GROUNDWATER MONITORING DATA RELEASE
2010 SAMPLING EVENT
HARSHAW FUSRAP SITE

U.S. Army Corps of Engineers
Buffalo District

Building Strong®

February 2011

Formerly Utilized Sites Remedial Action Program (FUSRAP)

FUSRAP was initiated in 1974 to identify, investigate, and 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 Corps follows the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan.

Site Description

The 55-acre former Harshaw Chemical Company Site is located at 1000 Harvard Avenue, approximately three miles southwest of downtown Cleveland in Cuyahoga County, Ohio. The site is in a low-lying area adjacent to the Cuyahoga River and Big Creek which is surrounded on three sides by industries and includes several developed and undeveloped land parcels.

Purpose

The purpose of this environmental data release is to support the CERCLA process and to provide groundwater monitoring data that can be used to assess contaminant movement. A subset of all of the site wells is sampled annually to complement the Remedial Investigation (RI) results. The GW data will be used in the Feasibility Study to develop and evaluate remedial alternatives for the site.

The Corps Buffalo District is posting this data to the Harshaw Site Web page available at http://www.lrb.usace.army.mil/fusrap/harshaw/. Included are groundwater monitoring data for 2010 and the Corps' analyses of these data.

Scope

Groundwater monitoring is currently being performed annually at the Harshaw Site. Figure 1 on the next page shows the location of the groundwater monitoring wells sampled at the Harshaw Site during 2008-2010. A total of 18 wells were part of the monitoring program in 2010, and filtered and unfiltered samples were taken for all wells. Based on results from the 2008 sampling event, wells with no potential impacts have been ruled out from further sampling. All wells sampled in 2009 were also sampled in 2010, with the exception of background well BKG-MW0003 which was covered with fill and not available for sampling. BKG-MW0003 was replaced with BKG-MW0005.

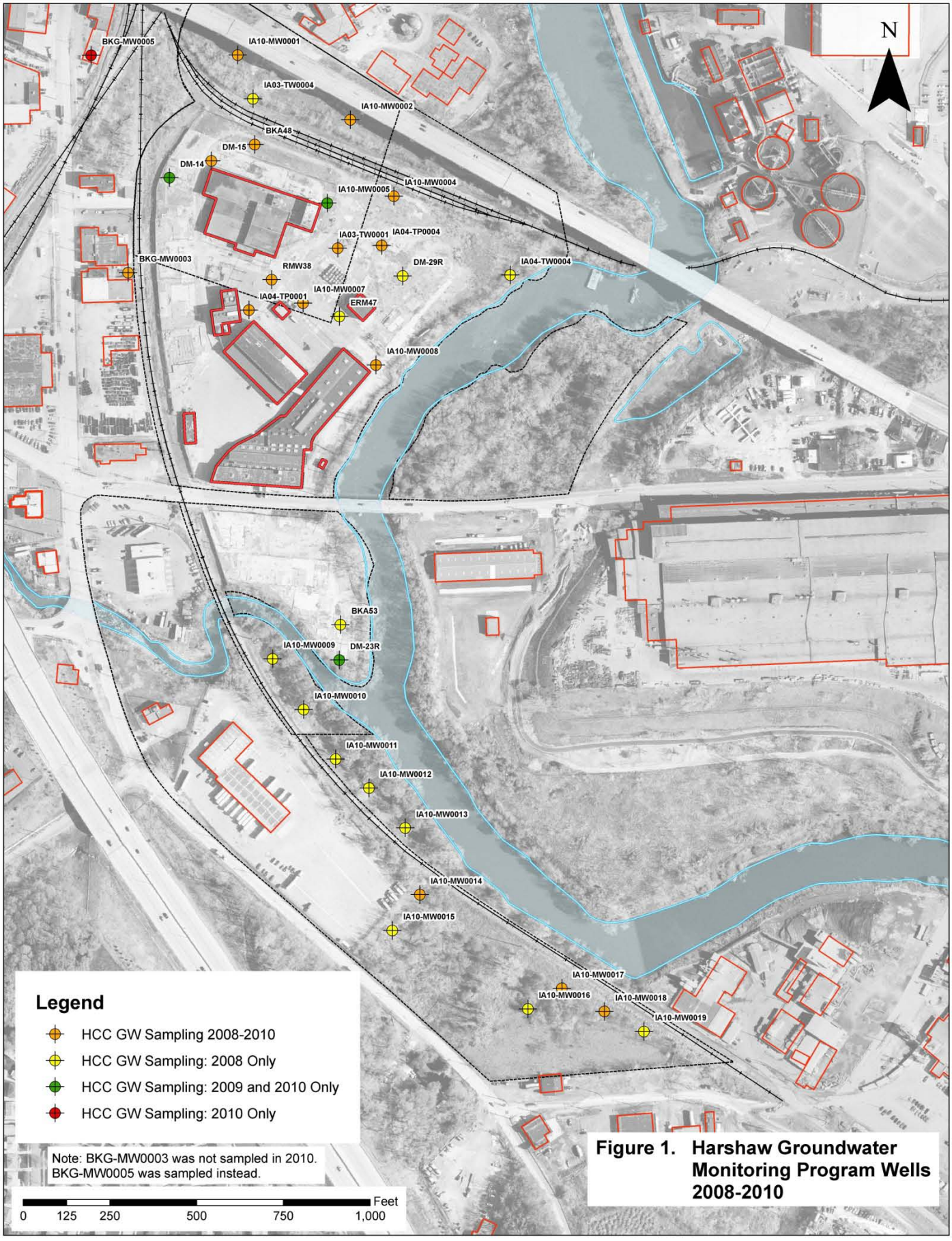

Figure 1. Harshaw Groundwater Monitoring Program Wells 2008-2010

Additional information on the rationale for groundwater sampling at the Harshaw Site is presented in Table 1. The groundwater analysis includes monitoring for isotopic radium (Ra-226, Ra-228), isotopic thorium (Th-230, Th-232), isotopic uranium (U-234, U-235, U-238), and total uranium (presented as elemental mass and the sum of three isotopes). Hydrogeologic conditions and a more detailed description of the site groundwater monitoring program are summarized in the Conceptual Site Model for Groundwater that is available on the Harshaw Site Web page. Groundwater flow at the Harshaw Site is controlled by the nature of the unconsolidated soil deposits, the topography of the underlying shale bedrock, the relative elevation of the Cuyahoga River and Big Creek, and the recovery of site groundwater. In general, groundwater flow across the site is from west to east. A potentiometric map using groundwater elevations taken from most of the Harshaw Site monitoring wells was developed for the 2010 sampling event (Figure 2).

Constituents of interest (COIs) and associated U.S. Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCLs) include isotopic radium (5 pCi/L), isotopic thorium (15 pCi/L[1]), sum of isotopic uranium (27 pCi/L), and total uranium (30 µg/L).

Results and Interpretation

Groundwater surface elevations measured at the groundwater wells are presented in Table 1 and were plotted as groundwater contours in Figure 2. This data indicates that groundwater flow at the site is generally consistent with the interpretations presented in the RI Report. Localized variations in groundwater contours and flow patterns may be explained by groundwater withdrawals induced by the existing site groundwater pump and treat system. The estimated zone of influence for the pump and treat system is discussed in detail in the Conceptual Site Model for Groundwater available on the Harshaw Site Web page.

Analytical results for the 2010 monitoring event are presented in Tables 2 and 3. Table 2 shows data for unfiltered samples and Table 3 shows data for filtered samples (dissolved). Analytical results above the EPA MCLs include total uranium in BKA48 and DM15, which are located adjacent to Building G-1 and report concentrations similar to those measured during the RI and 2008-2009 groundwater sampling. The concentration of total uranium in a third well (RMW-38), downgradient of Building G-1, has decreased significantly below the EPA MCL since RI monitoring was performed. The concentration of total uranium in the filtered sample from well IA10-MW0001, located north of Building G-1 was found to exceed the EPA MCL, although, the unfiltered sample result remained below the MCL value. In general, recent constituent concentrations measured in RI monitoring wells are consistent with previously monitored results. There is currently not sufficient data to perform statistical analyses that would indicate long-term concentration trends in the groundwater monitoring wells.

[1] Gross alpha MCL includes thorium isotopes, and excludes radon and uranium.

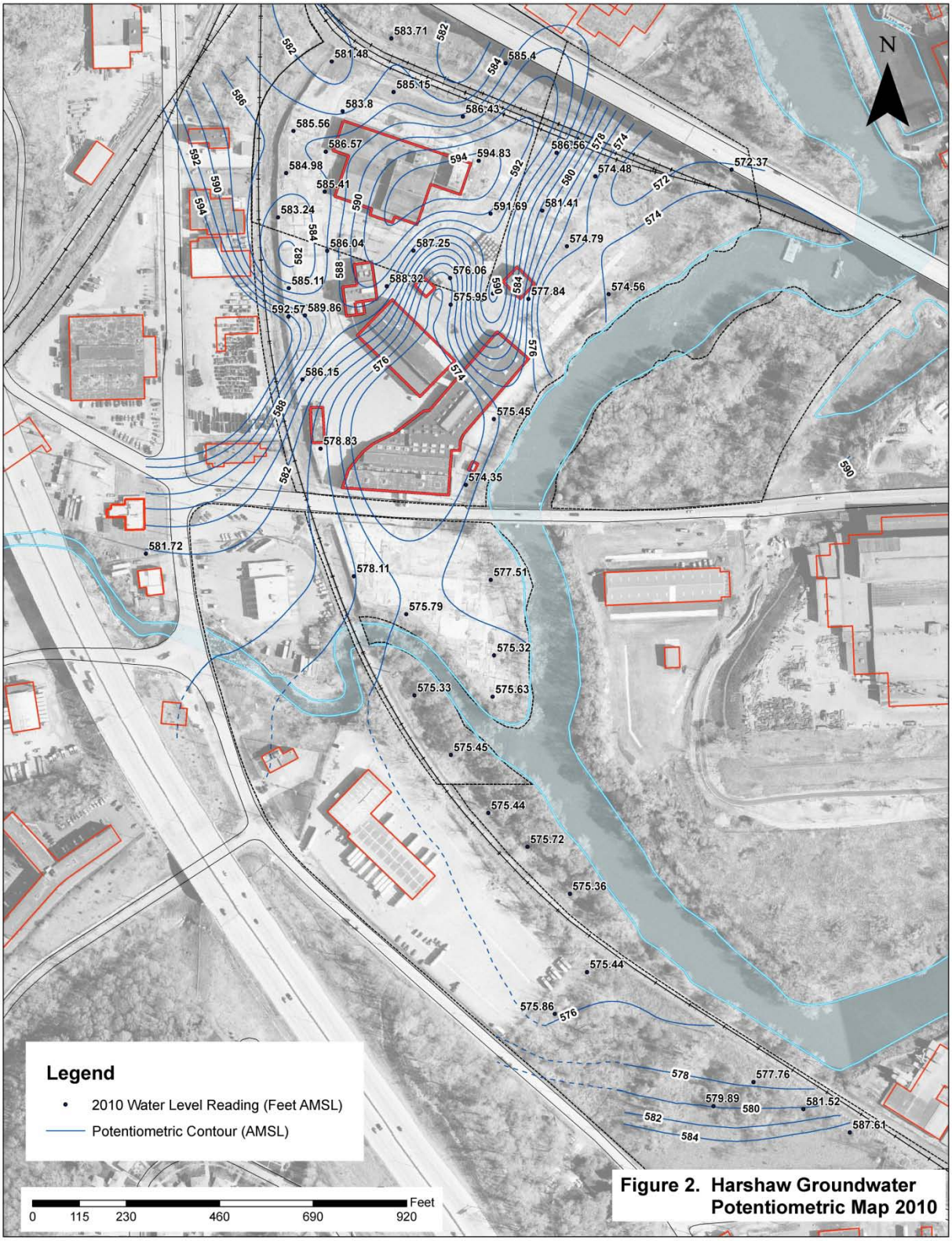

Figure 2. Harshaw Groundwater Potentiometric Map 2010

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Table 1
Harshaw FUSRAP Site Groundwater Elevations
2008-2010

Well	Top of Casing Elev (ft AMSL)	Depth to Water (ft TOC)	WL Elev (ft AMSL)	Depth to Water (ft TOC)	WL Elev (ft AMSL)	Depth to Water (ft TOC)	WL Elev (ft AMSL)	Well Sampling Rationale
		2008		2009		2010		
BKA48	594.87	12.65	582.22	11.33	583.54	9.72	585.15	Monitor Uranium Plume
BKA51	595.76	--	--	--	--	17.65	578.11	Water-Level Monitoring
BKA53	593.40	19.99	573.41	20.01	573.39	18.08	575.32	Determine MED Impacts in IA05
BKG-MW0001	592.10	--	--	--	--	10.38	581.72	Water-Level Monitoring
BKG-MW0003	591.98	9.94	582.04	8.62	583.36	--	--	Upgradient Monitoring Baseline
BKG-MW0005	592.20	--	--	--	--	7.81	584.39	Upgradient Monitoring Baseline
DM-1	596.13	--	--	--	--	9.98	586.15	Water-Level Monitoring
DM-3	594.14	--	--	--	--	1.57	592.57	Water-Level Monitoring
DM-4	593.84	--	--	--	--	3.98	589.86	Water-Level Monitoring
DM-5	596.36	--	--	--	--	11.25	585.11	Water-Level Monitoring
DM-9	598.01	--	--	--	--	11.97	586.04	Water-Level Monitoring
DM-10	592.71	--	--	--	--	9.47	583.24	Water-Level Monitoring
DM-11	595.89	--	--	--	--	10.48	585.41	Water-Level Monitoring
DM-12	596.13	--	--	--	--	11.15	584.98	Water-Level Monitoring
DM-14	596.33	13.95	582.38	12.68	583.65	10.77	585.56	Monitor Uranium Plume
DM-15	596.46	16.48	579.98	13.32	583.14	12.66	583.80	Monitor Uranium Plume
DM-26	592.99	--	--	--	--	17.26	575.73	Water-Level Monitoring
DM-22R	594.81	--	--	--	--	19.02	575.79	Water-Level Monitoring
DM-23R	593.06	19.60	573.46	19.67	573.39	17.43	575.63	Determine MED Impacts in IA05
DM-25R	592.84	--	--	--	--	17.39	575.45	Water-Level Monitoring
DM-28R	595.09	--	--	--	--	20.53	574.56	Water-Level Monitoring
DM-29R	595.49	22.51	572.98	22.08	573.41	20.70	574.79	Monitor Uranium Plume
DM-30R	594.91	--	--	--	--	20.56	574.35	Water-Level Monitoring
ERM47	593.06	19.56	573.50	13.68	579.38	2.74	590.32	Monitor Uranium Plume
IA03- TW0001	596.50	6.39	590.11	--	--	4.81	591.69	Monitor Uranium Plume
IA03- TW0002	595.39	--	--	--	--	8.96	586.43	Water-Level Monitoring
IA03- TW0003	593.39	--	--	--	--	11.91	581.48	Water-Level Monitoring
IA03- TW0004	592.92	12.15	580.77	--	--	9.21	583.71	Monitor Uranium Plume
IA04- TP0001	596.32	17.02	579.30	9.46	586.86	8.00	588.32	Monitor Uranium Plume
IA04- TP0002	595.74	--	--	--	--	19.79	575.95	Water-Level Monitoring
IA04- TP0003	595.39	--	--	--	--	17.55	577.84	Water-Level Monitoring
IA04- TP0004	595.20	19.50	575.70	14.79	580.41	13.79	581.41	Monitor Uranium Plume
IA04- TP0005	594.47	21.64	572.83	--	--	19.99	574.48	Monitor Uranium Plume
IA04- TW0001	595.16	--	--	--	--	20.81	574.35	Water-Level Monitoring
IA04- TW0002	593.59	--	--	--	--	14.76	578.83	Water-Level Monitoring
IA04- TW0003	580.97	--	--	--	--	R	--	Water-Level Monitoring
IA04- TW0004	594.44	17.52	576.92	--	--	15.02	579.42	Monitor Uranium Plume
IA04- TW0006	589.71	--	--	--	--	17.34	572.37	Water-Level Monitoring
IA05- TW0001	598.64	--	--	--	--	21.13	577.51	Water-Level Monitoring
IA10- MW0001	593.86	11.81	582.05	10.31	583.55	9.96	583.90	Monitor Uranium Plume
IA10- MW0002	595.72	13.80	581.92	12.22	583.50	10.32	585.40	Monitor Uranium Plume
IA10- MW0003	584.05	--	--	--	--	R	--	Water-Level Monitoring
IA10- MW0004	595.88	13.92	581.96	12.82	583.06	9.32	586.56	Monitor Uranium Plume
IA10- MW0005	594.83	--	--	5.69	589.14	0.00	594.83	Monitor Uranium Plume
IA10- MW0007	592.95	--	--	17.87	575.08	16.89	576.06	Monitor Uranium Plume
IA10- MW0008	592.57	--	--	18.98	573.59	17.25	575.32	Monitor Uranium Plume
IA10- MW0009	586.74	--	--	12.99	573.75	11.41	575.33	Determine MED Impacts in IA07
IA10- MW0010	586.60	--	--	12.86	573.74	11.15	575.45	Determine MED Impacts in IA07
IA10- MW0011	591.43	--	--	17.65	573.78	15.99	575.44	Determine MED Impacts in IA07
IA10- MW0012	583.70	--	--	9.95	573.75	7.98	575.72	Determine MED Impacts in IA07
IA10- MW0013	586.09	--	--	12.36	573.73	10.73	575.36	Determine MED Impacts in IA07
IA10- MW0014	597.25	--	--	23.42	573.83	21.81	575.44	Determine MED Impacts in IA07
IA10- MW0015	598.56	--	--	24.60	573.96	22.70	575.86	Determine MED Impacts in IA07
IA10- MW0016	594.71	--	--	17.54	577.17	14.82	579.89	Determine MED Impacts in IA07
IA10- MW0017	595.48	--	--	19.42	576.06	17.72	577.76	Determine MED Impacts in IA07
IA10- MW0018	592.21	--	--	13.64	578.57	10.69	581.52	Determine MED Impacts in IA07
IA10- MW0019	597.19	--	--	13.98	583.21	9.58	587.61	Determine MED Impacts in IA07
RMW-38	596.76	12.33	584.43	10.93	585.83	9.51	587.25	Monitor Uranium Plume
RMW-39	595.93	--	--	--	--	9.36	586.57	Water-Level Monitoring

AMSL	Above Mean Sea Level
ft	foot (feet)
--	Not Available/Not Measured
TOC	Top of Casing
R	Data rejected due to quality issues

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Table 2
Former Harshaw Chemical Site
Groundwater Unfiltered Analytical Results 2010

Well	Date of Collection	Radium-226[1]	Radium-228[1]	Thorium-230[2]	Thorium-232[2]	Total Uranium[5] (KPA)	Total Uranium[3,5] (Alpha Spec)	Uranium-234	Uranium-235	Uranium-238
Units		pCi/L	pCi/L	pCi/L	pCi/L	µg/L	pCi/L	pCi/L	pCi/L	pCi/L
US EPA MCLs		5	5	15	15	30 µg/L	27 pCi/L	-	-	-
	Aug-08	ND	ND	0.389	ND	**271**	**234**	115	3.82	115
	Aug-09	0.713	0.94	0.0533	0.00671	**457**	**293**	139	10.1	144
BKA48	Jun-10	ND	ND	ND	ND	**270**	**216**	105	1.22	110
	Aug-08	1.15	1.64	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--	--	--
BKA53	--	--	--	--	--	--	--	--	--	--
	Aug-08	0.89	ND	ND	ND	5	3.77	2.07	ND	1.7
	Aug-09	0.127	2.69	ND	0.0168	5.17	3.84	2.02	0.0682	1.75
BKG-MW0003[4]	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
BKG-MW0005[4]	Jun-10	0.927	ND	0.45	ND	1.54	1.86	1.01	0.215	0.631
	--	--	--	--	--	--	--	--	--	--
	Aug-09	0.254	1.05	0.567	0.421	17.2	15.2	6.94	0.547	7.72
DM14	Jun-10	ND	ND	0.516	0.325	7.58	7.15	3.81	0.316	3.02
	Aug-08	1.72	0.987	ND	ND	**34.6**	23.8	12.7	ND	11.1
	Aug-09	0.52	0.436	ND	ND	28.1	21.4	10.3	0.707	10.4
DM15	Jun-10	0.298	ND	0.77	0.25	**49.8**	**38.7**	19.7	ND	19
	--	--	--	--	--	--	--	--	--	--
	Aug-09	0.774	1.94	0.0111	ND	2.78	2.47	1.25	0.032	1.19
DM23R	Jun-10	1.43	ND	ND	ND	2.53	1.31	0.843	ND	0.468
	Aug-08	1.01	2.75	ND	ND	ND	0.388	0.388	ND	ND
	--	--	--	--	--	--	--	--	--	--
DM29R	--	--	--	--	--	--	--	--	--	--
	Aug-08	1.25	1.46	ND	ND	ND	0.127	ND	ND	0.127
	--	--	--	--	--	--	--	--	--	--
ERM47	--	--	--	--	--	--	--	--	--	--
	Aug-08	ND	0.909	0.262	0.332	2.53	1.40	0.723	ND	0.676
	Aug-09	0.413	2.5	0.242	0.301	1.93	1.75	0.868	0.0685	0.814
IA03-TW0001	Jun-10	ND	ND	ND	ND	1.88	1.88	1.44	ND	0.44
	Aug-08	1.05	1.53	ND	ND	ND	0.470	0.313	ND	0.157
	--	--	--	--	--	--	--	--	--	--
IA03-TW0004	--	--	--	--	--	--	--	--	--	--
	Aug-08	0.582	1.73	ND	ND	7.16	6.71	3.17	0.233	3.31
	Aug-09	0.285	1.89	0.0304	0.00442	14.8	6.90	3.53	0.143	3.23
IA04-TP0001	Jun-10	ND	ND	ND	0.275	5.41	4.58	2.36	0.406	1.81
	Aug-08	0.615	ND	ND	0.0823	ND	0.472	0.297	ND	0.175
	Aug-09	1.2	3.51	0.522	0.667	14	7.85	4.17	0.171	3.51
IA04-TP0004	Jun-10	0.24	ND	ND	R	2.35	2.07	1.34	ND	0.726
	Aug-08	0.75	0.875	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--	--	--
IA04-TP0005	--	--	--	--	--	--	--	--	--	--
	Aug-08	0.671	0.96	ND	ND	11.1	7.78	3.26	ND	4.52
	--	--	--	--	--	--	--	--	--	--
IA04-TW0004	--	--	--	--	--	--	--	--	--	--
	Aug-08	0.751	1.32	0.25	ND	21.2	13.6	7.16	0.55	5.87
	Aug-09	0.43	0.76	ND	ND	25.4	19.3	9.28	0.50	9.52
IA10-MW0001	Jun-10	0.358	ND	ND	ND	28.7	21.97	10.9	0.367	10.7
	Aug-08	1.2	1.21	0.0416	ND	ND	ND	ND	ND	ND
	Aug-09	0.187	3.9	0.0342	0.00882	ND	0.0349	0.00193	ND	0.033
IA10-MW0002	Jun-10	2.39	0.439	1.06	0.35	1.02	1.87	1.41	ND	0.456
	Aug-08	0.908	0.884	ND	ND	6.26	5.69	3.58	ND	2.11
	Aug-09	0.569	3.05	0.0262	0.0215	6.21	4.57	2.46	0.0624	2.05
IA10- MW0004	Jun-10	ND	ND	0.425	ND	6.39	6.62	3.56	0.448	2.61
	--	--	--	--	--	--	--	--	--	--
	Aug-09	0.984	2.25	0.284	0.281	17.3	18.5	9.84	0.505	8.14
IA10- MW0005	Jun-10	ND	ND	ND	ND	14.8	11.19	6.01	0.178	5

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Table 2
Former Harshaw Chemical Site
Groundwater Unfiltered Analytical Results 2010

Well	Date of Collection	Radium-226[1]	Radium-228[1]	Thorium-230[2]	Thorium-232[2]	Total Uranium[5] (KPA)	Total Uranium[3,5] (Alpha Spec)	Uranium-234	Uranium-235	Uranium-238
Units		pCi/L	pCi/L	pCi/L	pCi/L	µg/L	pCi/L	pCi/L	pCi/L	pCi/L
US EPA MCLs		5	5	15	15	30 µg/L	27 pCi/L	-	-	-
	Sep-08	0.486	1.46	ND	ND	--	12.9	7.93	0.535	4.47
	Aug-09	0.373	1.89	0.0464	ND	21.3	18.3	9.67	0.511	8.09
IA10- MW0007	Jun-10	ND	ND	ND	R	20.3	16.13	8.33	0.234	7.57
	Sep-08	0.722	ND	ND	ND	--	3.85	2.02	ND	1.83
	Aug-09	0.605	1.99	0.065	ND	9.53	5.37	2.54	0.192	2.64
IA10- MW0008	Jun-10	ND	ND	ND	0.134	21.7	16.28	7.53	0.293	8.46
	Sep-08	1.14	2.16	0.0766	ND	--	0.347	0.034	ND	0.313
	--	--	--	--	--	--	--	--	--	--
IA10-MW0009	--	--	--	--	--	--	--	--	--	--
	Sep-08	1.24	2.46	0.146	0.0781	--	0.432	0.167	0.155	0.11
	--	--	--	--	--	--	--	--	--	--
IA10- MW0010	--	--	--	--	--	--	--	--	--	--
	Sep-08	R	2.61	ND	ND	--	0.236	0.236	ND	ND
	--	--	--	--	--	--	--	--	--	--
IA10- MW0011	--	--	--	--	--	--	--	--	--	--
	Sep-08	R	2.8	R	ND	--	ND	ND	ND	ND
	--	--	--	--	--	--	--	--	--	--
IA10- MW0012	--	--	--	--	--	--	--	--	--	--
	Sep-08	2.25	2.78	ND	ND	--	ND	ND	ND	ND
	--	--	--	--	--	--	--	--	--	--
IA10- MW0013	--	--	--	--	--	--	--	--	--	--
	Sep-08	ND	1.52	R	ND	--	0.496	0.496	ND	ND
	Aug-09	0.848	3.36	0.0326	0.00971	0.222	0.313	0.146	0.0138	0.153
IA10- MW0014	Jun-10	ND	1	ND	0.366	1.03	0.242	ND	0.242	ND
	Sep-08	1.11	2.5	0.053	ND	--	1.64	0.889	0.168	0.582
	--	--	--	--	--	--	--	--	--	--
IA10- MW0015	--	--	--	--	--	--	--	--	--	--
	Sep-08	ND	ND	ND	ND	--	0.269	ND	ND	0.269
	--	--	--	--	--	--	--	--	--	--
IA10- MW0016	--	--	--	--	--	--	--	--	--	--
	Sep-08	R	ND	ND	ND	--	12.7	6.88	ND	5.84
	Aug-09	0.428	2.73	0.0171	0.0282	14.7	7.86	4.16	0.215	3.48
IA10- MW0017	Jun-10	0.376	1.34	ND	ND	2.04	1.81	0.83	ND	0.978
	Sep-08	R	2.12	ND	ND	--	4.87	2.52	ND	2.35
	Aug-09	ND	1.59	0.00954	0.000257	5.15	4.02	2.1	0.0743	1.85
IA10- MW0018	Jun-10	ND	ND	0.536	ND	7.42	6.12	2.98	0.371	2.77
	Sep-08	R	1.42	R	ND	--	4.59	2.6	0.349	1.64
	--	--	--	--	--	--	--	--	--	--
IA10- MW0019	--	--	--	--	--	--	--	--	--	--
	Aug-08	ND	0.915	ND	ND	4.39	3.14	1.79	ND	1.35
	Aug-09	0.573	1.51	0.020	ND	2.66	2.19	1.13	0.0438	1.02
RMW38	Jun-10	ND	ND	ND	0.211	3.71	3.34	1.68	0.39	1.27

-- Not Analyzed
ND Not Detected
R Data has been rejected because of quality issues
1 MCL refers to the sum of Ra-226 and Ra-228 (MCL=5pCi/L)
2 Gross alpha MCL includes Thorium isotopes, and excludes radon and uranium.
3 MCL refers to the sum of Uranium Isotopes (MCL=27pCi/L or 30 µg/L)
4 Background Well
5 Kinetic Phosphorescence Analysis (KPA) and Alpha Spec are used to analyze total U and isotopic U, respectively.

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Table 3
Former Harshaw Chemical Site
Groundwater Filtered Analytical Results 2010

Well	Date of Collection	Radium-226[1] Dissolved	Radium-228[1] Dissolved	Thorium-230[2] Dissolved	Thorium-232[2] Dissolved	Total Uranium[5] Dissolved (KPA)	Total Uranium[3,5] Dissolved (Alpha Spec)	Uranium-234 Dissolved	Uranium-235 Dissolved	Uranium-238 Dissolved
Units		pCi/L	pCi/L	pCi/L	pCi/L	µg/L	pCi/L	pCi/L	pCi/L	pCi/L
US EPA MCLs		5	5	15	15	30 µg/L	27 pCi/L	-	-	-
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
BKA48	Jun-10	ND	ND	ND	ND	**298**	**226**	103	0.7	122
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
BKA53	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
BKG-MW0003[4]	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
BKG-MW0005[4]	Jun-10	ND	ND	ND	ND	1.8	0.860	0.436	ND	0.424
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
DM14	Jun-10	ND	0.583	ND	ND	4.99	5.92	2.85	0.502	2.57
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
DM15	Jun-10	0.281	ND	0.437	0.546	**47.8**	**41.6**	20	0.712	20.9
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
DM23R	Jun-10	0.832	0.84	0.331	0.798	2.98	1.46	0.629	ND	0.826
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
DM29R	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
ERM47	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA03-TW0001	Jun-10	ND	ND	0.619	ND	2.18	2.43	1.32	0.244	0.862
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA03-TW0004	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA04-TP0001	Jun-10	ND	ND	0.656	0.156	5.01	4.09	2.39	ND	1.7
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA04-TP0004	Jun-10	ND	ND	ND	ND	2.01	2.25	1.52	ND	0.727
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA04-TP0005	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA04-TW0004	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA10-MW0001	Jun-10	ND	ND	ND	ND	**31.8**	21.1	10.9	ND	10.2
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA10-MW0002	Jun-10	0.343	ND	0.895	0.292	1.31	1.25	1.25	ND	ND
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA10- MW0004	Jun-10	ND	ND	ND	ND	6.33	5.40	3.15	0.208	2.04
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
IA10- MW0005	Jun-10	ND	ND	ND	ND	16	10.7	5.87	ND	4.87

US Army Corps of Engineers
Buffalo District
BUILDING STRONG

Table 3
Former Harshaw Chemical Site
Groundwater Filtered Analytical Results 2010

Well	Date of Collection	Radium-226[1] Dissolved	Radium-228[1] Dissolved	Thorium-230[2] Dissolved	Thorium-232[2] Dissolved	Total Uranium[5] Dissolved (KPA)	Total Uranium[3,5] Dissolved (Alpha Spec)	Uranium-234 Dissolved	Uranium-235 Dissolved	Uranium-238 Dissolved
Units		pCi/L	pCi/L	pCi/L	pCi/L	µg/L	pCi/L	pCi/L	pCi/L	pCi/L
US EPA MCLs		5	5	15	15	30 µg/L	27 pCi/L	-	-	-
	Sep-08	0.966	0.827	R	ND	--	11.5	6.82	0.467	4.19
	--	--	--	--	--	--	--	--	--	--
IA10- MW0007	Jun-10	ND	ND	ND	ND	17.3	13.1	7.32	ND	5.77
	Sep-08	0.464	R	ND	ND	--	4.31	2.04	ND	2.27
	--	--	--	--	--	--	--	--	--	--
IA10- MW0008	Jun-10	ND	ND	ND	ND	21	18.0	9.39	0.368	8.2
	Sep-08	0.685	0.673	ND	0.034	--	0.0539	ND	ND	0.0539
	--	--	--	--	--	--	--	--	--	--
IA10-MW0009	--	--	--	--	--	--	--	--	--	--
	Sep-08	0.818	1.97	0.0601	0.0386	--	0.155	0.0443	0.0684	0.042
	--	--	--	--	--	--	--	--	--	--
IA10- MW0010	--	--	--	--	--	--	--	--	--	--
	Sep-08	0.759	3.45	ND	ND	--	0	ND	ND	ND
	--	--	--	--	--	--	--	--	--	--
IA10- MW0011	--	--	--	--	--	--	--	--	--	--
	Sep-08	0.926	ND	ND	ND	--	ND	ND	ND	ND
	--	--	--	--	--	--	--	--	--	--
IA10- MW0012	--	--	--	--	--	--	--	--	--	--
	Sep-08	2.31	ND	R	ND	--	0.532	0.532	ND	ND
	--	--	--	--	--	--	--	--	--	--
IA10- MW0013	--	--	--	--	--	--	--	--	--	--
	Sep-08	1.21	R	R	ND	--	3.87	1.64	ND	2.23
	Aug-09	1.14	2.87	0.0401	ND	0.222	0.310	0.185	0.00405	0.121
IA10- MW0014	Jun-10	0.695	1.43	ND	0.088	1.11	ND	ND	ND	ND
	Sep-08	0.996	1.78	0.0835	0.0337	--	2.03	1.12	ND	0.909
	--	--	--	--	--	--	--	--	--	--
IA10- MW0015	--	--	--	--	--	--	--	--	--	--
	Sep-08	ND	R	R	ND	--	0.427	ND	ND	0.427
	--	--	--	--	--	--	--	--	--	--
IA10- MW0016	--	--	--	--	--	--	--	--	--	--
	Sep-08	ND	3.32	ND	ND	--	10.4	6.08	ND	4.3
	Aug-09	0.817	3.34	0.00347	ND	13.3	7.13	3.67	0.22	3.24
IA10- MW0017	Jun-10	0.503	1.36	0.372	ND	1.8	1.88	1.07	ND	0.805
	Sep-08	ND	4.7	ND	ND	--	4.03	2.26	0.423	1.35
	Aug-09	0.516	3.73	0.0399	ND	6.49	4.10	2.14	0.118	1.84
IA10- MW0018	Jun-10	0.365	ND	0.483	0.206	7.59	5.69	3.12	ND	2.57
	Sep-08	ND	R	ND	ND	--	3.76	2.15	ND	1.61
	--	--	--	--	--	--	--	--	--	--
IA10- MW0019	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
RMW38	Jun-10	ND	ND	ND	0.325	3.58	3.30	1.87	ND	1.43

-- Not Analyzed
ND Not Detected
R Data has been rejected because of quality issues
1 MCL refers to the sum of Ra-226 and Ra-228 (MCL=5pCi/L)
2 Gross alpha MCL includes Thorium isotopes, and excludes radon and uranium.
3 MCL refers to the sum of Uranium Isotopes (MCL=27pCi/L or 30 µg/L)
4 Background Well
5 Kinetic Phosphorescence Analysis (KPA) and Alpha Spec are used to analyze total U and isotopic U, respectively.