F U S R A P U P D A T E

The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Summer 2014

(314) 260-3905 www.mvs.usace.army.mil

St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Sites

Recent Remedial Action Construction Activities at the St. Louis Downtown Site

Remedial Action (RA) construction activities at the St. Louis Downtown Site are continuing at three locations. These include the Mallinckrodt property beneath the Building 101 footprint in Plant 6 WH, the City of St. Louis property east of the Mississippi River Flood Protection Levee, near the foot of Destrehan Street, and the Kiesel property located at the northeast corner of Hall and Branch Streets.

Excavation beneath Mallinckrodt's former Bulk Shipping Center (Building 101) footprint continues and approximately 34,000 cubic yards (cys) of soil, to an average depth of about 10 feet below ground surface, have been removed from the eastern portion of the area. This excavation required the removal of several abandoned concrete foundations from historical Manhattan Engineer District/Atomic Energy Commission buildings, significantly impacting excavation progress. The excavated volume includes layback volumes required for the deeper portions of the excavation. Backfill authorization for much of the eastern area has now been issued, and the backfilling of these approved portions is about 10 to 20% completed. After RA of the eastern portion of the building footprint is completed, the western portion of the excavation will begin. This will occur prior to the scheduled completion of the total building footprint area in the fourth quarter of 2015. A 500 foot rail spur extension is planned for the northern portion of this restored area. The spur will provide for additional gondola rail car storage for the adjacent Soil Storage and Loadout Facility.

Upcoming Events

Information Releases: Winter Newsletter - January 2015
This newsletter is issued twice a year.

Upcoming Meetings: Check http://www.mvs.usace.army.mil/Missions/CentersofExpertise/FormerlyUtilizedSitesRemedialActionProgram.aspx for updates.

City of St. Louis Property – St. Louis Downtown Site

Recent activities at the City Property east of the Levee have included the required excavation adjacent to the previously installed sheet pile wall at the toe of the levee. The purpose is to remove contaminated soil around the abandoned Metropolitan St. Louis Sewer District sewers. After a flood protection berm was re-established at the river bank, deep excavation proceeded to the required depth of about 35 feet. This required removal of about 18,000 bank cys of soil.

RA on the Kiesel Hall Street Property is nearing completion. Related contamination on adjacent City of St. Louis and Gunther Salt properties is also being removed. Additional excavation on the Gunther Salt property north of the Kiesel property to remove contaminated soil should be completed by the second quarter of 2014. A total of about 9,800 bank cys of contaminated soil, including about 3,600 bank cys of contaminated soil from adjacent City of St. Louis and Gunther Salt properties has been removed from this area to date.

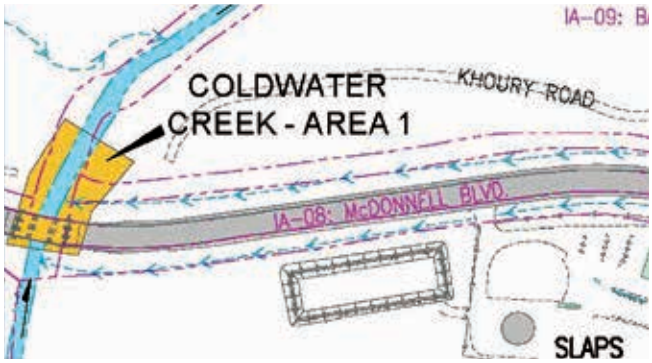
North County

Coldwater Creek Sampling

In North County, pre-design investigation (PDI) sampling is ongoing in several areas. The U.S. Army Corps of Engineers (USACE) continues to sample within the Coldwater Creek (CWC) corridor and the adjacent 10 year floodplain from Frost Avenue to the St. Denis Bridge. Sampling started in October 2013 and, to date, over 2000 samples have been collected. The USACE appreciates the cooperation of those property owners and the cities of Hazelwood and Florissant who have signed Rights-of-

Entry (ROE) to allow sampling to progress. Winter and spring weather conditions have at times made sampling soil and sediment too dangerous beneath the creek water line or on the steep creek banks; therefore, the majority of sampling progress has been made in areas outside of the creek banks and within the 10 year floodplain during this period of time.

The USACE completed sampling from McDonnell Boulevard to Frost Avenue and will begin remedial activities at the southernmost end of Area 1 at McDonnell Boulevard and move northward toward Frost Avenue. The remediation of Area 1 is projected to begin in September 2014 and is anticipated to take approximately four months. The PDI Report that contains the CWC sampling data from McDonnell Boulevard to Frost Avenue is on the Formerly Utilized Sites Remedial Action Program (FUSRAP) website.



Area 1 is where the USACE will begin remedial activities in CWC in the fall (starting at the McDonnell Boulevard Bridge)

North County Sampling Activities

The USACE has completed PDI sampling in several areas of North County so far this year. Sampling was completed on the properties adjacent to McDonnell Boulevard (Vicinity Properties {VPs} 1, 2, 7, 13, 14, 15, and IA-11); Byassee Road and adjacent properties. Banshee Road, and Latty Avenue were completed as well. The USACE began PDI sampling at the Pershall Road Property in May 2013. This PDI sampling effort, which includes approximately 300 sampling locations, is expected to be completed in September 2014. The USACE has slated PDI sampling to begin in October 2014 at the Frost Avenue Property, which includes the Frost Avenue roadway and portions of the Frost Avenue ROW property. This PDI sampling effort includes approximately 160 sample locations and is expected to take approximately eight weeks to complete once the work begins. Sampling is expected to begin at the eastern end of the Frost Avenue Property at the North Hanley Road intersection and progress westward toward the Eva Avenue intersection.

Latty Avenue Sampling

How does FUSRAP determine if remediation is necessary?

In 2005 the USACE signed the Record of Decision (ROD) for the North St. Louis County Sites. The ROD includes site descriptions and history as well as the planned response actions.

For the North St. Louis County Sites, the radionuclide contaminants of concern are radium (Ra)-226, thorium (Th)-230, and uranium (U)-238. The cleanup criteria or remediation goals (RGs) for the North St. Louis sites are: within the top six inches of soil, the RGs are 5 PicoCuries per gram (pCi/g), 14 pCi/g, and 50 pCi/g, respectively. In soil below six inches RGs are 15 pCi/g, 15 pCi/g, and 50 pCi/g, respectively. In sediment (i.e., under the water in CWC) the RGs are 15 pCi/g, 43 pCi/g, and 150 pCi/g, respectively.

The ROD stated that RA (i.e., cleanup) is needed when the amount of FUSRAP-related radioactive material in the soil exceeds background levels by more than the cleanup criteria cited in the ROD. The RGs in the ROD are specific to each of the principle FUSRAP radionuclides (Ra-226, Th-230, and U-238). The USACE determines if cleanup is required by sampling or characterizing individual properties.

If the assessment shows that the amount of radioactive materials in soil does not exceed the background level by more than the cleanup criteria, then cleanup is not needed and a Final Status Survey Report is written to provide the details of the assessment used to release the property.

If the assessment shows that the amount of radioactive materials in soil exceeds the background level by more than the cleanup criteria, then remediation is required.

The North County ROD uses an ARAR (applicable or relevant and appropriate requirements) (40 CFR 192, Subpart B) which requires that the surface and subsurface

standards for Ra-226 of 5 pCi/g and 15 pCi/g, respectively, be met as an average [over 100 square meters (m^2)]. Since Ra-226 is in the radioactive decay chain of both Th-230 and U-238, this requirement is applied by USACE for all three principle radionuclides. If the result of a sample is over the RG, then additional samples are collected at 100 m^2 surrounding that sample to determine the extent of contamination in that area. This is why the environmental data is evaluated (i.e., averaged) over 100 m^2 instead of at individual locations.

Also, since more than one cleanup criteria must be evaluated at the same time, a sum-of-ratios (SOR) approach is used with the individual cleanup criteria for each of the principle radionuclides to determine if cleanup is required. The SOR must also be applied over 100 m^2.

$$SOR_N^{depth \le 0.5ft} = \frac{Ra\text{-}226_N}{5\ pCi/g} + \frac{Th\text{-}230_N}{14\ pCi/g} + \frac{U\text{-}238_N}{50\ pCi/g}$$

$$SOR_N^{depth > 0.5ft} = \frac{Ra\text{-}226_N}{15\ pCi/g} + \frac{Th\text{-}230_N}{15\ pCi/g} + \frac{U\text{-}238_N}{50\ pCi/g}$$

In general, the following steps are utilized to evaluate the environmental data and assess if cleanup is required.

1. All the sample results are evaluated against the cleanup criteria as described above at each individual sample location.
2. If the SOR for each sample collected on the property is ≤ 1.0, then the cleanup criteria has been met over the entire land area and cleanup is not required.
3. In cases where an individual sample result has an SOR > 1.0, then the average SOR must be calculated over 100 m^2 to determine if the RG has been met at that location. In these cases, additional samples are typically collected within each of these 100 m^2 areas so that sufficient information is available to determine if cleanup is necessary.
4. If the average SOR at this 100 m^2 location is ≤ 1.0, then the RG has been met and cleanup is not required.
5. If the average SOR is > 1.0 at this 100 m^2 location, then the RG has not been met and cleanup is required.

Assessment Example

Environmental soil samples were collected on a property, analyzed at an analytical laboratory, and all individual sample results had SOR values < 1.0 except at one location. As a result, additional samples were collected within the 100 m^2 area surrounding that sample and the following assessment was conducted to determine if remedial action would be necessary at this 100 m^2 area.

Example of a Sample Situation:

Samples collected within the 100 m^2 area requiring additional evaluation: SVP68932, SVP109640, SVP109641, SVP114485, and SVP109643.

Table 1. 100 m² Area Sample Data Summary

Sample ID	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238	SOR_N
Background (Avg)	0.95	1.49	1.08	---
SVP68932	1.04	15.0	1.38	0.99
SVP109640	0.75	8.28	0.48	0.49
SVP109641	0.88	5.33	0.86	0.27
SVP114485	1.48	24.0	1.03	1.5
SVP109643	1.13	5.03	1.10	0.29

Table 2. Area-Weighted Average SOR_N

Station ID	Sample ID	Depth (ft)	SOR_N	Effective Surface Area (m^2)	Area Weighted Average SOR_N
SVP68392	SVP68392	0.0-0.5	0.99	20.0	0.71
SVP109640	SVP109640		0.49	20.0	
SVP109641	SVP109641		0.27	20.0	
SVP109642	SVP114485		**1.50**	20.0	
SVP109643	SVP109643		0.29	20.0	

Note: Bold font indicates the sample with SOR_N value greater than 1.0.

Since the area weighted average was < 1.0, the area does not require remediation.

Keeping in Touch

Mailing Lists - To receive newsletters and other printed communications, sign up for our mailing list any time.

Phone: (314) 260-3905
Mail: 8945 Latty Avenue, Berkeley, MO 63134
Fax: (314) 260-3941

Homepage - To reach our site, go to http://www.mvs.usace.army.mil/Missions/CentersofExpertise/FormerlyUtilizedSitesRemedialActionProgram.aspx

If you have any suggestions, questions, or comments, please contact us.

Educational Information

Q: How do you correlate real-time survey results to contaminant concentrations for a Superfund Site?

A: The U.S. Environmental Protection Agency (EPA) Superfund program has developed a new Counts per Minute (CPM) calculator to correlate real-time survey results. These are often expressed as CPMs to contaminant concentrations that are more typically provided in risk assessments or for cleanup levels that are usually expressed in pCi/g or pCi/m^2. Currently, there is no EPA guidance for Superfund sites on correlating CPM field survey readings back to risk, dose, or other ARARs-based concentrations. This calculator is a web-based model that estimates a gamma detector response for a given level of contamination. The intent of the calculator is to facilitate more real-time measurements within a Superfund response framework. The CPM calculator has two major sub-calculators based on the field survey scenario: (1) ground-based scanning of surface contamination and (2) ground-based scanning of volumetric contamination. Work on a third major sub-calculator, areal-based scanning of contamination, has not begun yet. When using the Volume calculator, there are six different options for source material – soil, concrete, plate glass, wood, steel, and drywall. The model for these sources is based on a uniformly contaminated cylindrical slab source of varying thickness. In addition to facilitating greater use of real-time measurement at Superfund sites, the CPM calculator may also standardize the process of converting laboratory data to real time measurements. It will thus lessen the amount of laboratory sampling that is needed for site characterization and confirmation surveys. However, it will not remove the need for sampling. The CPM calculator was developed as a stand-alone device, but, in the future, it will be incorporated into all of EPA's Superfund models for risk and dose assessment. (Stuart Walker OSRTI)

http://online.unitconverterpro.com/unit-conversion/radiation.html
http://hps.org/publicinformation/ate/q10433.html

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U.S. Army Corps of Engineers - St. Louis District
FUSRAP Project Office
8945 Latty Avenue
Berkeley, Missouri 63134