Former Harshaw Chemical Company Proposed Plan for Closure and No Further Action at Investigative Area - 06

US Army Corps of Engineers April 2010

The Corps Announces Proposed Plan

The public is invited to review and comment on the Proposed Plan for the Formerly Utilized Sites Remedial Action Program (FUSRAP) Former Harshaw Chemical Company Investigative Area - 06 hereafter referred to as IA06. The recommended action in this Proposed Plan is No Further Action for IA06. The US Army Corps of Engineers (the Corps) follows the process outlined in the Comprehensive Environmental Response Compensation and Liability Act (CERCLA 42 United States Code Chapter 103 Subchapter I) for FUSRAP sites. This process allows for a site to be recommended for No Further Action if no unacceptable risks exist under the reasonably anticipated future land use, which for IA06 would be recreational. The Corps conducted a Remedial Investigation and Baseline Risk Assessment and determined that current levels of FUSRAP-related radionuclides and chemicals at IA06 of the Harshaw Site support a No Further Action Proposed Plan. The purpose of this document is to provide information about the site, its history, current condition, present the Proposed Plan for IA06 of the site and solicit input from the public.

Public Comment Period
April 26, 2010 – May 26, 2010
USACE will accept written comments on the Proposed Plan during the public comment period.

Public Meeting
Wednesday, May 12, 2010 @ 6:30 pm
Cleveland Metroparks' CanalWay Center located at 4524 East 49th Street in Cuyahoga Heights
Cleveland, Ohio

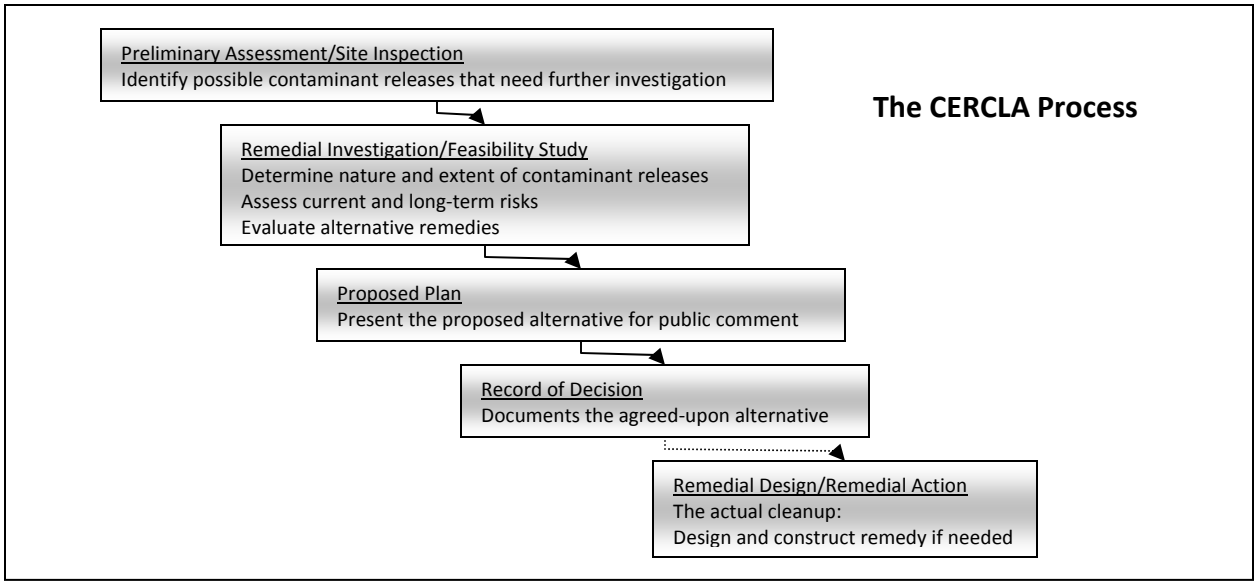
For more information, see the Administrative Record File at the following locations:

Cuyahoga County Public Library – Brooklyn Branch
4480 Ridge Rd
Brooklyn, OH

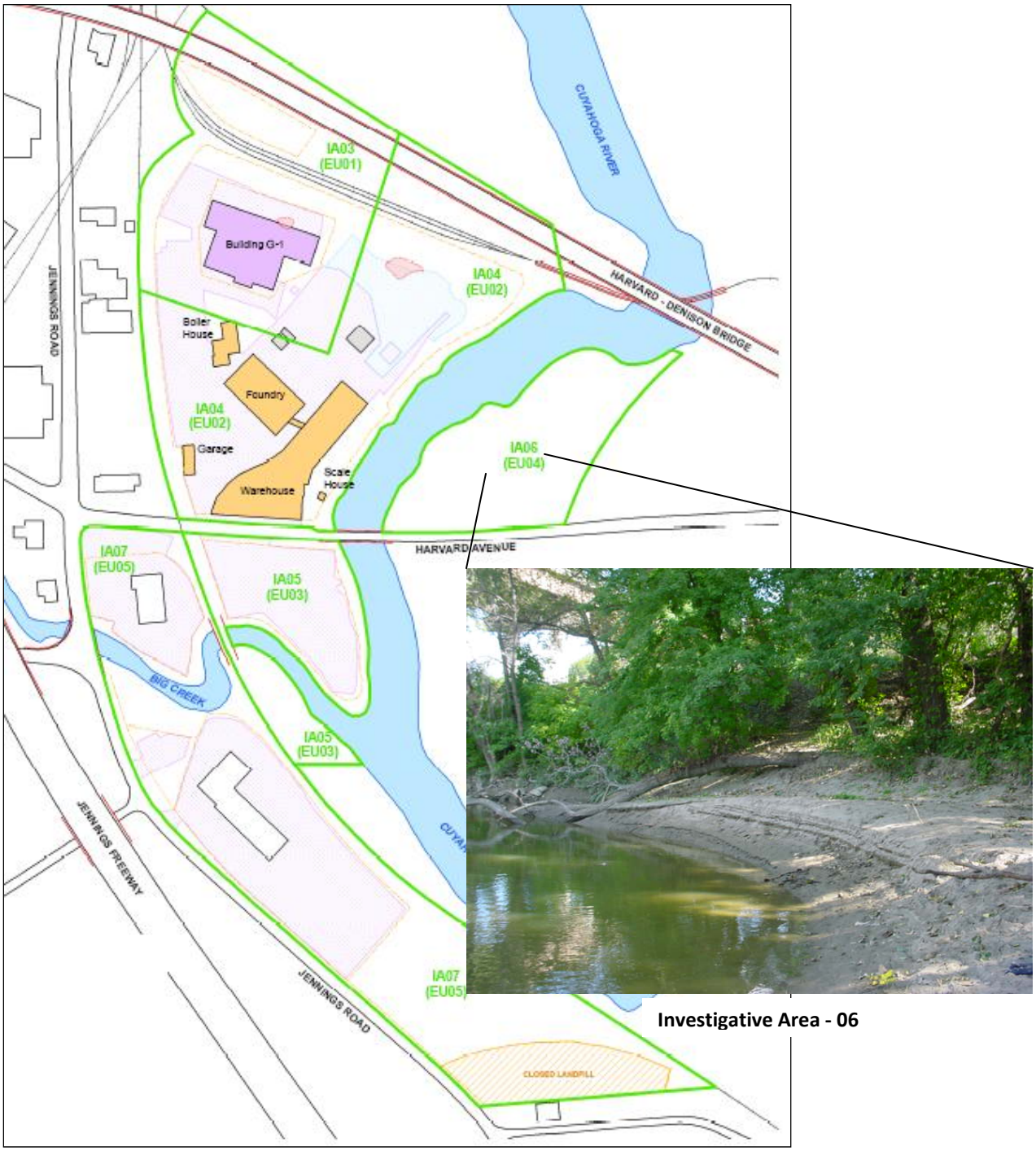
USACE Buffalo District
1776 Niagara St
Buffalo, NY 14207

Site History and Description

The mission of FUSRAP is to identify, assess and clean up or control sites with residual radioactivity resulting from the early years of the Nation's atomic energy program, initially carried out by the Manhattan Engineer District and later taken over by the Atomic Energy Commission, collectively referred to as MED/AEC. Beginning in 1944, the primary role of the former Harshaw Chemical Company was converting uranium concentrate feed materials to uranium tetrafluoride (UF_4), uranium



hexafluoride (UF_6) and uranium trioxide (UO_3). These operations ceased by May 1953. UO_3 produced from recycled uranium was purified in the Harshaw refinery in 1953 into early 1954, at which point all FUSRAP-related process operations ceased.



Investigative Area - 06

Former Harshaw Chemical Company FUSRAP Site

The Harshaw Chemical Company is located at 1000 Harvard Avenue, in Cleveland, Ohio, approximately three miles south of downtown Cleveland. It is a 55-acre property located in an industrialized area of

Cleveland. The Cuyahoga River and Big Creek run through the Harshaw Site. The figure on the previous page shows the Harshaw Site and how the USACE divided it up into Investigative Areas to aid in the investigation.

The Remedial Investigation for the Harshaw Site covered all of the Investigative Areas. This Proposed Plan is solely for IA06, an approximate 6-acre parcel which can be seen east of the Cuyahoga River and north of Harvard Avenue. Based on historic information and aerial photo analysis, IA06 was never used as a production area either for FUSRAP-related activities or the former Harshaw Chemical Company's commercial processes. However, there is some evidence of small areas of ground disturbance which can be attributed to historical construction-debris fill activities. The parcel is currently vacant and is approximately 90% wooded and 10% vegetated open space. A plan has been developed by the Ohio Canal Corridor for extending the Towpath Trail from its current terminus at Harvard Avenue to Can Park Basin in downtown Cleveland (~ 6 miles north). The extension of the trail could in part be located within the IA06 area.

Site Characterization

In 2001 the Corps conducted a Preliminary Assessment of the Harshaw Site. The Preliminary Assessment concluded that although there was no imminent threat to human health or the environment, the site should be included in FUSRAP and undergo further characterization to determine potential future risk associated with past MED/AEC activities.

Prior to the Harshaw Site being determined eligible for FUSRAP, investigations were conducted by site owners. Though these investigations generally focused on the main process area which can be seen on the site map on the previous page as being located on the opposite side of the Cuyahoga River, there was some limited data for IA06. In 2002 the Corps initiated a Remedial Investigation of the entire Harshaw Site. The Corps used data from the historic investigations as an aid to help determine the areas to study during the Remedial Investigation. For a complete description of characterization activities and results the public is encouraged to read the Harshaw Remedial Investigation Report available in the Administrative Record File located in the

What is a radionuclide?

Atoms that are unstable due to an imbalance of forces in their nucleus are called radionuclides. An unstable nucleus will eventually undergo radioactive decay. During decay radionuclides give off energy either in the form of particles or rays. This energy is called "radiation."

There are four types of radiation, alpha, beta, and gamma and X-ray. Each of these is defined by the amount of energy they possess, the distance they can travel, and the materials they can travel through. For example, alpha particles have a large mass, but have little penetrating power and can be stopped by a sheet of paper. Gamma-rays, on the other hand are more penetrating, requiring a dense material, like lead, to block them. A beta particle is similar to an electron and has virtually no mass. The type of radiation an element gives off as it decays plays a very important part in determining the health risks associated with that element.

Atoms of a given element may exist as different isotopes. Isotopes are atoms that have the same number of protons, which determines what element they represent, but different numbers of neutrons. For example, uranium has 92 protons. The number of neutrons can vary from 138 to 148. Uranium with 138 neutrons is written as U-230 (92 protons + 138 neutrons = 230). Only U-234, U-235 and U-238 are naturally occurring.

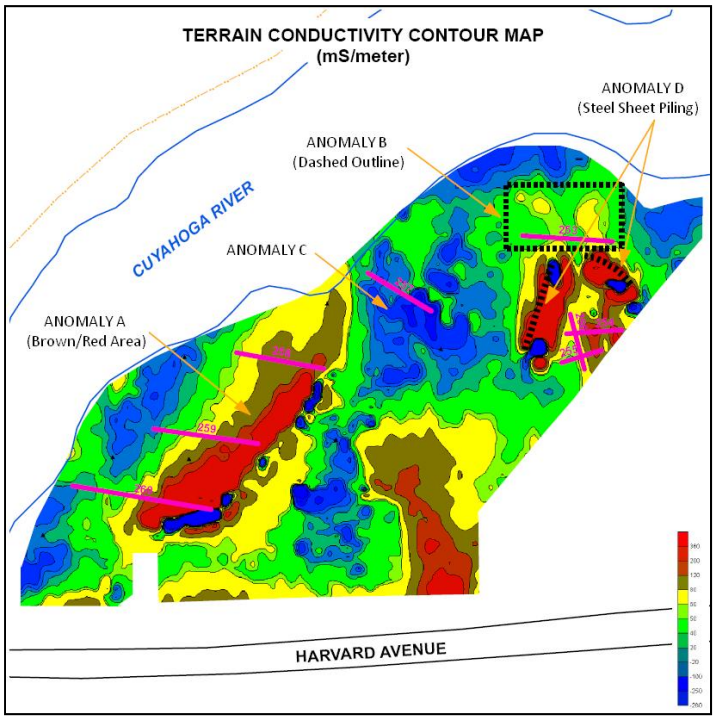
As a radioactive atom decays, it may become a different radionuclide or a stable element. U-238 will give off eight alpha particles and six beta particles in a fourteen step "process" to become lead-206, a stable isotope of lead. As it decays to lead-206, other common radionuclides formed include thorium-230, radium-226, radon-222 and lead-210. Each of these decays is accompanied with the emission of gamma radiation, which, like X-rays, is electromagnetic in nature. The various forms of this "radioactivity" can be detected by field instrumentation, such as a Geiger-Mueller detector, when placed in proximity to the radioactive source.

Cuyahoga County Brooklyn Branch Library or the US Army Corps of Engineers Buffalo District Office. The Remedial Investigation Report contains a full description of the site physical characteristics, history, nature and extent of contamination, and human health and ecological risk assessments. Characterization and conclusions pertaining to IA06 are summarized in this Proposed Plan.

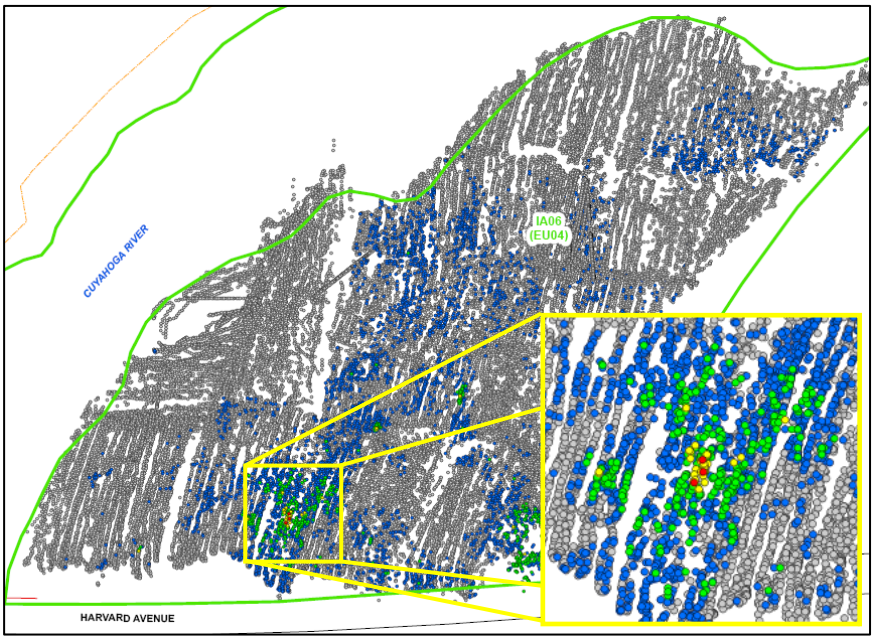
Soil Characterization

Geophysical Survey

To begin the investigation in IA06, the Corps performed geophysical surveys using electromagnetic terrain conductivity scans and ground penetrating radar. The geophysical surveys did not indicate the presence of underground utilities, tanks or other storage containers, or building foundations. Four anomalies were detected as shown on the figure to the right. Anomaly A is coincident with an elevation change and has visible debris such as bricks and broken concrete and asphalt. Anomalies B and C had no distinguishing visual characteristics, and soil borings taken in these areas had no MED/AEC material in the results. Anomaly D was investigated and verified to be a steel sheet pile wall.



Gamma Walkover Survey



The Corps performed a gamma walkover survey using a mini-FIDLER (Field Instrument for the Detection of Low Energy Radiation) to characterize gamma radiation levels across IA06 and identify any elevated locations for collection of soil borings. The yellow and red dots near the south-central portion of IA06 shown in the figure to the left indicate elevated gamma readings. Previous investigations had identified this area as having elevated uranium concentrations.

Soil Sampling

Using the geophysical and gamma walkover survey data described on the previous page, the Corps developed a field sampling plan for IA06. Four phases of soil sampling were conducted with the objective to characterize the geophysical survey anomalies; investigate elevated areas identified by the gamma walkover survey and confirm historical results; characterize the nature and extent of MED/AEC-related radionuclides and chemicals; assess the risk they might pose to current and potential future land users; and collected sufficient data to support IA06 closure. From a review of data from early phases of the investigation, the Corps determined that No Further Action in IA06 was a possible outcome for the area and could support community planning actions. Thus, the final phase of IA06 sampling was designed to collect sufficient data to support this determination.

The Corps collected a total of 99 soil samples from 42 locations during the Remedial Investigation in IA06. As described in the Remedial Investigation Report, some soil borings produced more than one sample based on field screening results of the entire boring core. Intervals selected for additional laboratory analysis were those which produced the highest field screening results for radioactivity by Geiger-Mueller detector or for uranium by x-ray fluorescence analysis. The Corps analyzed soil samples for the following radionuclides and chemicals:

Why is uranium discussed as both a radionuclide and a chemical?
Uranium is a naturally occurring metal that is radioactive, i.e., is also a radionuclide. As such, uranium can be tested for using techniques typical to metals –giving results either as mg/kg or parts per million (ppm). It poses risks to human health as a heavy metal – toxic by ingestion, particularly to the kidney. As a radionuclide, uranium is measured in terms of radioactivity concentration, giving results in pico-Curies per gram (pCi/g), for example in soils. As a radionuclide, uranium poses a risk to human health from the radiation associated with radioactive decay. You will see it discussed in both contexts in this document.

Radionuclides:
- Uranium-234, 235, 236 & 238
- Thorium-230 & 232
- Radium-226 & 228
- Technetium-99
- Americium-241
- Cesium-137
- Europium-152 & 154
- Neptunium-237
- Plutonium-238 & 239/240

Chemicals:
- Lithium
- Molybdenum
- Uranium
- Kerosene (as analyzed by Total Petroleum Hydrocarbons - Diesel Range Organics)

These radionuclides and chemicals were used at the former Harshaw Chemical Company in processes related to contracts with the MED/AEC and had the potential to be released to the environment and pose a risk to human health. Cesium-137 is an exception as there is no evidence that it was ever used under contract to the MED or AEC. It is included because of an isolated elevated detection elsewhere on the Harshaw Site. Also, though lead-210 was not directly analyzed, the Corps assumed that it would be present in equilibrium with radium-226 and included it in the risk assessment.

The Corps selected analytical methods with sufficient sensitivity to meet the data requirements of a human health risk assessment. Several of the radionuclides listed above were not detected; that is, were below laboratory method detection limits. In addition, the Corps had a subset of samples analyzed by a method which precisely analyzes uranium isotope mass ratios. This additional analysis provided sufficient data to verify the assumption that uranium residues on the site are not enriched uranium.

The table on the next page is a summary of soil sampling results from IA06 as well as background sampling results which are taken outside of the impacted area to determine a natural level for the area. Borings in IA06 were taken to a depth of 13 feet plus an additional deeper boring to find the lower limit

of potential MED/AEC-related impacts. The background sampling locations the Corps collected soil from were in the Cleveland Metroparks located approximately 1.5 miles from the Harshaw Site.

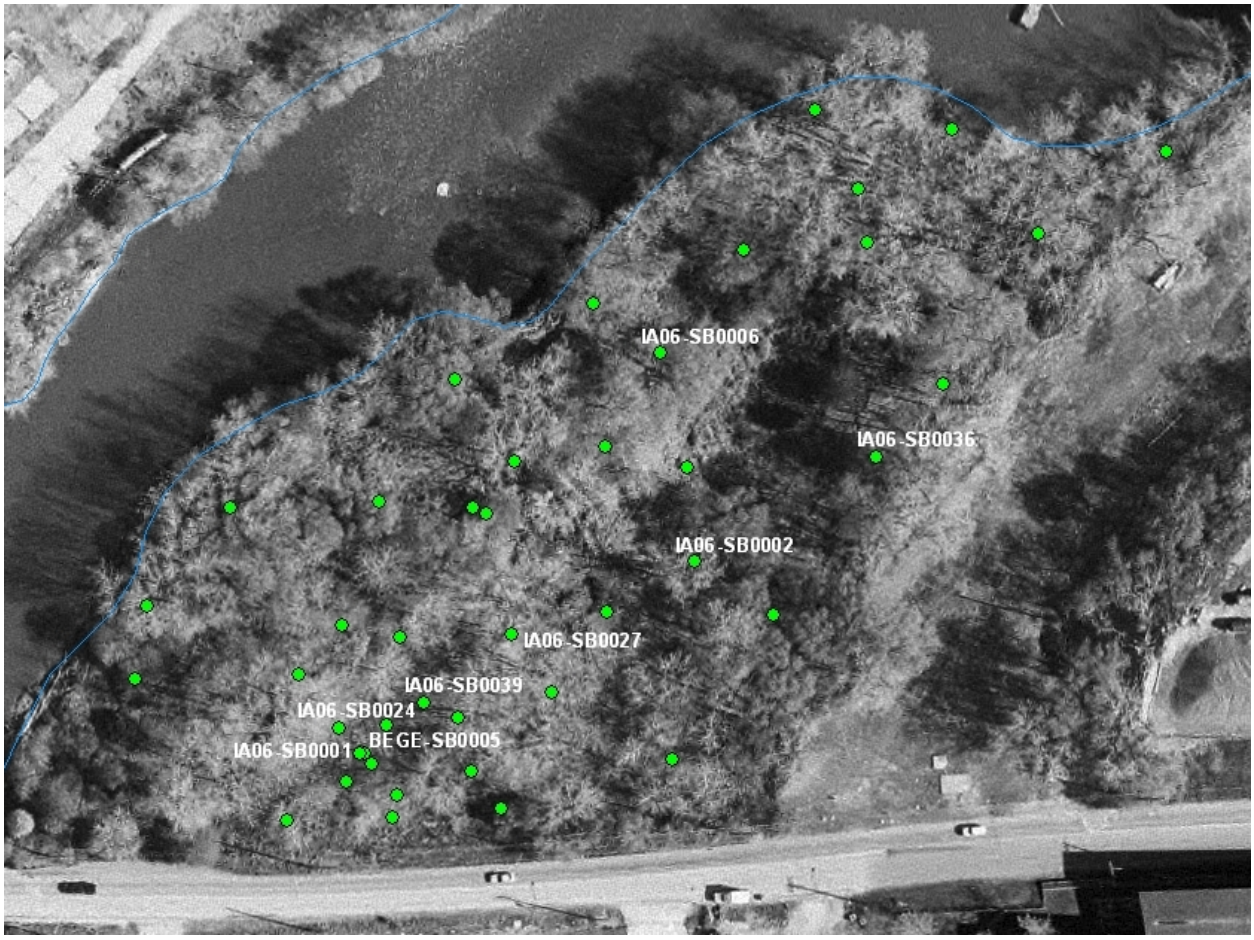
Summary of Results in Investigative Area - 06								
Parameter	**Units**	**# of Results**	**# of Non-Detects**	**Frequency of Detection**	**Range of Detected Results**	**Average of Detected Results**	**Background Value**	**Location of Maximum Result**
IA06 Soil (0'-13')								
Radionuclides								
Americium-241	pCi/g	96	95	1%	0.275	0.275	-	IA06-SB0027
Cesium-137	pCi/g	95	45	52.6%	0.016-1.09	0.166	0.540	IA06-SB0036
Europium-152	pCi/g	4	4	0%	-	-	-	-
Europium-154	pCi/g	4	4	0%	-	-	-	-
Neptunium-237	pCi/g	4	4	0%	-	-	-	-
Plutonium-238	pCi/g	4	4	0%	-	-	-	-
Plutonium-239/240	pCi/g	4	4	0%	-	-	-	-
Radium-226	pCi/g	98	0	100%	0.213-2.36	0.891	1.41	BEGE-SB0005
Radium-228	pCi/g	98	0	100%	0.322-1.46	0.801	1.79	IA06-SB0039
Technecium-99	pCi/g	4	4	0%	-	-	0	-
Thorium-228	pCi/g	102	0	100%	0.163-2.98	0.95	1.41	IA06-SB0001
Thorium-230	pCi/g	78	0	100%	0.233-10.0	1.42	1.21	IA06-SB0027
Thorium-232	pCi/g	102	0	100%	0.225-1.56	0.833	1.41	IA06-SB0039
*Total Uranium **	*mg/kg*	*93*	*37*	*60.2%*	*1.70-109*	*13.0*	*7.26*	*IA06-SB0024*
Uranium-233	µg/g	4	4	0%	-	-	-	-
Uranium-234	pCi/g	93	37	60.2%	0.567-36.2	4.34	2.42	IA06-SB0024
Uranium-235	pCi/g	94	79	16.0%	0.078-2.39	0.686	0.106	IA06-SB0024
Uranium-236	µg/g	4	4	0%	-	-	-	-
Uranium-238	pCi/g	93	37	60.2%	0.567-36.2	4.34	2.42	IA06-SB0024
Chemicals								
Lithium	mg/kg	14	0	100%	10.8-30.1	20.4	31.7	IA06-SB0006
Molybdenum	mg/kg	14	0	100%	2.25-5.63	3.52	4.13	IA06-SB0002
TPH-DRO	mg/kg	14	0	100%	5.49-322	101	19.0	IA06-SB0006
IA06 Soil (> 13 ')								
Radionuclides								
Americium-241	pCi/g	1	1	0%	-	-	-	-
Cesium-137	pCi/g	1	1	0%	-	-	0.540	-
Radium-226	pCi/g	1	0	100%	0.763	0.763	1.41	IA06-SB0027
Radium-228	pCi/g	1	0	100%	1.03	1.03	1.79	IA06-SB0027
Thorium-228	pCi/g	1	0	100%	1.20	1.20	1.41	IA06-SB0027
Thorium-230	pCi/g	1	0	100%	1.18	1.18	1.21	IA06-SB0027
Thorium-232	pCi/g	1	0	100%	1.11	1.11	1.41	IA06-SB0027
*Total Uranium **	*mg/kg*	*1*	*0*	*100%*	*17.9*	*17.9*	*7.26*	*IA06-SB0027*
Uranium-234	pCi/g	1	0	100%	5.95	5.95	2.42	IA06-SB0027
Uranium-235	pCi/g	1	0	100%	0.205	0.205	0.106	IA06-SB0027
Uranium-238	pCi/g	1	0	100%	5.95	5.95	2.42	IA06-SB0027

*Total Uranium has been calculated based off gamma spectroscopy analysis

Of the radionuclides, uranium was detected at the highest levels relative to background. The Corps collected additional samples, both horizontally and vertically, around elevated uranium sample locations to determine the extent of the elevated radioactivity. Uranium impacts were generally confined to the south-central portion of IA06 and were coincident with elevated activity reported in the gamma walkover survey. Likewise, thorium-230 and radium-226 results above background were generally

collocated with elevated uranium activity. These areas were characterized by visible construction debris such as bricks and broken concrete and asphalt, suggesting that elevated results are associated with dumped debris.

None of the radionuclides listed in the table on the preceding page associated with recycled uranium processing were found, which includes all others except cesium-137. The latter, cesium-137, which is widely distributed from atmospheric fallout, was detected at levels similar to those at the background location. Total petroleum hydrocarbons in the boiling range of kerosene were detected above background in some locations.



Sample Locations in IA06

Groundwater Characterization

Groundwater sampling was not conducted in IA06 because the uranium levels in soil would not result in significant groundwater impacts. Additionally, the periodic flooding and resulting mixture of river water with groundwater in IA06 would result in consistently diluted samples. This condition was seen while sampling wells along the river bank elsewhere on the Harshaw Site during an IA06 flood. Therefore, to be conservative, the Corps used two separate methods to estimate potential uranium concentrations in groundwater in IA06. The first analysis estimated maximum possible groundwater concentrations based on uranium partitioning between groundwater and soil (the ability of uranium to adhere to and dissolve from soil into groundwater). Groundwater concentrations were estimated from soil concentrations using an average soil-water partitioning coefficient (K_d) of 14.0 mL/g and a minimum K_d value of 6.8 mL/g measured in soils on the main Harshaw Site. Large values of Kd indicate less contaminant would be expected to be found in ground water. The values used in the Corps' analysis were very low. Assuming saturated conditions and reversible partitioning – both very conservative assumptions for IA06 – groundwater uranium concentrations will vary between 3.3 μg/L and 16.3 μg/L. This K_d analysis is both simple in its approach and highly conservative in the concentrations it produces.

The second analysis used SESOIL, an analytical groundwater model which incorporates site specific input parameters and utilizes complex equations to solve for more probable conditions than assumed in the first analysis. This analysis compares uranium concentration profiles in IA06 soils with those in IA03 soils, the main uranium processing area on the Harshaw Site. Using SESOIL, the calculated uranium concentration leaching to groundwater from the IA03 soil profile ranged from 1.0 μg/L (now) to 6.2 μg/L (650 years from now). These are considered reasonable worst-case predictions for IA06 conditions since IA03 had much higher soil concentrations. In addition, concentrations predicted from either analysis would be further diluted in groundwater during transport to the Cuyahoga River, i.e., dispersion within groundwater and soil partitioning would lower uranium concentrations in groundwater while flowing to the river. Sampling results of Cuyahoga River water and sediments have been at or near background concentrations since the Corps began the Remedial Investigation.

The US Environmental Protection Agency has established the “maximum contaminant level” for uranium in drinking water at 30 μg/L. As shown by the above analyses, groundwater under IA06 will not exceed this drinking water standard. Groundwater at the Harshaw Site is not used as a drinking water source as other sources are readily available (municipal water supply). Additionally, a search of the Ohio Department of Natural Resources well database found no wells within a two mile radius (the maximum search radius) that are used for drinking water or crop irrigation. The Corps has thus concluded that 30 μg/L is a highly protective benchmark against which to compare modeling results.

Risk Assessment

The Corps conducted both a baseline human health risk assessment and a screening level ecological risk assessment. A baseline risk assessment determines the risk a site poses in its current condition. These risks, which result from residual radionuclides or chemicals from past MED/AEC activities, are determined for both current and hypothetical land users.

The hypothetical land users evaluated in the baseline risk assessment include industrial, maintenance and construction workers, resident, subsistence farmer, and recreational visitor/trespasser. However, it is highly unlikely that IA06 would be developed for the subsistence farmer (someone who lives on the land, uses only groundwater at the site as drinking water and an irrigation source, and eats meat, milk and vegetables raised, produced and grown on the land). IA06 lies in the 100-Year Flood Plain and is regularly inundated by river waters, and the meandering nature of the Cuyahoga River results in regular

deposition and erosion of the IA06 shoreline. Additionally, the development of this area for residential use is also unlikely given the size of the property and the viable surrounding businesses limiting any residential development to the 6-acre property size. Therefore, the most likely land uses for IA06 are commercial, industrial, or recreational.

What is "risk" and how is it calculated?

A FUSRAP baseline human health risk assessment is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. The Corps follows the process developed by the US Environmental Protection Agency (EPA):

Step 1: Analyze Contamination (Hazard Identification)
Step 2: Estimate Exposure (Exposure Assessment)
Step 3: Assess Potential Health Dangers (Toxicity Assessment)
Step 4: Characterize Site Risk (Risk Characterization)

Step 1 occurs during the Remedial Investigation phase. The Corps collects samples from site soils, groundwater, sediments, surface soils, and building materials, where appropriate. These samples are analyzed for hazardous materials that are likely present as a result of past activities. For example, if a site processed uranium compounds the site would be tested for uranium and hazardous materials uranium contains or decays to, such as thorium-230.

In Step 2, the risk assessor considers different ways people might be exposed to the radionuclides and chemicals identified in Step 1 by developing a conceptual site model which identifies current and potential future land users and maps out the different ways in which each could be exposed to hazardous materials at the site. For example, someone who works commercially at the site would be exposed approximately 8 hours a day 5 days a week. They would likely not come in contact with groundwater or soils below a certain depth, say 2 feet. By comparison, a construction worker might come in contact with deeper soils through excavation activities. The exposure assessment considers the concentrations that people might be exposed to in environmental media, and the potential frequency and duration of exposure. Using this information, the risk assessor identifies a "reasonable maximum exposure" (RME) scenario, and computes an RME exposure, which is the highest level of human exposure that could reasonably be expected to occur.

In Step 3, the risk assessor compiles information on the toxicity of each chemical to assess potential health risks. The risk assessor considers two types of health risk: cancer risk and non-cancer risk. The likelihood of the occurrence of cancer resulting from exposures at remediation sites is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance" of cancer occurrence over a lifetime. In other words, for every 10,000 people that could be exposed at the RME level, at most, one extra cancer would be expected to occur over a lifetime. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. For non-cancer health effects, the risk assessor calculates a "hazard index."

In Step 4, the results of the three previous sites are combined, evaluated, and summarized. The risk assessor determines whether the potential health risks are acceptable for people at or near the site according to relevant benchmarks promulgated by the USEPA or other agencies such as the Nuclear Regulatory Commission.

Baseline Human Health Risk Assessment

To begin, any radionuclide or chemical which was detected in IA06, exceeded background levels, was detected more than 5% of the time and exceeded preliminary screening levels, was evaluated further in the risk assessment. Preliminary screening levels used during the baseline human health risk assessment were US Nuclear Regulatory Commission regulations for decommissioning licensed sites[*]. These regulations provided a benchmark to which the Corps could compare data even though the Harshaw Site is not a licensed site. Preliminary screening levels for chemicals were taken from US Environmental Protection Agency Regional Screening Levels[†]. Following these steps, the radionuclides

[*] United States Nuclear Regulatory Commission, Office of Nuclear Materials Safety and Safeguards, *Consolidated Decommissioning Guidance*, September 2003, NUREG 1757, Volume 1, Revision 2.
[†] United States Environmental Protection Agency, *Regional Screening Levels for Chemical Contaminants at Superfund Sites,* September 12, 2008 version.

and chemicals that were carried forth into the risk assessment in IA06 were radium-226 (and lead-210), thorium-230, uranium-234, uranium-238, total uranium, kerosene, and molybdenum for ecological risks.

In IA06 there is very little radioactivity above background levels. For the reasonable maximum exposure - the maximum exposure reasonably expected to occur in a population - radiological cancer risks are below acceptable risk levels for a maintenance worker, the current land use. Hypothetical land uses and users evaluated were recreational and residential users, industrial and maintenance workers, construction workers, and subsistence farmers. The risk summary table shown here presents the results of the cancer risk assessment. Uranium was also evaluated for its non-cancer, i.e., heavy metal, toxicity and found not to exceed health benchmarks.

Risk Summary Table

Receptor	Year	Average Background Baseline Risk	IA06 Baseline Risk
Surface Soil (0-2 feet below ground surface)			
Industrial worker	0	2E-05	3E-05
	1000	1E-05	1E-05
Maintenance worker	0	5E-05	5E-05
	1000	2E-05	3E-05
Recreational Adult	0	3E-06	3E-06
	1000	1E-06	2E-06
Recreational Adolescent	0	1E-06	1E-06
	1000	4E-07	6E-07
Total Soil (0-13 feet below ground surface)			
Residential Adult/Child	0	***1E-04***	***1E-04***
	185	***1E-04***	***1E-04***
	1000	6E-05	8E-05
Construction worker	0	2E-06	2E-06
	1000	9E-07	1E-06
Subsistence Farmer Adult	0	***4E-04***	***4E-04***
	185	***4E-04***	***6E-04***
	1000	***2E-04***	***2E-04***

Potential cancer risks that exceed the 1 in 10,000 (1E-04) upper bound of the acceptable risk range are bolded and italicized in the table. Of the hypothetical land uses evaluated, only subsistence farming and residential uses exceeded acceptable risk levels. However, potential risks posed to residents and subsistence farmers are equivalent to those risks posed by background levels of the same radionuclides with only one exception. The groundwater modeling tool built into the risk estimating program (different than the one discussed under *Groundwater Characterization*) predicts uranium concentrations in groundwater peaking 185 years from the present. At that time, potential risks to the subsistence farmer exceed background risks but at a level which could still be considered within the acceptable range. Guidance provided by the US EPA[‡] states that the 1 in 10,000 (1E-04) risk upper bound is not considered a discrete line and that a specific risk estimate around 1E-04 may be considered acceptable based on site conditions. Using groundwater in IA06 is unlikely due to the availability of a public drinking water source and proximity to a surface water source. Considering these site conditions (i.e. no groundwater use) potential risks are equivalent to background and within the acceptable risk range.

Risks from the reasonable maximum exposure were compared to those estimated for the central tendency exposure, which considers exposure values that are more representative of the average population. For example, the central tendency exposure assumes that a person will drink an average of 6 cups of water a day compared to over 10 cups for the reasonable maximum exposure. By calculating the central tendency exposure the Corps examined more typical risks posed by current site conditions in addition to the upper limit represented by the reasonable maximum exposure. For the subsistence farmer, risks were within the acceptable risk range for the entire evaluation period.

[‡] United States Environmental Protection Agency Office of Solid Waste and Emergency Response, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, 1991, OSWER Directive 9355.0-30.

The RESRAD model was developed to estimate potential risk from radioactive decay in soils. The groundwater modeling portion of RESRAD may overestimate risk from the groundwater pathway in IA06. As an example, in the RESRAD groundwater model, an impacted soil area 100 times larger than actual site conditions was used to leach uranium in to groundwater. Therefore, if SESOIL (a more sophisticated groundwater model which better represents actual site conditions) had been used in the risk model, potential risks for all land uses in the time period evaluated would fall within the acceptable range.

The human health risk assessment also evaluated non-cancer risk from chemicals including uranium as a heavy metal. Non-cancer risk is expressed as a “hazard index.” The hazard index incorporates a "threshold level" (a hazard index of 1) below which non-cancer health effects are not expected. The hazard index for a maintenance worker in IA06 was estimated to be 0.007, for a construction worker 0.05 and for a subsistence farmer 0.2. The hazard index for a teenager who might visit IA06 in the future for recreational purposes was estimated to be 0.005 These results show that there are no unacceptable non-cancer risks in IA06.

Screening Level Ecological Risk Assessment

An ecological site walkover indicated that IA06, located in a heavily industrialized area of Cleveland, has limited adequate habitat for small mammals, birds and other fauna. There are no sensitive habitats or threatened and endangered species on the site that warrant special consideration or protection. No ecosystem or habitat restoration is planned for the site. Nonetheless, a conservative screening level risk assessment was performed to evaluate the potential for adverse environmental effects to occur due to the presence of MED/AEC related radionuclides and chemicals on IA06. Lithium, molybdenum and kerosene potentially contribute to the overall risk to ecological receptors. However, lithium detections are equivalent to naturally occurring levels and molybdenum is only slightly above naturally occurring levels. Kerosene was above background levels (19 mg/kg) but the exposure point concentration calculated for IA06 (289 mg/kg) was well below background levels found in the industrialized vicinity of the Harshaw Site (2,070 mg/kg). The most significant contribution to ecological risk in IA06 was the possible risk posed to the robin from exposure to uranium. Exposure to naturally occurring levels of uranium was also estimated to have the potential to pose risks to the robin according to the conservative screening level ecological assessment. This indicates that the toxicity assumptions used for uranium likely over-estimated potential risks. Because uranium concentrations in IA06 are not much greater than background, actual risk for robins due to exposure to uranium is likely to be low. The screening level risk assessment concluded that ecological risk is negligible and no further action is warranted with respect towards ecological receptors in IA06.

Conclusions

The Corps has concluded, based on investigation findings, no further action is necessary in IA06. The baseline human health risk assessment shows that there is no unacceptable risk to current or reasonably anticipated future land uses. The Corps has worked with local community groups, such as the Ohio Canal Corridor, to discuss potential uses of this parcel and has concluded that IA06 is most likely to be developed as a recreational area. Under recreational land use, IA06 poses no unacceptable risk. Under a No Further Action alternative, no remedial action would be performed and no land-use controls would need to be implemented. This proposed action is consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and its implementing regulations.

Community Participation

This Proposed Plan for the Harshaw Site Investigative Area - 06 was prepared in accordance with the Comprehensive Environmental Response Compensation and Liability Act, 42 United States Code 9601 et seq., as amended. The Energy and Water Development Appropriations Act for Fiscal Year 2000, Public Law 106-60 Section 611, provides the Corps authority to conduct this work as the lead Federal Agency. This document fulfills the requirements of CERCLA Section 117(a) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) [40 CFR 300.343(f)(2)]. After evaluating all relevant information, the Corps has determined that No Further Action is required to be protective of human health and the environment pursuant to the criteria described in the NCP, 40 CFR 300.430(e)(9)(iii).

Public input is encouraged by the Corps and no final decision will be made regarding IA06 until all public comments are considered. The Corps invites members of the public to review the Proposed Plan and the supporting documents which further describe the conditions at IA06 and form the basis for this Proposed Plan. These documents may be found in the Administrative Record File for the Harshaw Site at the following locations:

US Army Corps of Engineers - Buffalo District
CERLCA Records Room (by appointment)
1776 Niagara Street
Buffalo, New York 14207
1.800.833.6390 (press "4" at the recorded message)

Cuyahoga Public Library, Brooklyn Branch
4480 Ridge Road
Brooklyn, Ohio 44144

These documents are also available on the web at:
www.lrb.usace.army.mil/fusrap/harshaw/#Documents

Members of the public who wish to submit comments may do so in writing to the Corps at the following address:

US Army Corps of Engineers – Buffalo District
Environmental Project Management Team
1776 Niagara Street
Buffalo, New York 14207

A tear off sheet is provided on the next page to assist you in providing your comments to us. Comments may also be submitted electronically by sending an email to *fusrap@usace.army.mil*. Please refer to this Proposed Plan for the Harshaw Site IA06 in any comments. Comments should be submitted electronically or postmarked no later than May 26, 2010 (30 days after the release of this Proposed Plan). After the close of the public comment period, the Corps will review and respond to public comments. A Record of Decision will be drafted based on input by the public and will document the Corps' final determination for IA06.

If there are any questions regarding the comment process or the Proposed Plan, please direct them to the address noted above or telephone 1.800.833.6390.

/S/
JOHN W. PEABODY
Major General, US Army
Division Engineer

Tear off sheet

Dear Harshaw FUSRAP Team,

I would like to provide you with the following comments on the IA06 Proposed Plan.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Submitted by:

Name: _____

Organization: _____

Address: _____

_____

_____

1st Fold here

Please
Affix
First
Class
Postage

US Army Corps of Engineers, Buffalo District
Environmental Project Management Team
1776 Niagara Street
Buffalo, NY 14207

2nd Fold here

Tape Closed Here