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

The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Winter 2016

(314) 331-8000 www.mvs.usace.army.mil

St. Louis Formerly Utilized Sites Remedial Action Program Activities

Coldwater Creek Floodplain Investigations

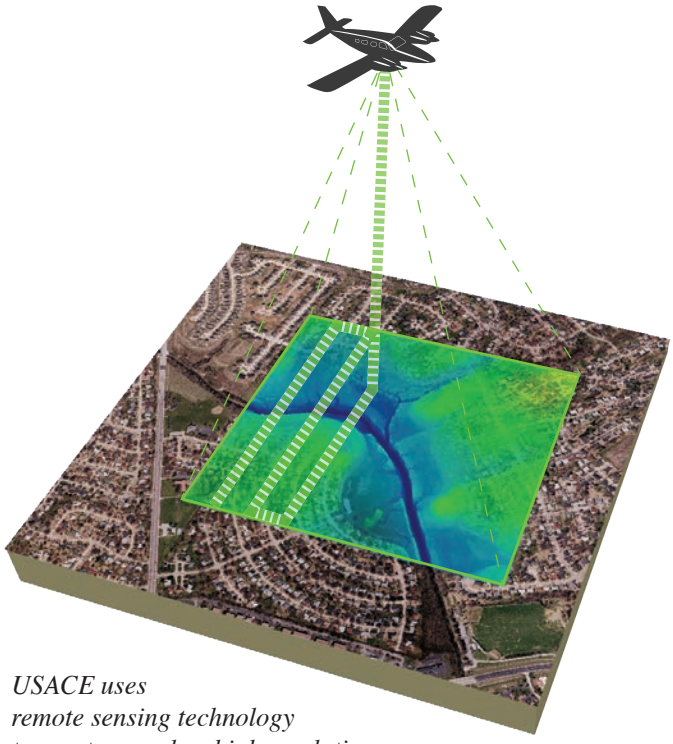
The U.S. Army Corps of Engineers (USACE) uses floodplain knowledge and geospatial mapping techniques to help guide Coldwater Creek (CWC) investigations. Investigations begin with map making and proceed with soil and sediment sampling and analysis.

Floodplains are low-lying areas along a river or stream and subject to flooding. Flood experts predict the frequency that a stream will reach a particular level. For example, a "10-year floodplain" represents an area with a 10 percent chance of flooding in any year. A 100-year floodplain represents an area with a 1 percent chance of flooding in any year.

USACE knew that floodplain maps would be valuable in planning investigations of CWC and its corridor. USACE evaluated floodplain maps from the Federal Emergency Management Agency and also used locally developed CWC data from Metropolitan St. Louis Sewer District and USACE studies. FUSRAP geographic information system (GIS) specialists used this data to estimate 10- and 25-year floodplain elevations.

In order to develop floodplain maps, USACE uses advanced technology tools to test, confirm, and modify their existing maps. For example, FUSRAP GIS specialists create three-dimensional models based on elevation data. Accurate topographic data of the CWC floodplain is collected by a remote sensing technology called Light Detection and Ranging (LIDAR).

LIDAR uses a laser beamed to a surface area that is reflected back to the LIDAR sensor. This technology uses a GPS (global positioning system) receiver to record three-dimensional data about the earth's surface. GIS specialists produce complex, high resolution maps called digital elevation models using LIDAR data. These models give USACE an understanding of the contour of CWC's floodplain and its surroundings.



USACE uses remote sensing technology to create complex, high resolution maps of Coldwater Creek.

Scientists reviewed existing laboratory results from hundreds of previously sampled locations along CWC and adjacent properties. They looked at the radiological findings of these sampling results and compared them to the floodplain maps. The analysis revealed that radiological contamination attributable to flooding did not appear to significantly extend beyond the 10-year floodplain. Therefore, the 10-year floodplain has since been used as the starting point for radiological investigations along CWC.

If investigation results in an area warrant, USACE will continue investigation beyond the 10-year floodplain until the limits of contamination are appropriately determined.

Upcoming Events

Information Releases: Summer Newsletter - 2016
This newsletter is issued twice a year.

Upcoming Meetings: St. Louis Oversight Committee Meeting, Wednesday, February 17, 2016, 6:00 - 8:30 p.m. at James J. Eagan Community Center, Florissant Civic Center Gym; 1 James J. Eagan Drive, Florissant

North St. Louis County Sites

Contamination Control to Protect the Public and Workers

Public health and worker safety are the highest priorities for USACE. During remediation activities at a work site, USACE implements specific measures to control radioactive contamination and protect members of the public and workers. As you may have already seen, remediation work areas are fenced off from passersby. USACE also takes measures to control any potential for radioactive materials to become airborne. Much care goes into controlling any activity in which contaminated materials could be transferred from a work site to other areas.

Work Area Isolation
When USACE prepares to initiate remediation, the work area is isolated from the public so no one wanders into contaminated or potentially contaminated areas. The restricted area is wider than the actual work area in order to ensure workers do not inadvertently enter or exit a potentially contaminated area without the proper personal protective clothing and screening. Fencing is generally used to create the restricted area barrier and to control unauthorized access. Appropriate warning signs, barricades, ropes, and additional fencing are then used to mark the contaminated areas within the restricted area. Workers put on and remove their protective clothing at a designated point called the "step-off" pad before leaving the restricted area. This is also the point where the workers will scan their hands, work shoes, etc., to ensure that they have not picked up any contamination that could spread to clean areas. The pads and protective clothing items are then disposed of with the contaminated material.

Prevention of Airborne Spread
The potential for radioactive materials to become airborne from the project site does exist, but this possibility is strictly controlled. USACE conducts air monitoring continuously during work hours when the potential to generate measurable airborne radioactivity is highest. These air-monitoring locations are chosen based on the excavation location, wind direction, and the activities to be performed. Dust is controlled by continuously spraying the soil with water. Keeping soil damp keeps dust emissions from becoming airborne. The height that soil is dropped from an excavator bucket into the bed of a dump truck can affect how much dust is created. To avoid dust dispersion, the height is minimized as much as possible.

Inside an access-restricted FUSRAP work site, a generator on the left powers an air sampling unit on the right.

USACE also uses geotextile fabric to cover piles of contaminated materials that may need to remain at the site. In addition, dump trucks used to transport contaminated materials from the project site are covered with a tarp before leaving the remediation area. These trucks also have sift-proof gates. The tarps and gates prevent contaminated materials or dust from escaping the truck bed and dispersing into the air.

Prevention of Transfer Spread
USACE also takes care to eliminate the spread of contaminated soil particulates during the transfer of the soil from the excavation site to the area where the contaminated materials are loaded into railcars for disposal shipment. Before the dump trucks leave the remediation area, their exteriors are visually inspected for the presence of soil, sediment, or debris. If any debris is detected, the dump trucks are decontaminated by brushing or wiping as necessary. In addition, the trucks undergo a radiological survey. If the survey results indicate any radiological

Keeping in Touch

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

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Homepage - To reach our site, go to http://bit.ly/FUSRAPstl

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

USACE samples soil along the creek bed of Coldwater Creek in order to detect contamination.

contamination, the truck is decontaminated before it is allowed to leave the remediation area.

The haul routes that trucks use to carry contaminated material from the project site to the loading site are also radiologically surveyed to ensure the transported material has not contaminated any part of the roadway. Any excavation equipment used to dig out the contaminated soil is decontaminated and surveyed before leaving the site.

Selection of Sampling Locations along Coldwater Creek

There are two types of sampling locations within CWC, systematic and biased. The systematic sample locations are determined using a grid. The grid is used for the entire 10-year floodplain adjacent to CWC, following the approved work plans. These samples are used to provide coverage of the entire area. The selection of the 10-year floodplain is a starting point and if contamination is found at the border of the floodplain, sampling will be expanded beyond the 10-year floodplain until the extent of the contamination is determined.

Biased sampling locations are selected based on the conceptual site model (CSM) for CWC. The CSM is used to define areas where contamination is more likely to accumulate or become trapped or covered. Biased sampling target areas are independent of systematic sampling. Identified by the CSM as places where contamination is likely, biased sampling targets include:

- Areas of known physical movement (hauling and historic grading)
- Topographical low-lying areas (current and historical)
- Depositional areas within CWC (where the creek bends, around structures, etc.)
- Mouths of tributaries (current and historical location)
- Where the channel may have been realigned or improved according to historical aerial photographs
- Properties where flooding has been identified.

At least 20 percent of the systematic samples are taken to a depth of 6 feet below ground surface. Locations of known fill material and areas where potentially contaminated materials may exist below 6 feet are sampled to greater depths. Biased locations, however, are sampled to a specified depth based on the rationale for the sample. For example, samples within historic tributaries will extend to the depth of the former channel.

Meeting Remediation Goals

Sampling results are compared to the appropriate Record of Decision (ROD) remediation goals. Samples that do not meet these goals are considered contaminated, and USACE conducts additional investigation. Further investigation includes defining the area – also called delineating or bounding an area – by collecting samples. Workers collect samples at a minimum of three locations evenly spaced around the area that exceeds the ROD remediation goals. The distance, depth, and amount of the bounding samples depend on each specific area. Sometimes several rounds of bounding sampling may occur depending on the extent of the contamination.

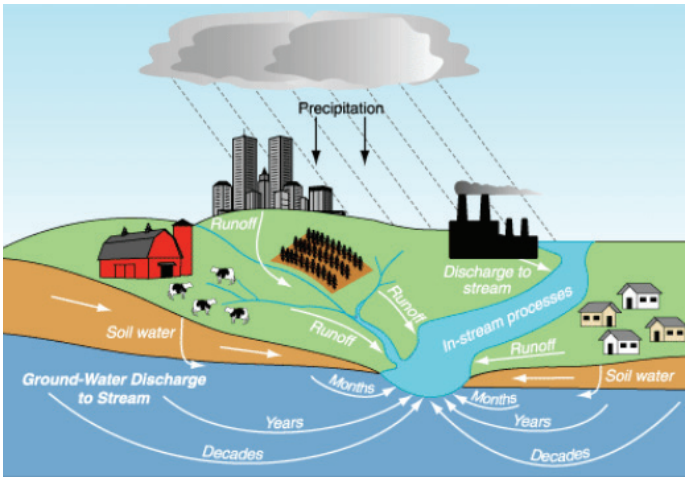
Workers collect sediment samples at Coldwater Creek.

Educational Information

Q: What is a conceptual site model?

A: A conceptual site model (CSM) is an illustration or a document with tables and illustrations that show the physical, chemical, and biological processes that impact an area. These are the processes that control the way contamination in soil, air, groundwater, surface water, and sediments move around. The CSM shows investigators where contamination is likely to be. It also shows how people or the environment might be affected. Because of weather and land use changes, these conditions change often so USACE reflects those changes in the CSM. Scientists use CSMs to identify site features, including those on the surface and below, to understand the extent of identified contamination.

USACE uses systematic sampling of soil and sediment in the Coldwater Creek 10-year floodplain in order to collect data for a complete CSM. After evaluating the CSM's "picture" of how materials move and collect in Coldwater Creek, USACE identifies sampling target areas. In addition to sampling these target areas, a systematic sampling grid is applied to the area to ensure suitable coverage.



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