MW-01	Uranium-238	-0.028	pCi/L	U	0.150
MW-01-F	Americium-241	-0.053	pCi/L	U	0.073
MW-01-F	Plutonium-238	0.051	pCi/L	U	0.075
MW-01-F	Plutonium-241	1.8	pCi/L	U	5.34
MW-01-F	Pu-239/240	-0.032	pCi/L	U	0.050
MW-01-F	Thorium-228	0.014	pCi/L	U	0.144
MW-01-F	Thorium-230	-0.006	pCi/L	U	0.136
MW-01-F	Thorium-232	-0.026	pCi/L	U	0.136
MW-01-F	Total Uranium	0.067	ug/L	J	0.002
MW-01-F	Uranium-234	0.131	pCi/L	J	0.149
MW-01-F	Uranium-235	-0.023	pCi/L	U	0.174
MW-01-F	Uranium-238	0.001	pCi/L	U	0.134
MW-03	Americium-241	0.163	pCi/L	J	0.163
MW-03	Plutonium-238	0.146	pCi/L	U	0.193
MW-03	Plutonium-241	10.8	pCi/L	J	11.3
MW-03	Pu-239/240	0	pCi/L	U	0.100
MW-03	Thorium-228	1.18	pCi/L		0.576
MW-03	Thorium-230	0.054	pCi/L	U	0.185
MW-03	Thorium-232	0.181	pCi/L	J	0.207
MW-03	Total Uranium	1.98	ug/L		0.050
MW-03	Uranium-234	1.15	pCi/L		0.357
MW-03	Uranium-235	0.036	pCi/L	U	0.105
MW-03	Uranium-238	0.773	pCi/L		0.286
MW-05	Americium-241	0.069	pCi/L	J	0.100
MW-05	Plutonium-238	0.152	pCi/L	J	0.100
MW-05	Plutonium-241	-0.781	pCi/L	U	4.34
MW-05	Pu-239/240	0.062	pCi/L	J	0.068
MW-05	Thorium-228	-0.058	pCi/L	U	0.125
MW-05	Thorium-230	0.033	pCi/L	U	0.083
MW-05	Thorium-232	-0.041	pCi/L	U	0.083
MW-05	Total Uranium	0.127	ug/L	U	0.005
MW-05	Uranium-234	0.06	pCi/L	J	0.095
MW-05	Uranium-235	-0.017	pCi/L	U	0.124
MW-05	Uranium-238	0.047	pCi/L	U	0.095
MW-05-F	Americium-241	0.008	pCi/L	U	0.062
MW-05-F	Plutonium-238	0	pCi/L	U	0.090
MW-05-F	Plutonium-241	3.04	pCi/L	U	6.29
MW-05-F	Pu-239/240	0.04	pCi/L	U	0.061
MW-05-F	Thorium-228	0.012	pCi/L	U	0.091
MW-05-F	Thorium-230	-0.016	pCi/L	U	0.067
MW-05-F	Thorium-232	0.019	pCi/L	U	0.067
MW-05-F	Total Uranium	0.105	ug/L	U	0.003
MW-05-F	Uranium-234	-0.005	pCi/L	U	0.110
MW-05-F	Uranium-235	0.03	pCi/L	U	0.143
MW-05-F	Uranium-238	0.054	pCi/L	J	0.110
MW-07	Americium-241	0.005	pCi/L	U	0.049
MW-07	Plutonium-238	0.014	pCi/L	U	0.087
MW-07	Plutonium-241	3.62	pCi/L	U	4.58
MW-07	Pu-239/240	0.034	pCi/L	U	0.049
MW-07	Thorium-228	-0.021	pCi/L	U	0.110
MW-07	Thorium-230	-0.022	pCi/L	U	0.108
MW-07	Thorium-232	0	pCi/L	U	0.108
MW-07	Total Uranium	0.224	ug/L	J	0.005
MW-07	Uranium-234	0.244	pCi/L	J	0.247
MW-07	Uranium-235	0.054	pCi/L	U	0.187
MW-07	Uranium-238	-0.037	pCi/L	U	0.144
MW-07-F	Americium-241	0.026	pCi/L	J	0.041
MW-07-F	Plutonium-238	0.119	pCi/L	U	0.113
MW-07-F	Plutonium-241	7.88	pCi/L	J	6.55
MW-07-F	Pu-239/240	0.009	pCi/L	U	0.057
MW-07-F	Thorium-228	-0.012	pCi/L	U	0.131
MW-07-F	Thorium-230	-0.04	pCi/L	U	0.105
MW-07-F	Thorium-232	0	pCi/L	U	0.105
MW-07-F	Total Uranium	0.205	ug/L	J	0.005
MW-07-F	Uranium-234	0.208	pCi/L	J	0.202
MW-07-F	Uranium-235	-0.012	pCi/L	U	0.176
MW-07-F	Uranium-238	-0.007	pCi/L	U	0.134
MW-08	Americium-241	-0.007	pCi/L	U	0.089
MW-08	Plutonium-238	0.058	pCi/L	U	0.081
MW-08	Plutonium-241	2.71	pCi/L	U	4.70
MW-08	Pu-239/240	0.048	pCi/L	U	0.087

Sample Location	Isotope	Result	Units	Qualifier	Uncertainty
MW-33	Americium-241	0.064	pCi/L	U	0.112
MW-33	Plutonium-238	0.119	pCi/L	U	0.089
MW-33	Plutonium-241	1.69	pCi/L	U	5.88
MW-33	Pu-239/240	0.03	pCi/L	U	0.064
MW-33	Thorium-228	0.022	pCi/L	U	0.098
MW-33	Thorium-230	0.077	pCi/L	J	0.098
MW-33	Thorium-232	-0.009	pCi/L	U	0.074
MW-33	Total Uranium	0.213	ug/L	J	0.005
MW-33	Uranium-234	0.242	pCi/L		0.170
MW-33	Uranium-235	-0.008	pCi/L	U	0.113
MW-33	Uranium-238	0.108	pCi/L	J	0.108
MW-33-F	Americium-241	0.021	pCi/L	U	0.063
MW-33-F	Plutonium-238	0.094	pCi/L	U	0.077
MW-33-F	Plutonium-241	3.09	pCi/L	U	4.88
MW-33-F	Pu-239/240	0.028	pCi/L	U	0.059
MW-33-F	Thorium-228	-0.011	pCi/L	U	0.106
MW-33-F	Thorium-230	-0.031	pCi/L	U	0.064
MW-33-F	Thorium-232	-0.008	pCi/L	U	0.064
MW-33-F	Total Uranium	0.2	ug/L	J	0.005
MW-33-F	Uranium-234	0.133	pCi/L	J	0.146
MW-33-F	Uranium-235	-0.015	pCi/L	U	0.111
MW-33-F	Uranium-238	0.06	pCi/L	J	0.085
MW-39	Americium-241	0.02	pCi/L	U	0.060
MW-39	Plutonium-238	0.069	pCi/L	U	0.087
MW-39	Plutonium-241	2.28	pCi/L	U	4.27
MW-39	Pu-239/240	0.026	pCi/L	U	0.078
MW-39	Thorium-228	0.039	pCi/L	U	0.202
MW-39	Thorium-230	-0.079	pCi/L	U	0.149
MW-39	Thorium-232	-0.049	pCi/L	U	0.148
MW-39	Total Uranium	0.143	ug/L	J	0.003
MW-39	Uranium-234	0.081	pCi/L	J	0.121
MW-39	Uranium-235	-0.01	pCi/L	U	0.105
MW-39	Uranium-238	0.057	pCi/L	J	0.081
MW-39-DUP	Americium-241	0.01	pCi/L	U	0.056
MW-39-DUP	Plutonium-238	0.034	pCi/L	U	0.086
MW-39-DUP	Plutonium-241	4.7	pCi/L	U	6.03
MW-39-DUP	Pu-239/240	0.023	pCi/L	U	0.083
MW-39-DUP	Thorium-228	-0.106	pCi/L	U	0.129
MW-39-DUP	Thorium-230	-0.053	pCi/L	U	0.077
MW-39-DUP	Thorium-232	-0.035	pCi/L	U	0.074
MW-39-DUP	Total Uranium	0.221	ug/L	J	0.004
MW-39-DUP	Uranium-234	0.03	pCi/L	U	0.101
MW-39-DUP	Uranium-235	0.032	pCi/L	U	0.091
MW-39-DUP	Uranium-238	0.014	pCi/L	U	0.102
MW-39-DUP-F	Americium-241	0.077	pCi/L	J	0.104
MW-39-DUP-F	Plutonium-238	0.048	pCi/L	U	0.090
MW-39-DUP-F	Plutonium-241	-2.03	pCi/L	U	4.70
MW-39-DUP-F	Pu-239/240	0.019	pCi/L	U	0.084
MW-39-DUP-F	Thorium-228	-0.056	pCi/L	U	0.084
MW-39-DUP-F	Thorium-230	0.009	pCi/L	U	0.067
MW-39-DUP-F	Thorium-232	-0.057	pCi/L	U	0.067
MW-39-DUP-F	Total Uranium	0.23	ug/L	J	0.004
MW-39-DUP-F	Uranium-234	0.049	pCi/L	U	0.120
MW-39-DUP-F	Uranium-235	0	pCi/L	U	0.100
MW-39-DUP-F	Uranium-238	0.032	pCi/L	J	0.077
MW-39-F	Americium-241	0.002	pCi/L	U	0.070
MW-39-F	Plutonium-238	0.037	pCi/L	U	0.080
MW-39-F	Plutonium-241	-1.79	pCi/L	U	4.37
MW-39-F	Pu-239/240	0.009	pCi/L	U	0.054
MW-39-F	Thorium-228	0.003	pCi/L	U	0.141
MW-39-F	Thorium-230	0.088	pCi/L	J	0.139
MW-39-F	Thorium-232	0.049	pCi/L	U	0.138
MW-39-F	Total Uranium	0.181	ug/L	J	0.004
MW-39-F	Uranium-234	0.071	pCi/L	U	0.134
MW-39-F	Uranium-235	-0.014	pCi/L	U	0.115
MW-39-F	Uranium-238	0.073	pCi/L	U	0.123
MW-40	Americium-241	-0.005	pCi/L	U	0.047
MW-40	Plutonium-238	0.023	pCi/L	U	0.099
MW-40	Plutonium-241	6.82	pCi/L	J	5.76
MW-40	Pu-239/240	0	pCi/L	U	0.039
MW-40	Thorium-228	0.094	pCi/L	J	0.130
MW-40	Thorium-230	0.021	pCi/L	U	0.100
MW-40	Thorium-232	0	pCi/L	U	0.100
MW-40	Total Uranium	0.042	ug/L	U	0.001
MW-40	Uranium-234	-0.033	pCi/L	U	0.115
MW-40	Uranium-235	-0.01	pCi/L	U	0.150
MW-40	Uranium-238	-0.006	pCi/L	U	0.115
MW-40-DUP	Americium-241	0.039	pCi/L	U	0.075
MW-40-DUP	Plutonium-238	0.058	pCi/L	U	0.080
MW-40-DUP	Plutonium-241	-2	pCi/L	U	4.64
MW-40-DUP	Pu-239/240	-0.029	pCi/L	U	0.073
MW-40-DUP	Thorium-228	-0.107	pCi/L	U	0.135
MW-40-DUP	Thorium-230	-0.022	pCi/L	U	0.073
MW-40-DUP	Thorium-232	-0.039	pCi/L	U	0.065
MW-40-DUP	Total Uranium	0.046	ug/L	U	0.001
MW-40-DUP	Uranium-234	-0.03	pCi/L	U	0.092
MW-40-DUP	Uranium-235	-0.008	pCi/L	U	0.120
MW-40-DUP	Uranium-238	0.052	pCi/L	J	0.092
MW-40-DUP-F	Americium-241	0.085	pCi/L	J	0.091
MW-40-DUP-F	Plutonium-238	0.069	pCi/L	U	0.068
MW-40-DUP-F	Plutonium-241	1.84	pCi/L	U	4.41
MW-40-DUP-F	Pu-239/240	0.06	pCi/L	J	0.051
MW-40-DUP-F	Thorium-228	-0.024	pCi/L	U	0.094
MW-40-DUP-F	Thorium-230	-0.061	pCi/L	U	0.073
MW-40-DUP-F	Thorium-232	0.012	pCi/L	U	0.086
MW-40-DUP-F	Total Uranium	0.034	ug/L	U	0.001
MW-40-DUP-F	Uranium-234	0.096	pCi/L	J	0.102
MW-40-DUP-F	Uranium-235	0.019	pCi/L	U	0.119
MW-40-DUP-F	Uranium-238	0.031	pCi/L	U	0.092
MW-40-F	Americium-241	0.043	pCi/L	U	0.085
MW-40-F	Plutonium-238	0.13	pCi/L	U	0.094
MW-40-F	Plutonium-241	7.37	pCi/L	J	5.41
MW-40-F	Pu-239/240	0.044	pCi/L	U	0.041

Radiologic Data

Sample Location	Isotope	Result	Units	Qualifier	Uncertainty
MW-08	Thorium-228	-0.177	pCi/L	U	0.137
MW-08	Thorium-230	-0.088	pCi/L	U	0.132
MW-08	Thorium-232	-0.07	pCi/L	U	0.132
MW-08	Total Uranium	0.058	ug/L	J	0.001
MW-08	Uranium-234	0.009	pCi/L	U	0.114
MW-08	Uranium-235	0.083	pCi/L	J	0.150
MW-08	Uranium-238	-0.038	pCi/L	U	0.114
MW-08-F	Americium-241	0.003	pCi/L	U	0.059
MW-08-F	Plutonium-238	0.068	pCi/L	U	0.075
MW-08-F	Plutonium-241	3.81	pCi/L	U	5.08
MW-08-F	Pu-239/240	0.059	pCi/L	U	0.055
MW-08-F	Thorium-228	-0.08	pCi/L	U	0.135
MW-08-F	Thorium-230	0.028	pCi/L	U	0.132
MW-08-F	Thorium-232	-0.062	pCi/L	U	0.133
MW-08-F	Total Uranium	0.06	ug/L	J	0.001
MW-08-F	Uranium-234	-0.163	pCi/L	U	0.138
MW-08-F	Uranium-235	-0.022	pCi/L	U	0.177
MW-08-F	Uranium-238	-0.135	pCi/L	U	0.137
MW-09A	Americium-241	0.017	pCi/L	U	0.057
MW-09A	Plutonium-238	0.01	pCi/L	U	0.070
MW-09A	Plutonium-241	0.413	pCi/L	U	4.61
MW-09A	Pu-239/240	0.079	pCi/L		0.063
MW-09A	Thorium-228	-0.159	pCi/L	U	0.152
MW-09A	Thorium-230	-0.177	pCi/L	U	0.150
MW-09A	Thorium-232	-0.118	pCi/L	U	0.148
MW-09A	Total Uranium	0.111	ug/L	J	0.002
MW-09A	Uranium-234	-0.011	pCi/L	U	0.082
MW-09A	Uranium-235	0.036	pCi/L	U	0.107
MW-09A	Uranium-238	0.018	pCi/L	U	0.083
MW-09A-F	Americium-241	0.016	pCi/L	U	0.061
MW-09A-F	Plutonium-238	0.08	pCi/L	J	0.085
MW-09A-F	Plutonium-241	-0.108	pCi/L	U	4.80
MW-09A-F	Pu-239/240	0.03	pCi/L	U	0.066
MW-09A-F	Thorium-228	-0.004	pCi/L	U	0.140
MW-09A-F	Thorium-230	-0.009	pCi/L	U	0.130
MW-09A-F	Thorium-232	0.012	pCi/L	U	0.130
MW-09A-F	Total Uranium	0.116	ug/L	J	0.003
MW-09A-F	Uranium-234	0.034	pCi/L	U	0.141
MW-09A-F	Uranium-235	-0.024	pCi/L	U	0.128
MW-09A-F	Uranium-238	0.001	pCi/L	U	0.119
MW-13	Americium-241	0.013	pCi/L	U	0.075
MW-13	Plutonium-238	0.08	pCi/L	U	0.109
MW-13	Plutonium-241	-2.35	pCi/L	U	4.48
MW-13	Pu-239/240	-0.017	pCi/L	U	0.053
MW-13	Thorium-228	-0.019	pCi/L	U	0.089
MW-13	Thorium-230	-0.028	pCi/L	U	0.057
MW-13	Thorium-232	0	pCi/L	U	0.057
MW-13	Total Uranium	0.123	ug/L	U	0.003
MW-13	Uranium-234	0.106	pCi/L	J	0.110
MW-13	Uranium-235	0.022	pCi/L	U	0.104
MW-13	Uranium-238	0.034	pCi/L	J	0.080
MW-13-F	Americium-241	-0.012	pCi/L	U	0.058
MW-13-F	Plutonium-238	0.153	pCi/L	J	0.103
MW-13-F	Plutonium-241	2.33	pCi/L	U	4.62
MW-13-F	Pu-239/240	0.03	pCi/L	U	0.038
MW-13-F	Thorium-228	0.017	pCi/L	U	0.103
MW-13-F	Thorium-230	0.008	pCi/L	U	0.058
MW-13-F	Thorium-232	-0.014	pCi/L	U	0.058
MW-13-F	Total Uranium	0.111	ug/L	U	0.004
MW-13-F	Uranium-234	0.024	pCi/L	U	0.081
MW-13-F	Uranium-235	0.022	pCi/L	U	0.105
MW-13-F	Uranium-238	0.017	pCi/L	U	0.080
MW-14	Americium-241	0.034	pCi/L	J	0.064
MW-14	Plutonium-238	-0.011	pCi/L	U	0.106
MW-14	Plutonium-241	0.602	pCi/L	U	5.40
MW-14	Pu-239/240	0.043	pCi/L	U	0.080
MW-14	Thorium-228	0.128	pCi/L	J	0.165
MW-14	Thorium-230	-0.017	pCi/L	U	0.072
MW-14	Thorium-232	-0.017	pCi/L	U	0.072
MW-14	Total Uranium	0.032	ug/L	U	0.001
MW-14	Uranium-234	-0.077	pCi/L	U	0.085
MW-14	Uranium-235	-0.022	pCi/L	U	0.110
MW-14	Uranium-238	0.034	pCi/L	U	0.084
MW-14-F	Americium-241	-0.031	pCi/L	U	0.098
MW-14-F	Plutonium-238	0.103	pCi/L	U	0.086
MW-14-F	Plutonium-241	2.05	pCi/L	U	4.90
MW-14-F	Pu-239/240	0.056	pCi/L	J	0.059
MW-14-F	Thorium-228	-0.098	pCi/L	U	0.099
MW-14-F	Thorium-230	-0.072	pCi/L	U	0.074
MW-14-F	Thorium-232	-0.045	pCi/L	U	0.074
MW-14-F	Total Uranium	0.031	ug/L	U	0.001
MW-14-F	Uranium-234	-0.006	pCi/L	U	0.092
MW-14-F	Uranium-235	0.001	pCi/L	U	0.120
MW-14-F	Uranium-238	0.077	pCi/L		0.093
MW-15	Americium-241	0.182	pCi/L	J	0.131
MW-15	Plutonium-238	0.137	pCi/L	U	0.321
MW-15	Plutonium-241	-2.97	pCi/L	U	18.9
MW-15	Pu-239/240	-0.107	pCi/L	U	0.150
MW-15	Thorium-228	0.17	pCi/L		0.119
MW-15	Thorium-230	0.036	pCi/L	J	0.056
MW-15	Thorium-232	0	pCi/L	U	0.056
MW-15	Total Uranium	0.064	ug/L	U	0.002
MW-15	Uranium-234	0.463	pCi/L		0.221
MW-15	Uranium-235	0.142	pCi/L	J	0.134
MW-15	Uranium-238	0.179	pCi/L	J	0.140
MW-15-F	Americium-241	-0.055	pCi/L	U	0.074
MW-15-F	Plutonium-238	-0.024	pCi/L	U	0.097
MW-15-F	Plutonium-241	1.82	pCi/L	U	5.87
MW-15-F	Pu-239/240	0	pCi/L	U	0.041
MW-15-F	Thorium-228	-0.045	pCi/L	U	0.069
MW-15-F	Thorium-230	-0.011	pCi/L	U	0.053
MW-15-F	Thorium-232	0	pCi/L	U	0.048
MW-15-F	Total Uranium	0.051	ug/L	U	0.001
MW-15-F	Uranium-234	0.007	pCi/L	U	0.076
MW-15-F	Uranium-235	-0.007	pCi/L	U	0.099
MW-15-F	Uranium-238	0.021	pCi/L	J	0.076
MW-20	Americium-241	-0.017	pCi/L	U	0.085
MW-20	Plutonium-238	0.029	pCi/L	U	0.079
MW-20	Plutonium-241	-1.93	pCi/L	U	5.66
MW-20	Pu-239/240	0.011	pCi/L	J	0.040
MW-20	Thorium-228	4.23	pCi/L		1.02
MW-20	Thorium-230	1.32	pCi/L		0.467
MW-20	Thorium-232	0.66	pCi/L		0.312

Sample Location	Isotope	Result	Units	Qualifier	Uncertainty
MW-40-F	Thorium-228	-0.085	pCi/L	U	0.107
MW-40-F	Thorium-230	-0.027	pCi/L	U	0.105
MW-40-F	Thorium-232	0	pCi/L	U	0.105
MW-40-F	Total Uranium	0.038	ug/L	U	0.001
MW-40-F	Uranium-234	-0.002	pCi/L	U	0.130
MW-40-F	Uranium-235	0.002	pCi/L	U	0.140
MW-40-F	Uranium-238	-0.049	pCi/L	U	0.107
MW-51	Americium-241	0.03	pCi/L	U	0.083
MW-51	Plutonium-238	0.104	pCi/L	U	0.149
MW-51	Plutonium-241	9.72	pCi/L	J	10.1
MW-51	Pu-239/240	0.016	pCi/L	U	0.084
MW-51	Thorium-228	-0.055	pCi/L	U	0.106
MW-51	Thorium-230	-0.047	pCi/L	U	0.104
MW-51	Thorium-232	0.022	pCi/L	U	0.103
MW-51	Total Uranium	0.247	ug/L	J	0.005
MW-51	Uranium-234	-0.114	pCi/L	U	0.132
MW-51	Uranium-235	-0.023	pCi/L	U	0.171
MW-51	Uranium-238	0.013	pCi/L	U	0.136
MW-51-F	Americium-241	0.032	pCi/L	U	0.095
MW-51-F	Plutonium-238	0.153	pCi/L	U	0.088
MW-51-F	Plutonium-241	3.89	pCi/L	U	5.19
MW-51-F	Pu-239/240	0.029	pCi/L	U	0.041
MW-51-F	Thorium-228	-0.051	pCi/L	U	0.114
MW-51-F	Thorium-230	-0.075	pCi/L	U	0.112
MW-51-F	Thorium-232	0	pCi/L	U	0.112
MW-51-F	Total Uranium	0.234	ug/L	J	0.005
MW-51-F	Uranium-234	0.087	pCi/L	U	0.154
MW-51-F	Uranium-235	0.074	pCi/L	J	0.176
MW-51-F	Uranium-238	0.096	pCi/L	J	0.153
MW-52	Americium-241	0.088	pCi/L	J	0.125
MW-52	Plutonium-238	0.028	pCi/L	U	0.070
MW-52	Plutonium-241	2.3	pCi/L	U	4.99
MW-52	Pu-239/240	0.033	pCi/L	U	0.051
MW-52	Thorium-228	0.033	pCi/L	U	0.102
MW-52	Thorium-230	-0.011	pCi/L	U	0.067
MW-52	Thorium-232	0.027	pCi/L	J	0.054
MW-52	Total Uranium	0.216	ug/L	J	0.004
MW-52	Uranium-234	0.154	pCi/L	J	0.137
MW-52	Uranium-235	0.084	pCi/L	J	0.121
MW-52	Uranium-238	0.033	pCi/L	U	0.092
MW-52-F	Americium-241	0.189	pCi/L	J	0.133
MW-52-F	Plutonium-238	0.085	pCi/L	U	0.103
MW-52-F	Plutonium-241	4.09	pCi/L	U	5.40
MW-52-F	Pu-239/240	-0.003	pCi/L	U	0.068
MW-52-F	Thorium-228	-0.066	pCi/L	U	0.055
MW-52-F	Thorium-230	-0.072	pCi/L	U	0.055
MW-52-F	Thorium-232	0.007	pCi/L	U	0.054
MW-52-F	Total Uranium	0.191	ug/L	J	0.004
MW-52-F	Uranium-234	0.151	pCi/L	J	0.132
MW-52-F	Uranium-235	0.05	pCi/L	J	0.108
MW-52-F	Uranium-238	0.116	pCi/L	J	0.114
MW-53	Americium-241	-0.031	pCi/L	U	0.061
MW-53	Plutonium-238	0.152	pCi/L		0.092
MW-53	Plutonium-241	-0.76	pCi/L	U	5.60
MW-53	Pu-239/240	-0.012	pCi/L	U	0.069
MW-53	Thorium-228	0.178	pCi/L	J	0.206
MW-53	Thorium-230	-0.039	pCi/L	U	0.105
MW-53	Thorium-232	0.052	pCi/L	J	0.106
MW-53	Total Uranium	7.24	ug/L		0.108
MW-53	Uranium-234	3.1	pCi/L		0.730
MW-53	Uranium-235	0.064	pCi/L	U	0.120
MW-53	Uranium-238	1.92	pCi/L		0.524
MW-53-F	Americium-241	0.041	pCi/L	U	0.081
MW-53-F	Plutonium-238	0.084	pCi/L	J	0.067
MW-53-F	Plutonium-241	0	pCi/L	U	4.19
MW-53-F	Pu-239/240	0.017	pCi/L	U	0.062
MW-53-F	Thorium-228	0.047	pCi/L	U	0.122
MW-53-F	Thorium-230	-0.024	pCi/L	U	0.103
MW-53-F	Thorium-232	0	pCi/L	U	0.103
MW-53-F	Total Uranium	6.63	ug/L		0.098
MW-53-F	Uranium-234	2.81	pCi/L		0.699
MW-53-F	Uranium-235	0.126	pCi/L	J	0.139
MW-53-F	Uranium-238	2	pCi/L		0.559
MW-59	Americium-241	-0.012	pCi/L	U	0.070
MW-59	Plutonium-238	0.091	pCi/L	U	0.082
MW-59	Plutonium-241	6.26	pCi/L	J	5.21
MW-59	Pu-239/240	0.038	pCi/L	U	0.035
MW-59	Thorium-228	-0.003	pCi/L	U	0.110
MW-59	Thorium-230	-0.046	pCi/L	U	0.103
MW-59	Thorium-232	0	pCi/L	U	0.103
MW-59	Total Uranium	0.176	ug/L	J	0.005
MW-59	Uranium-234	-0.064	pCi/L	U	0.107
MW-59	Uranium-235	0.03	pCi/L	U	0.140
MW-59	Uranium-238	-0.029	pCi/L	U	0.107
MW-59-F	Americium-241	0.03	pCi/L	U	0.062
MW-59-F	Plutonium-238	0.018	pCi/L	U	0.078
MW-59-F	Plutonium-241	4.57	pCi/L	J	4.98
MW-59-F	Pu-239/240	0.007	pCi/L	U	0.042
MW-59-F	Thorium-228	-0.034	pCi/L	U	0.099
MW-59-F	Thorium-230	-0.023	pCi/L	U	0.097
MW-59-F	Thorium-232	-0.006	pCi/L	U	0.097
MW-59-F	Total Uranium	0.057	ug/L	J	0.002
MW-59-F	Uranium-234	-0.073	pCi/L	U	0.095
MW-59-F	Uranium-235	0	pCi/L	U	0.123
MW-59-F	Uranium-238	0.145	pCi/L	J	0.129
PZ-09	Americium-241	0.178	pCi/L	J	0.124
PZ-09	Plutonium-238	0.144	pCi/L	U	0.161
PZ-09	Plutonium-241	5.46	pCi/L	U	7.97
PZ-09	Pu-239/240	0.082	pCi/L	U	0.077
PZ-09	Thorium-228	0.014	pCi/L	U	0.114
PZ-09	Thorium-230	0.026	pCi/L	U	0.091
PZ-09	Thorium-232	0.025	pCi/L	J	0.091
PZ-09	Total Uranium	0.167	ug/L	J	0.004
PZ-09	Uranium-234	0.092	pCi/L	J	0.149
PZ-09	Uranium-235	-0.01	pCi/L	U	0.152
PZ-09	Uranium-238	0.025	pCi/L	U	0.116
PZ-09-DUP	Americium-241	0.028	pCi/L	U	0.060
PZ-09-DUP	Plutonium-238	0.099	pCi/L	U	0.137
PZ-09-DUP	Plutonium-241	1.18	pCi/L	U	7.45
PZ-09-DUP	Pu-239/240	0.011	pCi/L	U	0.077
PZ-09-DUP	Thorium-228	0.062	pCi/L	U	0.153
PZ-09-DUP	Thorium-230	0.008	pCi/L	U	0.106
PZ-09-DUP	Thorium-232	0.015	pCi/L	U	0.106

Radiologic Data

Sample Location	Isotope	Result	Units	Qualifier	Uncertainty
MW-20	Total Uranium	1.61	ug/L		0.116
MW-20	Uranium-234	1.8	pCi/L		0.484
MW-20	Uranium-235	0.07	pCi/L	J	0.115
MW-20	Uranium-238	1.06	pCi/L		0.352
MW-22	Americium-241	0.007	pCi/L	U	0.046
MW-22	Plutonium-238	0.034	pCi/L	U	0.071
MW-22	Plutonium-241	1.98	pCi/L	U	4.27
MW-22	Pu-239/240	0.051	pCi/L	J	0.067
MW-22	Thorium-228	0.226	pCi/L	J	0.196
MW-22	Thorium-230	0.067	pCi/L	J	0.116
MW-22	Thorium-232	0.084	pCi/L		0.102
MW-22	Total Uranium	0.292	ug/L		0.006
MW-22	Uranium-234	0.233	pCi/L		0.146
MW-22	Uranium-235	0.035	pCi/L	U	0.102
MW-22	Uranium-238	0.094	pCi/L	J	0.104
MW-22-F	Americium-241	0.197	pCi/L		0.121
MW-22-F	Plutonium-238	0.025	pCi/L	U	0.063
MW-22-F	Plutonium-241	0.484	pCi/L	U	4.33
MW-22-F	Pu-239/240	0.025	pCi/L	U	0.049
MW-22-F	Thorium-228	-0.037	pCi/L	U	0.107
MW-22-F	Thorium-230	-0.025	pCi/L	U	0.105
MW-22-F	Thorium-232	-0.007	pCi/L	U	0.105
MW-22-F	Total Uranium	0.059	ug/L	J	0.002
MW-22-F	Uranium-234	-0.036	pCi/L	U	0.073
MW-22-F	Uranium-235	0.025	pCi/L	U	0.095
MW-22-F	Uranium-238	0.009	pCi/L	U	0.075
MW-33	Americium-241	0.064	pCi/L	U	0.112
MW-33	Plutonium-238	0.119	pCi/L	U	0.089
MW-33	Plutonium-241	1.69	pCi/L	U	5.88
MW-33	Pu-239/240	0.03	pCi/L	U	0.064
MW-33	Thorium-228	0.022	pCi/L	U	0.098
MW-33	Thorium-230	0.077	pCi/L	J	0.098
MW-33	Thorium-232	-0.009	pCi/L	U	0.074
MW-33	Total Uranium	0.213	ug/L	J	0.005
MW-33	Uranium-234	0.242	pCi/L		0.170
MW-33	Uranium-235	-0.008	pCi/L	U	0.113
MW-33	Uranium-238	0.108	pCi/L	J	0.108
MW-33-F	Americium-241	0.021	pCi/L	U	0.063
MW-33-F	Plutonium-238	0.094	pCi/L	U	0.077
MW-33-F	Plutonium-241	3.09	pCi/L	U	4.88
MW-33-F	Pu-239/240	0.028	pCi/L	U	0.059
MW-33-F	Thorium-228	-0.011	pCi/L	U	0.106
MW-33-F	Thorium-230	-0.031	pCi/L	U	0.064
MW-33-F	Thorium-232	-0.008	pCi/L	U	0.064
MW-33-F	Total Uranium	0.2	ug/L	J	0.005
MW-33-F	Uranium-234	0.133	pCi/L	J	0.146
MW-33-F	Uranium-235	-0.015	pCi/L	U	0.111
MW-33-F	Uranium-238	0.06	pCi/L	J	0.085

Sample Location	Isotope	Result	Units	Qualifier	Uncertainty
PZ-09-DUP	Total Uranium	0.124	ug/L	J	0.003
PZ-09-DUP	Uranium-234	0.117	pCi/L	J	0.156
PZ-09-DUP	Uranium-235	0.052	pCi/L	U	0.180
PZ-09-DUP	Uranium-238	0.049	pCi/L	U	0.138
PZ-09-DUP-F	Americium-241	0.004	pCi/L	U	0.083
PZ-09-DUP-F	Plutonium-238	0.056	pCi/L	U	0.083
PZ-09-DUP-F	Plutonium-241	4.4	pCi/L	J	4.91
PZ-09-DUP-F	Pu-239/240	0.021	pCi/L	U	0.046
PZ-09-DUP-F	Thorium-228	0.085	pCi/L	U	0.173
PZ-09-DUP-F	Thorium-230	-0.019	pCi/L	U	0.097
PZ-09-DUP-F	Thorium-232	-0.006	pCi/L	U	0.097
PZ-09-DUP-F	Total Uranium	0.022	ug/L	U	0.001
PZ-09-DUP-F	Uranium-234	-0.098	pCi/L	U	0.108
PZ-09-DUP-F	Uranium-235	-0.028	pCi/L	U	0.140
PZ-09-DUP-F	Uranium-238	-0.016	pCi/L	U	0.107
PZ-09-F	Americium-241	0.166	pCi/L		0.105
PZ-09-F	Plutonium-238	0.053	pCi/L	U	0.102
PZ-09-F	Plutonium-241	3.03	pCi/L	U	4.43
PZ-09-F	Pu-239/240	0.004	pCi/L	U	0.056
PZ-09-F	Thorium-228	0.034	pCi/L	U	0.143
PZ-09-F	Thorium-230	-0.005	pCi/L	U	0.098
PZ-09-F	Thorium-232	-0.007	pCi/L	U	0.098
PZ-09-F	Total Uranium	0.035	ug/L	U	0.001
PZ-09-F	Uranium-234	0.104	pCi/L	J	0.128
PZ-09-F	Uranium-235	-0.02	pCi/L	U	0.149
PZ-09-F	Uranium-238	0.057	pCi/L	U	0.114
SP-DR-01	Americium-241	0.003	pCi/L	U	0.065
SP-DR-01	Plutonium-238	0.073	pCi/L	U	0.067
SP-DR-01	Plutonium-241	14.7	pCi/L	J	9.29
SP-DR-01	Pu-239/240	0.1	pCi/L	J	0.076
SP-DR-01	Thorium-228	0.163	pCi/L	U	0.286
SP-DR-01	Thorium-230	-0.049	pCi/L	U	0.182
SP-DR-01	Thorium-232	0.039	pCi/L	U	0.182
SP-DR-01	Total Uranium	5.3	ug/L		0.081
SP-DR-01	Uranium-234	7.25	pCi/L		1.63
SP-DR-01	Uranium-235	0.162	pCi/L		0.196
SP-DR-01	Uranium-238	2	pCi/L		0.668
SP-DR-01-F	Americium-241	0.09	pCi/L	J	0.105
SP-DR-01-F	Plutonium-238	0.073	pCi/L	U	0.046
SP-DR-01-F	Plutonium-241	8.03	pCi/L	J	5.04
SP-DR-01-F	Pu-239/240	0.049	pCi/L	U	0.038
SP-DR-01-F	Thorium-228	0.181	pCi/L	J	0.223
SP-DR-01-F	Thorium-230	0.002	pCi/L	U	0.157
SP-DR-01-F	Thorium-232	-0.01	pCi/L	U	0.157
SP-DR-01-F	Total Uranium	1.45	ug/L		0.025
SP-DR-01-F	Uranium-234	2.02	pCi/L		0.658
SP-DR-01-F	Uranium-235	-0.012	pCi/L	U	0.187
SP-DR-01-F	Uranium-238	0.611	pCi/L		0.342

Table 7. Groundwater Sampling Summary of Detections

Metal	Average	Minimum	Maximum	Number of Detections	USEPA or PADEP Primary or Secondary Drinking Water Standard (1)	SLDA-specific Upgradient Average
	ug/L	ug/L	ug/L	n	ug/L	ug/L
Aluminum	2055.6	1.6	55000	36	200.0	NC
Antimony	1.0	0.54	1.8	9	6.0	NC
Arsenic	6.6	1	15	8	10.0	NC
Barium	211.8	23	640	45	2000.0	NC
Beryllium	2.6	0.26	33	23	4.0	NC
Cadmium	3.7	3	4.4	2	5.0	NC
Calcium	43384.4	3700	200000	45	NA	NC
Chromium	9.4	0.34	250	41	100.0	NC
Cobalt	11.0	0.12	180	33	NA	NC
Copper	10.9	0.25	150	38	1000.0	NC
Iron	7718.6	87	99000	36	300.0	NC
Lead	1.4	0.26	12	17	15.0	NC
Magnesium	13584.0	650	69000	45	NA	NC
Manganese	371.1	0.61	3000	45	50.0	NC
Mercury	ND	ND	ND	0	2.0	NC
Nickel	38.4	0.79	680	45	100.0	NC
Potassium	5093.1	780	80000	45	NA	NC
Selenium	2.4	1.9	3.3	15	50.0	NC
Silver	0.3	0.21	0.55	5	100.0	NC
Sodium	28726.7	2700	210000	45	NA	NC
Thallium	0.3	0.18	0.6	3	2.0	NC
Vanadium	1.3	0.49	5.8	20	NA	NC
Zinc	77.9	1.8	2200	39	5000.0	NC
Total Uranium	0.90	0.06	7.20	32	30	0.9
Radionuclide	pCi/L	pCi/L	pCi/L	n	pCi/L	pCi/L
Americium-241	0.11	0.03	0.20	15	15	ND
Plutonium-238	0.12	0.08	0.15	5	15	ND
Plutonium-241	8.06	4.40	14.70	10	300 (2)	ND
Plutonium-239/240	0.04	-0.11	0.10	8	15	ND
Thorium-228	0.80	0.09	4.23	8	15	ND
Thorium-230	0.32	0.04	1.32	5	15	0.74
Thorium-232	0.17	0.03	0.66	6	15	0.39
Uranium-234	0.95	0.06	7.25	24	16.4 (3)	0.6
Uranium-235	0.10	0.05	0.16	9	0.2 (3)	ND
Uranium-238	0.44	0.02	2.00	22	10 (3)	0.3

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.

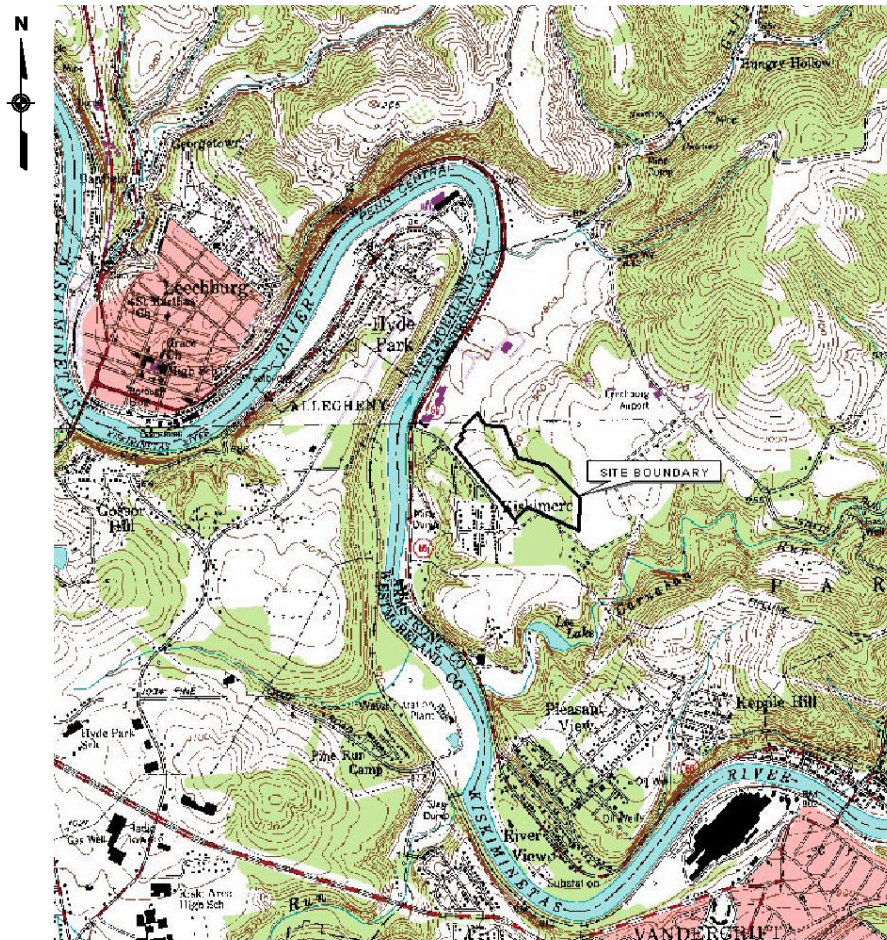
(3) - Based on 40 CFR 9, 141, 142, Federal Register, 7 Dec. 2000, Assumes a U234:U238 ratio of 1.6:1.

NA - No Standard Available

Average exceeds water quality standard.

NC - Not Calculated for non-FUSRAP constituents of concern

ND - Not Detected



2000 0 2000 Feet

SITE LOCATION MAP



STATE KEY MAP



SITE ADDRESS:
1105 MARY STREET
VANDERGRIFT, PA 15690

VICINITY MAP

**SHALLOW LAND DISPOSAL AREA
SITE LOCATION MAP**

Figure 1

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

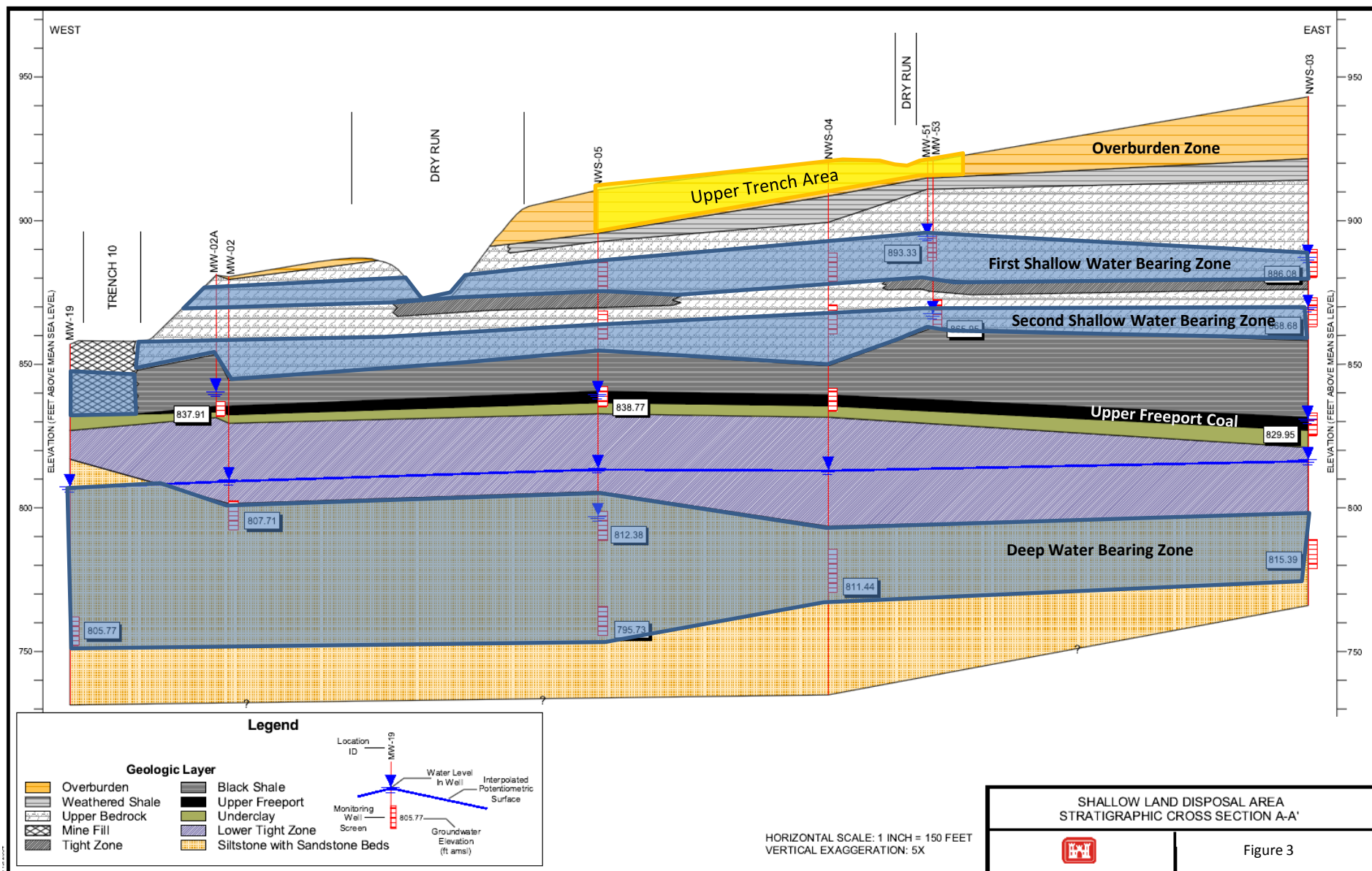
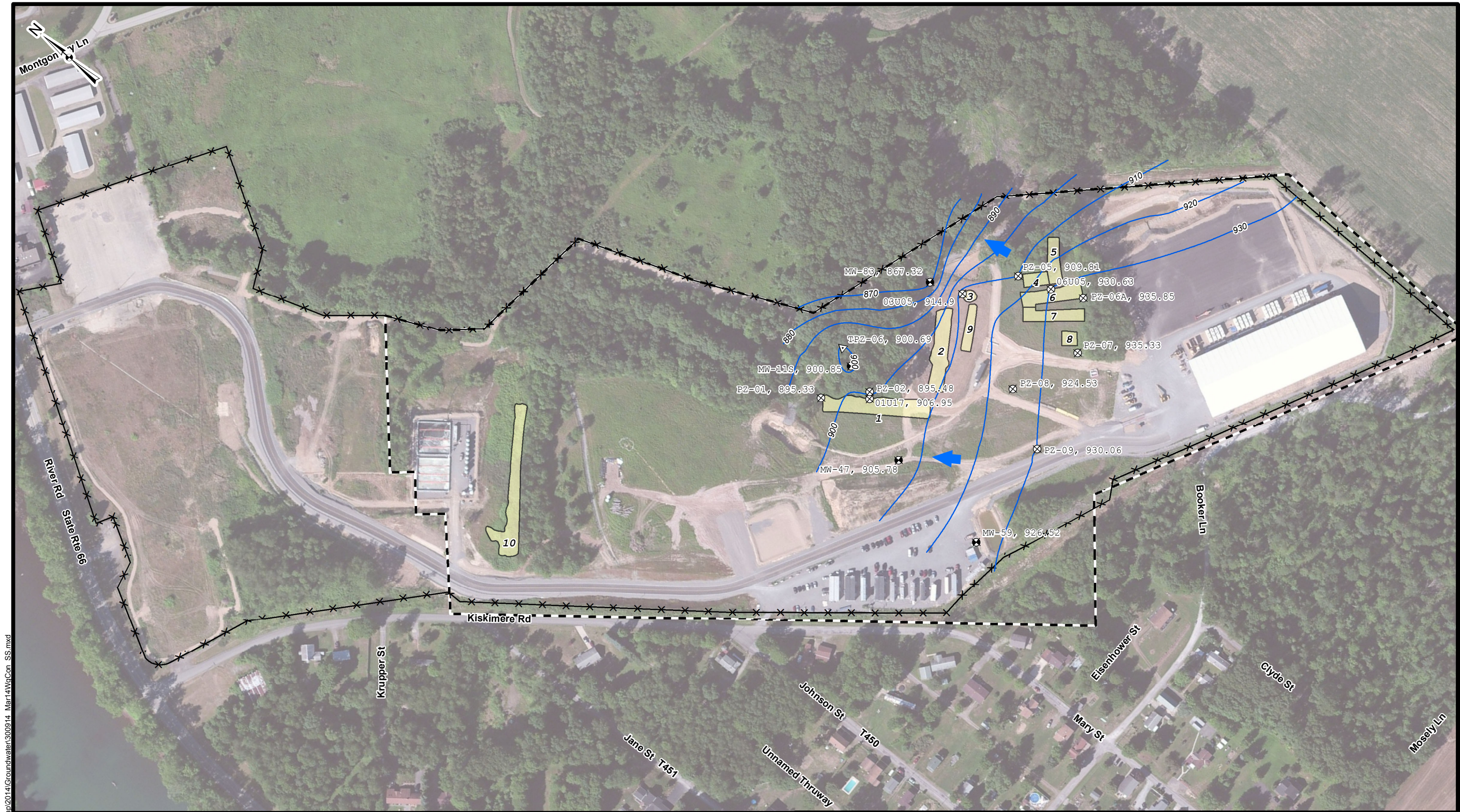


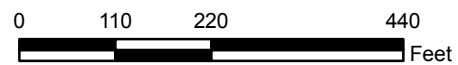
Figure 3. Northwest to Southeast Geologic Cross Section Through SLDA



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Legend

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



U.S. ARMY ENGINEER DISTRICT
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US Army Corps of Engineers
Buffalo District

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GROUNDWATER ELEVATION CONTOUR MAP
OVERBURDEN - MARCH 2014

SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 4



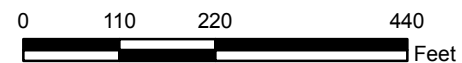
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Legend - Monitoring Well - Piezometer - Temporary Piezometer - Groundwater Elevation Contour (ft amsl) - Groundwater Flow Direction - Trench - Fenceline - Site Boundary		U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS US Army Corps of Engineers Buffalo District	GROUNDWATER ELEVATION CONTOUR MAP FIRST SHALLOW BEDROCK ZONE - MARCH 2014	
		Document Name: 300914_Mar14WgCon_1S.mxd Drawn By: h5tdewtf Date Saved: 13 Mar 2015 Time Saved: 3:44:43 PM	SHALLOW LAND DISPOSAL AREA PARKS TOWNSHIP, PENNSYLVANIA	FIGURE 5



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



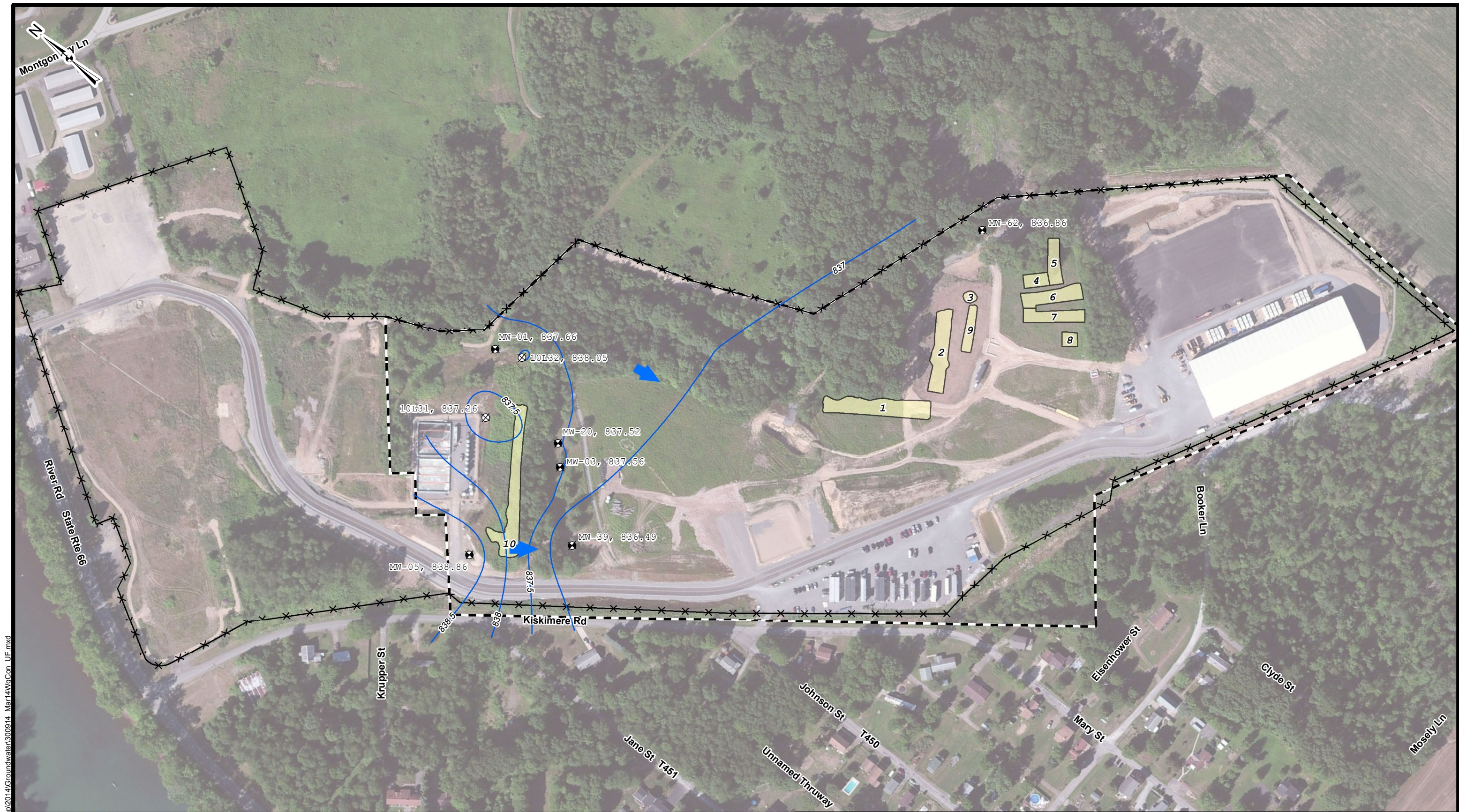
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
US Army Corps of Engineers
Buffalo District
BUFFALO, NY

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GROUNDWATER ELEVATION CONTOUR MAP
SECOND SHALLOW BEDROCK ZONE - MARCH 2014

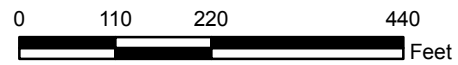
SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 6

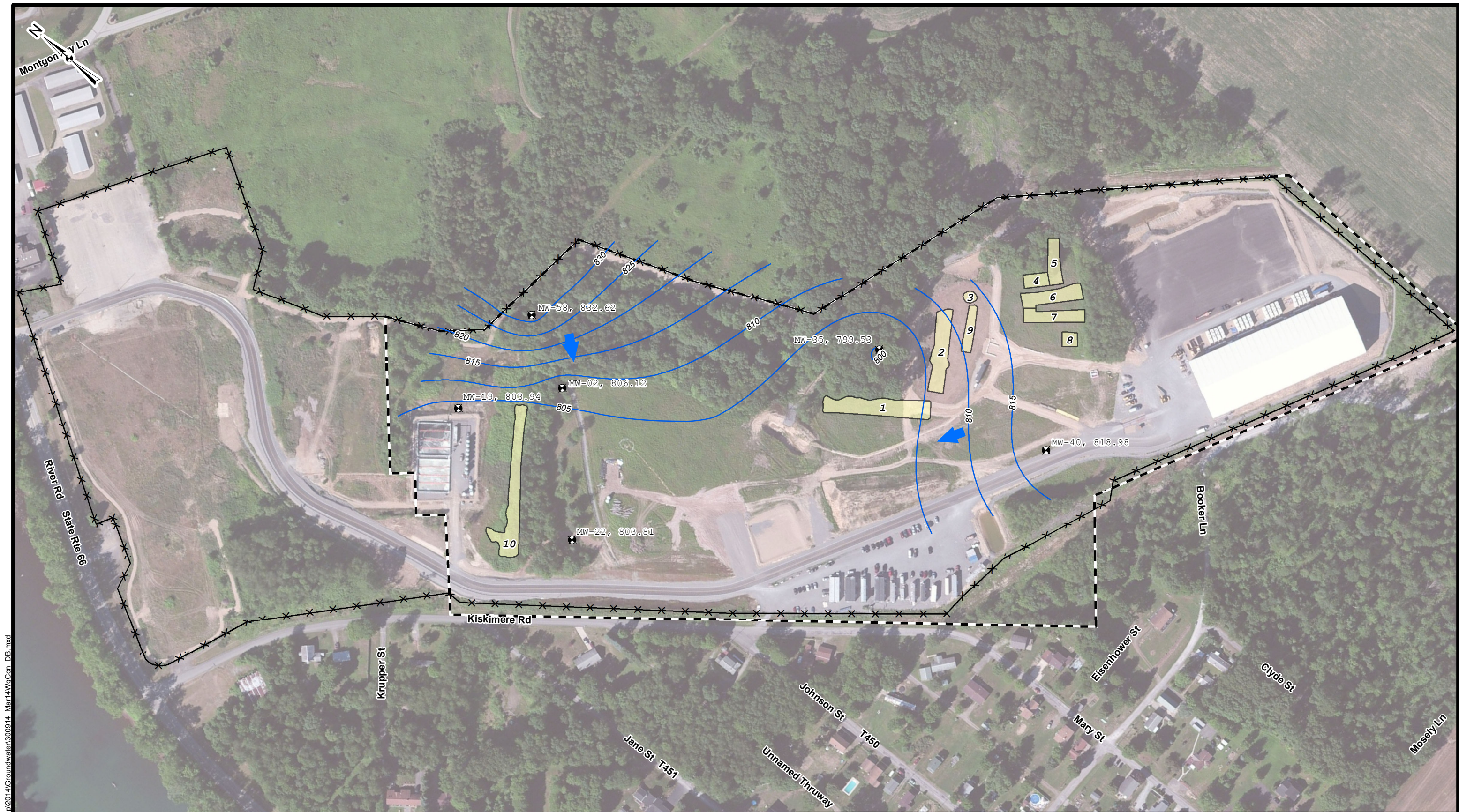


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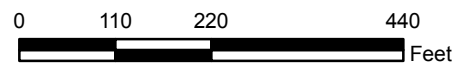
Legend Monitoring Well Piezometer Temporary Piezometer Groundwater Elevation Contour (ft amsl) Groundwater Flow Direction Trench Fenceline Site Boundary	
--	--



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



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BUFFALO, NY

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GROUNDWATER ELEVATION CONTOUR MAP
DEEP BEDROCK ZONE - MARCH 2014

SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 8

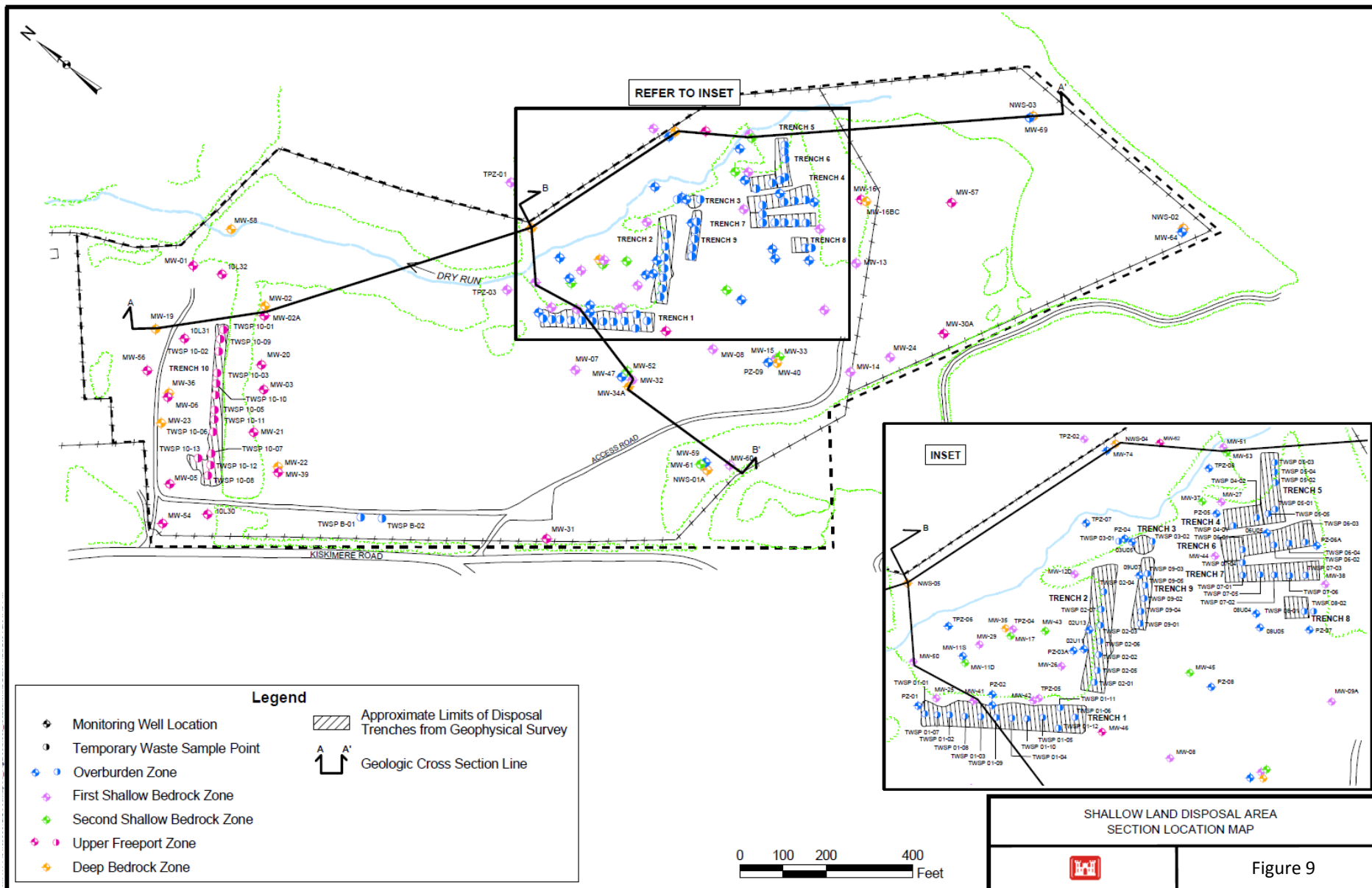


Figure 9. Pre-existing and Remedial Investigation Wells

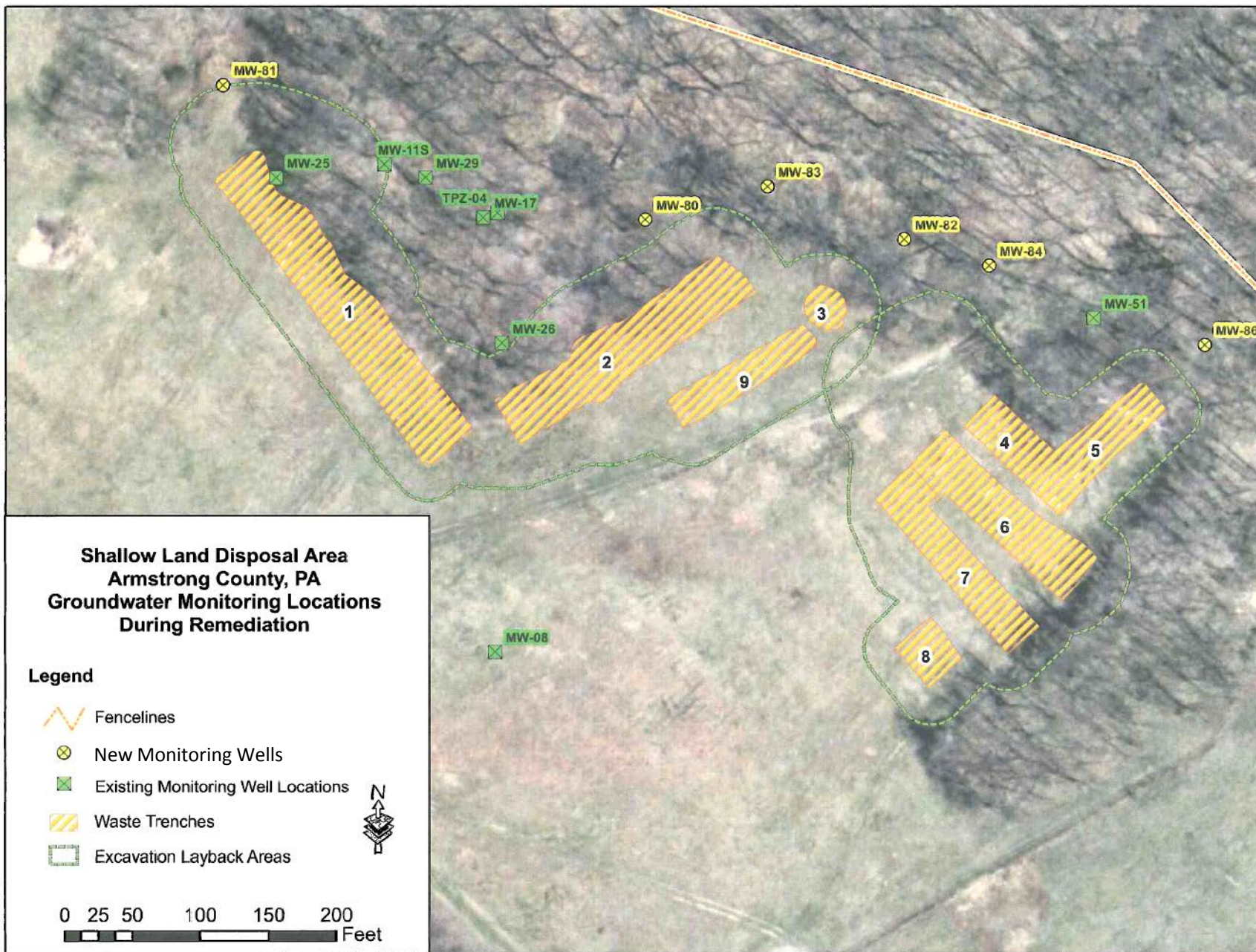


Figure 10. Remedial Action Groundwater Monitoring Locations (Monthly Program)

SLDA GROUNDWATER MONITORING PROGRAM Annual Well Sampling

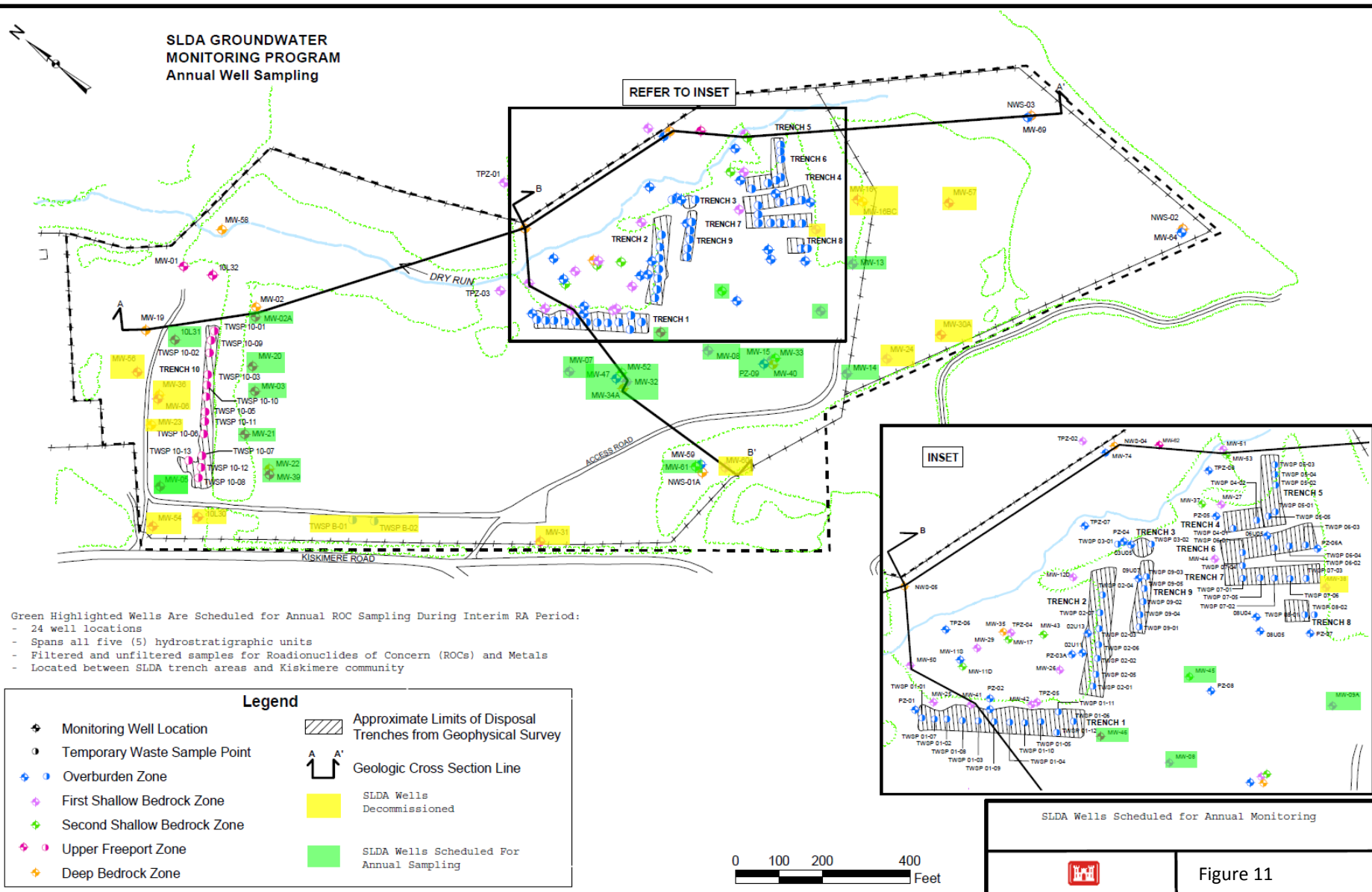
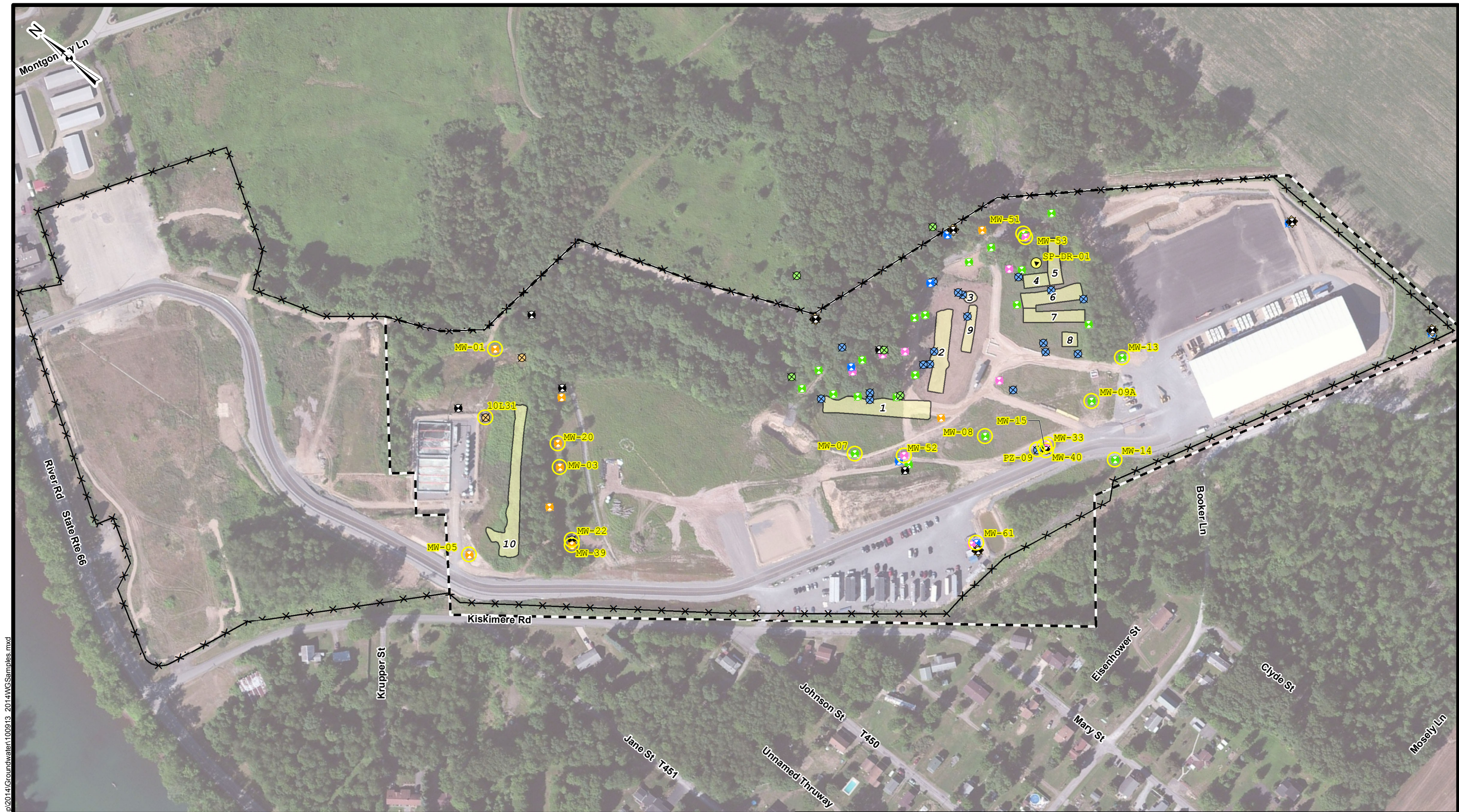
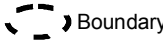
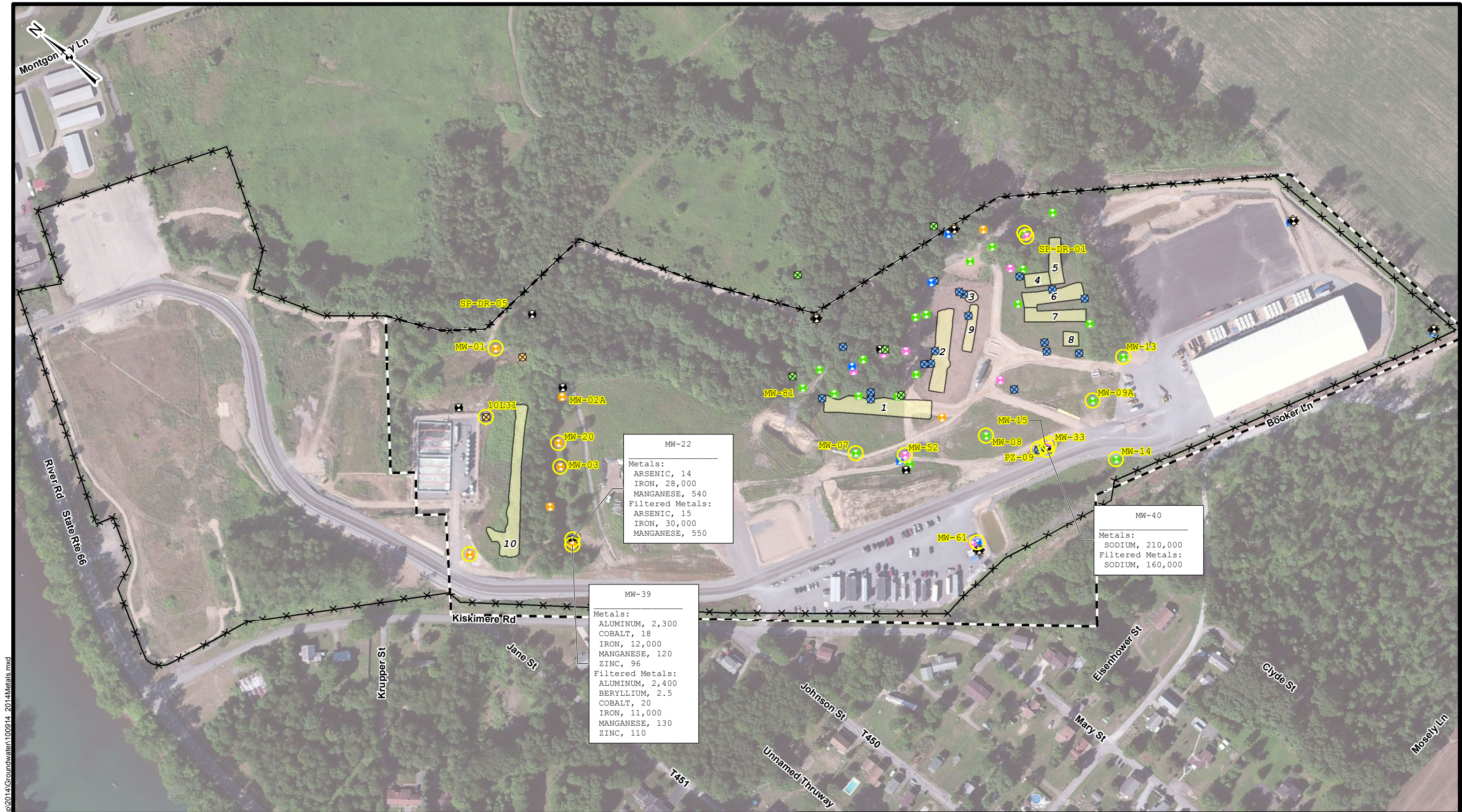


Figure 11. Annual Groundwater Sampling Locations



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Legend			 Fenceline	 Boundary	 Trench	0 110 220 440 Feet	 U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS Buffalo District	GROUNDWATER SAMPLING LOCATIONS (MARCH 2014)				
 Monitoring Well/Piezometer (Sampled 2014)	 Monitoring Well (Second Shallow Bedrock)	 Piezometer (Overburden)						 Monitoring Well (Upper Freeport Zone)	 Piezometer (First Shallow Bedrock)	 Piezometer (Upper Freeport Zone)	 Monitoring Well (Overburden)	 Monitoring Well (Deep Bedrock)



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Legend

Monitoring Well/Piezometer (Sampled 2014)

Monitoring Well (Second Shallow Bedrock)

Surface Water Location (Sampled 2014)

Monitoring Well (Overburden)

Monitoring Well (First Shallow Bedrock)

Monitoring Well (Upper Freeport Zone)

Monitoring Well (Deep Bedrock)

Nested Monitoring Well

Piezometer (Overburden)

Piezometer (First Shallow Bedrock)

Piezometer (Upper Freeport Zone)

Fenceline

Site Boundary

0

110

220

440

Feet

U.S. ARMY ENGINEER DISTRICT

CORPS OF ENGINEERS

Buffalo District

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GROUNDWATER SAMPLING LOCATIONS

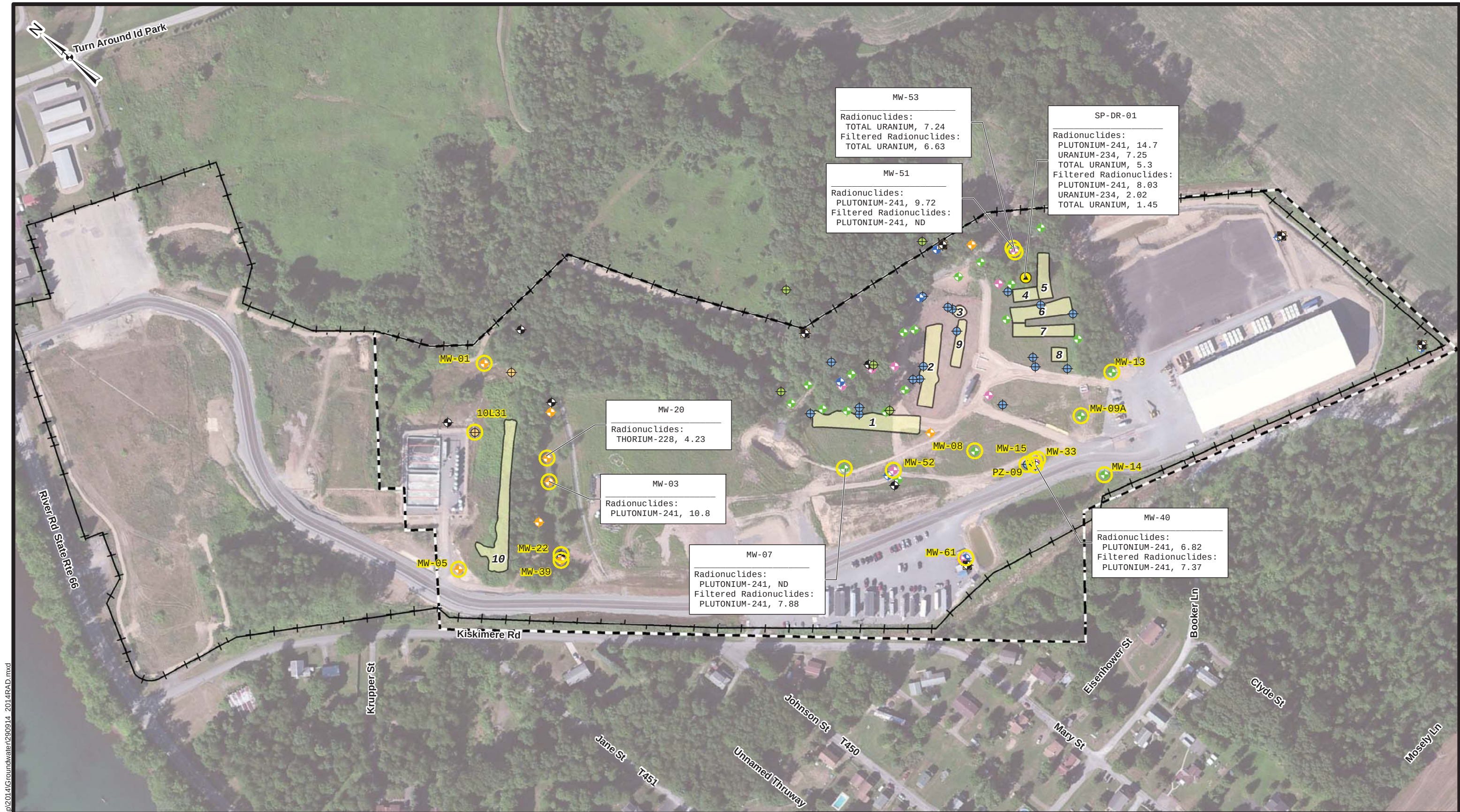
EXHIBITING METALS EXCEPTIONS

(MARCH 2014)

SHALLOW LAND DISPOSAL AREA

PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 13



Document Path: K:\SLDA\GIS\ArcMap2014\Groundwater\290914_2014RAD.mxd

Legend					GROUNDWATER SAMPLING LOCATIONS EXHIBITING RADIOLOGICAL EXCEPTIONS (MARCH 2014)	
Monitoring Well/Piezometer (Sampled 2014)	Monitoring Well (Second Shallow Bedrock)	Piezometer (Overburden)	Fenceline			
Surface Water Location (Sampled 2014)	Monitoring Well (Upper Freeport Zone)	Piezometer (First Shallow Bedrock)	Site Boundary			
Monitoring Well (Overburden)	Monitoring Well (Deep Bedrock)	Piezometer (Upper Freeport Zone)	Trench			
Monitoring Well (First Shallow Bedrock)	Nested Monitoring Well					
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS BUFFALO, NY				SHALLOW LAND DISPOSAL AREA PARKS TOWNSHIP, PENNSYLVANIA		
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				FIGURE 14		