APPENDIX G
FACT SHEETS ISSUED TO DATE

THIS PAGE INTENTIONALLY LEFT BLANK

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

RIGHT OF ENTRY

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Army Corps of Engineers (USACE) environmental program known as the Formerly Utilized Sites Remedial Action Program (FUSRAP).

These sites contain soils contaminated with uranium, thorium and radium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's early atomic program in the 1940s and 1950s.

Surface water (caused by rain or snow) and flooding events transported contaminated material from the St. Louis Airport Site (SLAPS), Latty Avenue Properties and haul roads into Coldwater Creek (CWC). Once contamination reached CWC, creek flow moved contaminated material downstream.

USACE first eliminated the sources of contamination at SLAPS and Latty. USACE continues to investigate and sample the CWC corridor (banks and sediment) and the adjacent properties within the creek's 10-year floodplain.

To learn more about FUSRAP, contact the FUSRAP Area Office at 314-260-3905 or, via email, at STLFUSRAP@usace.army.mil.

The U.S. Army Corps of Engineers (USACE) Formerly Utilized Sites Remedial Action Program (FUSRAP) and property owners have been successful partners in the cleanup of radiological contamination.

FUSRAP supports the St. Louis community through radioactive-soil remediation projects that protect human health and the environment. One critical activity is sampling the soil of properties within the 10-year floodplain of Coldwater Creek as well as the soil and sediment within the Coldwater Creek corridor to determine the location of radioactive contamination.

To enter onto private property, USACE needs the property owner's permission in writing. Testing cannot begin until the property owner signs a right of entry (ROE) and returns it to USACE. Properties along Coldwater Creek comprise an integrated system; the condition of one property may potentially impact the surrounding adjacent properties. From a community perspective, it is good to know the condition of all contiguous/adjacent properties.

All expenses are borne by the U.S. government.

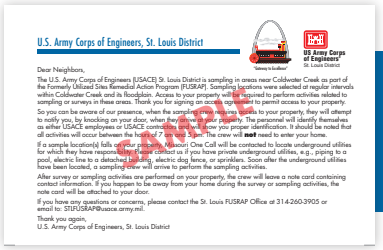
WHAT IS A RIGHT OF ENTRY?

An ROE gives permission for USACE to be on private property to take soil samples, scan for radioactive contamination and/or access other properties that require investigation. It also grants permission for cleaning up radiological contamination in soil. The terms of an ROE cannot be easily changed because they are set by government regulations.

WHEN WILL USACE SEEK A RIGHT OF ENTRY? HOW LONG DOES IT LAST?

Because of scheduling constraints and weather, the exact dates and times when sampling will occur cannot be set very far in advance of when the sampling will take place. Property owners will typically receive requests for an ROE several months in advance of the visit. USACE can receive a signed ROE (which does not have to be notarized) via U.S. mail or email.

Properties with signed ROEs are generally tested according to the pace of work required as the crews move downstream. Although FUSRAP activities at residential properties are usually measured in days, weeks or months, a typical ROE lasts for two years. USACE sometimes requests an extension if sampling, remediation and restoration cannot be accomplished during that period for reasons such as project scope or scheduling, weather or access.


U.S. Army Corps of Engineers, St. Louis District

Dear Neighbors,

The U.S. Army Corps of Engineers (USACE) St. Louis District is sampling in areas near Coldwater Creek as part of the Formerly Utilized Sites Remedial Action Program (FUSRAP). Sampling locations were selected at regular intervals within Coldwater Creek and its floodplain. Access to your property will be required to perform activities related to sampling or surveys in these areas. Thank you for signing an access agreement to permit access to your property.

So you can be aware of our presence, when the sampling crew arrives to your property, they will attempt to notify you, by knocking on your door, when they arrive at your property. The personnel will identify themselves as either USACE employees or USACE contractors and will show you proper identification. It should be noted that all activities will occur between the hours of 7 am and 5 pm. The crew will **not** need to enter your home.

If a sample location(s) falls on your property, Missouri One Call will be contacted to locate underground utilities for which they have responsibility. We will contact us if you have private underground utilities, e.g., piping to a pool, electric line to a detached building, electric dog fence, or sprinklers. Soon after the underground utilities have been located, a sampling crew will arrive to perform the sampling activities.

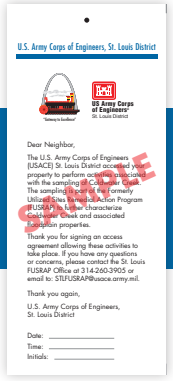
After survey or sampling activities are performed on your property, the crew will leave a note card containing contact information. If you happen to be away from your home during the survey or sampling activities, the note card will be attached to your door.

If you have any questions or concerns, please contact the St. Louis FUSRAP Office at 314-260-3905 or email to: STLFUSRAP@usace.army.mil.

Thank you again,
U.S. Army Corps of Engineers, St. Louis District

SAMPLE

Postcard Sent to Residents


U.S. Army Corps of Engineers, St. Louis District

Dear Neighbor,

The U.S. Army Corps of Engineers (USACE) St. Louis District accessed your property to perform activities associated with the sampling at Coldwater Creek. The sampling is part of the formerly Utilized Sites Remedial Action Program (FUSRAP) to further characterize Coldwater Creek and associated floodplain properties.

Thank you for signing an access agreement allowing these activities to take place. If you have any questions or concerns, please contact the St. Louis FUSRAP Office at 314-260-3905 or email to: STLFUSRAP@usace.army.mil.

Thank you again,
U.S. Army Corps of Engineers, St. Louis District

Date: _____
Time: _____
Initials: _____

SAMPLE

Information Tag Left for Residents

After a right of entry is signed, USACE will schedule a visit. Residential property owners will receive a postcard before the visit. When finished, the crew will leave a tag with the date and time of the visit on the front door.

WILL I BE NOTIFIED THAT USACE IS COMING? WHAT IF I'M NOT HOME?

At least two weeks before a crew arrives, property owners will receive a postcard letting them know of the upcoming visit. It is not possible to provide an exact date and time of the upcoming visit. When the crew arrives, they will knock on the owner's door to let them know the crew is there. If no one is home or if the owners are busy, the crew will proceed with their work. When finished, they will leave a tag on the door to let property owners know they were there. A phone number to call with questions or concerns is on the tag.

WHAT WORK WILL BE DONE ON MY LAND?

Work on private land will consist of collecting soil samples, performing a surface scan, walking through the property to access the Coldwater Creek corridor or a combination of these activities. The crew will mark the sampling area with small flags (if soil samples are needed). USACE will contact Missouri One Call to locate underground utilities.

The FUSRAP team will collect soil samples from the surface to 6 feet or deeper. They collect samples manually most of the time but sometimes must use a drill rig for deeper samples.

At the FUSRAP lab, scientists will analyze the soil samples. FUSRAP scientists will evaluate data from the analysis of the soil samples (if taken) and soil scanning (if required). USACE will send a letter to the landowner to report what is found.

If levels of contamination are at or above actionable levels, USACE will develop a plan on how to address it, talk to the owner about the plan and clean it up. Cleanup will be fully described first. After remediation, the crew will restore the area to its previous condition.

All FUSRAP sampling, testing, remediating (if needed) and restoring a property will be at the expense of the U.S. government.

WHAT IF I ELECT NOT TO SIGN A RIGHT OF ENTRY?

Signing the ROE enables USACE to proceed in a methodical fashion in fulfilling its mission to protect human health and the environment. The requirements for USACE to sample a property and to remediate contaminated soils do not go away if a property owner elects not to sign an ROE; the requirements simply get delayed.

Delays in sampling and remediation could have several impacts to the program and surrounding neighbors. Returning to sample and remediate out of sequence will result in higher costs to the taxpayer. Your neighbors, who may have already gone through the disruption of sampling and remediation, will once again be subject to those disruptions.

Contaminated soils tend to cross property lines, which means that sampling as well as possible remediation and restoration of neighboring properties could be delayed until all contiguous properties are accessible.

If you have special considerations before signing an ROE, such as dogs, health issues, etc., contact the FUSRAP realty specialist at 314-331-8167 to discuss those concerns.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

MARSSIM-BASED SAMPLING

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Department of Defense (DOD) Army Corps of Engineers (USACE) environmental program known as Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes four Missouri sites (SLDS, SLAPS, Latty, and SLAPS VPs). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's 1940s and 1950s atomic program.

USACE uses scientific knowledge and skilled investigators to identify places along Coldwater Creek that may need cleanup. The work requires deliberate sample site selection and then precise laboratory analysis in order to prioritize cleanup actions.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042

Four federal U.S. agencies (Department of Defense, Department of Energy, Environmental Protection Agency, and Nuclear Regulatory Commission) created a manual that provides detailed guidance on how to demonstrate that a site is in compliance with a radiation dose- or risk-based regulation. It is called the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). MARSSIM provides a standardized approach to test a radiologically contaminated site. USACE uses the MARSSIM approach to perform final status surveys to ensure that St. Louis FUSRAP cleanup goals are met.

USACE follows MARSSIM in the sampling campaign currently taking place on the SLAPS VPs, particularly Coldwater Creek. Engineers and scientists use all available resources to carry out the Radiation Survey and Site Investigation, which includes scoping, characterization, remedial action support, and final status surveys. While each type of survey is vital to meeting established goals, the scoping and characterization surveys are of particular interest to St. Louis FUSRAP because of the amount of time and efforts required to plan and execute this stage of the process.

Establishing a strategic sampling plan includes creating a gridded map that USACE uses to systematically evaluate an area of land. MARSSIM guidance helps to standardize this process by providing key points of emphasis to consider when classifying a particular area.

A full evaluation, however, requires that developers take additional factors into account in order to focus the biased sampling. USACE studies areas of concern and plans additional samples located specifically to evaluate areas with a higher contamination potential. Examples include low-lying areas adjacent to the creek and areas of high sediment deposition.

Consistent use of this process allows USACE to produce detailed plans that can be used for efficient collection of data. Some sampling efforts literally require collecting hundreds, even thousands, of samples in order to gain full knowledge about a particular area. This knowledge, coupled with a consistent approach to evaluating risk, provides sufficient information for USACE to make evaluations based on established goals. Currently, the MARSSIM-based approach is being used to perform sampling and other fieldwork. It is also being used during the strategic planning for the next phases of evaluation.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

ENVIRONMENTAL MONITORING PROGRAM

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Army Corps of Engineers (USACE) environmental program known as the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes the North County Sites and the St. Louis Downtown Site. These sites contain soils contaminated with uranium, thorium and radium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's 1940s and 1950s atomic program.

USACE uses scientific knowledge and skilled investigators to identify places at and near these sites that may need cleanup. The work requires deliberate sample site selection and then precise laboratory analysis in order to prioritize cleanup actions.

To learn more about FUSRAP, contact the FUSRAP Project Office at 314-260-3905 or, via email, at STLFUSRAP@usace.army.mil.

The U.S. Army Corps of Engineers (USACE) is responsible for the Environmental Monitoring Program (EMP) for the St. Louis Site, including St. Louis Downtown Site (SLDS) and North County (NORCO) Sites. The EMP includes year-round monitoring of various media including surface water and sediment in and along Coldwater Creek, groundwater, stormwater, excavation water and laboratory-discharge water. FUSRAP scientists follow plans, guidelines and regulations to collect samples to monitor site conditions.

The EMP follows the Environmental Monitoring Implementation Plan for each calendar year (EMICY). Separate EMICY documents are annually developed for SLDS and NORCO Sites. The objectives change every year based on the status of removal actions, changes in monitoring-well networks, regulatory concerns and prior-year contaminant trends. EMICY documents identify sampling locations, frequencies, parameters and criteria for evaluation of the resultant data. The activities outlined in the EMICYs demonstrate compliance with regulations and the requirements of state or local permits.

To conduct the monitoring described in the EMICYs, USACE samples various media at the SLDS and NORCO Sites and documents the findings in the annual Environmental Monitoring and Data Analysis Reports (EMDARs). The EMDARs provide the laboratory analytical results received during the previous year. The EMDARs include data and evaluation of indoor and outdoor air, stormwater, excavation-water, laboratory discharge, groundwater and Coldwater Creek sediment and surface-water monitoring. The EMDARs demonstrate compliance with the respective Record of Decision goals, requirements and permitted guidelines. The public can read EMICYs and EMDARs at https://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program.

COLDWATER CREEK SURFACE WATER AND SEDIMENT MONITORING AND SAMPLING

As part of the EMP, during the spring and fall of every year, USACE environmental scientists collect surface-water and sediment samples from eight stations along Coldwater Creek.

Surface water collected in Coldwater Creek shows that pollution-prevention methods used during remediation activities are working to prevent degradation of the creek.

Data collected from these stations show that remediation work is not negatively impacting surface-water quality and that pollution-prevention methods are working. The sampling stations are located along Coldwater Creek from McDonnell Boulevard near the airport to near Lindbergh Avenue (U.S. Highway 67). As remediation continues, USACE will evaluate new sampling stations from U.S. Highway 67 to the Missouri River. The data from this sampling are reported in the annual EMDAR for the NORCO Sites.

GROUNDWATER MONITORING AND SAMPLING

USACE environmental scientists maintain and monitor a network of 27 groundwater monitoring wells at the NORCO Sites and 13 groundwater monitoring wells at SLDS. They sample groundwater four times a year. Before sampling, the scientists inspect and measure water levels in all wells. Water-quality parameters, such as pH and turbidity, are collected prior to sampling each well. Representative water samples are then collected from the wells identified for sampling, and the water samples are carefully packaged and shipped to analytical laboratories for analysis of contaminants of concern. All of the data obtained from each quarterly event are reported in the annual EMDARs.

Groundwater monitoring wells are valuable for testing water quality and detecting contaminants of concern.

STORMWATER AND EXCAVATION WATER MONITORING AND SAMPLING

Stormwater and excavation-water monitoring is an integral component of the EMP. Excavation activities and stormwater resulting from removal actions at St. Louis Sites could result in discharges that are covered under various state and local discharge requirements. The purpose of this monitoring is to meet state and local requirements for discharges to various outfalls. The results of stormwater and excavation-water monitoring are reported in the annual EMDARs.

AIR QUALITY MONITORING AND SAMPLING

The FUSRAP air-quality sampling program is designed to provide surveillance of public exposure routes, verify compliance with air-quality regulations and quantify the potential release of radioactive materials to the atmosphere. Air quality is monitored near remedial-action areas at the SLDS and the NORCO Sites. In addition, USACE air- quality scientists collect air samples from an established background air quality monitoring station. Background samples are collected to obtain baseline air-quality comparison data.

A USACE scientist monitors air quality. Results from such tests show that remediation is not negatively impacting the environment.

Air-quality monitoring is also conducted near any contaminated soil load-out area to monitor potential airborne radiation in areas that represent the maximum-potential public radiation exposure. USACE scientists also monitor air quality for particulates and both outdoor and indoor (at some locations) air for radon. Particulate air samples are collected using calibrated air pumps. Indoor air quality is monitored for radon at two locations at SLDS and at 10 locations at the North County Sites. All of the data and results are documented in the annual EMDAR and National Emission Standards for Hazardous Air Pollutants reports (included in the EMDAR as an appendix).

WHAT THIS MEANS TO YOU

By following the EMP, USACE ensures that work is conducted in compliance with applicable public protection standards and regulations. The resulting data are then used to verify and document that the public and environment are not adversely affected by FUSRAP actions. All of the EMP data and results are annually reported in the EMDARs, which can be reviewed at https://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program or at https://go.usa.gov/xwjzB.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

RISK ASSESSMENT

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup called the Formerly Utilized Sites Remedial Action Program (FUSRAP) for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

A risk assessment is a method used to quantify threats to human health and the environment. By examining the potential adverse effects caused by a hazardous substance, the risk assessment can help decide what needs to be cleaned up, where, and to what level. Risk assessments help determine the most effective way to clean up a site while reducing the overall risk to human health and the environment. The investigation of Coldwater Creek is an example of how a risk assessment works.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042.

WHAT IS A RISK ASSESSMENT?

A risk assessment is a method used to quantify threats to human health and the environment. It is performed during the Remedial Investigation/Feasibility Study process required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). By examining the potential adverse effects caused by a radioactive or hazardous chemical substance, the risk assessment can help decide what needs to be cleaned up, where, and to what level.

HOW ARE RISK ASSESSMENTS PERFORMED?

Risk assessments are made up of two parts: a human health risk assessment and an ecological risk assessment. Together, they help determine the most effective way to clean up a site while reducing the overall risk to human health and the environment.

HUMAN HEALTH RISK ASSESSMENT

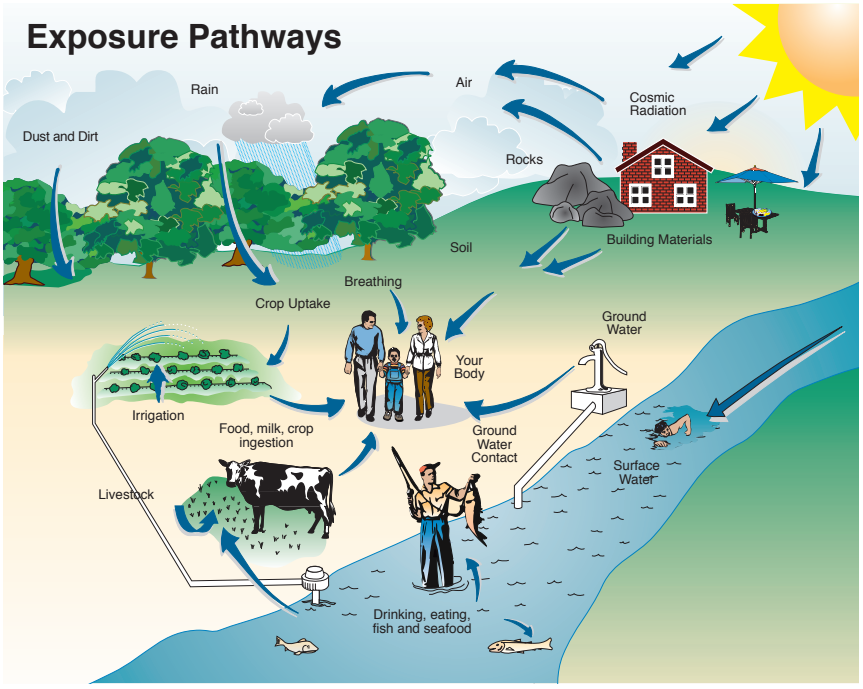
The human health risk assessment determines the risk posed by radioactive or chemical contaminants to people who live, work or play at or near the site. This assessment has four main steps:

- Data collection/evaluation - determines what contaminants are present at a site, where they are present, what levels they are present in, and whether or not the contaminants are moving off the site.
- Exposure assessment - calculates ways people might be exposed to the contaminants identified at the site. People may be exposed by breathing, touching, or consuming contaminated air, water, soil, or food in what we call "pathways." The estimates take into account how long, how often, and how many ways people could be exposed to site contaminants.
- Toxicity assessment - evaluates the health effects that exposure to site contaminants could cause. It includes an assessment of the increased risk of cancer and other effects (such as rashes, eye irritation, breathing difficulties, or organ damage).
- Risk characterization - combines the results of the three steps above to identify the critical risks posed by the site and determine whether they are great enough to cause health problems for people at or near a site.

ECOLOGICAL RISK ASSESSMENT

The ecological risk assessment focuses on the effects that site contamination has or could have on plants and wildlife. This assessment has five main steps:

- Problem Formulation - identifies specific chemicals, animal, and plant species at a site, measures chemical levels present, and whether or not chemicals are moving off the site.
- Analyses - calculates how animals and plants might be exposed to site contaminants, at what levels, and over how many years this exposure might reasonably be expected to occur. Exposures are calculated for groups of animals like birds, mammals, and fish and plants like grasses, trees, and aquatic plants.



Risk is calculated based on how much of a contaminant affects a person's body (called "exposure") and how dangerous a contaminant is to humans. An exposure pathway is the way in which a person may come in contact with a material.

- Toxicity Assessment - requires literature reviews, field studies, and toxicity tests to identify what the health effects of the various contaminants would be on each animal and plant groups.
- Risk Characterization - determines the most critical ecological site risks and whether they are great enough to cause health problems for animals or plants at/near a site. If this step identifies potential unacceptable risks to plants and/or animals, then remedial action is necessary. A Feasibility Study is then performed to identify and evaluate remedial alternatives to reduce these risks.
- Data Acquisition - includes a number of activities performed throughout the ecological risk assessment process. Activities may include identification of threatened or endangered species/habitats, analyses of wildlife impacts, monitoring abundance of species within the area, and others.

CHEMICAL AND RADIOLOGICAL INVESTIGATIONS

In the process of organizing and analyzing information for both the human health and ecological assessments, USACE takes further measures to fully understand any radiological or chemical impact. Both radiological and chemical assessments consider similar exposure scenarios and pathways, determine exposure point concentrations, and provide estimates of risks to humans and the environment. Radiological assessments, however, evaluate the maximum risk over a 1,000 year period because some radionuclides have long half-lives.

In addition to the pathways evaluated in chemical risk assessments, radiological assessments evaluate the external direct exposure pathway. External exposure occurs when someone is close enough to a radioactive material to be affected by alpha, beta, or gamma emitting radionuclides. Depending on the pathway, radionuclides could release energy directly to different types of tissue, possibly causing DNA and other cell damage.

USACE uses risk assessments to provide consistent and credible ways to prioritize clean up actions. Risk assessments provide a basis for communicating risks to the public and for protecting all stakeholders.

HOW IS RADIOLOGICAL RISK MEASURED?

A cancer risk is the probability of an individual developing cancer over a lifetime as a result of exposure to a contaminant that can cause cancer. Under the Comprehensive Environmental Restoration, Compensation, and Liability Act (CERCLA), the U.S. Environmental Protection Agency established an acceptable risk range as risk falling somewhere below or between the minimum risk of 1 additional cancer occurring in a population of 1 million people and a maximum risk of 1 additional cancer occurring in a population of 10,000. Because risk is calculated as a probability, a finding of a cancer risk does not necessarily mean that someone will actually get cancer. USACE follows these guidelines for determining what and when cleanup actions are required.

WHY ARE RADIOLOGICAL RISKS ESTIMATED FOR CHILDREN?

In order to estimate radiological risks that show the greatest caution, scientists sometimes assume receptors are children. Children have behaviors, like putting fingers or toys in their mouths when playing, that put them at higher risk for exposure. Scientists calculate a child's risk with that normal behavior in mind.

The estimated dose from contact with Coldwater Creek assumes that a child will:

- Spend 52 hours of time in the creek in a year
- Drink 14 gallons of creek water in a year
- Swallow 1.3 grams (about 1/4 teaspoon) of creek sediment in a year

Even with that much contact in mind, the information from the samples allows scientists to estimate radiological risk for a child who plays in Coldwater Creek to be at the low-end of the U.S. EPA's acceptable risk range. This means that the probability of developing cancer is extremely low.

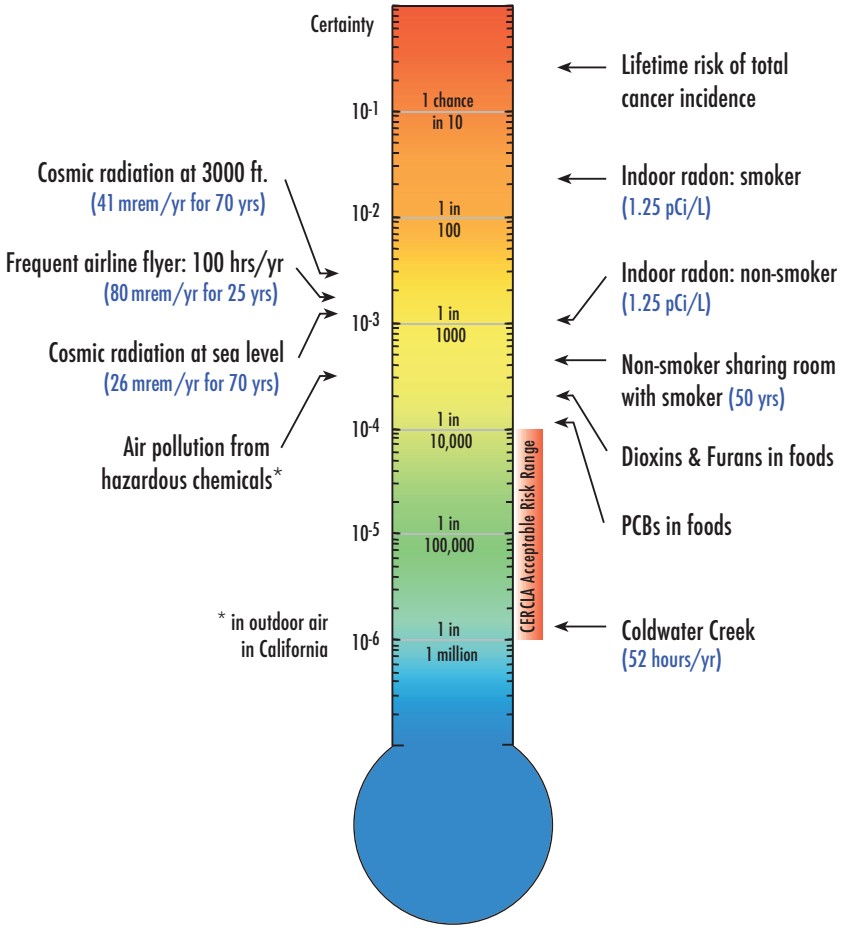
HOW LOW IS LOW?

A comparison of the levels of radiological risk is helpful to answer that question. Using monitoring data collected since 2000, scientists estimate that anyone who visits Coldwater Creek 26 times a year for 2 hours per visit has radiological risk that is much lower than the risk associated with other types of exposures (for example, smoking, cosmic radiation from the sun, and air pollution).

WHERE CAN I FIND MORE DETAIL?

Reports on dose assessments, including one for Coldwater Creek, dating back to the year 2000, are available on the USACE website, www.mvs.usace. army.mil/. Search for Environmental Monitoring Data and Analysis Reports.

Lifetime Risk of Cancer Incidence



US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

RISK RANGE

"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

The CERCLA acceptable risk range is defined as the risk of one additional cancer in 10,000 to one additional cancer in 1,000,000 (or in scientific notation 10^{-4} to 10^{-6}). The risk range is used in the CERCLA process in three instances: the baseline risk assessment during the Remedial Investigation, development of remedial goals in the Feasibility Study, and in the documentation of protectiveness of the final site conditions during the Site Closeout.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042.

WHAT IS THE "ACCEPTABLE RISK RANGE" AND WHY IS IT USED?

Under the Comprehensive Environmental Restoration, Compensation, and Liability Action (CERCLA), the acceptable risk range is defined as risk falling somewhere between 1 additional cancer in 10,000 and 1 additional cancer in 1,000,000. It is used in three instances: the baseline risk assessment during the Remedial Investigation, development of remedial goals in the Feasibility Study, and in the documentation of protectiveness of the final site conditions during the Site Closeout. The risk assessment is used to quantify threats posed by a hazardous substance to human health and the environment. The results of the risk assessment are used to establish the basis for taking a remedial action and aid in the development of cleanup alternatives during the Feasibility Study. The condition of the site after cleanup is documented in the Post Remedial Action Report (PRAR), which ultimately becomes part of the final Site Closeout Report.

RISK RANGE IN THE RISK ASSESSMENT

Whether or not a risk is unacceptable is based on a comparison of the total current (and/or future) risks to the acceptable risk range. The acceptable risk range is defined as risk falling somewhere between 1 additional cancer in 10,000 and one additional cancer in 1,000,000. This range is commonly expressed as 10^{-4} to 10^{-6}. When the risk assessment indicates the total risk to an individual exceeds the 10^{-4} end of the risk range, action is generally warranted at the site. For sites where the total site risk to an individual, based on the reasonable maximum exposure or RME for both current and future land use, is less than 10^{-4} (the upper bound of the CERCLA risk range) action generally is not warranted unless there are non-cancer health effects or negative ecological effects that warrant action.

RISK RANGE IN THE FEASIBILITY STUDY

Once a decision has been made to take action, a Feasibility Study is conducted. As part of the Feasibility Study, cleanup levels (or remediation goals) are developed for the site. The first step in developing cleanup levels is to determine whether acceptable or reasonable and appropriate requirements (or ARARs) exist for the site. As a side note, ARARs at their simplest level refer to legal requirements for the cleanup of the site.

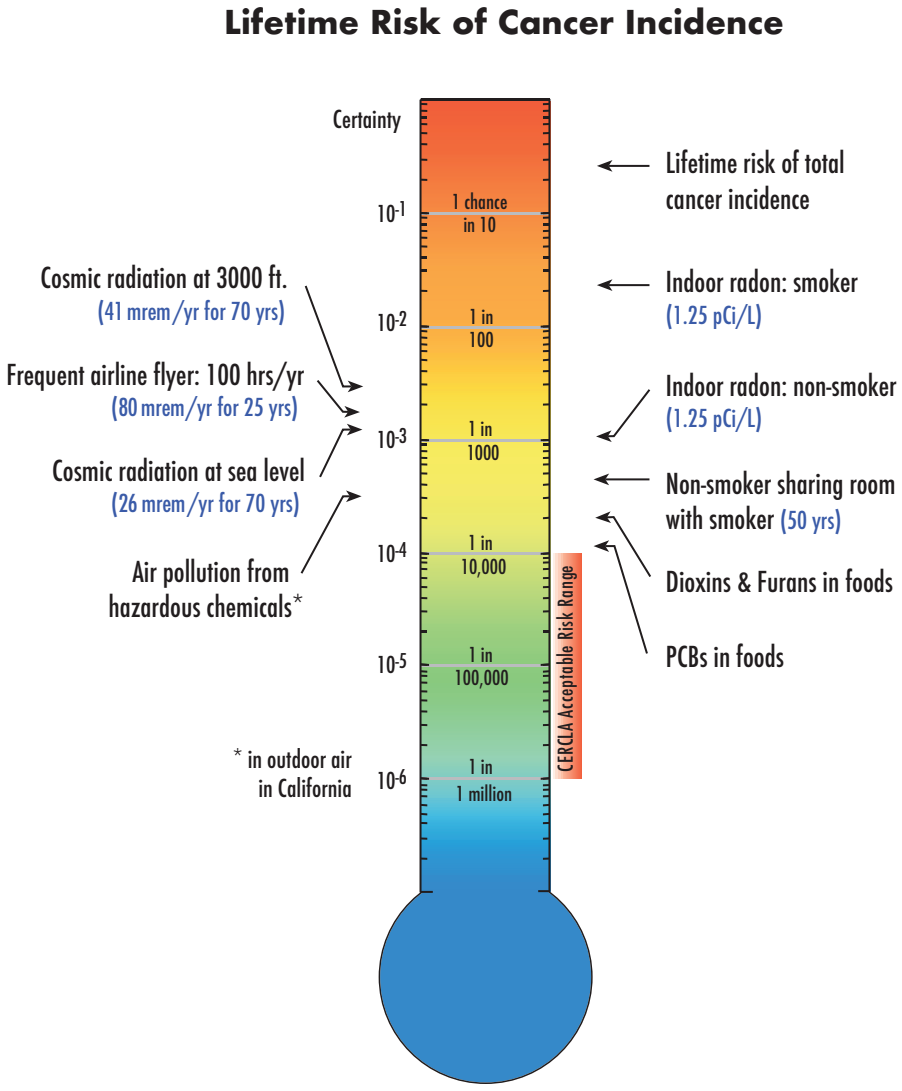
If an ARAR for a specific hazardous substance defines an acceptable level of exposure, compliance with the level in the ARAR will generally be considered protective even if it is outside the risk range. However, if there is the potential for exposure to multiple hazardous substances or pathways of exposure, and the individual ARAR levels for the substances or pathways add up to more than 10^{-4}, then compliance with the levels in the ARARs may not be protective.

The risk range is used to determine the cleanup level when an ARAR level is determined not to be protective. A risk of 10^{-6} is used as the starting point for determining the most appropriate cleanup level for the hazardous substance and is referred to as the "Preliminary Remediation Goal" or PRG. The final cleanup level (or remedial goal) could ultimately be anywhere within the acceptable risk range of 10^{-4} to 10^{-6}, but must have a CERCLA basis to move off the PRG. The final remedial goal is based on the consideration of site-specific exposure factors (which include pathways of exposure, exposure to sensitive persons such as pregnant women), technical factors (such as detection limits, background levels), and uncertainty factors (for example reliability of data, weight of scientific evidence regarding health effects).

The risk range is also used to determine cleanup levels when there are no ARARs to use as cleanup levels. As is done for ARAR levels that are not protective, a risk level of 10^{-6} is used as the starting point for determining the most appropriate cleanup level for a hazardous substance(s) at a site for which ARARs are not available. The final cleanup level without an available ARAR could be anywhere within the acceptable risk range of 10^{-4} to 10^{-6}. The final cleanup level is based on the consideration of the same site-specific exposure factors, technical factors, and uncertainty factors identified above.

RISK RANGE IN THE SITE CLOSEOUT

A residual site risk assessment is performed upon completion of remediation for each portion of the site. The risk of contaminants remaining on site is determined through this assessment and is documented in the Post Remedial Action Report and the Site Closeout Report. (These reports document the protectiveness of the overall site and of specific portions of the site.)



US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

CLEANUP

"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

There are basic actions required to carry out a cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): sampling, remedy design, implementation, release, and ultimately final closeout. This fact sheet explains each of these actions and its purpose in the process.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042.

While specific cleanup activities vary depending upon the final remedy selected, the basic process required to carry out a cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is similar. Unless the "no further action" remedy is selected for a site, the cleanup process typically includes sampling (or Pre-Design Investigation), design (or Remedial Design), implementation (or Remedial Action), release (or Post Remedial Action Report), and ultimately final closeout/five year reviews. Many of the actions described herein are typical of cleanup activities for the cleanup of the St. Louis FUSRAP Sites under CERCLA. Let's look at each of these in turn.

SAMPLING (PRE-DESIGN INVESTIGATION)

The cleanup process begins with sampling (referred to as the Pre-Design Investigation) to identify the potential problem areas. The Corps collects data, conducts interviews and researches the historical use of the site to identify these areas. Potentially impacted areas could be the result of material storage, waste processing activities, or migration via wind or storm-water runoff.

A radiological walkover, using an instrument that detects radioactivity, is then conducted. A technician scans the site to determine whether areas of elevated radiological activity exist. Based on the results from the walkover, soil samples are collected to define the concentration and limits of contamination within any elevated areas located during the walkover. Systematic samples are collected to document concentrations within portions of the area that do not have elevated levels of contamination. The results of these activities are documented in the Preliminary Design Investigation Report.

DESIGN (REMEDIAL DESIGN)

Based on the Pre-Design Investigation Report, the remedial design develops the engineering approach and procedures required to safely carry out the selected remedy presented in the Record of Decision. Draft copies of the remedial design are provided to the Environmental Protection Agency (EPA) and Missouri Department of Natural Resources (MDNR) for review and comment. Once their comments have been addressed, the document is finalized and cleanup work can begin.

IMPLEMENTATION (REMEDIAL ACTION)

The remedial action implements the remedial design. The final remedy carried out at the site (for example capping, on-site disposal cell,

treatment, or partial/complete excavation) is the one identified in the Record of Decision. Because each of these remedies may include excavation either as the remedy or a component of the remedy, this section will discuss the requirements of excavation as an example of how a remedial action is carried out.

The actual removal or excavation is composed of two parts: gross excavation and guided or "precision" excavation. Gross excavation uses a bulldozer or excavator to remove large volumes of contaminated soil to a predetermined depth. A radiation technician then walks over the hole with radiological detection equipment to identify hot spots (or isolated areas where contaminated soils remain). Any hotspots are marked and excavated. This is referred to as "guided excavation" since limited portions of the work area require excavation to a deeper elevation to achieve the selected remedy. Precision excavation minimizes the potential for cross-contamination of clean areas.

RELEASE (POST REMEDIAL ACTION REPORT)

To ensure the site meets remediation goals established in the Record of Decision, a final status survey is performed. Continuing the example provided in the previous section, let's look at how an excavated site is released. (Note, however, that other activities might be required to evaluate the success of other remedies.) After the site contractor believes the remedial goals have been achieved, the Corps sends an independent contractor to the site to conduct a radiological walkover and collect samples to verify that the remediation goals have been achieved. The Corps reviews the sample data to determine whether the area meets the Record of Decision goals and can be backfilled with clean material, or additional soil removal is necessary.

The effectiveness of the cleanup, and compliance with the Record of Decision are documented in the Post Remedial Action Report (or PRAR). Further, the PRAR also documents the condition of the site after the cleanup, and whether any restrictions for future land use (such as deed restrictions, or restrictions on the installation of wells) are necessary. Copies of the draft report are given to the property owner, the EPA , and the MDNR for review and comment prior to being issued in final form. The PRAR should be maintained with property information in a secure location since this information is useful should the landowner decide to sell the property, make property improvements or undertake actions that disturb the ground surface, such as grading.

CLOSE OUT / 5-YEAR REVIEWS

It should be noted that while these activities (that is sampling, remedy design, and implementation) occur in a step-by-step process in each area, they may occur simultaneously in various portions of the site. The close out process is the only activity that must wait until all the areas comprising a site have been cleaned up. Due to the size and complexity of some sites, along with budget constraints, it becomes necessary to split the site into manageable areas. The cleanup status of each area will be defined in a PRAR. Once the all of the areas comprising the site meet the remedial goals set in the Record of Decision, the site can be closed out. The PRARs are then compiled into a single document called a Final Closeout Report. If a property meets the "unrestricted use and unlimited exposure" requirement, no further action is necessary. If a property does not meet this scenario (that is, contaminants remain above levels that allow for unlimited use and unrestricted exposure), 5-year reviews are required to determine whether the remedy identified in the Record of Decision is still protective of human health and the environment.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

WHAT IS FUSRAP?

"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

The FY 1998 Energy and Water Appropriations Bill , in which Congress transferred management of the Formerly Utilized Sites Remedial Action Program (FUSRAP) to the U.S. Army Corps of Engineers (USACE), was signed into law on October 13, 1997. Prior to the signing of this bill, FUSRAP had been managed by the U.S. Department of Energy.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042.

The Formerly Utilized Sites Remedial Action Program (FUSRAP) is an environmental remediation program. It addresses radiological contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) during development of the atomic weapons in the 1940s and 50s.

BACKGROUND

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium and radium from ore at the St. Louis Downtown Site (SLDS) in downtown St. Louis, Missouri. During this time and until 1967, radioactive process byproducts were stored at an area adjacent to the Lambert-St. Louis Airport, which is now referred to as the St. Louis Airport Site (SLAPS).

In 1966, the SLAPS wastes were purchased, moved, and stored at Latty Avenue. Part of this property later became known as the Hazelwood Interim Storage Site (HISS). During this move, handling and transportation of the contamination spread the materials along haul routes and to adjacent vicinity properties forming the St. Louis Airport Site Vicinity Properties (SLAPS VPs).

During the late 1950s and early 1960s, Dow Chemical Company in Madison, Illinois operated as a uranium extrusion and rod-straightening facility. Contamination is now in dust located on roof beams at the Madison Site.

HOW HAZARDOUS ARE FUSRAP SITES?

Even though FUSRAP sites contain levels of radioactivity above current guidelines, none of the sites pose an immediate health risk to the public or environment given current land uses. The contaminated materials have very low concentrations and people are not exposed to them for long periods of time.

Although these materials do not pose an immediate hazard, they will remain radioactive for thousands of years, and health risks could increase if the use of the land were to change. Under FUSRAP, each site is cleaned to levels acceptable for the projected future use of the land such as residential development, industrial operations, or recreational use.

What Are FUSRAP's Objectives?

The objectives of FUSRAP are to:

- Protect human health and the environment.
- Execute the approved alternative for cleaning up radioactive contamination above health-based cleanup guidelines.
- Minimize adverse effects on area business operations.

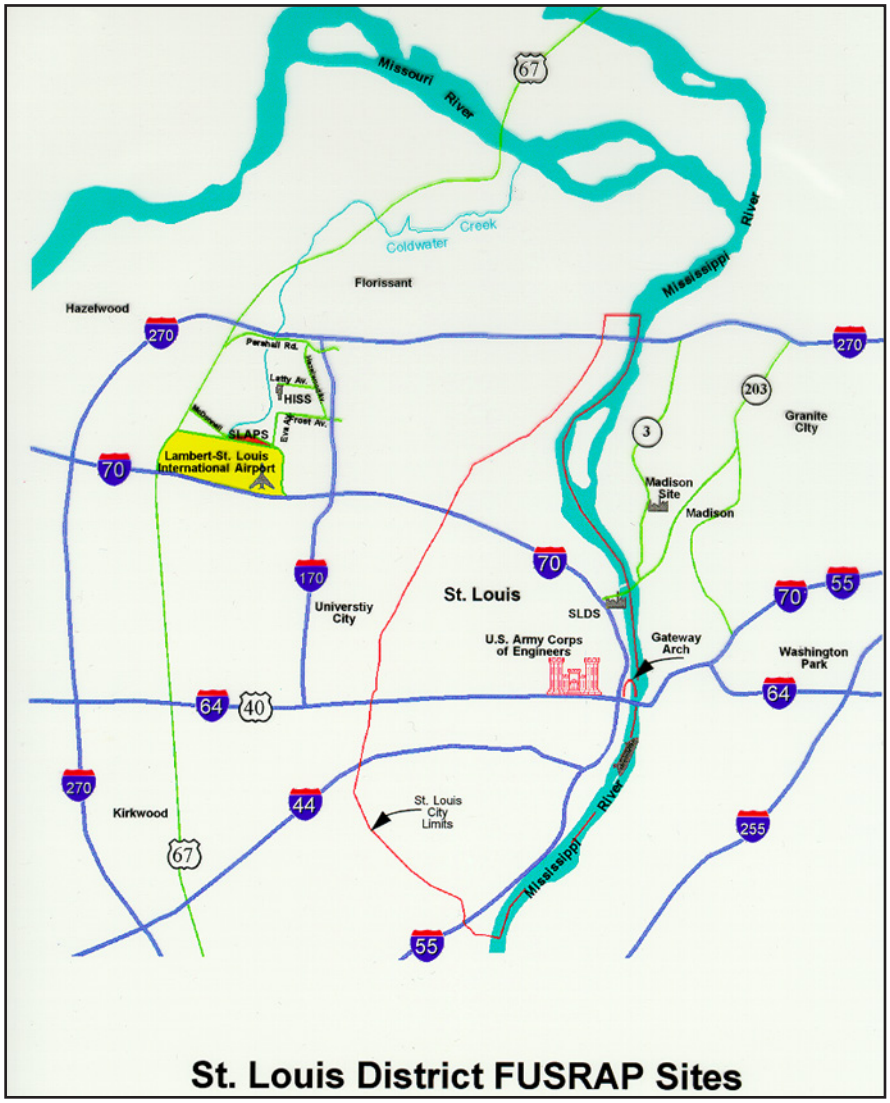
HOW DOES FUSRAP WORK?

FUSRAP sites undergo several steps that lead to cleanup. Information about the site is collected and reviewed. A Remedial Investigation/Feasibility Study (RI/FS) is conducted to develop cleanup alternatives. The Remedial Investigation identifies the type and location of the contamination. The Feasibility Study develops and evaluates cleanup alternatives.

The public is informed about the development of the RI/FS cleanup alternatives through public meetings and the media. Public participation is especially encouraged during the selection of the final remediation, or cleanup, method.

When a cleanup alternative is chosen, a Proposed Plan (PP) is written to explain why it was chosen. Members of the public are asked to comment on all the cleanup options, including the selected alternative. After public comments have been considered, a final decision is made and documented in a Record of Decision (ROD). The Remedial Design follows the ROD and includes technical drawings and specifications that show how the cleanup will be conducted.

Cleanup, or Remedial Action, begins after the Remedial Design is complete. This phase involves site preparation and construction activities. When these remediation activities are completed, verification surveys are conducted to ensure that cleanup objectives for the site have been met and are documented in a Post Remedial Action Report (PRAR).



St. Louis District FUSRAP Sites

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

RADON BASICS

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup called the Formerly Utilized Sites Remedial Action Program (FUSRAP) for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's early atomic program in the 1940s and 50s.

Radon is a radioactive gas that constantly filters up from soil and rocks around the world. Depending on your location, the ground under you releases differing amounts of radon all the time. Outdoors, radon does not become hazardous because it mixes with air. But when radon enters a building, it can concentrate in basements and lower levels. Only the soil about 1-foot under or around a building affects its radon levels. Radon can be found in homes, offices, and schools. But you and your family are most likely to get your greatest exposure at home, where you spend the most time.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042.

USACE shares the St. Louis community's concerns about radon. USACE has tested indoor and outdoor radon concentrations in ongoing air quality monitoring at the FUSRAP sites for the past 15 years. Experts from other federal agencies, such as the U.S. Environmental Protection Agency (EPA) also test radon here and around the United States.

RADON IS A RADIOACTIVE GAS

Radon is a radioactive gas that constantly filters up from soil and rocks around the world. Depending on your location, the ground under you releases differing amounts of radon all the time. Outdoors, radon does not become hazardous because it mixes with air. But when radon enters a building, it can concentrate in basements and lower levels. Only the soil about 1-foot under or around a building affects its radon levels. Radon can be found in homes, offices, and schools. But you and your family are most likely to get your greatest exposure at home, where you spend the most time.

RADON HAS POTENTIAL HEALTH EFFECTS

Some radon in indoor and outdoor air is unavoidable. The risk of health problems increases where high radon levels are trapped in homes. Radon cannot be seen or tasted or smelled. But we can detect it scientifically. Radon and its potential health effects have been studied extensively. Scientists estimate your health risks are based on the concentrations you receive. High concentrations of radon may increase your risk of developing lung cancer. Smoking in conjunction with or without radon exposure greatly increases the risk of cancer.

Radon gas filters up from soil and rocks everywhere. Only soil about 1-foot under or around a building affects its radon levels

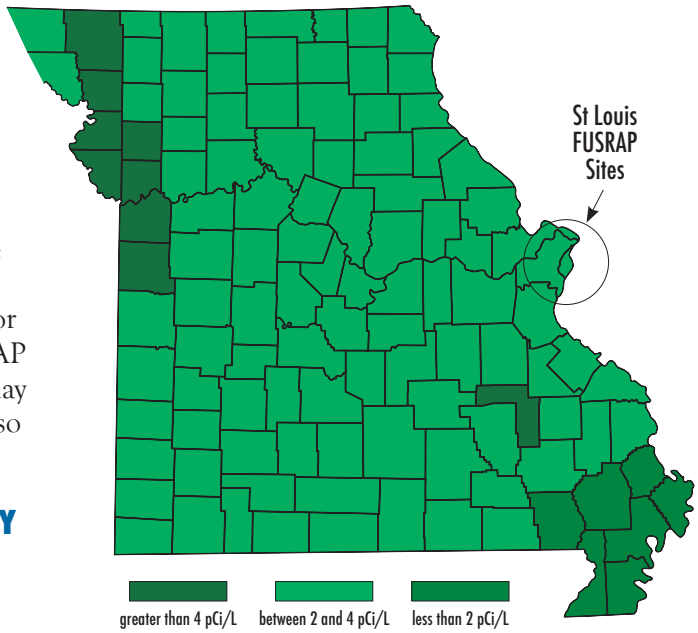
RADON IS RELEASED AT ST. LOUIS FUSRAP SITES

Radioactive elements are not stable. They change constantly and release energy in a process we call radioactive decay. Uranium -238, common in soil everywhere, decays into uranium-234 and then to thorium-230 and radium-226. Radium-226 is also not stable, and it decays to radon-222.

Radon-222 decays to other elements and eventually to lead, which is stable.

The measurement of time that it takes for radioactive elements to decay to half of their original amount is called a half-life. The speed of this change is random and different for each element. Radium-226 has a 1,600 year half-life. Radon-222 has a 3.8 day half-life. In the 1940s, the Manhattan Engineer District/Atomic Energy Commission shipped mined uranium ore to the St. Louis Downtown Site. They separated uranium and radium from the ore and shipped both to other states for processing. Scientists who have studied St Louis FUSRAP Sites agree that the uranium and radium at the sites today are at or near background levels. Radon is, therefore, also found to be at or near background levels.

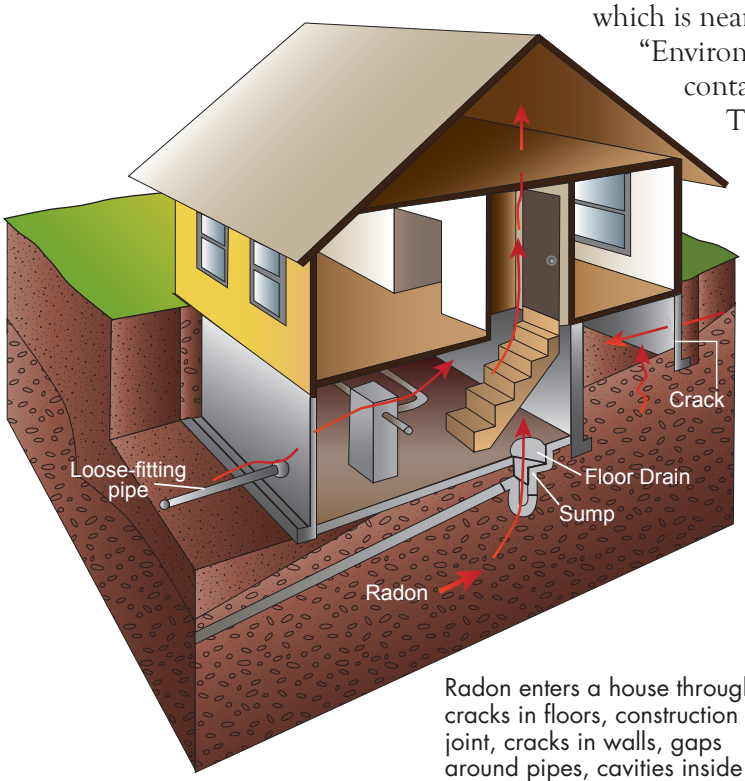
Average Indoor Radon Levels in Missouri (from EPA, 2013)



SCIENTISTS MEASURE RADON IN ST. LOUIS COUNTY AND FUSRAP SITES

Radon gas is measured in picocurie (trillionth of a curie) per liter (pCi/L). The U.S. Department of Health and Human Services recommends keeping indoor concentrations of radon below 4 pCi/L. The Missouri Department of Health and Senior Services measured indoor radon inside St. Louis County homes in 2013. All of 2635 homes tested had radon levels at or below 3.8 pCi/L.

Every building has some radon gas. On the FUSRAP project, USACE knows that MED/AEC contamination is still present under the Futura Coatings buildings. Knowing this, they have tested the inside air quality of these buildings for radon each year from 2000 to the present. The annual results are at or below 3.1 pCi/L, which is nearly equal to results across St. Louis County. The "Environmental Monitoring Data and Analysis Report" contains monitoring data for the St. Louis FUSRAP sites. These monitoring reports are available to you on the USACE website: http://bit.ly/FUSRAPstl



Radon enters a house through cracks in floors, construction joint, cracks in walls, gaps around pipes, cavities inside walls, your water supply.

YOU CAN TEST YOUR HOME FOR RADON

Any home may have a radon problem. Radon can be trapped in new and old homes, well sealed and drafty homes, and homes with or without basements. Testing is the only way to know if you and your family are at risk from radon. EPA and the Surgeon General recommend testing all homes below the third floor for radon.

Missouri residents can ask for a free radon test kit from Missouri Department of Health on their website at http://health.mo.gov. Ways to reduce radon in your home are discussed in EPA's Consumer Guide to Radon Reduction. You can get a copy at www.epa.gov/radon/pubs.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

COLDWATER CREEK SAMPLING

"Gateway to Excellence"

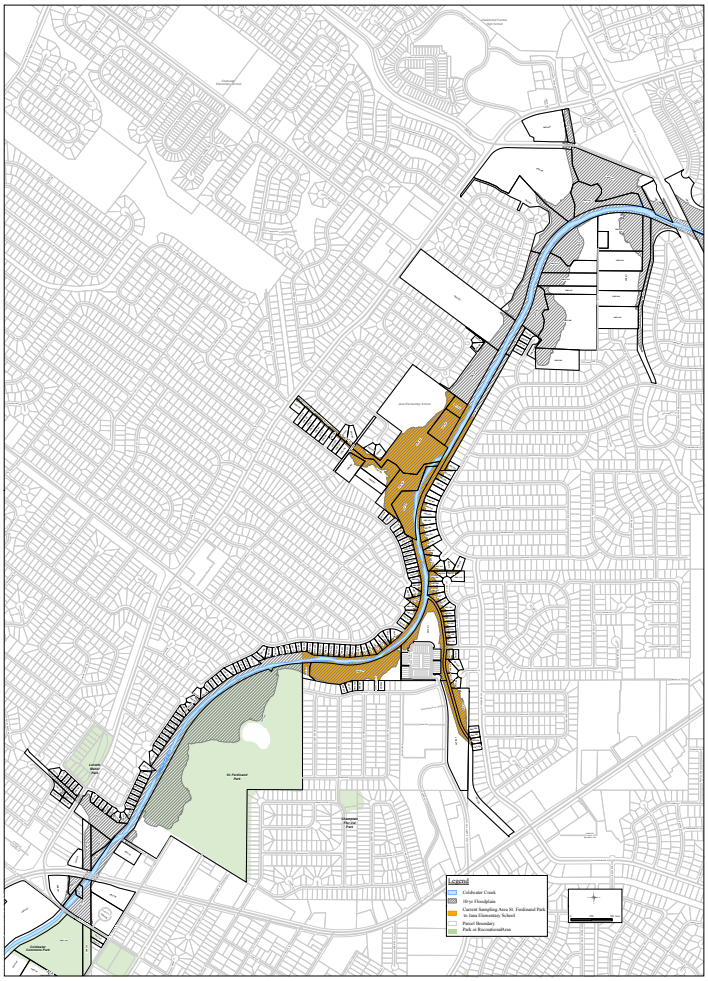
Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Army Corps of Engineers (USACE) environmental program known as the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes four Missouri sites (SLDS, SLAPS, Latty, and SLAPS VPs). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's 1940s and 1950s atomic program. In 1946, the MED bought a 21.7-acre tract of land now known as the SLAPS to store residues and scrap from uranium processing at the Mallinckrodt facility in downtown St. Louis.

Surface-water transport from contaminated material at the SLAPS, the Latty Avenue Site, and haul roads adjacent to CWC was the main way for contamination to enter CWC. Once contamination reached CWC, creek flow transported the contaminated material downstream.

USACE first eliminated the sources of contamination at SLAPS and HISS. The selected remedy for the North St. Louis County Sites is excavation of contaminated soil to meet the remediation goals. The waste was shipped off-site for disposal at a permitted facility and remediation was completed in 2013.

To learn more about FUSRAP, contact the FUSRAP Project Office at 314-260-3905 or, via email, at STLFUSRAP@usace.army.mil.

Coldwater Creek (CWC) is a St. Louis Airport Site Vicinity Property (SLAPS VP). Coldwater Creek flows 14.2 miles in a northeasterly direction from Banshee Road along the western border of the St. Louis Airport Site (SLAPS) and the Hazelwood Interim Storage Site (HISS)/Futura, through the city of Hazelwood, the city of Florissant, unincorporated areas of St. Louis County, and along the northern edge of the community of Black Jack, until it discharges into the Missouri River. There are approximately 700 vicinity properties adjacent to CWC from Highway I-270 to the Missouri River that are also SLAPS VPs. These properties are designated Coldwater Creek VPs and are primarily residential and recreational properties with some businesses. USACE continues to investigate and sample the CWC corridor (banks and sediment) and the adjacent properties within the 10-year flood plain.



Coldwater Creek flows along the western border of SLAPS through the city of Hazelwood, the city of Florissant, unincorporated areas of St. Louis County, and along the northern edge of the community of Black Jack, until it discharges into the Missouri River.

Contamination entered CWC through storm/surface water run-off and flooding from SLAPS, HISS/Futura, and haul roads adjacent to CWC. Once contamination reached CWC, creek flow transported the contaminated material downstream. USACE completed remedial activities at the source sites (SLAPS in 2007 and HISS/Futura sites in 2013).

CURRENT STATUS OF INVESTIGATION

USACE continues to investigate and sample the CWC corridor (banks and sediment) and the adjacent properties within the 10-year flood plain. To date, the investigation has progressed approximately 3.6 creek miles downstream from I-270/Pershall Road to the Jana Elementary School property.

More than 380 properties in the 10-year flood plain are included in the investigation conducted thus far. More than 12,000 samples have been collected from the CWC Corridor and flood plain properties. Official documents have been completed to release 67 properties. USACE issues these documents to property owners as they are completed. In addition, USACE issued status letters in the spring of 2018 to property owners where sampling is complete but the official document for release was not completed.

The CWC investigation identified contaminated soil within portions of the CWC Corridor and some flood plain properties (e.g., St. Cin Park, Duchesne Park, four backyards on Palm Drive, Chez Paree property, St. Ferdinand Cemetery and Metropolitan Sewer District property). Remedial activities have been completed at St. Cin Park, Duchesne Park, the Chez Paree property, and the Palm Drive properties. Surveys using sensitive radiation-detection instruments on structures, such as buildings, pavement, concrete within the CWC Corridor and flood-plain properties have not identified contamination.

An environmental monitoring program was implemented at the St. Louis Sites beginning in calendar year 1998. Ground water, air, surface water and sediment are all analyzed as part of the Environmental Monitoring Program, and the data collected are presented annually in an the North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Report. Currently, there are eight monitoring stations along Coldwater Creek where both surface water and sediment samples are collected.

WATER AND SEDIMENT COLLECTED IN COLDWATER CREEK TODAY SHOWS THAT POLLUTION PREVENTION METHODS USED DURING REMEDIATION ACTIVITIES ARE WORKING TO PREVENT DEGRADATION OF THE CREEK.

Typically, field work anywhere in SLAPS VPs begins with a radiological walkover survey. A sodium iodide detector is used to identify possible areas of contamination and sampling locations. Soil and sediment samples are collected for lab analysis in accordance with the sampling plan. The samples are collected from surface areas to the target depths deemed appropriate for that specific location. The samples are then sent to the on-site FUSRAP lab for identification and quantitative analysis. USACE on-site radiochemical lab is nationally accredited by the Department of Defense Environmental Laboratory Accreditation Program.

If the data shows contamination, further sampling is conducted to bound and define the contaminated area. If contamination is found on a homeowner's property adjacent to the creek, USACE personally notifies the owner to discuss results of the data. From there, USACE works directly with the owner at every step before, during, and after remediation to ensure the homeowner understands each step taken to remediate the property. After the remediation is completed, a Post Remedial Action Report/Final Status Survey Evaluation PRAR/FSSE) is published. This document outlines each step that was taken to sample and remediate the property. The PRAR/FSSE also contains all the sampling data, survey data, and risk and dose estimates. The document is sent to the property owner.

US Army Corps of Engineers®
St. Louis District®

Coldwater Creek Sampling

Formerly Utilized Sites Remedial Action Program (FUSRAP)

BUILDING STRONG®

Background

Coldwater Creek is a St. Louis Airport Site (SLAPS) Vicinity Property under the Formerly Utilized Sites Remedial Action Program. The U.S. Army Corps of Engineers (USACE) is implementing the selected remedy in accordance with the Record of Decision (ROD) for the North St. Louis County Sites.

For the North St. Louis County Sites, the principal radiological contaminants are Radium (Ra)-226, Thorium (Th)-230, and Uranium (U)-238. These also serve as effective surrogates for all other radionuclides that are present, including daughter products such as Protactinium (Pa)-231 and Actinium (Ac)-227. Because the different radiological contaminants are co-located, the excavations effectively remove all FUSRAP-related contaminants even if they are designed to target one specific contaminant.

Remediation Goals

The ROD identifies soil and sediment remediation goals that are applicable to Coldwater Creek. The dividing line between soil and sediment is the "mean water gradient" (mwg), a hydrologic term that refers to the average low water levels and reflects the level of the creek that stays damp throughout most of the year. For material above the mwg, soil remediation goals apply. For material below the mwg, sediment remediation goals apply. (See the ROD for additional information).

Remediation goals are based upon current and future land use analysis over a 1,000 year timeframe. The numerical values for each contaminant were based upon analysis of lifetime cancer risk and radiation exposure to a Reasonable Maximum Exposed (RME) receptor. The considered receptors for North County are residential (child and adult), industrial worker, recreational/ trespasser (child age 6-14 years old), construction worker, maintenance worker, and utility worker.

The sediment remediation goals were developed to meet the soil goals for unlimited use and unrestricted exposure even if sediments from the creek were relocated to an adjacent property (i.e., digging out part of the creek bank for maintenance or construction work.) The sediment goal recognizes that if such a scenario were to occur, the contaminated sediments would be mixed with non-contaminated sediments and soils as part of the dredging/excavation process. This assures that, in the event sediments are placed on surface areas adjacent to the creek, the contaminant levels will not exceed the surface soil goals. These remediation goals assure that Coldwater Creek and the surrounding area will remain protective for current and future anticipated uses (such as recreation, maintenance, construction, and gardening.)

Sampling Strategy and Process for Coldwater Creek

The first approach to addressing Coldwater Creek was to eliminate the sources of contamination at the SLAPS and the HISS/Latty Avenue site while sampling upstream to downstream. The remediation of these sites was completed in 2013. Prior to the start of actual sampling, research is done to identify potential problem areas. A plan summarizes the existing data, defines additional data needs, describes the rationale and methods for conducting the fieldwork (i.e. the actual sampling) and identifies the proposed sample locations. In selecting sampling locations, several factors are considered. They include: origin of contamination, migration pathways, physical movement (hauling and historic grading), depositional areas within the creek and the mouths of tributaries, areas susceptible to flooding or topographical low-lying areas (current and historical), areas where channel realignment and improvements may have occurred, locations required for statistical coverage and areas indicated by radiological walkover surveys. This multi-pronged approach helps ensure that potentially contaminated areas are investigated.

U.S. ARMY CORPS OF ENGINEERS – ST. LOUIS DISTRICT
114 James S. McDonnell Blvd., Hazelwood, MO 63042.
FUSRAP OFFICE: (314) 260-3905
https://www.mvs.usace.army.mil/Missions/FUSRAP/

June 2020
G20-0009

Field work begins with a radiological walkover survey. A sodium iodide detector is used as a screening tool to identify possible areas of contamination and sampling locations. Soil and sediment samples are collected for lab analysis in accordance with the plan. The samples are collected from surface areas to the target depths deemed appropriate for that specific location. The samples are next sent to the on-site lab for identification and quantitative analysis.

Description of Laboratory Analysis

The USACE has an on-site radiochemical lab, nationally accredited by the Department of Defense Environmental Laboratory Accreditation Program (DOD ELAP). Once in the lab, soil/sediment/water/air samples are prepared and analyzed. The USACE lab uses several instruments to identify and quantify isotopes. These instruments include: Gamma Spectroscopy High Purity Germanium detectors (soil and water); Alpha Spectroscopy Silicon PIPS detectors (soil and water); Kinetic Phosphorescence Analyzers (Total uranium in water); and Gross Alpha/Beta Gas Flow Proportional Counters (air and water samples.) Quantification and identification of radionuclides are needed to determine if contamination exists in the samples above remediation goals. Additional quality control samples are collected and analyzed at an independent laboratory to ensure accuracy and precision.

Historical Activities

DOE conducted sampling and analysis of Coldwater Creek sediments from 1986 to 1991. Samples were collected from the creek and at the water's edge from SLAPS to the Missouri River. Due to the lack of documentation regarding the sampling protocols followed by DOE and the precise locations of samples, the data has been used qualitatively to guide subsequent sampling activities.

In 1996, DOE was contacted by the City of Florissant regarding the replacement of the St. Denis Street Bridge. In September 1997, DOE conducted surveys and collected samples in the area of the bridge and found that Th-230 was the predominant radionuclide present. The highest concentration of Th-230 measured was 38.29 picoCuries per gram from a sample taken beneath the concrete placed under the bridge to stabilize the creek's bank. In October 1998, the USACE removed approximately 450 cubic yards of contaminated material and debris to support construction activities.

Shortly after FUSRAP responsibility was transferred to USACE, the USACE began performing radiological walkover surveys and collecting samples within the CWC Corridor to characterize adjacent properties as well as the creek. Approximately 350 soil and sediment samples have been collected from the CWC Corridor over time from the SLAPS to Frost Avenue.

Ongoing Work

In fall 2012, the USACE sampled Coldwater Creek immediately adjacent to the Ballfields area (i.e. from McDonnell Blvd to Frost Avenue). Over 1,000 samples were collected from this reach. The Pre-Design Investigation Report (PDIR) that contains all the data from this sampling event has been issued. This PDIR can be viewed on the FUSRAP website. (https://www.mvs.usace.army.mil/Missions/FUSRAP/)

As part of our continuous environmental monitoring program during remedial activities, in April 2013, the USACE completed the water and sediment sampling of eight locations along the creek. Results can be found in the annual Environmental Monitoring Data and Analysis Report (EM DAR) at the web site address listed below.

In October 2013, the USACE began sampling Coldwater Creek from Frost Avenue to the St. Denis Bridge. To date over 5,000 samples have been taken. Sampling includes the creek, creek banks and the 10-year flood plain. Additional sampling beyond the 10-year flood plain will occur if sampling results identify additional contamination beyond the flood plain. The USACE anticipates the completion of sampling this section by the end of 2015. Sampling the next 4-mile segment of the creek will start in 2016.

U.S. ARMY CORPS OF ENGINEERS – ST. LOUIS DISTRICT
114 James S. McDonnell Blvd., Hazelwood, MO 63042.
FUSRAP OFFICE: (314) 260-3905
https://www.mvs.usace.army.mil/Missions/FUSRAP/

June 2020
G20-0009

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

FREQUENTLY ASKED QUESTIONS ABOUT FUSRAP

"Gateway to Excellence

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites. These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's early atomic program in the 1940s and 50s.

For more than 20 years, scientists and management personnel have been investigating and cleaning the St. Louis Sites. This work is done under a federal environmental remediation program called FUSRAP.

1. WHAT IS FUSRAP?

The Formerly Utilized Sites Remedial Action Program (FUSRAP) is an environmental remediation program. It addresses radiological contamination generated by activities of the Manhattan Engineer District and Atomic Energy Commission (MED/AEC) during development of atomic weapons in the 1940s and 1950s.

2. HOW MANY SITES ARE THERE?

The St. Louis FUSRAP Sites consist of the St. Louis Downtown Site (SLDS) (Mallinckrodt and 37 vicinity properties [VPs]); the North St. Louis County Sites that include: the St. Louis Airport Site (SLAPS); the Latty Avenue properties (Hazelwood Interim Storage Site/Futura Coatings (HISS/Futura) and 8 Latty Avenue VPs; and SLAPS VPs that include over 148 industrial properties and Coldwater Creek from Banshee Road to the Missouri River and adjacent properties. St. Louis District is also responsible for response actions at Iowa Army Ammunition Plant and has completed response actions at the Madison, Illinois site, which has been returned to U.S. Department of Energy (DOE) for long-term stewardship.

3. HOW DID THE SITES BECOME CONTAMINATED?

Private companies throughout the United States under contract with the federal government performed work for the MED during World War II and for the AEC following the war. Both the MED and AEC were predecessors to the present day DOE.

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium and radium from high grade uranium ore at SLDS in downtown St. Louis. During that time and until 1967, radioactive process byproducts (waste residues) were stored at an area adjacent to Lambert-St. Louis Airport, what is now the SLAPS site.

Between 1966 and 1973, residues associated with the production and refinement of uranium materials were purchased by a private company, removed from SLAPS and transported by truck for storage at 9200 Latty Avenue (known as HISS since 1979) under an AEC license.

Crews removed thousands of cubic yards of soil and debris at the former Mallinckrodt buildings.

To learn more about FUSRAP, contact the FUSRAP Project Office at 314-331-8000 or email FUSRAP at STLFUSRAP@usace.army.mil

Residues migrated from SLAPS (via runoff or wind onto adjacent properties and into Coldwater Creek) or were released or otherwise deposited when material was transported along haul routes. These deposits contaminated the soil and sediment at the SLAPS VPs and Latty Avenue Properties.

4. WERE ANY OF THE SITES CLEANED UP IMMEDIATELY AFTER THE MED/AEC WORK WAS COMPLETED?

Mallinckrodt decontaminated plants where MED/AEC uranium processing occurred from the late 1940s through the early 1960s. The plants were released under the guidelines in effect at the time. As radiological regulatory guidelines changed to better protect the public, it became necessary to go back and remediate the Mallinckrodt plant sites (SLDS) to the new, more protective guidelines.

Remedial activities at Duchesne Park are now complete.

5. WHAT CONTAMINANTS ARE AT FUSRAP SITES?

FUSRAP sites are generally contaminated with uranium, thorium, and radium and their associated decay products. It is important to understand that the site soils are contaminated with low-levels of residual radioactivity because the raw product with high-level radioactivity was shipped offsite at the time of processing.

6. HOW DANGEROUS ARE THE ST. LOUIS FUSRAP SITES?

Even though FUSRAP sites may contain levels of radioactivity above current regulatory guidelines, none of the sites pose an immediate health risk to the public or environment given current land uses. Generally speaking, at St. Louis FUSRAP sites, the contamination is several inches to several feet below ground level, capped with vegetation, asphalt, or concrete and/or is in areas that are restricted from the general public.

7. IF THE SITES AREN'T DANGEROUS, THEN WHY DO THEY NEED TO BE CLEANED UP?

Although these materials are not currently a hazard, they will remain radioactive for thousands of years, and risk to exposure could increase if the use of the land were to change. Each site is remediated to a standard commensurate with foreseeable future uses for the land.

8. HOW DOES A SITE BECOME A PART OF THE PROGRAM?

Sites can be referred to FUSRAP by DOE or added legislatively by Congress.

9. HOW DID FUSRAP START?

FUSRAP was initiated in 1974 by DOE to study and take appropriate response actions at sites that have become contaminated because of work performed by private companies for the MED/AEC. The Energy and Water Development Appropriations Act for fiscal year 1998, signed into law on October 1997, transferred responsibility for the administration and execution of FUSRAP from DOE to USACE.

10. WHAT ARE FUSRAP'S OBJECTIVES?

The objectives of FUSRAP are to:

- Evaluate sites that supported MED/AEC nuclear work and determine if there is a threat release that requires a response to protect human health and the environment.
- Remediate or apply controls to these sites so that they meet current guidelines.
- Dispose of or stabilize in a radiologically and environmentally acceptable manner contamination that exceeds guidelines or causes an unacceptable level of risk.

- Complete all work in a manner consistent with appropriate federal laws and regulations and state and local environmental land use requirements (to the extent permitted by federal law).

11. DOES USACE HAVE TO FOLLOW ANY RULES WHEN CLEANING UP SITES?

Every step of the FUSRAP cleanup process is regulated by a number of federal and state laws and their implementing regulations. Chief among these is the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

CERCLA consists of a series of very specific steps and activities that must be performed to ensure a thorough cleanup process. It chronicles actions taken at a site from its initial site designation into the program to its closeout.

It is also typical for many FUSRAP sites to be subject to multiple laws, depending on the type and extent of contamination at the site. Other laws may include the Resource Conservation and Recovery Act, the Toxic Substances Control Act, the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, the Atomic Energy Act, the Uranium Mill Tailing Radiation Control Act, and state and local laws.

Public participation is an important component of the CERCLA process, and USACE encourages the public to be part of the process and coordinates with the public and regulators.

SLDS required remediating 37 contaminated sites.

SLAPS required remediating 10 contaminated sites.

12. HOW DOES FUSRAP WORK?

FUSRAP sites undergo several steps in the CERCLA process:

- **Preliminary Assessment/Site Inspection:** Collects and reviews information about the site. If it appears there may be contamination on site, a **site investigation** with sampling is performed to determine whether contamination is present on site.
- **Remedial Investigation/Feasibility Study:** Identifies the contamination at the site and its exact location. The **remedial investigation** (RI) will include a risk assessment, which is the science of estimating potential risks to human health and the environment posed by contaminants. Within FUSRAP, risk assessment information helps determine what actions should be taken to clean up the site.

  The **feasibility study** (FS) develops and evaluates effectiveness, challenges, and cost of remedial alternatives.
- **Proposed Plan:** Summarize those already conducted FS evaluations and present the "preferred alternative" and explain why it was selected as the preferred alternative. The **proposed plan** document is made publicly available (along with the RI and FS) and a public meeting is held to present the proposed plan.
- **Record of Decision:** The final remedy decision after careful consideration of the public comments. If the selected remedy includes remediation, a remedial design follows a **record of decision** and includes preparation of technical drawings and specifications that direct how the remediation will be conducted. Special care is taken to ensure the safety of workers, people on site (where applicable), and surrounding neighbors. Remediation begins after the remedial design is complete. This phase involves site preparation and construction activities. When these activities are completed, testing is conducted to ensure that remediation goals for the site have been met.

Remedial action under the North County ROD was completed at HISS and Futura in 2013.

13. WHAT STEPS ARE TAKEN TO PROTECT PEOPLE DURING REMEDIATION AT A SITE?

If remediation is the selected remedy for a site, a combination of engineering, administrative, and personal protective equipment controls are put in place to ensure the safety of site workers, people on site (where applicable), and surrounding neighbors. Perimeter air monitors are placed around an excavation site with samples taken and data evaluated on a daily basis. Engineering controls for dust management (such as watering down the material for excavation) are also used. In addition, USACE follows specific safety procedures to segregate the area of excavation, placing warning signs and safety precautions to ensure contamination is not going offsite during transportation of the contaminated materials from the excavation to the loadout area.

14. HOW IS FUSRAP ORGANIZED?

Administrative and financial management of FUSRAP activities is the responsibility of USACE Headquarters in Washington, DC. Headquarters then delegates work to the USACE Divisions, which in the case of the St. Louis District is the Mississippi Valley Division. Execution of the St. Louis District FUSRAP projects is done with a team approach. The team members include experts from the St. Louis District. Most site investigations and remedial action are done by contractors under the supervision of USACE with USACE ensuring that all FUSRAP activities comply with CERCLA requirements.

The St. Louis District executes FUSRAP as Lead Federal Agency in coordination with the USEPA Region 7 and the Missouri Department of Natural Resources.

15. WHAT KINDS OF EXPERTS COMPRISE EACH TEAM WITHIN THE ST. LOUIS DISTRICT?

Each project involves several experts dedicated to ensure that human health and the environment are protected. The core project team includes a program manager, project manager, project engineer, design engineer, health physicist, and an industrial hygienist.

In addition, the St. Louis FUSRAP team also includes support from chemists, biologists, the public affairs office, office of counsel, real estate office, and resource management, just to name a few.

16. WHERE DOES THE CONTAMINATED MATERIAL FROM THE ST. LOUIS SITES GO?

The contaminated material is transported by covered rail cars to an out-of-state, federally licensed disposal facility in Idaho. The Idaho facility is specifically licensed to receive low-level radioactive waste.

17. IS THE SOURCE OF CONTAMINATION GONE?

The two primary sources of contamination in North St. Louis County Sites are SLAPS and the Latty Avenue Properties. Remediation at SLAPS was completed in 2007. At HISS, piles were removed in 2001 and 2002. Remediation of the in-situ soil contamination at the Latty Avenue Properties was completed in 2013.

18. HOW DOES ST. LOUIS FUSRAP KNOW THAT COLDWATER CREEK IS NOT BEING RE-CONTAMINATED DURING REMEDIAL ACTIVITIES?

FUSRAP has performed long-term monitoring bi-annually since 1998. Originally, there were six sediment and water locations in Coldwater Creek that were sampled. Recently USACE added two more sampling locations north of I-270. The data shows no evidence that contamination has been moving into the creek. These results can be found in the Annual Environmental Monitoring Data/Analysis Reports on the FUSRAP website at http://bit.ly/FUSRAPstl.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

CONCEPTUAL SITE MODEL AND COLDWATER CREEK

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Department of Defense (DOD) Army Corps of Engineers (USACE) environmental program known as Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes four Missouri sites (SLDS, SLAPS, Latty, and SLAPS VPs). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's 1940s and 1950s atomic program.

USACE uses scientific knowledge and skilled investigators to identify places along Coldwater Creek that may need cleanup. The work requires deliberate sample site selection and then precise laboratory analysis in order to prioritize cleanup actions.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042

Before the Record of Decision (ROD) was prepared for the North County sites (including Coldwater Creek [CWC]), a Conceptual Site Model (CSM) was developed. A CSM presents the conditions and the physical, chemical, and biological processes that control the transport, migration, and potential impacts of contamination to human and/or ecological receptors. It may be a simple illustration (i.e., a drawing) or a sophisticated, comprehensive document. In the pre-ROD phase of a project, a CSM is used to identify the sources, receptors and pathways associated with the site, to identify data gaps and develop a sampling plan to address those gaps, and to support remedial decision making.

In the post-ROD phase of a project, a CSM is continually reexamined to ensure that the most recent understanding of the site (based on additional sampling and actual remedial action data) continues to support the original CSM. This assists in the development of pre-design sampling and remedial action design documents (if such action is needed) and ensures protection of the public and environment.

Coldwater Creek

In the case of CWC, the original CSM (as presented in the Feasibility Report/ Baseline Risk Assessment) was reexamined. Historical characterization data and remediation activities in North County supported the conclusions of the original model. The model was then developed in greater detail with specific focus on CWC to identify target areas for the currently planned round of sampling.

The CSM indicated that the original sources of contamination for CWC were the storage of materials at the St. Louis Airport Site (SLAPS), the stockpiling and processing of materials at the Latty Avenue Site, and the transportation of the material (by truck) when the material was moved from SLAPS to the Latty Avenue Site.

Potential transport mechanisms are ways by which material could move from SLAPS, the Latty Avenue Site, and roads into CWC. These mechanisms include surface water (i.e., storm water runoff), ground water seepage from beneath storage areas to CWC, windblown emissions (in the immediate

vicinity) and physical movement (i.e., falling off trucks into CWC or falling off trucks and being carried by storm water into CWC).

After evaluating these transport mechanisms and how the material would be moved by water within the creek, the following target areas were identified:

- Areas where channel improvements, realignments, or obstructions could have trapped sediment between 1946 and present;
- Tributaries and drainage areas within the 10-year floodplain of CWC;
- Depositional areas within the creek; and,
- Topographical low-lying areas outside the banks of CWC.

In addition to sampling these target areas, a systematic sampling grid will be applied to the area to ensure suitable coverage for statistical purposes. Flooded structures will be scanned, and gamma walkover surveys will be performed to cover those areas not previously evaluated.

Because USACE will require access to private property to perform portions of the sampling, landowners may be contacted by USACE real estate personnel. A signed right of- entry document will be required before sampling can proceed on private property.

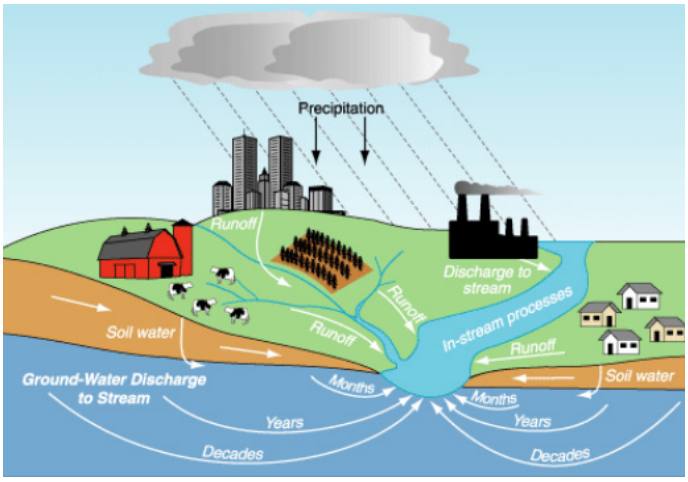
Coldwater Creek - Sampling Depositional Areas

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.



US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

LABORATORY ANALYSIS

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Army Corps of Engineers (USACE) environmental program known as the Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites contain soils contaminated with radium, thorium and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's atomic program in the 1940s and '50s.

USACE uses scientific knowledge and skilled investigators to identify places along Coldwater Creek that may need cleanup. The work requires deliberate sample-site selection and then precise laboratory analysis in order to prioritize cleanup actions.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042

Soil, sediment, water and air samples from St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP) sites go to an on-site laboratory where scientists have a strict protocol to assess the samples for levels of radiological contamination.

LABORATORY ANALYSIS OF SOIL SAMPLES

After collecting soil samples, workers deliver them to a dedicated FUSRAP Laboratory, central to the St. Louis Sites. The lab is run by an independent contractor who meets the exacting requirements of the U.S. Army Corps of Engineers (USACE) and the Department of Defense (DOD). Because USACE requires quick analysis of site samples, this lab runs two shifts, employing 11 specially trained technicians and scientists. All laboratory instruments meet National Institute of Standards and Technology calibration standards.

PROCESSING SOIL SAMPLES IN THE LABORATORY

The FUSRAP Lab tests soil (and other media) in a precise process that begins at the front door. Workers log and track field samples' movements through the lab from entry to analysis to disposal with careful documentation.

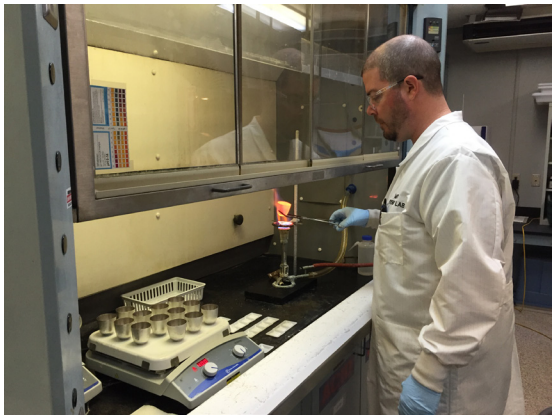
Soil is first dried overnight in an oven and then ground into a powder. After thoroughly mixing the sample, laboratory workers begin the steps to isolate any radium, thorium, or uranium isotopes.

On each site sample, separate but identical processes are run to isolate these three isotopes. Lab workers then measure levels of ionizing radiation in the sample for each radium, thorium, or uranium isotope. The laboratory equipment is specialized to detect ionizing radiation, which includes alpha and beta particles and gamma rays emitted from radioactive materials.

Reports from lab analysis guide USACE in meeting the remediation goals set by each site's Record of Decision.

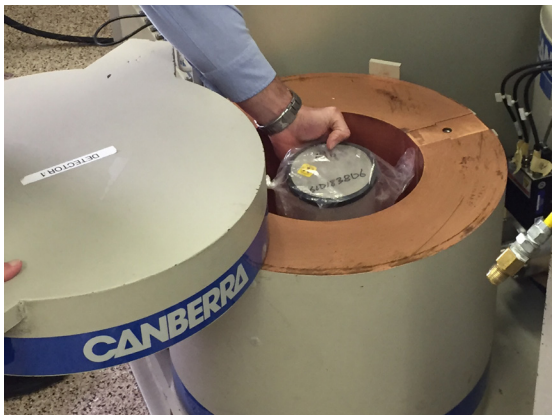
SOIL ANALYSIS STEP BY STEP

After soil and sediments are dried and ground into a powder, specially trained laboratory technicians begin the steps to isolate any radium, thorium or uranium from a sample.



Here, a specially trained laboratory technician separates thorium from other isotopes in a sample so that thorium alone can be measured by alpha spectroscopy.

Technicians mount isolated thorium on a filter and insert it into the alpha spectrometer. This step tests for radium, thorium or uranium alpha particles in samples.



Here, a technician loads a soil sample into a gamma spectrometer. The instrument detects gamma rays emitted from the sample, identifies the isotopes within the sample and measures them.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities - North County FUSRAP

AIR DISPERSAL OF HISTORIC CONTAMINATION

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites. These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's early atomic program in the 1940s and 50s.

For more than 20 years, scientists and management personnel have been investigating and cleaning the North St. Louis County Sites. Air dispersal is the specific focus of the study described in this fact sheet. The study, *Air Dispersion of MED/AEC Contaminants from the St. Louis Airport Site and the Hazelwood Interim Storage Site*, was added to the *Pre-Design Investigation Work Plan for Coldwater Creek from Frost Avenue to St. Denis Bridge.*

USACE encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3905 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134.

North St. Louis County Sites include the St. Louis Airport Site (SLAPS) and Hazelwood Interim Storage Site (HISS). SLAPS stored uranium ore process wastes from 1946 to 2006, and HISS stored similar waste from 1966 to 2011. After years of monitoring and cleanup, the SLAPS and HISS piles are now completely removed. The sites are in compliance with state and federal cleanup guidelines.

The St. Louis community expressed concerns about how wind may have spread contamination from SLAPS and HISS storage sites before and during the cleanup. In response, USACE recently completed a study that evaluated air dispersal from the historic storage sites.

MODELS SHOW THE TRANSPORT OF CONTAMINATED SOIL IN AIR

USACE tests air dispersal by wind by looking at what is in the soil. Soil samples collected since 1999show actual levels of contamination. Scientists used the soil sampling data from the two sites in a computer program called RESRAD. RESRAD stands for RESidual RADioactivity. RESRAD produces a simulated model that evaluates the pathways radionuclides use to move through the environment and the risk of them coming into contact with people.

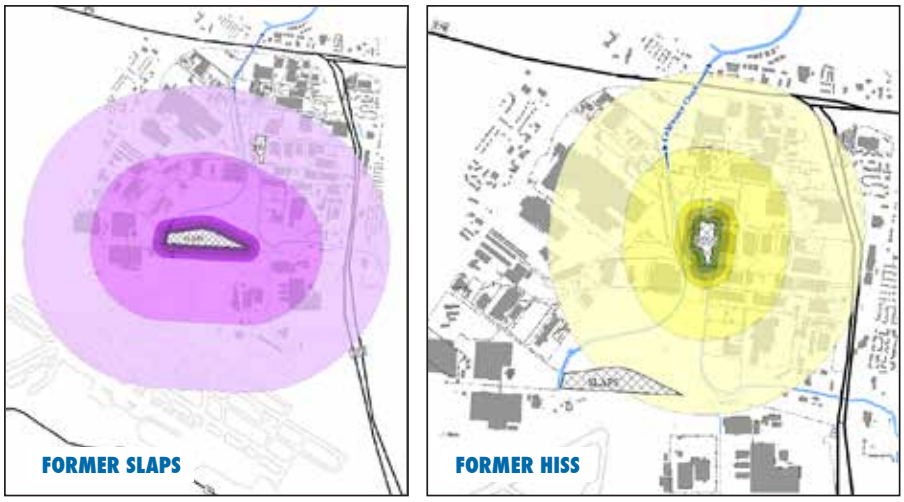
THORIUM DOES NOT MOVE EASILY IN THE AIR

Because thorium-230 is the most common contaminant at SLAPS and HISS, USACE used it in the model. Thorium is a heavy element found in nearly all soils worldwide and is naturally radioactive. Thorium, like lead or uranium, is heavy. It cannot drift around like pollen, but thorium dust can move. USACE used the concentration of thorium-230 in soil samples taken to calculate movement and potential health risks.

CONCENTRATION REDUCES WITH DISTANCE.

Samples show that thorium concentrations in the air decreased as wind moved away from the sites. Thorium in the air dropped to the ground with rain, snow, and sleet. Plus, gravity pulled thorium. These factors worked into the computer modeling used to reconstruct the situation. The models help USACE make cleanup decisions.

Soil samples from North County show how air has dispersed thorium.



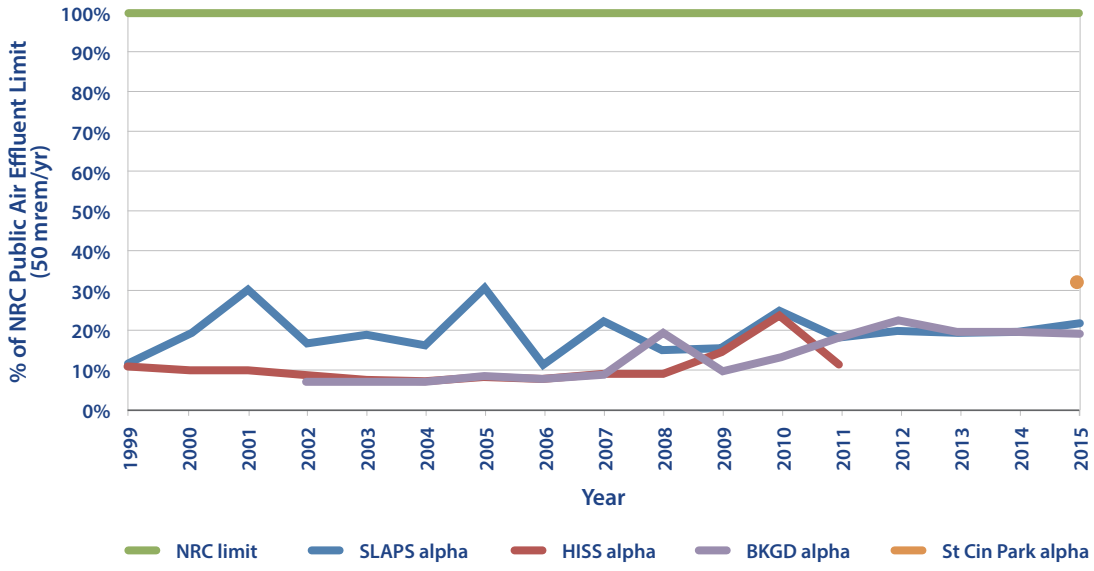
These maps show the worst case contamination levels during hypothetical severe weather. Thorium-230 was most concentrated in the centers of SLAPS and HISS. You can see in the maps that the highest concentrations are around the centers of the "donut" shapes. Concentrations lessen away from the centers.

SITE MODELING INCLUDED SEVERE WEATHER.

North County has had some severe weather conditions. For example, the F1 tornado in 2004 had wind speeds up to 112 mph. RESRAD computer modeling included the tornado activity for the SLAPS and the HISS area to see how it potentially affected air dispersal. Using the RESRAD modeling, USACE tested results using the extreme worst case scenario:

- very dry, dusty conditions
- maximum value for tornado wind speed for 365 days of the strongest winds for 60 years
- highest contamination sample values ever found onsite

USACE found that the potential impact to surrounding areas from the air dispersion of contaminants previously stored on SLAPS and HISS did not play a primary role in contaminant movement leading to human exposure. In short, wind was not primary transport for contamination.



Air dispersion of contaminants as alpha wave radiation from SLAPS and HISS for 16 years is shown in this graph. Even the highest number at St. Cin Park is only one third of the NRC public safety limit.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

COLDWATER CREEK SOIL SAMPLING AND ANALYSIS

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Department of Defense (DOD) Army Corps of Engineers (USACE) environmental program known as Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes four Missouri sites (SLDS, SLAPS, Latty, and SLAPS VPs). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's 1940s and 1950s atomic program.

USACE uses scientific knowledge and skilled investigators to identify places along Coldwater Creek that may need cleanup. The work requires deliberate sample site selection and then precise laboratory analysis in order to prioritize cleanup actions.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042

USACE selects sampling points along Coldwater Creek (CWC) with the goal of obtaining the most representative locations possible. In order to gather accurate and representative information, FUSRAP investigators collect samples from carefully chosen systematic and biased sampling locations.

SYSTEMATIC SAMPLING LOCATIONS

The systematic sample locations follow a grid based on the 10-year floodplain adjacent to CWC. USACE will collect more samples if contamination is found at the border of the floodplain, and USACE will expand sampling beyond the 10-year floodplain until the extent of contamination is clearly determined. At systematic sample locations, USACE generally collects samples from the surface to a depth of 2 to 6 feet, depending on the nature of the sample. If the location has known fill materials, workers will collect deeper samples.

A conceptual site model is a tool that engineers create and use to understand an area. The model is based on the area's history and current status. Engineers look at the area features, both on the surface and below ground level, and identify what areas may be impacted by FUSRAP contaminants.

BIASED SAMPLING LOCATIONS

The conceptual site model for CWC identifies the biased sampling locations. This model defines areas where contamination likely accumulates or is trapped or covered. These locations are based on current and historical knowledge of:

- Physical movement (like hauling and historic grading)
- Topographically low-lying areas
- Depositional areas (like where CWC bends or goes around structures)
- Distinct locations (like the mouth of a tributary or a realigned channel)

At biased locations, USACE takes samples at a depth that is appropriate for the location. For example, samples within historic tributaries will extend to the depth of the former channel.

LABORATORY ANALYSIS OF SOIL SAMPLES

After collecting soil samples, workers deliver them to a dedicated FUSRAP Laboratory, central to the St. Louis Sites. The lab is run by an independent contractor who meets the strict requirements of USACE and DOD. Because USACE requires quick analysis of site samples, this lab runs two shifts, employing 11 specially trained technicians and scientists. All laboratory instruments meet National Institute of Standards and Technology calibration standards.

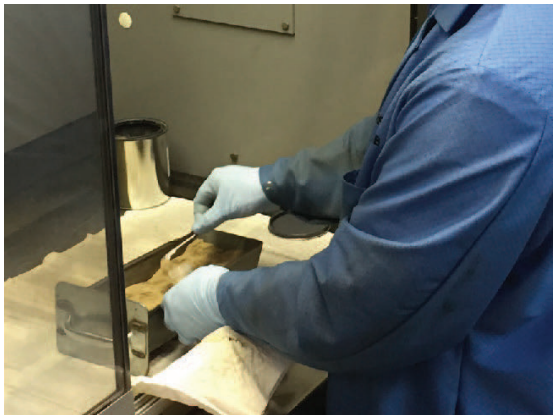
SOIL ANALYSIS STEP-BY-STEP

The FUSRAP lab tests soil (and other media) in a precise process that begins at the front door. Workers log and track field samples' movements through the lab from entry to analysis to disposal with careful documentation.

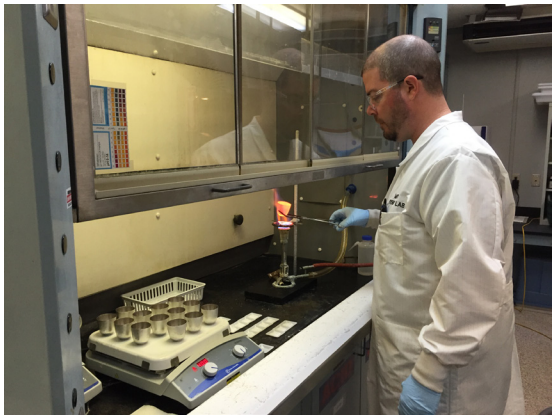
Soil is first dried overnight in an oven and then ground into a powder. After thoroughly mixing the sample, laboratory workers begin the steps to isolate any radium, thorium, or uranium isotopes.

From each site sample, separate but identical processes are run to isolate these three isotopes. Lab workers measure levels of ionizing radiation in each isolated radium, thorium, or uranium isotope. The laboratory equipment is specialized to detect ionizing radiation, which includes alpha and beta particles and gamma rays emitted from radioactive materials.

Reports from lab analysis guide USACE in meeting the remediation goals set by each site's Record of Decision.

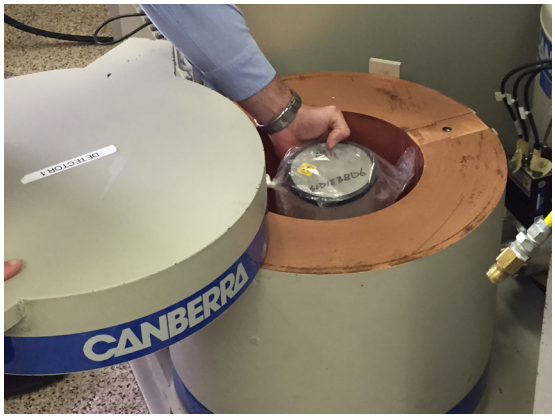


After soil and sediments are dried and ground into a powder, specially trained laboratory technicians begin the steps to isolate any radium, thorium, or uranium from a sample.



Here a specially trained laboratory technician separates thorium from other isotopes in a sample so thorium alone can be measured by alpha spectroscopy.

Technicians mount isolated thorium on a filter and insert it into the alpha spectrometer. This step tests for uranium, radium, and thorium alpha particles in samples.



Here a technician loads a soil sample into a gamma spectrometer. The instrument detects gamma rays emitted from the sample, identifies the isotopes within the sample, and measures them.

Summary of Activities at the

ST. LOUIS DOWNTOWN SITE
PROPOSED PLAN
INACCESSIBLE SOILS OPERABLE UNIT
GROUP 1 PROPERTIES

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup of the St. Louis Downtown Site (SLDS) under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The SLDS was formerly used for Federal defense activities performed under contracts with the Manhattan Engineer District and the Atomic Energy Commission in the 1940s and 50's.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis Downtown Site, contact
Steve Hamm
at (314) 260-3912

Or visit
http://www.mvs.usace.army.mil/Missions/CentersofExpertise/FormerlyUtilizedSitesRemedialActionProgram.aspx

Or write
St. Louis District, USACE
FUSRAP Project Office
8945 Latty Avenue
Berkeley, Missouri 63134

Administrative Records

Administrative Records are located at:

St. Louis District, USACE
FUSRAP Project Office
8945 Latty Avenue
Berkeley, Missouri 63134

And

St. Louis Public Library
1301 Olive Street
St. Louis, Missouri 63103

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in northern St. Louis City. These processes, conducted under contracts with the Manhattan Engineer District and the Atomic Energy Commission, resulted in radioactive contamination of some parts of the SLDS. (The SLDS is comprised of approximately 210 acres of land, which includes Mallinckrodt Inc, (formerly Mallinckrodt Chemical Works) and 38 surrounding vicinity properties.)

The Formerly Utilized Sites Remedial Action Program, administered by the U.S. Army Corps of Engineers (USACE), St. Louis District, conducted site characterization activities at SLDS. In 1998, USACE issued a Record of Decision which addressed soil contamination for accessible areas (i.e. area that were not beneath buildings or other actively used structures) and groundwater. Remediation under the 1998 Record of Decision is underway. The remaining inaccessible areas at SLDS have been grouped under the Inaccessible Soils Operable Unit (ISOU).

The areas included in the ISOU have been further subdivided into two groups. The Proposed Plan (which is the subject of this fact sheet) addressed the first of these two groups (i.e. Group 1).

The Preferred Alternative

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act, the Corps of Engineers issued a Proposed Plan indicating **No Further Action** for the Group 1 properties of the Inaccessible Soil Operable Unit at the St. Louis Downtown Site.

The Proposed Plan provides the rationale for No Further Actions for the inaccessible areas of the Group 1 Properties and includes a summary of the Baseline Risk Assessment, which was used as the primary basis for the selection of No Further Action. The rational for the selection of No Further Action is twofold:

(1) the determination that some of the Group 1 properties were not impacted by past MED/AEC operations, and

(2) the determination of no complete exposure pathways and/or no unacceptable risks to human health and the environment for impacted Group 1 properties.

An electronic copy of the Proposed Plan can be viewed on the St. Louis District FUSRAP website at: http://www.mvs.usace.army.mil/Portals/54/docs/fusrap/docs/SLDS/SLDS-ISOU-PP_Final_01-03-2014.pdf.

A paper copy of the Proposed Plan can be reviewed at the Administrative Record locations.

Properties Included in Group 1

Mallinckrodt Security Gate 49

Gunther Salt South

PSC Metals Inc.

St. Louis Metropolitan Sewer District Lift Station

Midtown Garage

Hjersted

Ameren UE

Cash Scrap Metals

Cotto-Waxo

Star Bedding Company

Christiana Court LLC

(Former) Curly Collins Recycling

Mallinckrodt LLC Plant 3

Mallinckrodt LLC Plant 8

Mallinckrodt LLC Plant 9

Mallinckrodt LLC Plant 11

Richey

Farve

Tobin Electric

Worth Industries

Bremen Bank

Eirten's Parlors

UAAA Local 1887

Dillion

Challenge Enterprises

Zamzow Manufacturing

Factory Tire Outlet

OJM Inc.

Terminal Railroad DT-9 Levee

Public Meeting

A public meeting will be held to present the Proposed Plan and accept written and verbal comments.

January 30, 2014 at 4:30pm

Clay Elementary School
3820 North 14th Street
St. Louis, Missouri 63107

Public Participation

The USACE encourages public input to ensure the "remedy" selected for the Group 1 properties meets the needs of the local community and is an effective solution to the problem.

Comments on the proposed plan will be accepted for 30 days after the draft Proposed Plan are issued. Verbal comments will be recorded during a public meeting scheduled to be held on January 30, 2014. Written comments may be submitted at any time during the comment period.

The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to make a final decision. The final decision will be documented in the Record of Decision for the Group 1 Properties associated with the Inaccessible Soil Operable Unit at the St. Louis Downtown Site.

U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

NORTH ST. LOUIS SITES
REMEDIAL DESIGN/REMEDIAL ACTION

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District is conducting a cleanup program for the North St. Louis County sites. The sites contain soils primarily contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission in the 1940s and 50s.

The U.S. Environmental Protection Agency and USACE have signed the Record of Decision that outlines the final remedy to cleanup the North St. Louis County sites.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3905 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. During this time and until 1967, radioactive by-products from this process were stored at a property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the St. Louis Airport Site (SLAPS). In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue. Part of this property became known as the Hazelwood Interim Storage Site (HISS), while the other part became known as the Futura property. During this move, handling, transport, and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue Vicinity Properties (VPs). Today, these sites, including impacted areas along Coldwater Creek, make up the North St. Louis County sites.

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act, the U.S. Army Corps of Engineers (USACE) developed a Feasibility Study (FS) outlining six alternatives for the final cleanup of the North St. Louis County sites. Based on this study, a Proposed Plan (PP) was also developed. The PP identified the USACE's preferred alternative and rationale for this preference; was also developed. These documents were released for public review and comment.

In May 2003, the USACE held a public meeting to present the FS/PP. A 75-day public comment period (May 1 – July 14, 2003) followed the release of the FS/PP to gain the opinions of citizens, public officials, and agencies. Comments received have been addressed and incorporated into the approved Record of Decision (ROD)–the document that describes the final course of action at the North County sites. Responses to these comments can be found in the Responsiveness Summary, which is an appendix to the ROD.

SELECTED REMEDY

The major components of the selected remedy are:

- excavate all accessible contaminated soil;
- dredge contaminated sediment from Coldwater Creek;
- remove contaminated soils from the surfaces of buildings and structures;
- dispose of soils and sediments at a properly permitted, off-site disposal facility;
- impose institutional controls (or use restrictions) on contaminated soils under roads, active rail lines and other permanent structures; and
- monitor groundwater and surface water.

REMEDIAL DESIGN

The USACE is developing the remedial design for final cleanup activities at the North St. Louis County sites. The design is being developed according to the criteria established in the approved ROD.

Under the remedial design, soils and sediments will be removed to levels that support release of the property for unlimited use/unrestricted exposure. These levels are as follows:

- Accessible surface soils/sediments (0-6 inches) contaminated with radium-226, thorium-230 and uranium-238 will be cleaned up to 5/14/50 picocuries per gram (pCi/g), respectively.
- Subsurface soils (below 6 inches) will be cleaned up to 15/15/50 pCi/g, respectively.
- Sediments below the low average water level of the creek will be cleaned up to 15/43/150 pCi/g, respectively.

Groundwater and surface water will be monitored during the implementation of the remedy. An estimated 230,000 cubic yards of soils and sediments exceeding these goals will be shipped to out-of-state disposal facilities.

On-site structures will be investigated to ensure that they also meet remedial goals. Decontamination technologies such as washing, vacuuming, scraping or other similar processes will be used to remove contaminated soils from the structures.

Areas addressed under previous removal actions will be evaluated to confirm that they are consistent with cleanup goals identified in the ROD. Any areas that do not meet these goals will be further remediated.

LONG-TERM STEWARDSHIP, INSTITUTIONAL CONTROLS AND MONITORING

Soils beneath roads, rail lines, and other permanent structures that exceed cleanup goals will be considered inaccessible. Institutional controls (or use restrictions) will be placed on inaccessible soils exceeding the cleanup criteria. In general, these use restrictions will:

- prohibit the development and use of the properties for housing, schools, child care facilities and playgrounds;
- maintain the physical integrity of the cover (i.e. road, rail line or permanent structure); and
- prevent and/or manage construction or maintenance activities.

Under the ROD, the specific institutional controls needed to implement use restrictions will be identified in the remedial design. An institutional control design and implementation plan (i.e. long-term stewardship plan) will be developed within the next 15 months to ensure the continued effectiveness of the institutional controls. The plan will identify the specific mechanisms necessary to implement the use restrictions described in the ROD and describe the monitoring, maintenance and inspection procedures that will be established for each of the institutional controls. The USACE will work with EPA, the Missouri Department of Natural Resources, landowners, municipalities, utilities, the U.S. Department of Energy, and the St. Louis Oversight Committee to develop this plan.

RemedialDesign-03Nov05-G05-185

Monitoring of the ground water, surface water and sediment will consist of response-action monitoring and long-term monitoring. These types of monitoring will be conducted where contamination remains above remediation goals for unlimited use and unrestricted exposure.

U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

NORTH ST. LOUIS COUNTY SITES RECORD OF DECISION

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District is conducting a cleanup program for the North St. Louis County sites. The sites contain soils primarily contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission in the 1940s and 50s.

The U.S. Environmental Protection Agency and USACE have signed the Record of Decision that outlines the final remedy to cleanup the North St. Louis County sites.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3905 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134

The North St. Louis County Sites Record of Decision (ROD) was finalized on September 2, 2005. These sites consist of the St. Louis Airport Site (SLAPS), the Latty Avenue Properties including the Hazelwood Interim Storage Site (HISS) and the Futura Coatings Property, and the SLAPS Vicinity Properties (VPs), which include Coldwater Creek.

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. During this time and until 1967, radioactive by-products from this process were stored at a property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the SLAPS. In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue. Part of this property became known as the HISS, while the other part became known as the Futura property. During this move, handling, transport, and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue VPs.

On October 4, 1989, Congress added SLAPS, HISS and Futura to the U.S. Environmental Protection Agency's (EPA) National Priorities List. In 1990, EPA negotiated a Federal Facilities Agreement, which described the process that would be used to cleanup contaminated soils in St. Louis, Missouri. At the direction of Congress, the U.S. Army Corps of Engineers (USACE) became responsible for the cleanup of FUSRAP sites in 1997.

CONTAMINANTS OF CONCERN

The sites contain soils primarily contaminated with radium, thorium, and uranium as a result of activities associated with the MED/AEC in the 1940s and 50s. The Selected Remedy addresses soil, sediment, surface water, groundwater, and structures contaminated as a result of MED/AEC uranium are processing activities. Co-located contaminants from sources other than MED/AEC will be addressed concurrent with the implementation of this remedy.

PUBLIC REVIEW

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act, the USACE developed a Feasibility Study (FS) outlining six alternatives for the final cleanup of the North St. Louis County sites. The Proposed Plan (PP) identified the USACE's preferred alternative and the rationale for this preference.

A 75-day public comment period (May 1 – July 14, 2003) followed the release of the FS/PP for North County to gain the opinions of citizens, public officials, and agencies. Further, the USACE presented the FS/PP at a public meeting held on May 29, 2003. Comments have been addressed and incorporated into the approved ROD–the document that describes the final remedy to address contamination present at the North St. Louis County sites. Responses to the comments can be found in the Responsiveness Summary, which is an appendix to the ROD.

SELECTED REMEDY

In response to the potential risk of radioactive exposure, the USACE will implement Alternative 5, *Excavation with Institutional Controls under Roads, Bridges, Railroads, and Other Permanent Structures*.

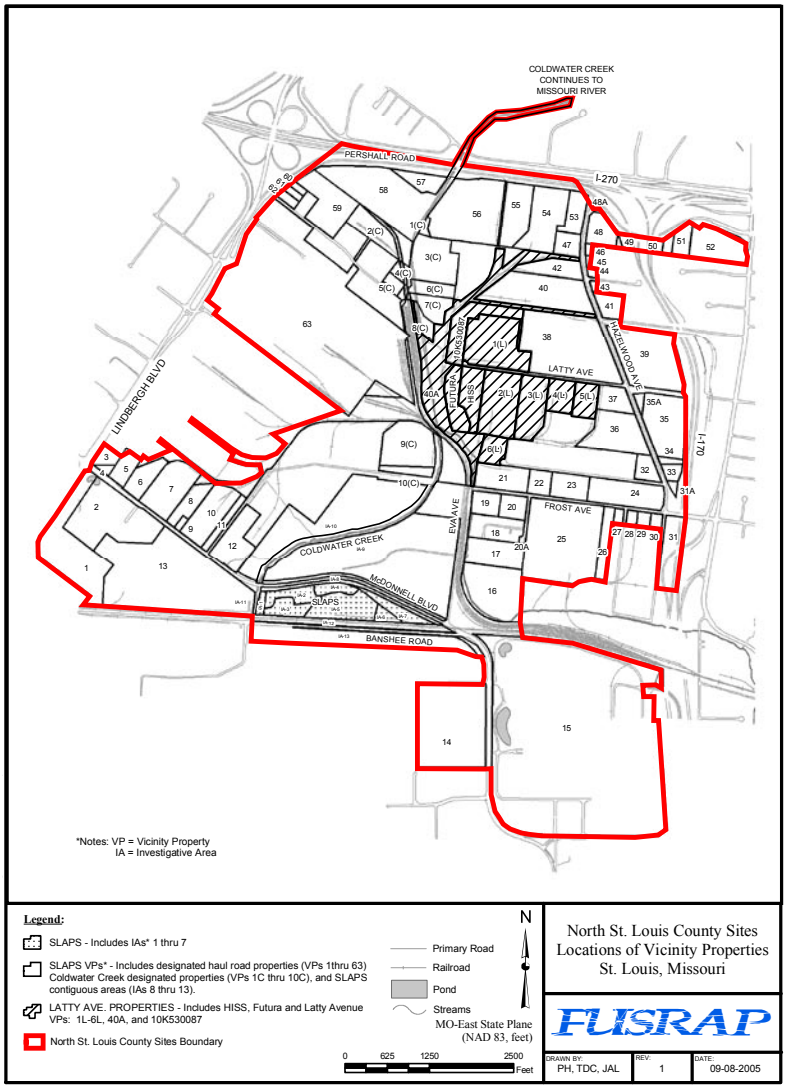
The major components of the selected remedy are:

- excavate all accessible contaminated soil;
- dredge contaminated sediment from Coldwater Creek;
- remove contaminated soils from the surfaces of buildings and structures;
- dispose of soils and sediments at a properly permitted, off-site disposal facility;
- impose institutional controls (or use restrictions) on contaminated soils under roads, active rail lines, and other permanent structures; and
- monitor ground water and surface water.

These components provide the basis for development of the remedial design. In addition, areas of the North St. Louis County sites that were cleaned up under interim criteria will be evaluated. The evaluation will confirm that cleanup activities undertaken prior to the effective date of this ROD achieve the remedial goals. Any previously cleaned up areas that do not meet the remedial goals will be further cleaned up consistent with this remedy.

In general, the long-term protectiveness of this alternative is high. This alternative protects human health and the environment and provides the best balance of effectiveness, cost, and implementability. The total cost is $274.3 million.

The ROD was approved by both the USACE and EPA on September 2, 2005 and was supported by the Missouri Department of Natural Resources.

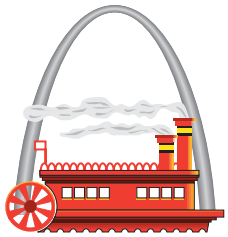


Locations of Vicinity Properties

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST LOUIS NORTH COUNTY SITE FEASIBILITY STUDY



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis North County Site. The Site contains soils primarily contaminated with radium, thorium, and uranium as a result of federal defense activities performed under contract with the Manhattan Engineering District and the Atomic Energy Commission during the nation's early atomic energy program in the 1940s and 50s.

On May 1, 2003, The USACE issued a Feasibility Study identifying and evaluating six alternatives for the North County Site. Public comment and regulatory review will help determine the remedy selected for the site. The USACE will respond to all significant comments in the North County Record of Decision, which will identify the final remedy for the site based in part upon public comments received during the 30-day review period.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis North County Site or to inquire about public involvement opportunities, contact

Jacqueline Mattingly at (314) 260-3924

Or write

St. Louis District, Corps of Engineers
FUSRAP Project Office
8945 Latty Avenue, Berkeley, MO 63134

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. During this time and until 1967, radioactive process byproducts were stored at a property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the St. Louis Airport Site (SLAPS). In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue, which became known as the Hazelwood Interim Storage Site (HISS) and Futura property. During this move, improper handling, transport and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue Vicinity Properties (VPs). Today these sites, including impacted areas along Coldwater Creek, make up the North County Site.

On October 4, 1989, SLAPS, HISS and Futura were added to the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL). In 1997, Congress directed the U.S. Army Corps of Engineers (USACE) to oversee the cleanup of all areas within the North County Site under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

CONTAMINANTS OF CONCERN

The radioactive contaminants of concern at the North County Site consist primarily of radium, thorium, and uranium. Investigations conducted to date indicate that these contaminants exist at levels requiring action for soils and sediments at the North County Site. Usable groundwater does not appear to be impacted.

SUMMARY OF ALTERNATIVES

Alternative 1 – No Action
This alternative includes no further excavation for the North County Site. It is required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to act as a baseline alternative for comparison with other alternatives. The cost of Alternative 1 is $1.5 million over a 30-year period because of the cost to conduct recurrent 5-year reviews.

Alternative 2 – Partial Excavation and Capping at SLAPS and HISS/Futura
Alternative 2 includes excavation of impacted soils from the VPs for out-of-state disposal. SLAPS and HISS/Futura would be capped with stone and clean

Alternative 1

No Action

Leave site as is with periodic environmental monitoring.

Cost: $1.5 million

Alternative 2

Partial Excavation and Capping at SLAPS and HISS

Excavate soil from the VPs and dispose out-of-state. Cap SLAPS and HISS and use institutional controls to limit access to contaminated areas.

Cost: $205 million

Alternative 3

Partial Excavation and Treatment

Excavate impacted soils from VPs and HISS, then consolidate and treat at SLAPS. Use institutional controls to limit access to contaminated areas.

Cost: $284 million

Alternative 4

Institutional Controls

Use institutional controls such as deed notices, land use restrictions, and zoning restrictions to limit future land use at SLAPS, HISS, and the VPs.

Cost: $129 million

Alternative 5

Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures

Remove contamination to allow unrestricted use at all sites. Control access under roads, bridges, railroads, and other permanent structures.

Cost: $223 million

Alternative 6

Excavation at all Properties

Excavate impacted soils from all locations, regardless of accessibility, for out-of-state disposal.

Cost: $286 million

soil. Institutional controls (e.g. zoning restrictions, etc.) would be used to restrict future land use at SLAPS, HISS/Futura and Coldwater Creek and to control soils beneath roads, bridges, railroads, and other permanent structures. The total cost is $205 million.

Alternative 3 – Partial Excavation and Treatment at SLAPS
This alternative includes excavation of impacted soils and sediments from HISS/Futura, the VPs and Coldwater Creek. The excavated soils would be consolidated at SLAPS for treatment (soil sorting and washing). Soils that meet supplemental standards would be used as backfill at SLAPS then covered with clean soils. Soils not meeting supplemental standards would be disposed of out-of-state. Institutional controls (e.g. zoning restrictions, etc.) would be used to restrict future land use at SLAPS and to control soils beneath roads, bridges, railroads, and other permanent structures. The total cost is $284 million.

Alternative 4 – Institutional Controls (No Further Excavation)
Alternative 4 consists of limiting the future land use at SLAPS, HISS/Futura, VPs, Coldwater Creek and controlling soils beneath roads, bridges, railroads, and other permanent structures using institutional controls (e.g. deed notices, land use restrictions, and zoning restrictions). Institutional controls and site maintenance would be implemented to prevent unacceptable exposures to site contamination. The total cost is $129 million.

Alternative 5 – Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures
This alternative uses a combination of excavation with out-of-state disposal for accessible soils. Institutional controls (e.g. zoning restrictions, etc.) would be implemented to control soils under roads, bridges, railroads, and other permanent structures. The total cost is $223 million.

Alternative 6 – Excavation at all Properties
Alternative 6 includes excavation of impacted soils from all locations, regardless of accessibility, for out-of-state disposal so that no institutional controls are required. All difficult-to-access soils under roads, bridges, railroads, and other permanent structures would be excavated under this alternative. The total cost is $286 million.

PUBLIC PARTICIPATION

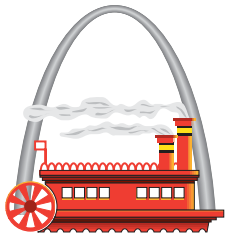
The USACE encourages public input to ensure the remedy selected for the St. Louis North County Site meets the needs of the local community and is an effective solution to the problem. Based on available information, the Corps of Engineers' preferred alternative is Alternative 5, Excavation with Institutional Controls Under Roads, Bridges, Railroads and Other Permanent Structures. Although Alternative 5 is preferred at the present time, public comments are welcome on all alternatives.

Written comments may be submitted to the USACE, at any time during the 30-day period. Oral comments will be recorded during the May 29, 2003 public meeting. The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to select a final remedy. The final remedy will be outlined in the Record of Decision, which will be submitted to EPA later in 2003.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST LOUIS NORTH COUNTY SITE OVERVIEW



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis North County Site. The Site contains soils primarily contaminated with radium, thorium, and uranium as a result of federal defense activities performed under contract with the Manhattan Engineering District and the Atomic Energy Commission during the nation's early atomic energy program in the 1940s and 50s.

The USACE issued a Feasibility Study identifying and evaluating alternatives for cleaning up the North County Site as well as a Proposed Plan detailing the preferred cleanup alternative on May 1, 2003. The Plan identifies Alternative 5, **Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures,** as the USACE's preferred remedy for the North County Site. Public comment and regulatory review will help determine the remedy selected for the site. The USACE will respond to all significant comments in the North County Record of Decision, which will identify the final remedy for the site based in part upon public comments received during the 30-day review period.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis North County Site or to inquire about public involvement opportunities, contact

Jacqueline Mattingly at (314) 260-3924

Or write

St. Louis District, Corps of Engineers
FUSRAP Project Office
8945 Latty Avenue, Berkeley, MO 63134

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. The processing of uranium left radioactive contamination at the site. A Record of Decision (ROD), which was developed to address the contamination in accessible soils and groundwater at SLDS based upon public input, was signed in 1998.

From 1946 until 1967, radioactive process byproducts were stored on 21.7-acres of property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the St. Louis Airport Site (SLAPS). In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue. The eastern part of this property later became known as the Hazelwood Interim Storage Site (HISS), while the western part became known as Futura. During this move, improper handling, transport and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue Vicinity Properties (VPs). Today these sites, including impacted areas along Coldwater Creek, make up the North County Site.

The North County Site is part of the Formerly Utilized Sites Remedial Action Program (FUSRAP), a program managed by the U.S. Department of Energy (DOE) until 1997. On October 4, 1989, Congress added SLAPS, HISS and Futura to the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL). In 1990, the EPA and DOE negotiated a Federal Facilities Agreement, which described the process that would be used to cleanup MED/AEC contamination in St. Louis. At the direction of Congress, the U.S. Army Corps of Engineers (USACE) became responsible for the cleanup of FUSRAP sites in 1997.

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act, the USACE has based their approach to cleaning up the North County Site on data and findings contained within six key documents: the Remedial Investigation, the Baseline Risk Assessment, the Ecological Risk Assessment, SLAPS & HISS Engineering Evaluation/ Cost Analyses (EE/CAs), and the Feasibility Study. These documents are available to the public through the North County Administrative Record File, which is maintained at both the FUSRAP Project Office and the City of St. Louis Public Library. A Proposed Plan identifying the USACE's preferred

Alternative 1

No Action

Leave site as is with periodic environmental monitoring.

Cost: $1.5 million

Alternative 2

Partial Excavation and Capping at SLAPS and HISS

Excavate soil from the VPs and dispose out-of-state. Cap SLAPS and HISS and use institutional controls to limit access to contaminated areas.

Cost: $205 million

Alternative 3

Partial Excavation and Treatment

Excavate impacted soils from VPs and HISS, then consolidate and treat at SLAPS. Use institutional controls to limit access to contaminated areas.

Cost: $284 million

Alternative 4

Institutional Controls

Use institutional controls such as deed notices, land use restrictions, and zoning restrictions to limit future land use at SLAPS, HISS, and the VPs.

Cost: $129 million

Alternative 5

Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures

Remove contamination to allow unrestricted use at all sites. Control access under roads, bridges, railroads, and other permanent structures.

Cost: $223 million

Alternative 6

Excavation at all Properties

Excavate impacted soils from all locations, regardless of accessibility, for out-of-state disposal.

Cost: $286 million

remedy for site cleanup is also available for review at both locations. The final cleanup remedy will be outlined in the Record of Decision, which will be submitted to the EPA and Missouri Department of Natural Resources later this year.

EARLY REMOVAL ACTIVITIES

While developing a comprehensive cleanup strategy for the North County Site, DOE developed interim actions to minimize exposure to contaminated materials. The first of these actions took place in 1985 when DOE built a retaining wall at SLAPS along the bank of Coldwater Creek to combat erosion. In 1997, the DOE removed approximately 5,100 cubic yards of contaminated material from the west end of SLAPS next to the retaining wall and shipped it to an out-of-state disposal facility.

Under the 1998 SLAPS EE/CA, the USACE began efforts to stabilize SLAPS and constructed a sedimentation basin to limit the migration of contamination from SLAPS via stormwater runoff. A rail spur was also installed on SLAPS in 1998 to provide for shipment of contaminated materials removed. Since 1998, an estimated 280,000 cubic yards of contaminated soils from the northern and eastern portions of SLAPS have been removed. Additional removals are ongoing. To date, all material has been shipped to out-of-state disposal facilities.

At HISS, the USACE removed storage piles under the 1998 HISS EE/CA. Before the pile removal began, a rail spur was built along the eastern boundary of HISS to allow shipment directly from the site. Removal of the storage piles began in March 2000 and was completed about 18 months later. Nearly 58,000 cubic yards were removed.

Removal actions have also been conducted at SLAPS and Latty Avenue VPs. Between 1995 and 1997, DOE excavated contaminated soils from the frontages of 30 properties along Hazelwood Boulevard, Latty Avenue and Frost Avenue.

PUBLIC PARTICIPATION

The USACE encourages public input to ensure the remedy selected for the North County Site meets the needs of the local community and is an effective solution to the problem.

Comments on the proposed alternatives will be accepted by the USACE for 30 days after the Feasibility Study and Proposed Plan are issued, unless a request for an extension is received. Verbal comments will be recorded during the May 29, 2003 public meeting at the Hazelwood Civic Center – East. Written comments may be submitted at anytime during the 30-day comment period, which currently ends May 30, 2003. The USACE will respond to all significant comments in the North County Record of Decision and will consider these comments when working with EPA to make a final decision. Interested parties should regularly check the FUSRAP website for current information at www.mvs.usace.army.mil/engr/fusrap/home2.htm.

U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

NORTH ST. LOUIS COUNTY SITES

REMEDIAL ACTION

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District is conducting a cleanup program for the North St. Louis County Sites. The sites contain soils primarily contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission in the 1940s and 50s.

The U.S. Environmental Protection Agency and USACE have signed the Record of Decision that outlines the final remedy to clean up the North St. Louis County Sites.

USACE encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3905 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134.

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission, the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site in St. Louis, Missouri from 1942 to 1957. During this time and until 1967, radioactive by-products from this process were stored at a property adjacent to the Lambert-St. Louis International Airport. In 1966, a buyer moved and stored the radioactive waste at a property on Latty Avenue. During this move and storage, the materials accidentally spread along haul routes and onto adjacent properties. Today, these sites, including impacted areas along Coldwater Creek, make up the North St. Louis County Sites.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the U.S. Army Corps of Engineers (USACE) and the other stakeholders, including the public, developed and approved the Record of Decision (ROD). This document describes the course of action at the North St. Louis County Sites.

COURSE OF ACTION

The course of action described by the ROD includes these actions:

- excavate all accessible contaminated soil
- dredge contaminated sediment from Coldwater Creek
- remove contaminated soils from the surfaces of buildings and structures
- dispose of soils and sediments at a properly permitted, off-site disposal facility
- impose institutional controls (or use restrictions) on contaminated soils under roads, active rail lines and other permanent structures
- monitor groundwater and surface water.

USACE excavates accessible contaminated soil according to requirements from the Record of Decision.

REMEDIAL DESIGN

USACE developed a remedial design for final cleanup activities at the North St. Louis County Sites. The design is in accordance with the approved ROD. Under the remedial design, soils and sediments will be removed to levels that support release of the property for unlimited use/unrestricted exposure. These levels are:

- Accessible surface soils/sediments (0 to 6 inches) contaminated with radium-226, thorium-230, and uranium-238 will be cleaned up to 5/14/50 picocuries per gram (pCi/g), respectively.
- Subsurface soils (below 6 inches) will be cleaned up to 15/15/50 pCi/g, respectively.
- Sediments below the low average water level of the creek will be cleaned up to 15/43/150 pCi/g, respectively.

USACE tests also investigate groundwater, surface water, and onsite structures for contamination. When scientists determine that the levels require cleanup, the cleanup process moves into removal or remedial action.

REMOVAL AND REMEDIAL ACTIONS

The CERCLA cleanup is divided into two categories: removal and remedial actions. A removal action is a short-term action, intended to stabilize or clean up a site that poses an imminent threat to human health or the environment. A remedial action is, generally, a longer-term action that eliminates or substantially reduces releases or threatened releases of hazardous substances that pose a threat to human health and the environment. For example, decontamination technologies — such as washing, vacuuming, scraping —remove contaminated soils from structures. Removal of contaminated soils is another example.

A remedial action is a final remedy but may not complete site cleanup. Independent investigators evaluate areas addressed under removal actions to confirm that they are consistent with cleanup goals identified in the ROD. USACE will further remediate any areas that do not meet these goals.

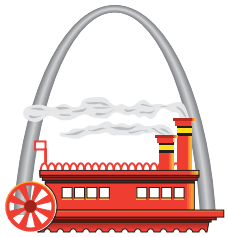
Under the ROD, the specific institutional controls (like fencing and warning signs) along with long-term monitoring of soil and groundwater are sometimes necessary. USACE conducts monitoring where contamination remains above remediation goals for unlimited use and unrestricted exposure.

USACE protects public health and the environment by removing low-level radioactive contamination generated by uranium processing from the 1940s and 1950s. Workers use survey equipment to confirm cleanup.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST LOUIS NORTH COUNTY SITE PROPOSED PLAN



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis North County Site. The Site contains soils primarily contaminated with radium, thorium, and uranium as a result of federal defense activities performed under contract with the Manhattan Engineering District and the Atomic Energy Commission during the nation's early atomic energy program in the 1940s and 50s.

The USACE issued a Proposed Plan detailing its preferred cleanup alternative for cleaning up the North County Site on May 1, 2003. The Plan identifies Alternative 5, **Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures,** as the USACE's preferred remedy for the North County Site. Public comment and regulatory review will help determine the final remedy selected for the site. The USACE will respond to all significant comments in the North County Record of Decision, which will identify the final remedy for the site based in part upon public comments received during the 30-day review period.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis North County Site or to inquire about public involvement opportunities, contact

Jacqueline Mattingly at (314) 260-3924

Or write

St. Louis District, Corps of Engineers
FUSRAP Project Office
8945 Latty Avenue, Berkeley, MO 63134

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. During this time and until 1967, radioactive process byproducts were stored at a property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the St. Louis Airport Site (SLAPS). In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue. Part of this property became known as the Hazelwood Interim Storage Site (HISS), while the other part became known as the Futura property. During this move, improper handling, transport and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue Vicinity Properties (VPs). Today these sites, including impacted areas along Coldwater Creek, make up the North County Site.

On October 4, 1989, SLAPS, HISS and Futura were added to the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL). In 1997, Congress directed the U.S. Army Corps of Engineers (USACE) to oversee the cleanup of all areas within the North County Site under the Formerly Utilized Sites Remedial Action Program.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, the USACE issued a Proposed Plan (PP) describing the preferred remedy for the North County Site. The PP provides background information on the North County Site, summarizes the six alternatives under consideration, and presents the USACE's rationale for its preferred remedy. The Plan also outlines the public's role in final decision-making.

THE PREFERRED ALTERNATIVE

The six site-wide alternatives are discussed at length in the Feasibility Study (FS) for the North County Site. The Proposed Plan provides a summary of each alternative, identifies the preferred alternative, and provides the rationale for the selection of this alternative. Based on currently available information, the USACE prefers **Alternative 5, Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other**

Alternative 1

No Action

Leave site as is with periodic environmental monitoring.

Cost: $1.5 million

Alternative 2

Partial Excavation and Capping at SLAPS and HISS

Excavate soil from the VPs and dispose out-of-state. Cap SLAPS and HISS and use institutional controls to limit access to contaminated areas.

Cost: $205 million

Alternative 3

Partial Excavation and Treatment

Excavate impacted soils from VPs and HISS, then consolidate and treat at SLAPS. Use institutional controls to limit access to contaminated areas.

Cost: $284 million

Alternative 4

Institutional Controls

Use institutional controls such as deed notices, land use restrictions, and zoning restrictions to limit future land use at SLAPS, HISS, and the VPs.

Cost: $129 million

Alternative 5

Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures

Remove contamination to allow unrestricted use at all sites. Control access under roads, bridges, railroads, and other permanent structures.

Cost: $223 million

Alternative 6

Excavation at all Properties

Excavate impacted soils from all locations, regardless of accessibility, for out-of-state disposal.

Cost: $286 million

Permanent Structures. This alternative protects human health and the environment and provides the best balance of effectiveness, cost, and implementability.

Alternative 5 uses a combination of excavation and off site disposal of accessible soils and sediments along with institutional controls (e.g. zoning restrictions) to manage soils under roads, bridges, railroads and other permanent structures. More specifically, Alternative 5 includes the following activities:

- Excavate surface soil (0-6 inches) with radionuclide concentrations above background of 5 pCi/g of Ra-226, 14 pCi/g of Th-230, and 50 pCi/g of U-238 by the sum of the ratios (SOR). Excavate subsurface soil (in subsequent layers) with radionuclide concentrations above background of 15 pCi/g of Ra-226, 15 pCi/g of Th-230, and 50 pCi/g of U-238 by SOR.
- Remove sediment below the mean water gradient of Coldwater Creek with radionuclide concentrations above background of 15 pCi of Ra-226, 43 pCi/g of Th-230, or 150 pCi/g of U-238; sediment above the mean water gradient would be addressed to surface and subsurface soil standard listed above.
- Excavation to these criteria allow unrestricted use at all properties except for inaccessible areas under roads, bridges, railroads, and other permanent structures. Institutional Controls (e.g. land use or zoning restrictions) would be placed on soils under roads, bridges, railroads and other permanent structures to ensure these areas are not excavated without appropriate oversight and safety procedures. A Long Term Stewardship Plan would be developed by USACE, in cooperation with site stakeholders, to address the specifics of the institutional controls.
- Dispose excavated soil and sediment at properly permitted disposal sites out-of-state.

In general, the long-term protectiveness of this alternative is high. The total cost is $223 million.

PUBLIC PARTICIPATION

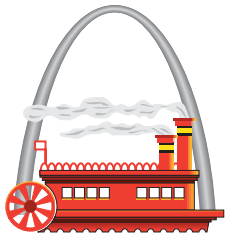
The USACE encourages public input to ensure the remedy selected for the St. Louis North County Site meets the needs of the local community and is an effective solution to the problem. Based on available information, the Corps of Engineers' preferred alternative is Alternative 5, Excavation with Institutional Controls Under Roads, Bridges, Railroads and Other Permanent Structures. Although Alternative 5 is preferred at the present time, public comments are welcome on all alternatives.

Written comments may be submitted to the USACE, at any time during the 30-day period. Oral comments will be recorded during the May 29, 2003 public meeting. The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to select a final remedy. The final remedy will be outlined in the Record of Decision, which will be submitted to EPA later in 2003.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST LOUIS NORTH COUNTY SITE PROPOSED PLAN



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis North County Site. The Site contains soils primarily contaminated with radium, thorium, and uranium as a result of federal defense activities performed under contract with the Manhattan Engineering District and the Atomic Energy Commission during the nation's early atomic energy program in the 1940s and 50s.

The USACE issued a Proposed Plan detailing its preferred cleanup alternative for cleaning up the North County Site on May 1, 2003. The Plan identifies Alternative 5, **Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures,** as the USACE's preferred remedy for the North County Site. Public comment and regulatory review will help determine the final remedy selected for the site. The USACE will respond to all significant comments in the North County Record of Decision, which will identify the final remedy for the site based in part upon public comments received during the 30-day review period.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis North County Site or to inquire about public involvement opportunities, contact

Jacqueline Mattingly at (314) 260-3924

Or write

St. Louis District, Corps of Engineers
FUSRAP Project Office
8945 Latty Avenue, Berkeley, MO 63134

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. During this time and until 1967, radioactive process byproducts were stored at a property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the St. Louis Airport Site (SLAPS). In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue. Part of this property became known as the Hazelwood Interim Storage Site (HISS), while the other part became known as the Futura property. During this move, improper handling, transport and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue Vicinity Properties (VPs). Today these sites, including impacted areas along Coldwater Creek, make up the North County Site.

On October 4, 1989, SLAPS, HISS and Futura were added to the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL). In 1997, Congress directed the U.S. Army Corps of Engineers (USACE) to oversee the cleanup of all areas within the North County Site under the Formerly Utilized Sites Remedial Action Program.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, the USACE issued a Proposed Plan (PP) describing the preferred remedy for the North County Site. The PP provides background information on the North County Site, summarizes the six alternatives under consideration, and presents the USACE's rationale for its preferred remedy. The Plan also outlines the public's role in final decision-making.

THE PREFERRED ALTERNATIVE

The six site-wide alternatives are discussed at length in the Feasibility Study (FS) for the North County Site. The Proposed Plan provides a summary of each alternative, identifies the preferred alternative, and provides the rationale for the selection of this alternative. Based on currently available information, the USACE prefers **Alternative 5, Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other**

Alternative 1

No Action

Leave site as is with periodic environmental monitoring.

Cost: $1.5 million

Alternative 2

Partial Excavation and Capping at SLAPS and HISS

Excavate soil from the VPs and dispose out-of-state. Cap SLAPS and HISS and use institutional controls to limit access to contaminated areas.

Cost: $205 million

Alternative 3

Partial Excavation and Treatment

Excavate impacted soils from VPs and HISS, then consolidate and treat at SLAPS. Use institutional controls to limit access to contaminated areas.

Cost: $284 million

Alternative 4

Institutional Controls

Use institutional controls such as deed notices, land use restrictions, and zoning restrictions to limit future land use at SLAPS, HISS, and the VPs.

Cost: $129 million

Alternative 5

Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures

Remove contamination to allow unrestricted use at all sites. Control access under roads, bridges, railroads, and other permanent structures.

Cost: $223 million

Alternative 6

Excavation at all Properties

Excavate impacted soils from all locations, regardless of accessibility, for out-of-state disposal.

Cost: $286 million

Permanent Structures. This alternative protects human health and the environment and provides the best balance of effectiveness, cost, and implementability.

Alternative 5 uses a combination of excavation and off site disposal of accessible soils and sediments along with institutional controls (e.g. zoning restrictions) to manage soils under roads, bridges, railroads and other permanent structures. More specifically, Alternative 5 includes the following activities:

- Excavate surface soil (0-6 inches) with radionuclide concentrations above background of 5 pCi/g of Ra-226, 14 pCi/g of Th-230, and 50 pCi/g of U-238 by the sum of the ratios (SOR). Excavate subsurface soil (in subsequent layers) with radionuclide concentrations above background of 15 pCi/g of Ra-226, 15 pCi/g of Th-230, and 50 pCi/g of U-238 by SOR.
- Remove sediment below the mean water gradient of Coldwater Creek with radionuclide concentrations above background of 15 pCi of Ra-226, 43 pCi/g of Th-230, or 150 pCi/g of U-238; sediment above the mean water gradient would be addressed to surface and subsurface soil standard listed above.
- Excavation to these criteria allow unrestricted use at all properties except for inaccessible areas under roads, bridges, railroads, and other permanent structures. Institutional Controls (e.g. land use or zoning restrictions) would be placed on soils under roads, bridges, railroads and other permanent structures to ensure these areas are not excavated without appropriate oversight and safety procedures. A Long Term Stewardship Plan would be developed by USACE, in cooperation with site stakeholders, to address the specifics of the institutional controls.
- Dispose excavated soil and sediment at properly permitted disposal sites out-of-state.

In general, the long-term protectiveness of this alternative is high. The total cost is $223 million.

PUBLIC PARTICIPATION

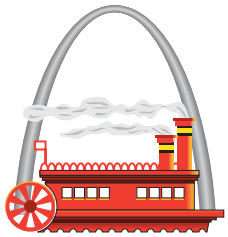
The USACE encourages public input to ensure the remedy selected for the St. Louis North County Site meets the needs of the local community and is an effective solution to the problem. Based on available information, the Corps of Engineers' preferred alternative is Alternative 5, Excavation with Institutional Controls Under Roads, Bridges, Railroads and Other Permanent Structures. Although Alternative 5 is preferred at the present time, public comments are welcome on all alternatives.

Written comments may be submitted to the USACE, at any time during the 30-day period. Oral comments will be recorded during the May 29, 2003 public meeting. The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to select a final remedy. The final remedy will be outlined in the Record of Decision, which will be submitted to EPA later in 2003.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST LOUIS NORTH COUNTY SITE OVERVIEW



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis North County Site. The Site contains soils primarily contaminated with radium, thorium, and uranium as a result of federal defense activities performed under contract with the Manhattan Engineering District and the Atomic Energy Commission during the nation's early atomic energy program in the 1940s and 50s.

The USACE issued a Feasibility Study identifying and evaluating alternatives for cleaning up the North County Site as well as a Proposed Plan detailing the preferred cleanup alternative on May 1, 2003. The Plan identifies Alternative 5, **Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures,** as the USACE's preferred remedy for the North County Site. Public comment and regulatory review will help determine the remedy selected for the site. The USACE will respond to all significant comments in the North County Record of Decision, which will identify the final remedy for the site based in part upon public comments received during the 30-day review period.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis North County Site or to inquire about public involvement opportunities, contact

Jacqueline Mattingly at (314) 260-3924

Or write

St. Louis District, Corps of Engineers
FUSRAP Project Office
8945 Latty Avenue, Berkeley, MO 63134

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. The processing of uranium left radioactive contamination at the site. A Record of Decision (ROD), which was developed to address the contamination in accessible soils and groundwater at SLDS based upon public input, was signed in 1998.

From 1946 until 1967, radioactive process byproducts were stored on 21.7-acres of property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the St. Louis Airport Site (SLAPS). In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue. The eastern part of this property later became known as the Hazelwood Interim Storage Site (HISS), while the western part became known as Futura. During this move, improper handling, transport and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue Vicinity Properties (VPs). Today these sites, including impacted areas along Coldwater Creek, make up the North County Site.

The North County Site is part of the Formerly Utilized Sites Remedial Action Program (FUSRAP), a program managed by the U.S. Department of Energy (DOE) until 1997. On October 4, 1989, Congress added SLAPS, HISS and Futura to the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL). In 1990, the EPA and DOE negotiated a Federal Facilities Agreement, which described the process that would be used to cleanup MED/AEC contamination in St. Louis. At the direction of Congress, the U.S. Army Corps of Engineers (USACE) became responsible for the cleanup of FUSRAP sites in 1997.

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act, the USACE has based their approach to cleaning up the North County Site on data and findings contained within six key documents: the Remedial Investigation, the Baseline Risk Assessment, the Ecological Risk Assessment, SLAPS & HISS Engineering Evaluation/ Cost Analyses (EE/CAs), and the Feasibility Study. These documents are available to the public through the North County Administrative Record File, which is maintained at both the FUSRAP Project Office and the City of St. Louis Public Library. A Proposed Plan identifying the USACE's preferred

Alternative 1

No Action

Leave site as is with periodic environmental monitoring.

Cost: $1.5 million

Alternative 2

Partial Excavation and Capping at SLAPS and HISS

Excavate soil from the VPs and dispose out-of-state. Cap SLAPS and HISS and use institutional controls to limit access to contaminated areas.

Cost: $205 million

Alternative 3

Partial Excavation and Treatment

Excavate impacted soils from VPs and HISS, then consolidate and treat at SLAPS. Use institutional controls to limit access to contaminated areas.

Cost: $284 million

Alternative 4

Institutional Controls

Use institutional controls such as deed notices, land use restrictions, and zoning restrictions to limit future land use at SLAPS, HISS, and the VPs.

Cost: $129 million

Alternative 5

Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures

Remove contamination to allow unrestricted use at all sites. Control access under roads, bridges, railroads, and other permanent structures.

Cost: $223 million

Alternative 6

Excavation at all Properties

Excavate impacted soils from all locations, regardless of accessibility, for out-of-state disposal.

Cost: $286 million

remedy for site cleanup is also available for review at both locations. The final cleanup remedy will be outlined in the Record of Decision, which will be submitted to the EPA and Missouri Department of Natural Resources later this year.

EARLY REMOVAL ACTIVITIES

While developing a comprehensive cleanup strategy for the North County Site, DOE developed interim actions to minimize exposure to contaminated materials. The first of these actions took place in 1985 when DOE built a retaining wall at SLAPS along the bank of Coldwater Creek to combat erosion. In 1997, the DOE removed approximately 5,100 cubic yards of contaminated material from the west end of SLAPS next to the retaining wall and shipped it to an out-of-state disposal facility.

Under the 1998 SLAPS EE/CA, the USACE began efforts to stabilize SLAPS and constructed a sedimentation basin to limit the migration of contamination from SLAPS via stormwater runoff. A rail spur was also installed on SLAPS in 1998 to provide for shipment of contaminated materials removed. Since 1998, an estimated 280,000 cubic yards of contaminated soils from the northern and eastern portions of SLAPS have been removed. Additional removals are ongoing. To date, all material has been shipped to out-of-state disposal facilities.

At HISS, the USACE removed storage piles under the 1998 HISS EE/CA. Before the pile removal began, a rail spur was built along the eastern boundary of HISS to allow shipment directly from the site. Removal of the storage piles began in March 2000 and was completed about 18 months later. Nearly 58,000 cubic yards were removed.

Removal actions have also been conducted at SLAPS and Latty Avenue VPs. Between 1995 and 1997, DOE excavated contaminated soils from the frontages of 30 properties along Hazelwood Boulevard, Latty Avenue and Frost Avenue.

PUBLIC PARTICIPATION

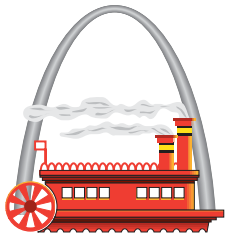
The USACE encourages public input to ensure the remedy selected for the North County Site meets the needs of the local community and is an effective solution to the problem.

Comments on the proposed alternatives will be accepted by the USACE for 30 days after the Feasibility Study and Proposed Plan are issued, unless a request for an extension is received. Verbal comments will be recorded during the May 29, 2003 public meeting at the Hazelwood Civic Center – East. Written comments may be submitted at anytime during the 30-day comment period, which currently ends May 30, 2003. The USACE will respond to all significant comments in the North County Record of Decision and will consider these comments when working with EPA to make a final decision. Interested parties should regularly check the FUSRAP website for current information at www.mvs.usace.army.mil/engr/fusrap/home2.htm.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST LOUIS NORTH COUNTY SITE FEASIBILITY STUDY



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis North County Site. The Site contains soils primarily contaminated with radium, thorium, and uranium as a result of federal defense activities performed under contract with the Manhattan Engineering District and the Atomic Energy Commission during the nation's early atomic energy program in the 1940s and 50s.

On May 1, 2003, The USACE issued a Feasibility Study identifying and evaluating six alternatives for the North County Site. Public comment and regulatory review will help determine the remedy selected for the site. The USACE will respond to all significant comments in the North County Record of Decision, which will identify the final remedy for the site based in part upon public comments received during the 30-day review period.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis North County Site or to inquire about public involvement opportunities, contact

Jacqueline Mattingly at (314) 260-3924

Or write

St. Louis District, Corps of Engineers
FUSRAP Project Office
8945 Latty Avenue, Berkeley, MO 63134

BACKGROUND

Under contracts with the Manhattan Engineer District and Atomic Energy Commission (MED/AEC), the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri from 1942 to 1957. During this time and until 1967, radioactive process byproducts were stored at a property adjacent to the Lambert-St. Louis International Airport, which is now referred to as the St. Louis Airport Site (SLAPS). In 1966, the SLAPS wastes were purchased, moved, and stored at a property on Latty Avenue, which became known as the Hazelwood Interim Storage Site (HISS) and Futura property. During this move, improper handling, transport and storage of the contamination spread the materials along haul routes and to adjacent properties forming the SLAPS and Latty Avenue Vicinity Properties (VPs). Today these sites, including impacted areas along Coldwater Creek, make up the North County Site.

On October 4, 1989, SLAPS, HISS and Futura were added to the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL). In 1997, Congress directed the U.S. Army Corps of Engineers (USACE) to oversee the cleanup of all areas within the North County Site under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

CONTAMINANTS OF CONCERN

The radioactive contaminants of concern at the North County Site consist primarily of radium, thorium, and uranium. Investigations conducted to date indicate that these contaminants exist at levels requiring action for soils and sediments at the North County Site. Usable groundwater does not appear to be impacted.

SUMMARY OF ALTERNATIVES

Alternative 1 – No Action
This alternative includes no further excavation for the North County Site. It is required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to act as a baseline alternative for comparison with other alternatives. The cost of Alternative 1 is $1.5 million over a 30-year period because of the cost to conduct recurrent 5-year reviews.

Alternative 2 – Partial Excavation and Capping at SLAPS and HISS/Futura
Alternative 2 includes excavation of impacted soils from the VPs for out-of-state disposal. SLAPS and HISS/Futura would be capped with stone and clean

Alternative 1

No Action

Leave site as is with periodic environmental monitoring.

Cost: $1.5 million

Alternative 2

Partial Excavation and Capping at SLAPS and HISS

Excavate soil from the VPs and dispose out-of-state. Cap SLAPS and HISS and use institutional controls to limit access to contaminated areas.

Cost: $205 million

Alternative 3

Partial Excavation and Treatment

Excavate impacted soils from VPs and HISS, then consolidate and treat at SLAPS. Use institutional controls to limit access to contaminated areas.

Cost: $284 million

Alternative 4

Institutional Controls

Use institutional controls such as deed notices, land use restrictions, and zoning restrictions to limit future land use at SLAPS, HISS, and the VPs.

Cost: $129 million

Alternative 5

Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures

Remove contamination to allow unrestricted use at all sites. Control access under roads, bridges, railroads, and other permanent structures.

Cost: $223 million

Alternative 6

Excavation at all Properties

Excavate impacted soils from all locations, regardless of accessibility, for out-of-state disposal.

Cost: $286 million

soil. Institutional controls (e.g. zoning restrictions, etc.) would be used to restrict future land use at SLAPS, HISS/Futura and Coldwater Creek and to control soils beneath roads, bridges, railroads, and other permanent structures. The total cost is $205 million.

Alternative 3 – Partial Excavation and Treatment at SLAPS
This alternative includes excavation of impacted soils and sediments from HISS/Futura, the VPs and Coldwater Creek. The excavated soils would be consolidated at SLAPS for treatment (soil sorting and washing). Soils that meet supplemental standards would be used as backfill at SLAPS then covered with clean soils. Soils not meeting supplemental standards would be disposed of out-of-state. Institutional controls (e.g. zoning restrictions, etc.) would be used to restrict future land use at SLAPS and to control soils beneath roads, bridges, railroads, and other permanent structures. The total cost is $284 million.

Alternative 4 – Institutional Controls (No Further Excavation)
Alternative 4 consists of limiting the future land use at SLAPS, HISS/Futura, VPs, Coldwater Creek and controlling soils beneath roads, bridges, railroads, and other permanent structures using institutional controls (e.g. deed notices, land use restrictions, and zoning restrictions). Institutional controls and site maintenance would be implemented to prevent unacceptable exposures to site contamination. The total cost is $129 million.

Alternative 5 – Excavation with Institutional Controls Under Roads, Bridges, Railroads, and Other Permanent Structures
This alternative uses a combination of excavation with out-of-state disposal for accessible soils. Institutional controls (e.g. zoning restrictions, etc.) would be implemented to control soils under roads, bridges, railroads, and other permanent structures. The total cost is $223 million.

Alternative 6 – Excavation at all Properties
Alternative 6 includes excavation of impacted soils from all locations, regardless of accessibility, for out-of-state disposal so that no institutional controls are required. All difficult-to-access soils under roads, bridges, railroads, and other permanent structures would be excavated under this alternative. The total cost is $286 million.

PUBLIC PARTICIPATION

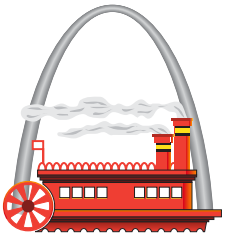
The USACE encourages public input to ensure the remedy selected for the St. Louis North County Site meets the needs of the local community and is an effective solution to the problem. Based on available information, the Corps of Engineers' preferred alternative is Alternative 5, Excavation with Institutional Controls Under Roads, Bridges, Railroads and Other Permanent Structures. Although Alternative 5 is preferred at the present time, public comments are welcome on all alternatives.

Written comments may be submitted to the USACE, at any time during the 30-day period. Oral comments will be recorded during the May 29, 2003 public meeting. The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to select a final remedy. The final remedy will be outlined in the Record of Decision, which will be submitted to EPA later in 2003.

U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

LONG-TERM STEWARDSHIP



"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

"Long-term Stewardship" includes all activities necessary to protect human health and the environment at sites that have residual contamination present after "cleanup" is complete. Long-term stewardship includes all engineered and institutional controls designed to contain or prevent exposure to residual contamination, such as surveillance activities, record-keeping activities, inspections, site monitoring, maintenance of barriers and contaminant structures, access control and posting signs.

The Long-term Stewardship Plan is being developed for the FUSRAP St. Louis Sites now to allow plenty of time for technical, managerial and financial planning.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3924 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134

WHAT IS LONG-TERM STEWARDSHIP?

"Long-term Stewardship" includes all activities necessary to protect human health and the environment at sites that have residual contamination present after "cleanup" is complete. Long-term stewardship includes all engineered and institutional controls designed to contain or prevent exposure to residual contamination, such as surveillance activities, record-keeping activities, inspections, site monitoring, maintenance of barriers and contaminant structures, access control and posting signs.

WHY IS A LONG-TERM STEWARDSHIP PROGRAM NEEDED?

The U.S. Army Corps of Engineers has made significant progress in cleaning up contamination left behind in St. Louis from the nation's early atomic program. However, some areas cannot be remediated to levels that allow for unrestricted use because of prohibitive costs, and worker safety issues. Long-term stewardship will be required to ensure that remedies remain effective because of the nature of the contaminants involved. Long-term stewardship is be addressed as a discrete program to maximize the effectiveness of its implementation and to enable the measurement of performance.

HOW WILL THE LONG-TERM STEWARDSHIP PROGRAM BE IMPLEMENTED?

Long-term stewardship will be implemented as described in the Long-term Stewardship Plan. This plan is currently being developed and coordinated by representatives of the Corps, U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), Missouri Department of Natural Resources (MDNR), local municipalities, utility companies, and the Oversight Committee. The community is also strongly encouraged to participate in the development of the long-term stewardship plan. In order to be effective, the Long-term Stewardship Plan will require community awareness of the exposure threat and assistance in establishing and maintaining the necessary controls. The long-term stewardship plan will identify activities necessary to ensure the continued protection of human health and the environment where residual hazards remain.

WHAT WILL THE LONG-TERM STEWARDSHIP PROGRAM ENTAIL?

Fundamentally, long-term stewardship programs require three attributes to be successful: responsibility, adaptability, and long-term effectiveness. Stewardship of contaminated sites requires that society (federal, state, local government agencies, and individuals) be willing to accept responsibility for ensuring a safe environment for current and future generations for the lifespan of the contaminants. Long-term stewardship programs must be adaptable to ensure the continued protectiveness of a remedy despite potentially changing physical and sociological demands. To maximize its long-term effectiveness, a layered and flexible system of controls must be employed and appropriate contingency plans developed to address unanticipated adverse events.

The primary function of long-term stewardship is to ensure protection of human health and the environment until the managed waste materials are no longer hazardous. The following four tools of stewardship will be used to accomplish this at the St. Louis FUSRAP Sites.

- Site Monitoring, Maintenance, and Reporting – Site monitoring includes periodic inspections to verify that engineered structures and barriers constructed to isolate hazards from the environment are intact. Maintenance activities could consist of repair of structures, replacement of signs and markers, and routine maintenance of security features such as fencing. All site activities must be documented for the archives.
- Institutional Controls – Institutional controls are administrative and/or legal conrols that minimize the potential for human exposure to contamination by limiting land or resource use. Institutional controls include zoning restrictions, use permits, well-drilling restrictions, and other restrictions administered under local government authority (such as deed restrictions, and easements to control land use).
- Information and Records Management – Information and records management consists of storing, preserving, and providing access to background and design information and to activity reports for long-term stewardship sites. This information is available for use by the general public, and other stakeholders. It must be maintain for the use of future generations long after the initial custodians are gone.
- Environmental Monitoring – Environmental monitoring is conducted for any area in which hazardous material remains on site in excess of the cleanup criteria after completion of the remedial action as part of the 5-year review process required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) . Environmental monitoring is performed to verify continued remedy performance and to provide an early indication of any problems that develop. Environmental monitoring can include air monitoring, surface water and groundwater monitoring, vegetation monitoring, soil and sediment sampling and monitoring, and wildlife assessments. It should be noted, however, that if a property meets the "unrestricted use and unlimited exposure" requirement (that is property can be used for any purpose), no further action is necessary.

Ultimately, all of these elements must work together to maintain the protectiveness of the site.

WHO WILL IMPLEMENT THE LONG-TERM STEWARDSHIP PROGRAM?

The process of establishing a reliable Long-term Stewardship program requires a collaborative team effort between property owners, local municipalities, state and federal agencies. At the federal level, responsibility for the long-term stewardship program is split between the USACE and the DOE. Under the Memorandum of Understanding between the these two federal agencies, the DOE will become responsible for implementing the program two years after the USACE completes the site remedy. Until the 2-year period is up, the Corps will be responsible for long-term stewardship responsibilities.

Implementation of the Long Term Stewardship Program will be a team effort involving property owners, local municipalities, and state and federal agencies.

U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

RELEASE

"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

When a property is "released", it means that the cleanup of the property has met the goals identified in the Record of Decision. Two key terms are important when the USACE makes a determination of release for a property in the Post Remedial Action Report. These terms are restricted use and unrestricted use. This fact sheet explains these terms and the circumstances under which each is assigned.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3924 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134

When a property is "released", it means that the cleanup of the property has met the goals identified in the Record of Decision. The property's release status is documented in a Post Remedial Action Report (PRAR) prepared by the U.S. Army Corps of Engineers. This report documents the effectiveness of the cleanup, demonstrates compliance with the Record of Decision, and any restrictions placed on the future use of the property.

Before finalizing the PRAR, the U.S. Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (MDNR) and the property owner receive copies of the document for review and comment. The Corps then addresses those comments, incorporates changes as required, and distributes the final document.

Two key phrases are important when the Corps makes a determination of release at a property in the PRAR. These phrases are "restricted use," and "unrestricted use and unlimited exposure".

RESTRICTED USE

"Restricted use" refers to any remedial action that does not allow for unlimited use and an unrestricted exposure. Institutional controls (such as deed restrictions) or engineering controls (such as fences) are necessary to prevent an unanticipated land use change that could result in

unacceptable exposure to human health and the environment from the remaining contamination. Simplified, the controls ensure that the cleanup remains effective.

Institutional controls or engineering controls are relied upon for the period during which the radioactivity could present a threat to human health and the environment. These controls would be maintained until the material was removed or an assessment showed that the residual contamination met unrestricted use standards.

After the completion of the cleanup, a review of the site is conducted once every 5 years to evaluate the performance of the remedy and determine whether the remedy is/will continue to be protective of human health and the environment. The 5-year review typically includes document review, site inspection, monitoring results and documentation of the effectiveness of the institutional or engineered controls. The 5-year reviews continue until the area meets the unrestricted use and unlimited exposure standard.

UNRESTRICTED USE AND UNLIMITED EXPOSURE

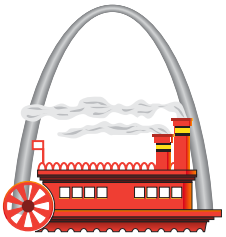
"Unrestricted use and unlimited exposure" means that the property owner can use the land for any purpose with no institutional or engineering controls. Cleanup to "unrestricted use" is not always practical. Areas where contamination is present under permanent structures (such as roads, buildings, railroads or bridges) and poses little to no risk to human health or the environment in its current state. Areas where efforts to cleanup to "unrestricted use" would present a significant safety risk or where such cleanup would be prohibitively costly are best addressed by using institutional and/or engineering controls until access can be granted to the government.

The next step is the site closeout and deletion from the National Priorities List (NPL), if applicable. The site closeout is a stand-alone document that provides a consolidated record of all removal activities for the site. The document made available for public review before it is finalized.

U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

ARARs



"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

Applicable or relevant and appropriate requirements, or ARARs, refer to a federal or more stringent state standard, which is aimed at protecting human health and the environment during the cleanup, that has been found to be legally applicable or relevant and appropriate for the site. ARARs are identified on a site-by-site basis. Factors such as the hazardous substance present, the location, the physical features, and the remedies being considered determine which standards must be met.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3924 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134

ARARS AND REMEDIATION GOALS

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires the selection of a remedial action that is protective of human health and the environment and complies with "applicable or relevant and appropriate requirements" (ARARs). The approach to determining protectiveness involves a risk assessment and consideration of both ARARs and "to-be-considered" materials (TBCs). While the subject of risk assessment is addressed in a separate fact sheet, the following information is furnished to provide a better understanding of the concept of an ARAR and how it influences remediation goals.

WHAT IS AN "ARAR"?

The term "**ARAR**" comes from the phrase "**applicable or relevant and appropriate requirement**" which appears in CERCLA. In additional to being protective of human health and the environment, CERCLA specifically requires remedial actions (or cleanups) to attain federal or more stringent state standards determined to be legally applicable or relevant and appropriate under the circumstances presented by the contaminants at the site, unless a waiver is granted. Put another way, an ARAR is:

- a promulgated federal or more stringent state law or regulation;
- aimed at protecting human health and the environment during the cleanup at a site; and that
- has been evaluated and found to be legally applicable or relevant and appropriate for the site.

The National Oil and Hazardous Substances Contingency Plan (NCP), which explains how CERCLA is to be implemented, provides further guidance by defining the concepts of "applicable" and "relevant and appropriate". A requirement is applicable if the specific terms (or "jurisdictional prerequisites") of the law or regulation directly address the circumstances at a site. If not applicable, a requirement may nevertheless be relevant and appropriate if circumstances at the site are, based on best professional judgment, sufficiently similar to the problems or situations regulated by the requirement.

HOW ARE ARARS IDENTIFIED?

ARARs are identified on a site-by-site basis. It involves a two-part analysis: first, a determination of whether a given requirement is applicable; then, if it is not applicable, a determination of whether it is both relevant and appropriate. Factors such as the contaminants present,

the location, the physical features, and the technologies being considered determine which requirements must be met. The lead agency and support agencies shall identify their specific requirements that are applicable or relevant and appropriate for a particular site.

WHAT ARE THE TYPES OF ARARS?

There are several different types of requirements that clean-up actions may have to satisfy. Generally, there are three types of ARARs:

(1) Ambient or chemical-specific requirements

(2) Action-specific requirements

(3) Location-specific requirements

WHEN ARE ARARS IDENTIFIED?

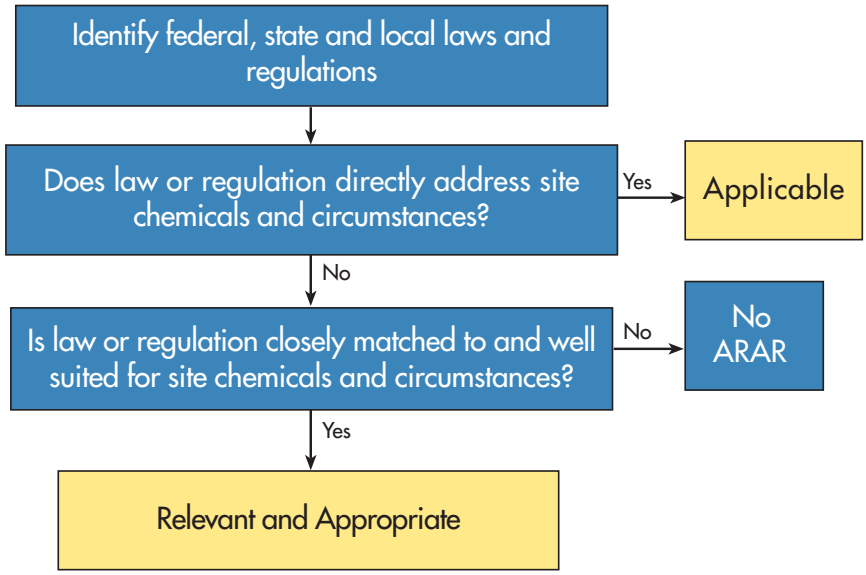
Different ARARs that may apply to a site and its remedial action are identified at multiple points in the remedy selection process. Generally, during the early stages of the Remedial Investigation and Feasibility Study and the site characterization phase, a list of potential ARARs is initially developed. These focus on chemical- and location-specific ARARs. Later during the development of remedial alternatives in the Feasibility Study, the list is modified and refined to ensure that it addresses action-specific ARARs for each proposed alternative.

Final ARARs and cleanup levels are presented in Feasibility Study (FS). The purpose of the FS is to ensure appropriate remedial alternatives are developed and evaluated. The FS presents relevant information concerning the remedial action alternatives so that decision-makers can select an appropriate remedy in the Record of Decision (ROD). During the development and screening of alternatives in the FS, remedial action objectives specifying contaminants and media of concern, potential exposure pathways, and remediation goals (or cleanup levels), are identified. (Note: preliminary remediation goals are developed in the FS; the final remediation goals are identified in the ROD.)

The signing of the Record of Decision "freezes" ARARs and clean-up standards through construction and five years thereafter. At the five-year review (which is mandated by CERCLA for sites where residual contamination exists), ARARs are re-examined.

HOW ARE ARARS USED?

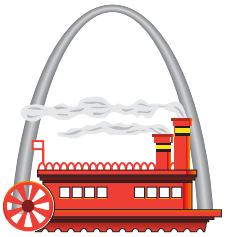
During the planning process, ARARs are used in conjunction with risk assessments/evaluations to determine the remediation goals for a particular site. They are also used in the evaluation of the proposed alternatives. The proposed or recommended plan must attain ARARs (unless a waiver of an ARAR is justified.) In addition, implementation of the remedial action should also comply with ARARs to protect public health and the environment. Finally, ARARs are examined at the five-year review to ensure that the remedy is still protective of human health and the environment.



U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

RISK ASSESSMENT



"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

The risk assessment is a method used to quantify threats to human health and the environment. By examining the potential adverse effects caused by a hazardous substance, the risk assessment can help decide what needs to be cleaned up, where, and to what level. Risk assessments are comprised of two elements: the human health risk assessment and the ecological risk assessment. Together, they help determine the most effective way to clean up a site while reducing the overall risk to human health and the environment.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3924 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134

WHAT IS A RISK ASSESSMENT?

The risk assessment is a method used to quantify threats to human health and the environment. It is performed during the Remedial Investigation / Feasibility Study process required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). By examining the potential adverse effects caused by a hazardous substance, the risk assessment can help decide what needs to be cleaned up, where, and to what level.

HOW ARE RISK ASSESSMENTS PERFORMED?

Risk assessments are comprised of two elements: the human health risk assessment and the ecological risk assessment. Together, they help determine the most effective way to clean up a site while reducing the overall risk to human health and the environment. The following sections describe these two parts of the risk assessment in detail.

HUMAN HEALTH RISK ASSESSMENT

The human health risk assessment determines the risk posed by the contaminants to people who live, work or play at or near the site. Below is a basic explanation of the four main parts of a human health risk assessment.

- **Data collection/evaluation** - determines what chemicals are present at a site, where they are present, what levels they are present in, and whether or not the chemicals are moving off the site.
- **Exposure assessment** - calculates ways people might be exposed to the chemicals identified at the site. People may be exposed to chemicals by breathing, touching, or consuming contaminated air, water, soil, or food. For each "pathway", the quantity of a chemical that someone could take into their lungs, digestive system, or absorb through their skin is estimated for the time the individual is effected by the site given its current and likely future uses. The estimates take into account how long, how often, and how many ways people could be exposed to site chemicals.
- **Toxicity assessment** - evaluates the health effects that exposure to site chemicals could cause. It includes an assessment of the increased risk of *cancerous effects*, and an assessment of toxicological thresholds for *non-cancerous* effects (such as rashes, eye irritation, breathing difficulties, or organ damage).
- **Risk characterization** - combines the results of the three steps above to identify the critical risks posed by the site and determine whether they are great enough to cause health problems for people at or near a site.

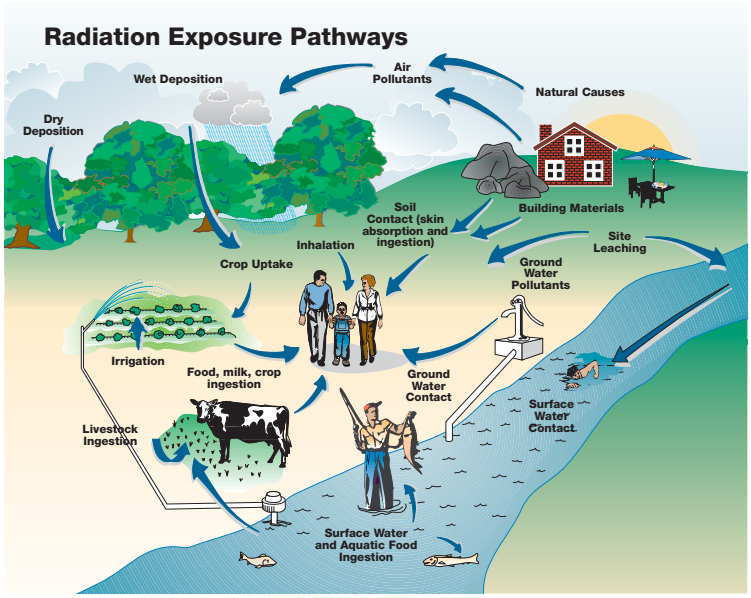
ECOLOGICAL RISK ASSESSMENT

The process for developing the ecological risk assessment is very similar to the human health risk assessment. The ecological risk assessment, however, focuses on the effects that site contamination has or could have on plants and wildlife. A basic explanation of the five major parts of this assessment follows.

- **Problem Formulation** - evaluates what chemicals, animal and plant species are present at a site, what levels the chemicals are present in, and whether or not the chemicals are moving off the site.
- **Analyses (Characterization of Exposure)** - calculates how animals and plants might be exposed to the chemicals, at what levels, and over how many years this exposure might reasonably be expected to occur. Animals may be exposed to chemicals the same ways that people could be exposed, by breathing, touching, or consuming contaminated air, water, soil, or food. Exposures are calculated for groups of animals like birds, mammals, and fish and plants like grasses, trees, and aquatic plants. Sometimes these groups are broken down into sub-groups such as birds of prey (eagles, hawks, etc.) and aquatic birds (ducks, geese, etc.).
- **Toxicity Assessment (Characterization of Ecological Effects** - requires literature reviews, field studies, and toxicity tests to identify what the health effects of the various chemicals would be on each animal and plant group (or sub-group) identified.
- **Risk Characterization** - determines the most critical ecological site risks and whether they are great enough to cause health problems for animals or plants at/near a site. The amount of uncertainty in the risk estimates is also considered. If this step identifies potential unacceptable risks to plants and/or animals, then remedial action is necessary and a Feasibility Study is performed to identify and evaluate remedial alternatives to reduce these risks.
- **Data Acquisition** - includes a number of activities performed throughout the ecological risk assessment process. Activities may include identification of threatened or endangered species/habitats, analyses of wildlife impacts, monitoring abundance of species within the area, and others.

HOW IS A RADIOLOGICAL RISK ASSESSMENT COMPLETED?

Overall, the process for assessing radionuclide exposures and radiation risks parallels the process for assessing increased risks from carcinogenic chemical exposures. Both radiological and chemical risk assessments follow the same processes, consider similar exposure scenarios and pathways, determine exposure point concentrations, and provide estimates of risks to humans and the environment. The primary difference is that the radiological risk assessment includes the external "direct exposure" pathway. The "direct exposure" pathway is unique to the radiological risk assessment.



We are exposed to ionizing radiation by many pathways. The main ones for most people are exposure to cosmic radiation, exposure to and breathing indoor and outdoor air, exposure to radiation from rocks and soils, and drinking and eating foods with naturally occurring radioactive elements.

US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

RADIATION BASICS

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 1950s.

Radiation is energy that travels in the form of waves or particles. Radioactivity is the property of some atoms to spontaneously give off energy. The atoms that make up the radioactive materials are the source of radiation. Ionizing radiation can be found in everything in nature in trace amounts – including people – but in high enough concentrations, it can cause chemical and/or physical changes in human tissue. While it is true that radiation can cause biological damage, it is important to keep the risks in perspective. We cannot eliminate radiation from our environment, but we can reduce our risks by controlling exposure.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042.

WHAT IS RADIATION?

Radiation is energy that travels in the form of waves or particles. Radiation is everywhere — in, around and above the world we live in. Depending on how much energy it has, radiation is described as either non-ionizing (low-energy) or ionizing (high-energy). Non-ionizing radiation includes the sun and various electronic devices. Ionizing radiation can be found in everything in nature in trace amounts — including people. Every element such as carbon and potassium, as well as uranium and thorium has a radioactive form. Although ionizing radiation is all around us, in high enough concentrations it can present a health hazard if it is not properly controlled.

WHAT EFFECTS CAN RADIATION HAVE?

Because it can knock electrons from the atoms and molecules in its path, ionizing radiation can cause chemical and/or physical changes in human tissue. The effect of radiation on the body depends on how long the exposure lasted, how much energy was absorbed, and the type and number of cells that were affected. Most of the time, the cells can repair any damage themselves; however, sometimes they cannot. While there are billions of cells in the body, if enough are damaged, there is a risk of adverse health effects.

IS ALL IONIZING RADIATION THE SAME?

Naturally occurring ionizing radiation may be one of three main types (alpha, beta or gamma). Alpha particles can travel approximately 1 to 2 inches in air and can be blocked by a sheet of paper. Beta particles can travel 6 to 10 feet in air but can be blocked by a few millimeters of substance (such as clothing, glass, plastic, aluminum). Gamma particles can travel the farthest but may be stopped with lead or concrete.

WHAT IS DOSE? HOW IS RADIATION MEASURED?

The dose is the quantity of radiation or energy received. A basic unit for measuring the amount of energy absorbed from radiation received is the *rad*. To show biological risk and the probability of harmful effect, the rad is converted to the *rem*, which stands for Radiation Equivalent Man. The rem reflects tissue dose and takes into account the type of radiation absorbed into the body as well as the likelihood of damage. Because exposure to radiation normally occurs in fractions of a rem, the commonly used unit of exposure is the *millirem (mrem)*: 1 rem equals 1,000 millirem.

It is important to understand that doses are averages that span a rather large range of values. For example, individual doses due to radon average about 230 millirem per year per person in the United States. The actual dose can vary widely, depending on where you live/work.

WHAT ARE THE SOURCES OF EXPOSURE TO RADIATION?

While it is true that radiation can cause biological damage, it is important to keep risks in perspective. Each year, we receive about a 310 millirem dose of radiation from natural sources. Natural sources include rocks and soil, which contain naturally occurring radioactive isotopes — such as radon, thorium, uranium and radium — or from cosmic sources — such as the sun and other sources in space. The average American receives an additional 310 millirem per year from human activities, mostly medical sources (such as X-rays). Thus, in the United States, the average person receives a dose of about 620 millirem per year from all sources.

WHAT IS THE DIFFERENCE BETWEEN RADIATION AND RADIOACTIVITY?

Radiation is the energy or particles that are released during radioactive decay. The radioactivity of a material refers to the rate at which it emits radiation.

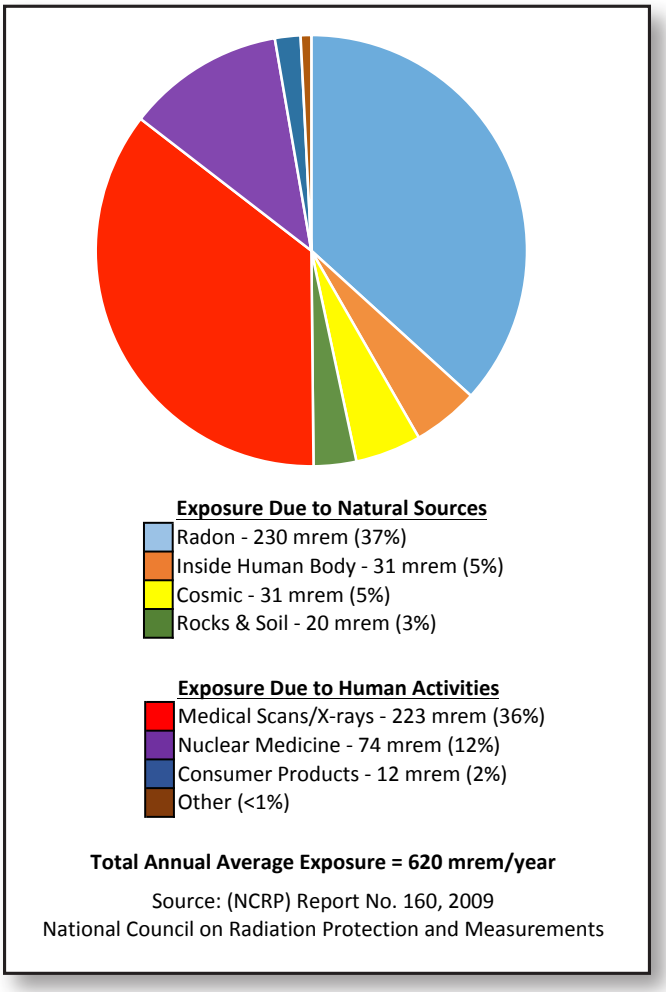
Each decay throws off particles and energy and is referred to as a "disintegration." The number of disintegrations per second or per minute is the *activity* of a sample. Activity is expressed in curies. *One curie equals 37 billion disintegrations per second.* At the FUSRAP St. Louis Sites, activity is commonly expressed in picocuries (pCi) 1/1,000,000,000,000 of a curie. In comparison, one disintegration per second is 27 picocuries.

HOW ARE PEOPLE EXPOSED TO RADIATION, AND HOW CAN THEY PROTECT THEMSELVES?

We can be exposed to ionizing radiation through a number of pathways. We can be exposed through inhalation, ingestion and direct exposure. The main pathways for most people are exposure to cosmic radiation, exposure to and breathing indoor and outdoor air, exposure to radiation from rocks and soils, and exposure through all of the foods and liquids that we eat and drink.

We can protect ourselves from direct exposure by using time, distance and shielding to limit our cumulative levels of exposure. The farther from the source of radiation, the shorter the time of exposure and the thicker the shielding, the safer a person is. We cannot eliminate radiation from our environment; we can, however, reduce our risks by controlling our exposure.

It may also be interesting to note that the radiation dosage varies depending on where we live. For instance, people living in Colorado are exposed to more natural radiation than those living near sea level: Since it's at a higher altitude, Colorado receives more cosmic radiation (because it's closer to the sun) and more terrestrial radiation (from the mountains, which contain naturally occurring uranium).



US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

SLAPS VICINITY PROPERTIES

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Army Corps of Engineers (USACE) environmental program known as the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes the North County Sites and the St. Louis Downtown Sites. These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's 1940s and 1950s atomic program.

To learn more about FUSRAP, contact the FUSRAP Project Office at 314-260-3905 or, via email, at STLFUSRAP@usace.army.mil.

BACKGROUND

The St. Louis Airport Site Vicinity Properties (SLAPS VPs) consist of approximately 148 properties including parcels along former haul routes between the SLAPS and the Latty Avenue Properties, Coldwater Creek (CWC), open fields ("former Ballfields" area) immediately north of the SLAPS, and other locations contiguous to SLAPS. The impacted areas also include haul routes between the SLAPS and the HISS. These routes include Eva Avenue, Frost Avenue, Hazelwood Avenue, McDonnell Boulevard, and Pershall Road. The SLAPS VPs are primarily located within the cities of Berkeley and Hazelwood, Missouri.

The part of CWC that is a SLAPS VP flows 14.2 miles in a northeasterly direction from Banshee Road to the Missouri River. CWC flows along the western border of SLAPS through the city of Hazelwood, the city of Florissant, unincorporated areas of St. Louis County, and along the northern edge of the community of Black Jack, until it discharges into the Missouri River. There are approximately 700 vicinity properties adjacent to CWC from Highway I-270 to the Missouri River that are also SLAPS VPs. These properties are designated CWC VPs. These properties are primarily residential and recreational properties with some businesses. The USACE continues to investigate/sample the CWC corridor (banks and sediment) and the adjacent properties within the 10-year flood plain. To date, more than 108,000 cubic yards (cys) have been removed from the SLAPS VPs. Because of this progress, USACE has released 115 SLAPS VPs and 80 CWC VPs for beneficial use.

USACE excavates contaminated soils from all properties to levels that allow for unlimited use and unrestricted exposure (UUUE), except for some limited areas where the soils are currently inaccessible.

Low-level radioactive contamination at the SLAPS VPs is linked to both the SLAPS and the Hazelwood Interim Storage Site (HISS)/Futura/ Latty Avenue VPs. In 1966, uranium-bearing residues were purchased from Manhattan Engineer District (MED) and removed from SLAPS to Latty Avenue properties under an Atomic Energy Commission (AEC) license. Over time residues migrated from other sites or were deposited when waste was hauled along transportation routes, and the soil and sediment at the SLAPS VPS became contaminated. Cleanup of North County sites was originally led by AEC and later the U.S. Department of Energy (DOE) until a 1997 Congressional action transferred the execution of the remediation

of FUSRAP sites to the U.S. Army Corps of Engineers (USACE) under the Energy and Water Development Appropriations Act. In early 2000, USACE collected samples from SLAPS, SLAPS VPs, HISS/Futura/Latty Ave VPs, and CWC and developed cleanup alternatives to address all of these sites. In 2005, the North County Record of Decision (ROD) was signed. The selected remedy for soils, sediments and permanent structures is outlined in the North County ROD. USACE excavates contaminated soils from all properties to levels that allow for unlimited use and unrestricted exposure (UUUE), except for some limited areas where the soils are currently inaccessible.

Inaccessible soils are located under permanent structures such as active roads, railways, or buildings where excavation is considered impractical under current conditions. Potential risks from contaminants in these inaccessible areas will be managed by imposing appropriate use restrictions through institutional controls (land use controls).

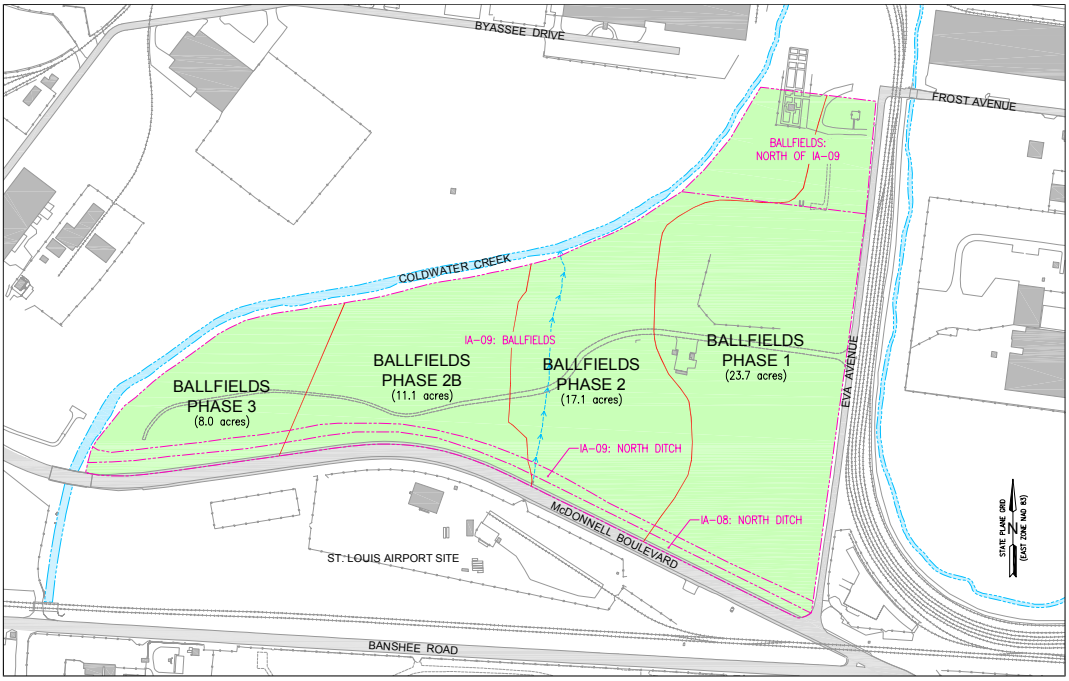
CURRENT ACTIVITIES

The USACE is currently remediating the "former Ballfields" (Ballfields) IA-09 property. The Ballfields are located north of the SLAPS and is bounded by Eva Avenue (Ave) to the east and McDonnell Boulevard (Blvd) to the south and CWC to the west and north. The Ballfields are owned by the St. Louis Airport Authority. The Ballfields are broken into four areas designated as IA-09 Ballfields, Ballfields North of IA-09, IA-09 North Ditch and IA-08 North Ditch. The former Ballfields are generally level topography. The Ballfields are also bisected by a drainage ditch that flows from south to north from a location near the IA-09 North Ditch to CWC.

The IA-08 North Ditch and IA-09 North Ditch are so named because they are on the north side of McDonnell Boulevard. These ditches parallel McDonnell Blvd and carry McDonnell Blvd runoff from Eva Ave on the east to CWC on the west. The IA-08 North Ditch and IA-09 North Ditch are part of the McDonnell Blvd right-of-way (ROW) that are owned by St. Louis County.

For planning and design purposes the Ballfields were broken into three phases: Phase 1 (23.7 acres), Phase 2/2B (28.2 acres) and Phase 3 (8 acres). Remediation activities at Phase 1 are completed (8,262 cys) were removed). Phase 2 is also completed. USACE is currently completing remedial activities at Phase 2B (21,614 cys have been removed from Phase 2/2b to date). Remedial activities in Phase 3 will start in April 2019. Approximately 70,500 cys are expected to be removed. Remedial activities at Phase 3 will take at least 1 to 3 years.

REMEDIAL ACTIVITY PHASES AT FORMER BALLFIELDS



US Army Corps of Engineers®
St. Louis District®

St. Louis Downtown Site

Formerly Utilized Sites Remedial Action Program (FUSRAP)

BUILDING STRONG®

Background

Through the Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Army Corps of Engineers is identifying, investigating, cleaning up or controlling sites throughout the United States that were part of the nation's early atomic weapons and energy programs during the 1940s, 1950s and 1960s. Generally sites that became contaminated during the early atomic energy program were cleaned up and released for use under the cleanup guidelines in effect at that time, which were not as strict as today's revised standards. Thus, low-level residual radioactive materials remain at many of these sites.

From 1942 to 1957 the Manhattan Engineer District (MED) and Atomic Energy Commission (AEC) contracted with Mallinckrodt Chemical Works to process various forms of uranium compounds, for machining and recovery of uranium metal at the St. Louis Downtown Site (SLDS) in downtown St. Louis, Missouri. This site consists of nearly 45 acres owned and operated by the chemical manufacturing facility Mallinckrodt LLC and multiple surrounding properties owned by other parties. It is located on the eastern border of St. Louis, approximately 300 feet west of the Mississippi River and 11 miles southeast of Lambert-St. Louis International Airport in North St. Louis City.

SLDS cleanup was originally led by AEC and later the Department of Energy until a 1997 Congressional action transferred FUSRAP responsibility to the U.S. Army Corps of Engineers under the Energy and Water Development Appropriations Act.

Project Description

The final cleanup remedy for accessible soils was outlined in a Record of Decision (ROD) which was finalized in August 1998. Under the ROD, radiological and chemical contamination in accessible surface and subsurface soil resulting from MED/ AEC processing activities will be excavated and shipped to a licensed out-of-state disposal facility.

Inaccessible soils potentially affected by MED/AEC include soils in sewer lines, on building surfaces, and beneath buildings or other permanent structures such as roads and railroads. The St. Louis District has completed the characterization and investigation of the designated SLDS Inaccessible Soils Operable Unit (ISOU). The ISOU has been separated into two groups, Group 1 and Group 2. A No Further Action ROD for the Group 1 Properties was finalized in September 2014. The remaining Group 2 properties are currently undergoing further characterization to determine if they represent No Further Action and can be included with the Group 1 ROD, could be remediated under the accessible ROD with property owner concurrence, or if a Group 2 ROD will be needed.

Ongoing Work

From the beginning of USACE FUSRAP remedial activities in 1998 through Fiscal Year 2018; 315,824 cubic yards of contaminated soil have been removed from the SLDS. Remedial activities have recently been completed at the Mallinckrodt Plant 1 Former Building 17 location. Currently, remedial activities are being conducted on Destrehan Street and Plant 7W in the Mallinckrodt Plant and in formerly inaccessible areas at Gunther Salt Properties.

More information about the work at the St. Louis Downtown Site can be found at:
http://www.mvs.usace.army.mil/Missions/CentersofExpertise/FormerlyUtilizedSitesRemedialActionProgram.aspx

U.S. ARMY CORPS OF ENGINEERS – ST. LOUIS DISTRICT
114 James S. McDonnell Blvd., Hazelwood, MO 63042.
FUSRAP OFFICE: (314) 260-3905
https://www.mvs.usace.army.mil/Missions/FUSRAP/

June 2020
G20-0009

US Army Corps of Engineers®
St. Louis District®

St. Louis Airport Site

Formerly Utilized Sites Remedial Action Program (FUSRAP)

BUILDING STRONG®

Background

Through the Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Army Corps of Engineers is identifying, investigating, cleaning up or controlling sites throughout the United States that were part of the nation's early atomic weapons and energy programs during the 1940s, 1950s and 1960s. Generally sites that became contaminated during the early atomic energy program were cleaned up and released for use under the cleanup guidelines in effect at that time, which were not as strict as today's revised standards. Thus, low-level residual radioactive materials remain at many of these sites.

In 1946, Manhattan Engineer District (MED) acquired the 21.7 acre tract of land now known as St. Louis Airport Site (SLAPS) to store residues from uranium processing from the Mallinckrodt facility in St. Louis. Most of the residues were stored in bulk on open ground, while some contaminated materials and scrap were buried in various areas of the property. In 1966-1967 most of the stored residues were sold and removed from SLAPS. Structures were razed and contaminated soils were buried with 1 to 3 feet of clean fill material, resulting in an acceptable surface dose rate with buried contamination in excess of federal guidelines. Following a 1976-1978 radiological investigation that indicated elevated concentrations of uranium and radium in area drainage ditches, the SLAPS properties were added to the National Priorities List in 1989, requiring cleanup to proceed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidelines. SLAPS cleanup was originally led by Atomic Energy Commission (AEC) and later the Department of Energy (DOE) until a 1997 Congressional action transferred the execution of FUS RAP to the U.S. Army Corps of Engineers under the Energy and Water Development Appropriations Act.

SLAPS is a 21.7 acre property located in St. Louis County, approximately 15 miles from downtown St. Louis. SLAPS is immediately north of the Lambert-St Louis International Airport and is bounded by Norfolk and Western Railroad and Banshee Road on the south, Coldwater Creek on the west, and McDonnell Blvd and adjacent recreational fields on the north and east.

Project Description

Remediation at the SLAPS was initiated in 1997 under Engineering Evaluation/Cost Analysis (EE/CAs) developed by DOE and the USACE. In September 2005, the North County Record of Decision (ROD) was finalized. The remainder of SLAPS was re mediated under the 2005 ROD. The area under the SLAPS rail spur still remains and will be remediated when North County is completed. The SLAPS was completed in 2007. The USACE removed over 410,000 cubic yards of contaminated material from the SLAPS site. A final Post Remedial Action Report/Final Status Survey Evaluation for the SLAPS was completed in 2009.

Ongoing Work

Current activities include site monitoring and maintenance of the rail spur which is still used to ship material excavated from the SLAPS VPs. Upon completion of remediation of the SLAPS VPs the rail spur will also be removed and the site will be turned over to the DOE for long term management.

More information about the work at the St. Louis Airport Site can be found at:
https://www.mvs.usace.army.mil/Missions/FUSRAP/

U.S. ARMY CORPS OF ENGINEERS – ST. LOUIS DISTRICT
114 James S. McDonnell Blvd., Hazelwood, MO 63042.
FUSRAP OFFICE: (314) 260-3905
www.mvs.usace.army.mil

June 2020
G20-0009

US Army Corps of Engineers®
St. Louis District®

SLAPS Vicinity Properties

Formerly Utilized Sites Remedial Action Program (FUSRAP)

BUILDING STRONG®

Background

Through the Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Army Corps of Engineers is identifying, investigating, cleaning up or controlling sites throughout the United States that were part of the nation's early atomic weapons and energy programs during the 1940s, 1950s and 1960s. Generally sites that became contaminated during the early atomic energy program were cleaned up and released for use under the cleanup guidelines in effect at that time, which were not as strict as today's revised standards. Thus, low-level residual radioactive materials remain at many of these sites.

Low-level radioactive contamination at the St. Louis Airport Site (SLAPS) Vicinity Properties (VPs) is linked to both the SLAPS and the Latty Avenue Properties. In 1966 uranium-bearing residues were purchased from Manhattan Engineer District (MED) and removed from SLAPS to Latty Avenue under Atomic Energy Commission (AEC) license. Over time residues migrated from other sites or were deposited when waste was hauled along transportation routes, and the soil and sediment at the SLAPS VPS became contaminated. Cleanup of North County sites was originally led by AEC and later the Department of Energy until a 1997 Congressional action transferred the execution of FUSRAP to the U.S. Army Corps of Engineers under the Energy and Water Development Appropriations Act.

The SLAPS VPs are located in the cities of Hazelwood and Berkeley, Missouri. There are more than 78 of these vicinity properties, including: Coldwater Creek and its VPs to the west; adjacent ball fields to the north and east; Norfolk and Western railroad properties adjacent to Coldwater Creek; Banshee Road to the south; and transportation routes (haul roads) and the properties adjacent to them.

Project Description

The selected remedy for soils, sediments and permanent structures is outlined in the North County Record of Decision (ROD) which was finalized in September 2005. To date over 65,000 cubic yards of contaminated soil have been removed from the SLAPS VPs. Currently 76 SLAPS VPs have been released for beneficial use. The USACE continues to perform sampling at the remaining VPs.

Coldwater Creek (CWC) is a SLAPS VP from Banshee Road to the Missouri River, an approximately 14 mile stretch of creek. The USACE completed remediation of a section of CWC from Banshee Road to McDonnell Boulevard (Blvd.) in 2005, a section of CWC adjacent to the St. Louis Airport Site. In 2012, the USACE completed sampling CWC from McDonnell Blvd. to Frost Avenue. In 2013, the USACE started sampling ewe from Frost Avenue (Ave.) to St. Denis Bridge, a 3.2 mile stretch of ewe that flows from the industrial to the residential areas of North County. Because of past flooding of CWC, the USACE decided to sample the corridor consisting of the sediments and banks of the creek, but also the adjacent properties within the 10-year flood plain. The 10-year flood plain is only considered a starting point to sample the adjacent properties of CWC. If contamination is found, sampling would extend beyond this area until all areas of contamination were found.

Ongoing Work

The USACE continues to sample ewe from Frost Ave. to the St. Denis Bridge. Contamination was found in residential backyards and City Parks north of 1-270. The USACE is currently remediating St. Cin Park. The USACE will initiate sampling CWC from St. Denis Bridge to Old Halls Ferry in late 2016.

More information about the work at the SLAPS VPs can be found at: https://www.mvs.usace.army.mil/Missions/FUSRAP/

U.S. ARMY CORPS OF ENGINEERS – ST. LOUIS DISTRICT
114 James S. McDonnell Blvd., Hazelwood, MO 63042.
FUSRAP OFFICE: (314) 260-3905
www.mvs.usace.army.mil

June 2020
G20-0009

US Army Corps of Engineers®
St. Louis District®

Latty Avenue Properties

Formerly Utilized Sites Remedial Action Program (FUSRAP)

BUILDING STRONG®

Background

Through the Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Army Corps of Engineers (USACE) is identifying, investigating, cleaning up or controlling sites throughout the United States that were part of the nation's early atomic weapons and energy programs during the 1940s, 1950s and 1960s. Generally sites that became contaminated during the early atomic energy program were cleaned up and released for use under the cleanup guidelines in effect at that time, which were not as strict as today's revised standards. Thus, low-level residual radioactive materials remain at many of these sites.

In early 1966 ore residues and uranium and radium bearing process wastes that had been stored at the St Louis Airport Site (SLAPS) were moved to the Hazelwood Interim Storage Site (HISS) on Latty Avenue. These wastes had been generated at the Mallinckrodt plant in St Louis from 1942 through the late 1950s under contracts with Manhattan Engineer District/ Atomic Energy Commission (MED/AEC). Due to private and public projects requiring decontamination, contaminated soils were relocated to several adjacent vicinity properties until a 1984 radiological survey indicated contamination in excess of federal guidelines. In 1989 the HISS properties were added to the National Priorities List, requiring cleanup to proceed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidelines. Latty cleanup was originally led by AEC and later the Department of Energy until a 1997 Congressional action transferred the execution of FUSRAP to the USACE under the Energy and Water Development Appropriations Act.

The Latty Avenue properties are 1.2 km northeast of the SLAPS located in the cities of Hazelwood and Berkeley Missouri, and consist of vicinity properties 1L-6L, 40A, 10k530087, the HISS and Futura Coatings Company. The majority of Vicinity Properties are located along Latty Avenue.

Project Description

In 1998, the USACE prepared an Engineering Evaluation/Cost Analysis (EE/CAs) to build a rail spur and remove the HISS and adjacent piles. In 1999, the USACE completed construction of the HISS/Latty Avenue rail spur to remove contaminated materials from the HISS piles and impacted soil from three adjacent Latty Avenue properties. The USACE chose to expedite the removal of the HISS piles to protect human health and the environment.

The USACE started removal of the HISS piles in the spring 2000. Removal started with the East Piles 1 & 2 located at VP-2L adjacent to HISS. Work continued on the removal of the piles located on the HISS property. Contaminated materials from the Spoil Piles A & B; Supplemental Pile and then the Main Pile were removed. Removal of the HISS piles was completed in the fall 2001. Over 52,000 cubic yards of contaminated material was removed and transported by covered gondola cars for disposal at an out-of-state licensed/properly permitted facility.

The selected remedy for soils, sediments and permanent structures for the North County sites was completed in September 2005 when the Record of Decision (ROD) was finalized. Remedial activities to remove in situ contaminated soils at the HISS/Futura and Latty VPs were initiated in 2007 and completed in 2013. The HISS rail spur was removed in 2011. The USACE removed 97,559 cubic yards of contaminated material from the sites. A Post-Remedial Action Report/Final Status Survey Evaluation (PRAR/FSSE) was issued for the HISS and Futura sites, VPlL, VP2L and VPs 3L - 6L.

U.S. ARMY CORPS OF ENGINEERS – ST. LOUIS DISTRICT
114 James S. McDonnell Blvd., Hazelwood, MO 63042.
FUSRAP OFFICE: (314) 260-3905
https://www.mvs.usace.army.mil/Missions/FUSRAP/

June 2020
G20-0009

Inaccessible soils are located under permanent structures such as active roads, railways, or buildings where excavation is considered impractical under current conditions. Inaccessible contaminated soils still exists under the Futura Buildings. Potential risks from contaminants in these inaccessible areas will be managed by imposing appropriate use restrictions through institutional controls.

Ongoing Work

The USACE completed an Institutional Controls Plan to manage the inaccessible contamination located under the Futura Buildings. Institutional Controls will be imposed at the Futura Buildings to protect the public and worker health and the environment. Current activities also include site monitoring.

More information about the work at the Latty Avenue Properties can be found at:
https://www.mvs.usace.army.mil/Missions/FUSRAP/

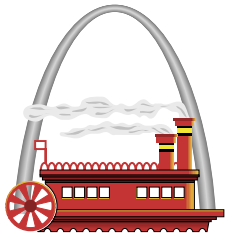
U.S. ARMY CORPS OF ENGINEERS – ST. LOUIS DISTRICT
114 James S. McDonnell Blvd., Hazelwood, MO 63042.
FUSRAP OFFICE: (314) 260-3905
https://www.mvs.usace.army.mil/Missions/FUSRAP/

June 2020
G20-0009

U.S. Army Corps of Engineers
St. Louis District

Summary of the

MADISON SITE PROPOSED PLAN



"Gateway to Excellence"

The U. S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the Madison Site. Contamination at the site is the result of federal defense activities performed under contracts with the U. S. Atomic Energy Commission during the late 1950s and early 1960s.

The USACE has issued a Proposed Plan describing the preferred remedy for remediating the Madison Site. Public comment and regulatory review will help determine the remedy selected for the site. Engineering plans, work instructions, and health and safety plans will be prepared before cleanup begins.

The USACE encourages private citizens to fully participate in the cleanup program.

To learn more about the Madison Site or to inquire about public involvement opportunities, contact Lou Dell'Orco at (314) 524-4083 or write St. Louis District, Corps of Engineers, FUSRAP Project Office, 9170 Latty Avenue, Berkeley, Missouri 63134

Background

During the late 1950s and early 1960s, the Mallinckrodt Chemical Company contracted with Dow Chemical Company to perform extrusions of uranium metal and straightening of extruded uranium rods for the U. S. Atomic Energy Commission (AEC). The work was conducted on an extrusion press and straightening table located in Building 6 at the Madison Site.

In 1989, the U. S. Department of Energy (DOE) conducted a preliminary radiological survey to evaluate and establish the radiological status of the Madison Site as part of the Formerly Utilized Sites Remedial Action Program (FUSRAP). The survey identified low concentrations of uranium in dust on overhead surfaces in a portion of Buildings 4 and 6. It concluded that this residual radioactive material did not pose a potential for significant radiation exposure to current building occupants, but did recommend further investigation to better define the extent of uranium contamination on overhead surfaces. On October 13, 1997, Congress transferred responsibility for FUSRAP from the DOE to the U. S. Army Corps of Engineers (USACE) as part of the 1998 Energy and Water Appropriations Bill.

Continuing in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, the USACE issued a Proposed Plan describing the preferred remedy for addressing the presence of uranium-contaminated dust on overhead surfaces in Buildings 4 and 6. This Plan provides background information on the Madison Site, describes the alternatives being considered to clean up the site, presents the rationale for selecting the preferred remedy and outlines the public's role in helping USACE make a final decision on a cleanup approach.

The Preferred Alternative

Four site-wide alternatives are discussed at length in the Feasibility Study (FS) for the Madison Site. The Proposed Plan provides a summary of each alternative, identifies the preferred alternative, and provides a rationale for the selection of this alternative.

The USACE prefers Alternative 4, Decontamination of Accessible Surfaces and Release of Building. This alternative protects human health and the environment and is believed to provide the best balance of effectiveness, cost and implementability. Under Alternative 4, uranium-contaminated dust on accessible surfaces (horizontal ledges such as window sills, electrical conduits, water conduits, and beams at the 25- and 36-foot levels) will be removed. Inaccessible areas are defined as those surfaces that can not be accessed either from the high-bay crane or through windows and may include select other areas, such as those around live power lines. Aggressive or non-aggressive removal techniques would be utilized as necessary to remove contamination.

Public Participation

The USACE encourages public input to ensure the remedy selected for the Madison Site meets the needs of the local community and is an effective solution to the problem.

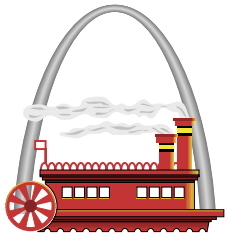
Comments on the proposed remedial action will be accepted for 30 days after the FS and Proposed Plan are issued. Verbal comments will be recorded during a public meeting scheduled to be held on February 17, 2000. Written comments may be submitted at any time during the 30-day comment period.

The USACE will respond to all significant comments and will consider these comments when working in cooperation with the regulators to make a final decision. The final remedy for the Madison Site will be selected after review and full consideration of all comments received during the public review period.

U.S. Army Corps of Engineers
St. Louis District

Summary of the

MADISON SITE FEASIBILITY STUDY



"Gateway to Excellence"

The U. S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the Madison Site. Contamination at the site is the result of federal defense activities performed under contracts with the U. S. Atomic Energy Commission during the late 1950s and early 1960s.

The USACE has issued a Feasibility Study identifying and evaluating alternatives for remediating the Madison Site. Public comment and regulatory review will help determine the remedy selected for the site. Engineering plans, work instructions, and health and safety plans will be prepared before cleanup begins.

The USACE encourages private citizens to fully participate in the cleanup program.

To learn more about the Madison Site or to inquire about public involvement opportunities, contact Lou Dell'Orco at (314) 524-4083 or write St. Louis District, Corps of Engineers, FUSRAP Project Office, 9170 Latty Avenue, Berkeley, Missouri 63134

Background

During the late 1950s and early 1960s, the Mallinckrodt Chemical Company contracted with Dow Chemical Company to perform extrusions of uranium metal and straightening of extruded uranium rods for the U. S. Atomic Energy Commission (AEC). The work was conducted on an extrusion press and straightening table located in Building 6 at the Madison Site.

In 1989, the U. S. Department of Energy (DOE) conducted a preliminary radiological survey to evaluate and establish the radiological status of the Madison Site as part of the Formerly Utilized Sites Remedial Action Program (FUSRAP). The survey identified low concentrations of uranium in dust on overhead surfaces in a portion of Buildings 4 and 6 in the vicinity of the extrusion press. It concluded that the uranium-contaminated dust did not pose a potential for significant radiation exposure to plant employees but did recommend further investigation to better define the extent of contamination on overhead surfaces.

On October 13, 1997, Congress transferred responsibility for FUSRAP from the DOE to the U. S. Army Corps of Engineers (USACE) as part of the 1998 Energy and Water Appropriations Bill. Alternatives for addressing the uranium contamination at the Madison Site are identified and evaluated in the Feasibility Study (FS).

Contaminants of Concern

The only contaminant of concern (COC) found during the investigation was processed natural uranium (i.e. uranium that has been separated from the other naturally occurring members of the uranium and actinium decay series). In general, the highest levels of uranium were found in dust on overhead surfaces above the extrusion press in Building 6 with decreasing levels progressing outward from this point. Utility workers working on or near overhead surfaces could experience unacceptable exposure from the contaminated surfaces.

Summary of Alternatives

Alternative 1 - No Action

This alternative leaves the dust in place and makes no changes from the current status. Mandated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), this alternative is provided as a baseline for comparison with other alternatives. The cost of Alternative 1 is $0.

Alternative 2 - Institutional Controls

Institutional controls would be implemented to prevent unacceptable exposures to uranium-contaminated surfaces. Institutional controls include use-limitations through deed restriction, land-use restrictions, and work instructions and permits identifying contamination and measures to reduce employee exposure. Periodic government inspections and airborne dust particle sampling/analysis would be performed. If uranium is detected in the airborne dust particles, breathing zone monitors would be required. The cost of Alternative 2 is $60,000.

Alternative 3 - Containment

Alternative 3 incorporates containment, institutional controls, and environmental monitoring to reduce both the potential for direct exposure and reduce any further spread of the contaminant. A coating would be sprayed onto accessible, uranium-contaminated surfaces at the 25-foot and 36-foot levels to immobilize the dust by trapping it beneath the coating. Dust on beams in the high-bay, which are accessible from the windows, would also be sprayed. Once the use of the building is discontinued, radiological support for decontamination would be provided prior to building demolition and rubble disposal following building demolition. The cost of Alternative 3 is $450,000.

Alternative 4 - Decontamination of Accessible Surfaces and Release of Building

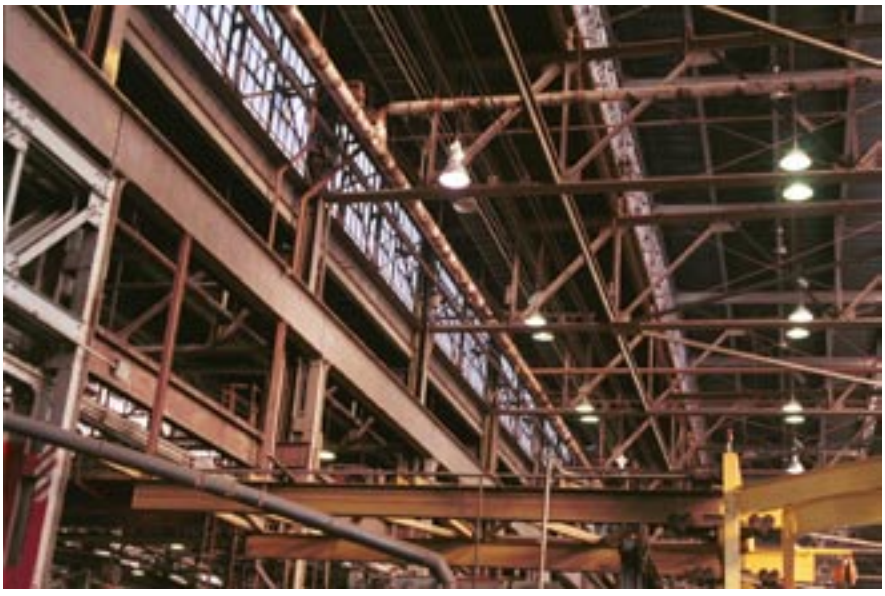
Alternative 4 includes decontamination of accessible uranium-contaminated surfaces at the 25-foot and 36-foot levels and the beams in the high-bay that are accessible from the windows. Inaccessible areas are defined as those surfaces that can not be accessed either from the high-bay crane or through windows. Inaccessible areas include the high-bay areas above the 36-foot level and select other areas around live power lines. Aggressive or non-aggressive removal techniques would be utilized, as necessary, to remove the uranium contamination. Decontamination work would take place when the building could be made available by the current owner. The cost of Alternative 4 is $250,000.

Public Participation

The USACE encourages public input to ensure the remedy selected for the Madison Site meets the needs of the local community and is an effective solution to the problem.

Comments on the proposed remedial action will be accepted for 30 days after the FS and Proposed Plan are issued. Verbal comments will be recorded during the February 17, 2000 public meeting and written comments may be submitted at any time during the 30-day comment period.

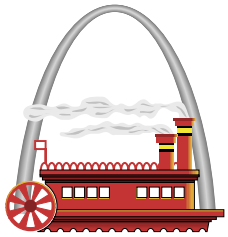
The USACE will respond to all significant comments and will consider these comments when working in cooperation with the regulators to make a final decision. The final remedy for the Madison Site will be selected after review and full consideration of all comments received during the public review period.



U.S. Army Corps of Engineers
St. Louis District

Summary of the

MADISON SITE REMEDIAL INVESTIGATION REPORT



"Gateway to Excellence"

The U. S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the Madison Site. Contamination at the site is the result of federal defense activities performed under contracts with the Atomic Energy Commission during the late 1950s and early 1960s.

The USACE has issued a Remedial Investigation to further evaluate the site's current radiological conditions in order to develop recommendations for further action at the Madison Site. Public comment and regulatory review will help determine the remedy selected for the site. Engineering plans, work instructions, and health and safety plans will be prepared before cleanup begins.

The USACE encourages private citizens to fully participate in the cleanup program.

To learn more about the Madison Site or to inquire about public involvement opportunities, contact Lou Dell'Orco at (314) 524-4083 or write St. Louis District, Corps of Engineers, FUSRAP Project Office, 9170 Latty Avenue, Berkeley, Missouri 63134

Background

During the late 1950s and early 1960s, the Mallinckrodt Chemical Company contracted with Dow Chemical Company to perform extrusions of uranium metal and straightening of extruded uranium rods for the U. S. Atomic Energy Commission (AEC). The work was conducted on an extrusion press and straightening table located in Building 6 at the Madison Site.

In 1989, the U. S. Department of Energy (DOE) conducted a preliminary radiological survey to evaluate and establish the radiological status of the Madison Site as part of the Formerly Utilized Sites Remedial Action Program (FUSRAP). The survey identified low concentrations of uranium in dust on overhead surfaces in a portion of Buildings 4 and 6 in the vicinity of the extrusion press. It concluded that uranium-contaminated dust did not pose a potential for significant radiation exposure to plant employees but did recommend further investigation to better define the extent of contamination present.

On October 13, 1997, Congress transferred responsibility for FUSRAP from the DOE to the U. S. Army Corps of Engineers (USACE) as part of the 1998 Energy and Water Appropriations Bill. In 1998, the USACE conducted a Remedial Investigation to further evaluate the current conditions of the uranium contamination and in order to develop recommendations for further action.

Survey Objectives

The objectives of the Remedial Investigation were as follows.

- Evaluate the current radiation levels of the site
- Identify the types of contaminants present at the site
- Assess the degree and extent of contamination
- Characterize potential risks to workers

A survey was conducted that consisted of taking samples near the extrusion press and straightening table to determine activity levels on floors and walls; on equipment surfaces; and in dust accumulated on overhead building surfaces. In addition, direct radiation levels and

uranium contamination were measured at the exit and entrance locations of Buildings 4 and 6, on the roof above the extrusion press, and on other surfaces in Buildings 4 and 6.

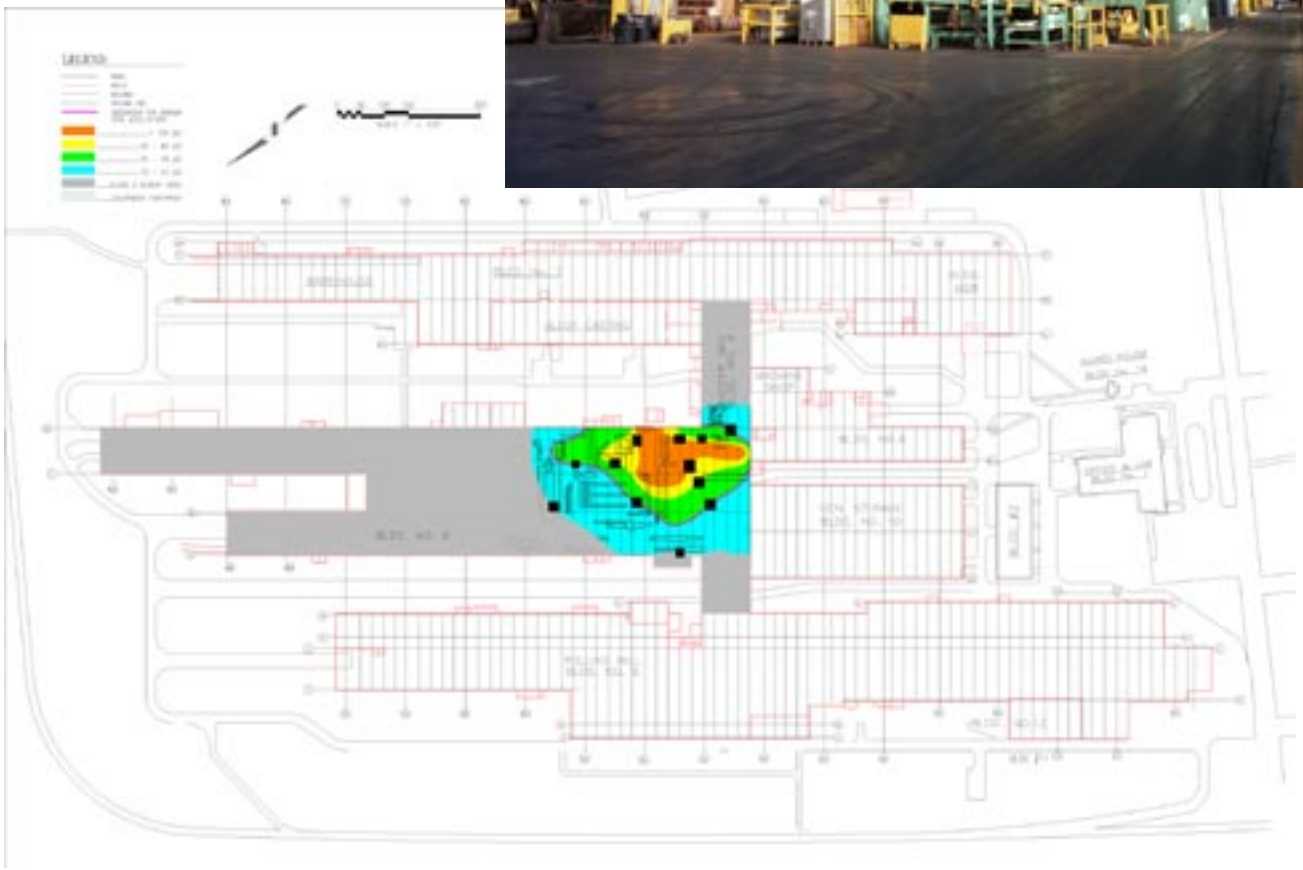
Survey Results

The only contaminant of concern (COC) found during the investigation was processed natural uranium (i.e. uranium that has been separated from the other naturally occurring members of the uranium and actinium decay series).

The survey identified detectable uranium in dust on overhead surfaces in a portion of Buildings 4 and 6, with the highest concentrations occurring directly above the extrusion press. The survey results for the remainder of Buildings 4 and 6 indicated that radioactivity levels are comparable to background.

The evaluation of the detected uranium concentrations demonstrated that the potential risk posed by the residual uranium-contaminated dust to current production workers is within the acceptable CERCLA risk range. However, the evaluation found that utility workers working on or near overhead surfaces could experience unacceptable exposure from the contaminated surfaces.

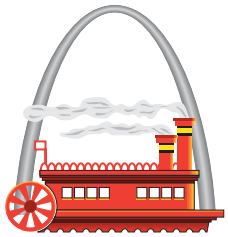
Based on the conclusions of this investigation, the USACE is proceeding with the appropriate environmental documentation to conduct remedial action consistent with the CERCLA process.



U.S. Army Corps of Engineers
St. Louis District

St. Louis Sites Fact Sheet

WHAT IS FUSRAP?



"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District, is conducting a radiological cleanup program for four Missouri sites (SLDS, SLAPS, SLAPS VPs, HISS). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission during the nation's early atomic program in the 1940s and 50s.

The FY 1998 Energy and Water Appropriations Bill , in which Congress transferred management of the Formerly Utilized Sites Remedial Action Program (FUSRAP) to the U.S. Army Corps of Engineers (USACE), was signed into law on October 13, 1997. Prior to the signing of this bill, FUSRAP had been managed by the U.S. Department of Energy.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about FUSRAP or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 260-3924 or write to the St. Louis District, Corps of Engineers, FUSRAP Project Office, 8945 Latty Avenue, Berkeley, Missouri 63134

The Formerly Utilized Sites Remedial Action Program (FUSRAP) is an environmental remediation program. It addresses radiological contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) during development of the atomic weapons in the 1940s and 50s.

BACKGROUND

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium and radium from ore at the St. Louis Downtown Site (SLDS) in downtown St. Louis, Missouri. During this time and until 1967, radioactive process byproducts were stored at an area adjacent to the Lambert-St. Louis Airport, which is now referred to as the St. Louis Airport Site (SLAPS).

In 1966, the SLAPS wastes were purchased, moved, and stored at Latty Avenue. Part of this property later became known as the Hazelwood Interim Storage Site (HISS). During this move, handling and transportation of the contamination spread the materials along haul routes and to adjacent vicinity properties forming the St. Louis Airport Site Vicinity Properties (SLAPS VPs).

During the late 1950s and early 1960s, Dow Chemical Company in Madison, Illinois operated as a uranium extrusion and rod-straightening facility. Contamination is now in dust located on roof beams at the Madison Site.

HOW HAZARDOUS ARE FUSRAP SITES?

Even though FUSRAP sites contain levels of radioactivity above current guidelines, none of the sites pose an immediate health risk to the public or environment given current land uses. The contaminated materials have very low concentrations and people are not exposed to them for long periods of time.

Although these materials do not pose an immediate hazard, they will remain radioactive for thousands of years, and health risks could increase if the use of the land were to change. Under FUSRAP, each site is cleaned to levels acceptable for the projected future use of the land such as residential development, industrial operations, or recreational use.

What Are FUSRAP's Objectives?

The objectives of FUSRAP are to:

- **Protect human health and the environment.**
- **Execute the approved alternative for cleaning up radioactive contamination above health-based cleanup guidelines.**
- **Minimize adverse effects on area business operations.**

HOW DOES FUSRAP WORK?

FUSRAP sites undergo several steps that lead to cleanup. Information about the site is collected and reviewed. A Remedial Investigation/Feasibility Study (RI/FS) is conducted to develop cleanup alternatives. The Remedial Investigation identifies the type and location of the contamination. The Feasibility Study develops and evaluates cleanup alternatives.

The public is informed about the development of the RI/FS cleanup alternatives through public meetings and the media. Public participation is especially encouraged during the selection of the final remediation, or cleanup, method.

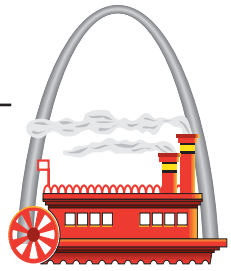
When a cleanup alternative is chosen, a Proposed Plan (PP) is written to explain why it was chosen. Members of the public are asked to comment on all the cleanup options, including the selected alternative. After public comments have been considered, a final decision is made and documented in a Record of Decision (ROD). The Remedial Design follows the ROD and includes technical drawings and specifications that show how the cleanup will be conducted.

Cleanup, or Remedial Action, begins after the Remedial Design is complete. This phase involves site preparation and construction activities. When these remediation activities are completed, verification surveys are conducted to ensure that cleanup objectives for the site have been met and are documented in a Post Remedial Action Report (PRAR).

U.S. Army Corps of Engineers
St. Louis District

St. Louis Downtown Site Fact Sheet

REMEDIAL DESIGN/ REMEDIAL ACTION



"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District is conducting a radiological cleanup program for the St. Louis Downtown Site (SLDS). The site contains soils contaminated with radium, thorium, uranium, cadmium and arsenic as a result of federal defense activities performed under contracts with the Manhattan Engineer District and the Atomic Energy Commission (MED/ AEC) in the 1940s and 50s.

The U. S. Environmental Protection Agency (EPA) and USACE have signed the Record of Decision (ROD) that outlines the final cleanup remedy for SLDS.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about the SLDS or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 524-4083 or write to the

St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Latty Avenue
Berkeley, MO 63134.

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri. This processing of ore, conducted under contracts with the Manhattan Engineer District and the Atomic Energy Commission, resulted in releases of spent ore, process chemicals, radium, thorium, and uranium to the environment. Later disposal and relocation of processing wastes resulted in radioactive contamination at other locations near the St. Louis Airport.

SLDS was part of the U. S. Department of Energy (DOE) Formerly Utilized Sites Remedial Action Program (FUSRAP). In 1997, the U. S. Army Corps of Engineers (USACE) became responsible for this FUSRAP site under the Energy and Water Appropriations Bill.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the USACE, St. Louis District, developed a Feasibility Study outlining six alternatives for the final cleanup of SLDS. Based on this study, a Proposed Plan, which identified the USACE's preferred alternative, was also developed. These documents were released for public review and comment.

In April 1998, the USACE held a public meeting to present the Proposed Plan. A 30-day comment period followed the release of the SLDS Feasibility Study and Proposed Plan to gain the opinions of citizens, public officials, and agencies. The USACE addressed and incorporated their comments into the Record of Decision (ROD), the document that describes the final course of action at SLDS, which was approved by the EPA in October 1998.

Plant 2 Remedial Action Underway

The U. S. Army Corps of Engineers (USACE) has completed the remedial design plan for final cleanup activities within the Mallinckrodt Plant 2 area. The plan was developed according to the criteria established in the approved SLDS ROD.

Plant 2 is located in the middle of Mallinckrodt. This area was selected for remediation to minimize disruption to current business operations and permit Mallinckrodt to utilize the site in accordance with their strategic development plan.

The remediation of Plant 2 began with the removal of the concrete slab in January. In preparation for this action, the area was surveyed and staked to mark the limits of excavation. The asphalt was then removed and sheet piling placed to support the foundations of structures close to the excavation area and to prevent cave-ins. A backhoe and excavator will be used to remove contaminated material from under the slab and load it into the onsite railcars for disposal.

The USACE contractor is currently excavating the subsurface of Plant 2. Once crews complete the excavation, the sides and bottom of the excavation will be surveyed and sampled to confirm that the radiological contamination, as defined in the SLDS ROD, has been removed to the approved criteria. Upon receiving confirmation from a final site survey that the site has been remediated, the site will be restored to grade.

The USACE currently anticipates Plant 2 remediation will be finished in July 1999. Approximately 8,500 cubic yards of contamination will be removed from this area.

Where to Next?

While the Plant 2 remediation is underway, the USACE will begin remedial design work on Plant 1. The remediation of Plant 1 will follow the criteria set forth in the approved SLDS ROD as Plant 2 work. The issuance of the Plant 1 design is expected in June 1999. The USACE and Mallinckrodt will also begin developing the remedial strategy and design plans for Plants 6 and 7.

What did you just say?

Q: *Why do environmental cleanup projects describe some excavation efforts as a remedial action and others as a removal action?*

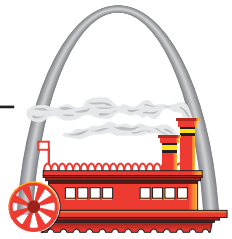
A: A Removal Action is intended to be a relatively quick action designed to address imminent threats to human health and the environment. The resulting cleanup may or may not be the final solution for the site involved. Removal Actions can be of three types: Emergency, Time-Critical, and Non-Time Critical. Engineering Evaluations/Cost Analyses (EE/CAs) are performed for Non-Time Critical removal actions, actions that could be taken more than six months after a determination that a response is needed.

Remedial Actions are longer-term activities that complete the site cleanup. A Remedial Action may be performed at a site after a removal action if the removal action does not or cannot present a complete solution. Remedial Actions implement the final cleanup method(s) selected in the Record of Decision.

U.S. Army Corps of Engineers
St. Louis District

St. Louis Downtown Site Fact Sheet

RECORD OF DECISION (ROD)



"Gateway to Excellence"

The United States Army Corps of Engineers (USACE), St. Louis District is conducting a radiological cleanup program for the St. Louis Downtown Site (SLDS). The site contains soils contaminated with radium, thorium, uranium, cadmium and arsenic as a result of federal defense activities performed under contracts with the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) in the 1940s and 50s.

The U. S. Environmental Protection Agency (EPA) and USACE have signed the Record of Decision (ROD) that outlines the final cleanup remedy for SLDS.

The Corps of Engineers encourages private citizens to participate fully in the cleanup program.

To learn more about the SLDS or to inquire about public involvement opportunities, contact the FUSRAP Project Office at (314) 524-4083 or write to the

St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Latty Avenue
Berkeley, MO 63134.

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri. Radioactive byproducts from processing resulted in contamination at SLDS. Wastes from this processing also contaminated other locations including the St. Louis Airport Site (SLAPS) and the Hazelwood Interim Storage Site (HISS).

SLDS was part of the U. S. Department of Energy (DOE) Formerly Utilized Sites Remedial Action Program (FUSRAP). In 1990, the U. S. Environmental Protection Agency (EPA) and DOE negotiated a Federal Facilities Agreement (FFA), which described the process that would be used to clean up contaminated soils in St. Louis, Missouri. The U. S. Army Corps of Engineers (USACE) became responsible for FUSRAP in 1997 under the Energy and Water Appropriations Bill.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the USACE, St. Louis District, has based their approach to cleaning up SLDS on data and findings contained within four key documents: the Remedial Investigation, the Baseline Risk Assessment, the Initial Screening of Alternatives, and the Feasibility Study. These documents are available for review in the Administrative Record, which is maintained at both 9170 Latty Avenue in Berkeley, Missouri and the St. Louis Public Library, Government Information Section, at 1306 Olive Street in St. Louis, Missouri. A Proposed Plan detailing USACE's preferred alternative was also issued and is available for review at both locations.

In April 1998, the USACE held a public meeting to present the Proposed Plan. A 30-day comment period followed the release of the Feasibility Study and Proposed Plan for SLDS to gain the opinions of citizens, public officials, and agencies. Their comments were addressed and incorporated into the approved Record of Decision, the document that describes the final course of action at SLDS.

A More Protective Action

The USACE held a public meeting on April 21, 1998 and reviewed the six remediation alternatives under consideration. Alternative 4 was presented as the preferred cleanup alternative taking into account its ability to protect human health and the environment, as well as its cost.

A review of State and Community Comments indicated that all respondents preferred Alternative 6 rather than Alternative 4 as stated in the Proposed Plan.

Alternative 4

Partial Excavation with Off-Site Disposal

Excavate accessible soils to composite criteria* in the top 2 feet and clean to depth 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $92 million

Alternative 6

Selective Excavation and Disposal

Excavate accessible soils to composite criteria* to 4-6 feet. Below 4-6 feet, clean to 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $114 million

**** Composite criteria is 5/5/50 pCi for the top 6 inches and 15/15/50 pCi below 6 inches for radium, thorium, and uranium respectively.***

Under Alternative 4:

- Contaminated soil above the composite criteria would be excavated to a depth of 2 feet and the soil disposed of at an off-site location. The remaining soil below 2 feet would be cleaned to a composite criterion of 50/100/150 pCi (no more than 50 pCi of radium, 100 pCi of thorium, or 150 pCi of uranium per gram of soil).
- Excavate the Plant 7 area and clean to a composite criterion of 5/5/50 pCi for the surface and 15/15/50 pCi for depths below 6 inches.

A 30-day comment period followed the meeting. Public and stakeholder response showed that many were concerned that the planned excavation was not deep enough, given the likelihood that future construction could go below the two feet of clean soil. Others raised the question of liability for unremediated soil that might be excavated and moved in the future. Review of State and community comments indicated that all respondents preferred Alternative 6 rather than Alternative 4 as stated in the Proposed Plan. Stakeholders included the State of Missouri, City of St. Louis, County of St. Louis, the St. Louis Oversight Committee, Mallinckrodt, Inc., and others.

USACE reviewed the public comments and agreed to proceed with Alternative 6. Upon further examination, it was determined that Alternative 6 not only assures greater human and environmental safety; it should also prove more cost-efficient because of the decreased need for government monitoring of the site after remediation. In addition, Alternative 6 lessens the chance of disrupting the landowner's future construction efforts.

Under Alternative 6:

- Accessible soils will be excavated to a composite criteria* to a depth of 4-6 feet. Below 4-6 feet, soils will be cleaned to 50/100/150 pCi.
- Plant 7-area soil will be excavated and cleaned to a composite criterion of 5/5/50 pCi for the surface and 15/15/50 pCi for depths below 6 inches.
- Inaccessible soils and remaining soils in excess of the composite criteria are to be managed as a separate operable unit.

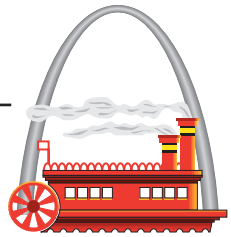
Public participation was an important component in determining the final remedy for SLDS. Public concern and a review of assumptions for the Proposed Plan led to the realization that a more protective and effective remedy was available.

Alternative 6 was approved in the SLDS Record of Decision by the U. S. Environmental Protection Agency, Region VII.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST. LOUIS DOWNTOWN SITE PROPOSED PLAN



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis Downtown Site (SLDS). The Site contains soils contaminated with radium, thorium, and uranium from federal defense activities performed under contracts with the Manhatten Engineer District and the Atomic Energy Commission in the 1940s and 50s.

The USACE has issued a Proposed Plan detailing the preferred alternative, **Partial Excavation with Off-Site Disposal**, for cleaning up SLDS. Public comment and regulatory review will help determine the remedy selected for the site. Engineering plans, work instructions, health and safety plans, and an environmental compliance plan will be prepared before cleanup begins.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis Downtown Site or to inquire about public involvement opportunities, contact
Chris W. Haskell
at (314) 524-3334
or write
St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Latty Avenue
Berkeley, MO 63134

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri. These processes, conducted under contracts with the Manhattan Engineer District and the Atomic Energy Commission, resulted in radioactive contamination.

The Formerly Utilized Sites Remedial Action Program, administered by the U.S. Army Corps of Engineers (USACE), St. Louis District, conducted site characterization activities at SLDS. Samples of the site's soil, groundwater, surface water, sediment, air, and structures have confirmed the presence of radium, thorium, and uranium contamination.

Continuing in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, the USACE issued a Proposed Plan describing the preferred remedy for cleaning up these contaminants at SLDS. This Plan provides background information on the SLDS, describes the alternatives being considered to clean up the site, presents the rationale for selecting the preferred remedy, and outlines the public's role in helping USACE make a final decision on a cleanup approach.

The Preferred Alternative

Six site-wide alternatives are discussed at length in the Feasibility Study (FS) for SLDS. The Proposed Plan provides a summary of each alternative, identifies the preferred alternative, and provides a rationale for the selection of this alternative.

The USACE prefers **Alternative 4, Partial Excavation with Off-Site Disposal**. This alternative protects human health and the environment and is believed to provide the best balance of effectiveness, cost, and implementability. Alternative 4 includes the following activities:

- Excavate acceptable soils to composite criteria in the top 2 feet and clean to 50/100/150.
- Excavate Plant 7 area to composite criteria to depth.
- Decontaminate and dismantle buildings, if necessary, as they are made available by the owner.

Six alternatives were evaluated to address contaminated soils at SLDS. The USACE prefers Alternative 4 with a cleanup level of 5/15/50.

Alternative 1

No Action

Leave SLDS in its current state.

(Required for comparison under CERCLA.)

Cost: $22 million

Alternative 2

Institutional Control and Site Maintenance

Prevent access to contaminated areas. Perform site maintenance to restrict use and monitor area.

Cost: $29 million

Alternative 3

Consolidation and Capping

Consolidate and cap contaminated soils and waste. Decontaminate or dismantle buildings.

Cost: $100 million

Alternative 4

Partial Excavation with Off-Site Disposal

Excavate accessible soils to composite criteria* in the top 2 feet and clean to depth 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $92 million

Alternative 5

Complete Excavation with Off-Site Disposal

Excavate accessible soils to composite criteria* depth.

Cost: $140 million

Alternative 6

Selective Excavation and Disposal

Excavate accessible soils to composite criteria* to 4-6 feet. Below 4-6 feet, clean to 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $114 million

* Composite criteria is 5/5/50 for the top 6 inches and 15/15/50 below 6 inches for radium, thorium, and uranium respectively.

- Ship contaminated soils off site to an authorized disposal facility.
- Implement institutional controls (such as fences and signs, site monitoring and surveillance, deed restrictions, and 5-year reviews) for areas where inaccessible soils beneath rail lines and buildings are left in place.

Public Participation

The USACE encourages public input to ensure the remedy selected for SLDS meets the needs of the local community and is an effective solution to the problem.

Comments on the proposed remedial action will be accepted for 30 days after the draft FS and Proposed Plan are issued. Verbal comments will be recorded during a public meeting scheduled to be held on April 21, 1998. Written comments may be submitted at any time during the 30-day comment period.

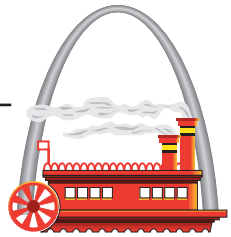
The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to make a final decision. The final cleanup remedy will be outlined in the Record of Decision, which will be submitted to the EPA by July 3, 1998.

Loading material removed during preparation of buildings for demolition

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST. LOUIS DOWNTOWN SITE FEASIBILITY STUDY



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis Downtown Site (SLDS). The Site contains soils contaminated with radium, thorium, and uranium from federal defense activities performed under contracts with the Manhatten Engineer District and the Atomic Energy Commission in the 1940s and 50s.

The USACE has issued a Feasibility Study identifying and evaluating alternatives for cleaning up SLDS. Public comment and regulatory review will help determine the remedy selected for the site. Engineering plans, work instructions, health and safety plans, and an environmental compliance plan will be prepared before cleanup begins.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis Downtown Site or to inquire about public involvement opportunities, contact
Chris W. Haskell
at (314) 524-3334
or write
St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Latty Avenue
Berkeley, MO 63134

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri. This processing of ore, conducted under contracts with the Manhattan Engineer District and the Atomic Energy Commission, resulted in radioactive contamination at SLDS. Processing these wastes also resulted in radioactive contamination at other locations near the St. Louis Airport Site (SLAPS), including the Hazelwood Interim Storage Site (HISS).

The U.S. Army Corps of Engineers (USACE), St. Louis District, has issued a Feasibility Study (FS) identifying and evaluating alternatives for cleaning SLDS. This FS is limited to the downtown site and is intended to accelerate the cleanup process by addressing it separately from SLAPS/HISS. The USACE believes that by focusing on SLDS, the cleanup project can be finished more rapidly.

Contaminants of Concern

The primary radioactive contaminants of concern (COCs) are radium, thorium, uranium, and their decay products. In general, the highest levels of contamination are on the Mallinckrodt property where access is currently restricted. Vicinity properties exhibit less contamination.

Summary of Alternatives

Alternative 1 – No Action

This alternative makes no changes from the current status. Required by the Comprehensive Environmental Response, Compensation, and Liability Act, this alternative is provided as a baseline for comparison with other alternatives. The cost of Alternative 1 is $22 million.

Alternative 2 – Institutional Control and Site Maintenance

Institutional controls and site maintenance would be used to prevent access to contaminated areas. Institutional controls include use limitations through deed restrictions, land use restrictions through zoning, and groundwater use restrictions through groundwater use advisories or well-drilling permits. Site maintenance includes land surveillance, restricted groundwater use, environmental monitoring of affected media, and minimal engineering controls. Site security, including fences and signs, is already maintained at most of the downtown areas. The cost of implementing this alternative is $29 million.

Alternative 3 – Consolidation and Capping

Six alternatives were evaluated to address contaminated soils at SLDS. The USACE prefers Alternative 4 with a cleanup level of 5/15/50.

Alternative 1

No Action

Leave SLDS in its current state.

(Required for comparison under CERCLA.)

Cost: $22 million

Alternative 2

Institutional Control and Site Maintenance

Prevent access to contaminated areas. Perform site maintenance to restrict use and monitor area.

Cost: $29 million

Alternative 3

Consolidation and Capping

Consolidate and cap contaminated soils and waste. Decontaminate or dismantle buildings.

Cost: $100 million

Alternative 4

Partial Excavation with Off-Site Disposal

Excavate accessible soils to composite criteria* in the top 2 feet and clean to depth 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $92 million

Alternative 5

Complete Excavation with Off-Site Disposal

Excavate accessible soils to composite criteria* depth.

Cost: $140 million

Alternative 6

Selective Excavation and Disposal

Excavate accessible soils to composite criteria* to 4-6 feet. Below 4-6 feet, clean to 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $114 million

* Composite criteria is 5/5/50 for the top 6 inches and 15/15/50 below 6 inches for radium, thorium, and uranium respectively.

Implementation of this alternative would involve excavation of contaminated soils exceeding the 5/15 pCi/g Ra-226 and 50 pCi/g U-238 criteria. The soils and waste would be consolidated and covered with a protective cap at a suitable downtown location. Contaminated soil beneath the cap site would remain in place. Contaminated buildings would be decontaminated and/or dismantled. To reduce the potential for exposure and human intrusion, institutional controls would be used to control access to the capped area. The cost of Alternative 3 is $100 million.

Alternative 4 – Partial Excavation with Off-Site Disposal

Excavate accessible soils exceeding 5/5/50 pCi/g in the top 6 inches and 15/15/50 pCi/g at 6-24 inch depths for radium, thorium, and uranium respectively, i.e. composite criteria. Excavate the Plant 7 area to composite criteria to depth. Excavate soil exceeding 50/100/150 pCi/g for radium, thorium, and uranium respectively, i.e. ALARA (as low as reasonably attainable) criteria, to depth and ship contaminated soils off site to an authorized disposal facility. The cost of this alternative is $92 million.

Alternative 5 – Complete Excavation with Off-Site Disposal

Contaminated soils would be removed and excavated soil would be shipped off site for disposal. Soils under buildings and railroads would be excavated as they became accessible. Contaminated buildings would be decontaminated or dismantled. Annual monitoring would continue until all soils are remediated. The cost of Alternative 5 is $140 million.

Alternative 6 – Selective Excavation and Disposal

Contaminated soils would be excavated as in Alternative 4, however, the depth would be extended to 6 feet in most areas of the plant and 4 feet at the vicinity properties and under the roads. The excavations would be filled with off-site borrow. Inaccessible soils would not be excavated. The cost of this alternative is $114 million.

Public Participation

The USACE encourages public input to ensure the remedy selected for SLDS meets the needs of the local community, and is an effective solution to the problem.

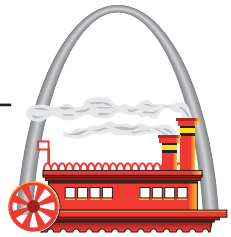
Comments on the proposed remedial action will be accepted for 30 days after the FS and Proposed Plan are issued. Verbal comments will be recorded during the April 21, 1998 public meeting and written comments may be submitted at any time during the 30-day comment period.

The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to make a final decision. The final cleanup remedy will be outlined in the Record of Decision, which will be submitted to EPA on July 3, 1998.

U.S. Army Corps of Engineers
St. Louis District

Summary of Activities at the

ST. LOUIS DOWNTOWN SITE OVERVIEW



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for the St. Louis Downtown Site (SLDS). The Site contains soils contaminated with radium, thorium, and uranium as a result of federal defense activities performed under contracts with the Manhatten Engineer District and the Atomic Energy Commission in the 1940s and 50s.

The USACE has issued a Feasibility Study identifying and evaluating alternatives for cleaning up SLDS as well as a Proposed Plan detailing the preferred cleanup alternative, **Partial Excavation with Off-site Disposal**. Public comment and regulatory review will help determine the remedy selected for the site. Engineering plans, work instructions, health and safety plans, and an environmental compliance plan will be prepared before cleanup begins.

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis Downtown Site or to inquire about public involvement opportunities, contact
Chris W. Haskell
at (314) 524-3334
or write
St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Latty Avenue
Berkeley, MO 63134

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium from ore at the St. Louis Downtown Site (SLDS) in St. Louis, Missouri. This processing of ore, conducted under contracts with the Manhattan Engineer District and the Atomic Energy Commission, resulted in releases of spent ore, process chemicals, radium, thorium, and uranium to the environment. Later disposal and relocation of processing wastes resulted in radioactive contamination at other locations near the St. Louis Airport.

SLDS was formerly part of the U.S. Department of Energy (DOE) Formerly Utilized Sites Remedial Action Program (FUSRAP). In 1990, the U.S. Environmental Protection Agency (EPA) and DOE negotiated a Federal Facilities Agreement (FFA), which described the process that would be used to clean up contaminated soils in St. Louis. The U.S. Army Corps of Engineers (USACE) became responsible for FUSRAP in 1997.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the USACE, St. Louis District, has based their approach to cleaning up SLDS on data and findings contained within four key documents: the Remedial Investigation, the Baseline Risk Assessment, the Initial Screening of Alternatives, and the Feasibility Study. These documents are available for review in the Administrative Record, which is maintained at both 9170 Latty Avenue in Berkeley, Missouri and the St. Louis Public Library, Government Information Section, at 1306 Olive Street in St. Louis, Missouri. A Proposed Plan detailing USACE's preferred alternative has also been issued and is available for review at both locations. The final cleanup remedy will be outlined in the Record of Decision, which will be submitted to the EPA on July 3, 1998.

Early Removal Activities

While developing a comprehensive cleanup strategy, the U.S. Department of Energy identified early removal actions that would minimize exposure to contaminated materials and allow for consolidating the impacted materials at temporary on-site storage areas. Four interim actions were performed between 1995 and 1997:

In 1995, 15,043 cubic yards of contaminated soil was excavated from the Mallinckrodt Plant 10 area and shipped off site for disposal at the Enviro-

Six alternatives were evaluated to address contaminated soils at SLDS. The USACE prefers Alternative 4 with a cleanup level of 5/15/50.

Alternative 1

No Action

Leave SLDS in its current state.

(Required for comparison under CERCLA.)

Cost: $22 million

Alternative 2

Institutional Control and Site Maintenance

Prevent access to contaminated areas. Perform site maintenance to restrict use and monitor area.

Cost: $29 million

Alternative 3

Consolidation and Capping

Consolidate and cap contaminated soils and waste. Decontaminate or dismantle buildings.

Cost: $100 million

Alternative 4

Partial Excavation with Off-Site Disposal

Excavate accessible soils to composite criteria* in the top 2 feet and clean to depth 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $92 million

Alternative 5

Complete Excavation with Off-Site Disposal

Excavate accessible soils to composite criteria* depth.

Cost: $140 million

Alternative 6

Selective Excavation and Disposal

Excavate accessible soils to composite criteria* to 4-6 feet. Below 4-6 feet, clean to 50/100/150. Excavate Plant 7 area to composite criteria* to depth.

Cost: $114 million

* Composite criteria is 5/5/50 for the top 6 inches and 15/15/50 below 6 inches for radium, thorium, and uranium respectively.

care facility in Utah.

In 1996, 750 cubic yards of contaminated soil was excavated from the City Property, Riverfront Trail area, and shipped off site for disposal at the Envirocare facility in Utah.

In 1996, the 50-series buildings on the Mallinckrodt property were decontaminated and demolished.

In 1997, Plant 6 and 7 Buildings were decontaminated and demolished.

Public Participation

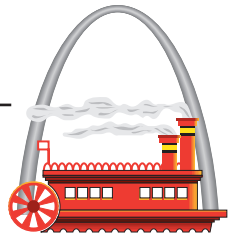
The USACE encourages public input to ensure the remedy selected for SLDS meets the needs of the local community and is an effective solution to the problem.

Comments on the proposed remedial action will be accepted for 30 days after the Feasibility Study and the Proposed Plan are issued. Verbal comments will be recorded during the April 21, 1998 public meeting and written comments may be submitted at any time during the 30-day comment period. The USACE will respond to all significant comments and will consider these comments when working with EPA to make a final deci-

Aerial view of the St. Louis Downtown Site in St. Louis, Missouri.

U.S. Army Corps of Engineers

Summary of Activities at the HAZELWOOD INTERIM STORAGE SITE



"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for two St. Louis Airport area sites. These sites once supported federal defense activities for the Manhattan Engineer District and the Atomic Energy Commission. The St. Louis Airport Site and the Hazelwood Interim Storage Site (HISS) today contain soils contaminated with uranium, thorium, and radium. Primary goals of cleanup are to restrict the release of contaminated materials and minimize potential impacts to human health and the environment. Secondary goals are to restore the sites for potential reuse.

The USACE has reviewed several interim cleanup measures for HISS and has identified one as a preferred alternative. Public comment and regulatory review will help determine the removal action selected for the site. Engineering plans, work instructions, health and safety plans, and an environmental compliance plan will be prepared before cleanup begins.

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium and radium from ore at the St. Louis Downtown Site in downtown St. Louis, Missouri. During this time and until 1967, radioactive process byproducts were stored at an area adjacent to the Lambert-St. Louis Airport. This area is known today as the St. Louis Airport Site (SLAPS).

In the years from 1966 to 1973, wastes were handled a number of times. For instance, in 1966, SLAPS wastes were purchased, moved, and stored at 9200 Latty Avenue. Part of this property later became known as the Hazelwood Interim Storage Site (HISS). Although site workers processed and shipped most of the material to Canon City, Colorado, soils remaining at the HISS site still contain contaminants. Improper storage, handling, and transportation also caused the spread of materials along haul routes and to vicinity properties.

In 1984, cleanup activities resulted in the clearing and excavation of the site and surrounding vicinity properties, but added an additional 14,000 cubic yards of contaminated soil to the HISS stockpile. A subsequent cleanup in 1986 resulted in a smaller, supplemental storage pile.

In 1996, the owner of Stone Container Corporation, located near HISS, expanded its facility and stockpiled about 8,000 cubic yards of contaminated soil. The stockpile is known as the Stone Container Pile.

Cleanup Activities

In 1990, the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy negotiated a Federal Facilities Agreement. The agreement described the process that would be used to clean up, or remediate, contaminated soils in St. Louis. The EPA placed HISS/Futura Coatings and the Latty Avenue vicinity properties on the National Priorities List to expedite their cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Values of the National Environmental Policy Act were also integrated into the process.

The Formerly Utilized Sites Remedial Action Program is conducting cleanup activities at HISS. Surveys and field investigations were conducted at HISS and SLAPS from 1977 through 1997. These studies

Three alternatives have been evaluated to address contaminated soils at HISS and vicinity properties. The USACE prefers Alternative 2.

Alternative 1

NO ACTION

Leave the HISS and Latty Avenue vicinity properties in their current condition; continue to monitor and maintain for both surface and air releases of radionuclides, perform monitoring of groundwater.

This alternative is a CERCLA requirement.

Cost: $7.5 million

Alternative 2

EXCAVATION AND DISPOSAL WITH REUSE OF BELOW-CRITERIA SOILS

Remove contaminated soil; store below-criteria soils on HISS for potential reuse as backfill in HISS subsurface, and ship contaminated soils off site for commercial disposal. This alternative assumes a significant amount of soil will be below the selected criteria.

Cost: $69.7 million

Alternative 3

EXCAVATION AND DISPOSAL

Remove contaminated soil; store below criteria soils on HISS for reuse as backfill, and ship contaminated soils off site for commercial disposal. This alternative assumes minimal quantities of soil will be below selected criteria.

Cost: $74.4 million

The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis Airport area sites or to inquire about public involvement opportunities, contact

Chris W. Haskell
at (314) 524-3364,
or write
St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Latty Avenue
Berkeley, MO 63134

determined the nature and distribution of chemical and radioactive contaminants and reviewed the geology and hydrology of the sites.

The USACE has prepared draft engineering evaluations/cost analyses that identify potential cleanup measures to be used until a comprehensive cleanup can be achieved. These analyses evaluate several possible interim cleanup measures and include the Stone Container property and soils on three Latty Avenue properties as part of the HISS cleanup.

The interim cleanup measure that is selected will be just one part of a comprehensive cleanup program for HISS. Comprehensive cleanup measures will be selected after completing the remedial investigation/ feasibility study process. This process is required by CERCLA and will result in a Record of Decision that identifies how HISS will be cleaned.

An interim removal action for HISS is planned to begin in 1998 and will continue until the action is completed.

Soils remaining at the HISS site are contaminated with uranium, thorium, and radium.

March 17,1998

U.S. Army Corps of Engineers

Summary of Activities at the ST. LOUIS AIRPORT SITE

"Gateway to Excellence"

The U.S. Army Corps of Engineers (USACE), St. Louis District, is conducting a cleanup program for two St. Louis Airport area sites. These sites once supported federal defense activities for the Manhattan Engineer District and the Atomic Energy Commission. The St. Louis Airport Site (SLAPS) and the Hazelwood Interim Storage Site today contain soils contaminated with uranium, thorium, and radium. Primary goals of cleanup are to restrict the release of contaminated materials and minimize potential impacts to human health and the environment. Secondary goals are to restore the sites for potential reuse.

The USACE has reviewed several interim cleanup measures for SLAPS and has identified one as a preferred alternative. Public comment and regulatory review will help determine the removal action selected for the site. Engineering plans, work instructions, health and safety plans, and an environmental compliance plan will be prepared before

Background

From 1942 to 1957, the Mallinckrodt Chemical Plant extracted uranium and radium from ore at the St. Louis Downtown Site in downtown St. Louis, Missouri. During this time and until 1967, radioactive process byproducts were stored at an area adjacent to the Lambert-St. Louis Airport in north St. Louis County. This area is known today as the St. Louis Airport Site (SLAPS).

In the years from 1966 to 1973, wastes were moved from the site. In 1966, residuals from SLAPS were purchased, moved, then stored at 9200 Latty Avenue. The Atomic Energy Commission (AEC) licensed the movement and storage. Site structures at SLAPS were demolished and buried on the property along with roughly 60 truckloads of scrap metal. Clean soil was then spread at a thickness of one to three feet to reduce radioactivity at the surface and to meet the standards then in place. In 1973, the U.S. Government and the City of St. Louis transferred ownership of SLAPS from AEC to the St. Louis Airport Authority.

Cleanup Activities

In 1990, the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy negotiated a Federal Facilities Agreement. The agreement described the process that would be used to clean up, or remediate, contaminated soils in St. Louis. The EPA placed SLAPS on the National Priorities List to expedite its cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Values of the National Environmental Policy Act were also integrated into the process.

The Formerly Utilized Sites Remedial Action Program is conducting cleanup activities at SLAPS. Surveys and field investigations were conducted at SLAPS and the Hazelwood Interim Storage Site from 1977 through 1997. These studies determined the nature and distribution of chemical and radioactive contaminants and reviewed the geology and hydrology of the sites.

The USACE has prepared a draft engineering evaluations/cost analyses for SLAPS that identifies potential cleanup measures to be used until the comprehensive cleanup plan is in place. These analyses evaluate several

Three alternatives have been evaluated to address contaminated soils at SLAPS and the ballfields. The USACE prefers Alternative 3 with a cleanup level of 5/15/50.

Alternative 1

NO ACTION

Leave the SLAPS and the Ballfields in their current condition; continue to monitor and maintain for both surface and air releases of radionuclides, perform monitoring of groundwater.

This alternative is a CERCLA requirement.

Cost: $11.4 million

Alternative 2

EXCAVATION AND DISPOSAL OF SLAPS AND THE BALLFIELDS

Excavate and remove contaminated materials; backfill excavated areas with clean soil. Dispose of contaminted materials at a licensed disposal facility.

Cost: $106.3 - 218.6 million

Alternative 3

EXCAVATION AND DISPOSAL OF SLAPS AND THE BALLFIELDS WITH USE OF BELOW-CRITERIA SOILS AS BACKFILL

Excavate and remove contaminated materials; backfill excavated areas with clean soil. Dispose of contaminated materials at a licensed disposal facility. Excavated materials that are below the selected cleanup criteria and that meet guidelines for chemicals an metals would be used at the SLAPS as backfill.

Cost: $103 - 210 million

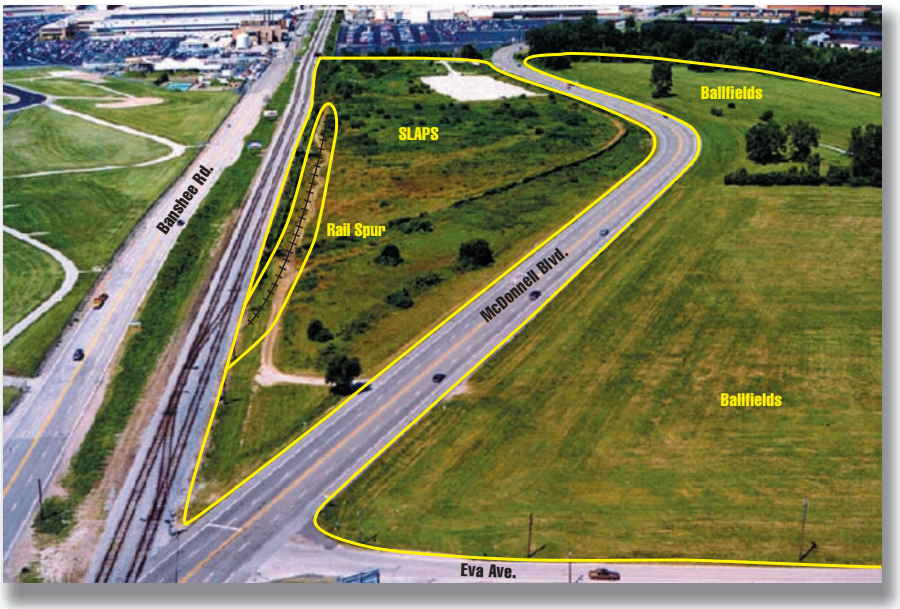
The USACE encourages private citizens to participate fully in the cleanup program.

To learn more about the St. Louis Airport area sites or to inquire about public involvement opportunities, contact
Chris W. Haskell
at (314) 524-3364,
or write
St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Latty Avenue

possible interim cleanup measures and include the nearby Ballfields property as part of the SLAPS cleanup.

The interim cleanup measure that is selected will be just one part of a comprehensive cleanup program for SLAPS. Comprehensive cleanup measures will be selected after completing the remedial investigation/ feasibility study process. This process is required by CERCLA and results in a Record of Decision (ROD) that identifies how SLAPS will be cleaned.

An interim removal action for SLAPS is planned to begin in 1998 and will continue until the action is completed or a ROD is issued for the site.



The St. Louis Airport Site and the Ballfields contain soil contaminated with uranium, thorium, and radium.

March 17,1998

FUSRAP Fact Sheet

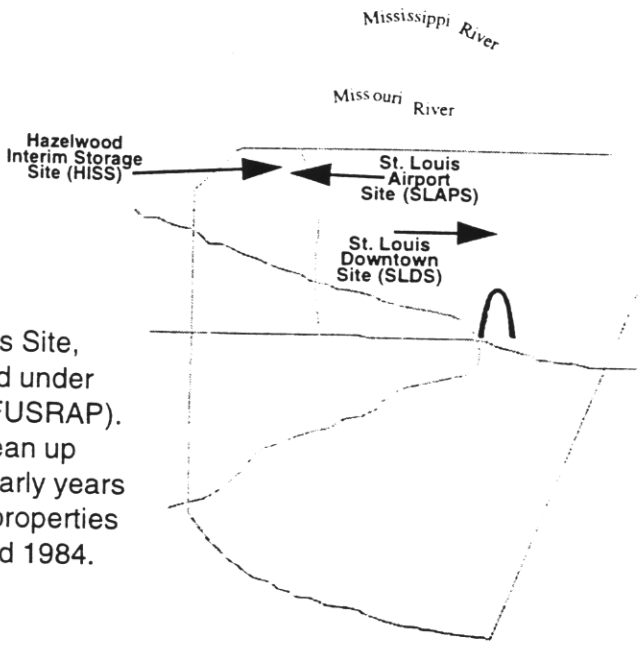
St. Louis Site
St. Louis, Missouri

U.S. Department of Energy • Formerly Utilized Sites Remedial Action Program • March 1997

This fact sheet has been prepared to address community outreach needs and is consistent with provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management.

The U.S. Department of Energy (DOE) is implementing a cleanup program for four groups of properties in the St. Louis area that are contaminated with low levels of radioactivity. The properties are:

- the St. Louis Downtown Site (SLDS);
- the St. Louis Airport Site (SLAPS);
- the Latty Avenue properties, which include the Hazelwood Interim Storage Site (HISS); and
- several nearby vicinity properties.



These properties, collectively referred to as the St. Louis Site, are among the 46 sites across the country being addressed under DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP was founded in 1974 to identify, manage, and clean up sites where radioactive contamination remained from the early years of our nation's atomic energy program. The four St. Louis properties were added to FUSRAP at various times between 1982 and 1984.

Site history

From 1942 to 1957, the Manhattan Engineer District (MED) and Atomic Energy commission (AEC) contracted with the Mallinckrodt Chemical Works to process uranium compounds at a plant in St. Louis. As a result of these activities, parts of the property became contaminated. When MED/AEC operations ceased, the facilities were decontaminated in accordance with the standards of the day. Later investigations showed that portions of the facility retained levels of radioactivity exceeding today's stricter guidelines. Four vicinity properties also contain areas of residual contamination.

In 1946, MED acquired SLAPS, a 21-acre site just north of the St. Louis airport, for storage of residues and other materials from SLDS. (SLAPS is now owned by the city of St. Louis.) In subsequent years, adjacent areas became contaminated as a result of erosion from SLAPS.

In 1966, a private company purchased SLAPS residues, which contained valuable metals, and began hauling them to a site on Latty Avenue, about one-half mile north in Hazelwood. Later, the material was sold again and much of it shipped to Colorado. Surveys in 1977 showed that the former owners had left contamination on the Latty property.

In addition, transport of the material had spread contamination along the haul routes. Although DOE was not responsible for this contamination, Congress directed that DOE add these areas to FUSRAP because of their similarity to other FUSRAP sites.

Cleanup Successes to Date

DOE's first major cleanups at the St. Louis Site took place in 1984 and 1986, when areas along Latty Avenue in Berkeley and Hazelwood were excavated to allow construction of city stormwater and sewer

lines. The contaminated soils were moved to the HISS onsite storage pile at the end of Latty Avenue.

DOE accelerated its interim cleanup work in 1994. Haul routes that fronted residential properties in Hazelwood and Berkeley were cleaned up in late 1994. In 1995 and 1996, more than a dozen haul route commercial properties were cleaned up, as were two large sections of SLDS. A SLDS vicinity property, the city-owned riverfront area, was also cleaned and restored in 1996. This cleanup allowed for the completion of a significant portion of the Riverfront Trail. Continued cleanups of haul route properties and portions of SLDS are planned for 1997.

Action on much of the remainder of the St. Louis Site awaits a formal remedy determination, or Record of Decision. The process of reaching remedy decisions is mandated by federal law and follows steps outlined in an agreement between DOE and the U.S. Environmental Protection Agency.

Cleanup impacts

In addition to the environment, the local economy also benefits from the FUSRAP cleanup. Cleaned and restored residential and commercial properties are free to be bought, sold, or improved without concern for radiological restrictions.

The cleanup work itself provides a significant economic benefit. FUSRAP relies heavily on local subcontracts and purchasing to carry out cleanup activities. Cleanup-related subcontracting and purchasing amounted to more than $1.2 million in fiscal year 1995, and to more than $2.3 million in FY '96. Waste transportation and disposal accounted for an additional $8.9 million over both fiscal years. Projected subcontract expenditures for FY 1997 are significantly higher. (As a matter of policy, FUSRAP uses small, disadvantaged businesses to the maximum extent possible.)

Public involvement

Through public involvement opportunities, local residents have a significant voice in St. Louis Site decision-making. Community concerns over DOE cleanup plans in 1994 led to the creation of the St. Louis Site Remediation Task Force. Task Force membership represented a broad cross-section of interested and affected parties or "stakeholders." Its stated mission was to identify and evaluate feasible remedial action alternatives for the cleanup and disposal of radioactive wastes at the St. Louis Site and to petition the DOE to pursue a cleanup strategy that is environmentally acceptable and responsive to public health and safety concerns.

The Task Force submitted its final report to DOE in September 1996, and DOE agreed to accept many of the group's recommendations. DOE determined that some of the recommendations, including those related to SLAPS, would require further review. Resolution of these remaining issues is projected for late 1997.

DOE has offered to create a Site Specific Advisory Board as a successor to the Task Force to provide stakeholders a forum for assisting the department with environmental management issues at the site.

For more information...

DOE maintains a Public Information Center where visitors and callers may obtain site information, view project documents, and participate in public involvement activities. The center's reading room includes a complete copy of the site Administrative Record, a collection of studies and documents deemed to have an impact on the selection of a final remedy for the site. The St. Louis Public Library, 1301 Olive Street in St. Louis also has a site Information Repository, which also includes a copy of the Administrative Record.

For more information, or to be added to the site mailing list, contact:

DOE Public Information Center
9170 Latty Avenue
Berkeley, Missouri 63134
(314) 524-4083

DOE also maintains a 24-hour, toll-free telephone number. An answering machine will record your comments or questions, and your call will be returned promptly. The number is **1-800-253-9759**. Visit FUSRAP on the World Wide Web at www.fusrap.doe.gov.

United States Environmental Protection Agency | Office of Solid Waste and Emergency Response | Publication No. 9230.1-05/FS | January 1990

EPA Superfund Technical Assistance Grants

Office of Emergency and Remedial Response
Hazardous Site Control Division (OS-220)

Quick Reference Fact Sheet

WHAT ARE TECHNICAL ASSISTANCE GRANTS

Background of Program – In 1980, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) – otherwise known as "Superfund" – established a trust fund for the cleanup of hazardous waste sites in the United States. CERCLA was amended and reauthorized when Congress passed the Superfund Amendments and Reauthorization Act (SARA) of 1986. The U.S. Environmental Protection Agency (EPA), working in concert with the States, is responsible for administering the Superfund program.

An important aspect of the Superfund program is citizen involvement at the local level in decision-making that relates to site-specific cleanup actions. For this reason, community outreach activities are underway at each of the 1,200 sites that are presently on, or proposed for listing on, the National Priorities List (NPL). The NPL is EPA's published list of the most serious abandoned or otherwise uncontrolled hazardous waste sites nationwide, which have been identified for possible remedial clean-up under Superfund.

Recognizing the importance of community involvement and the need for citizens living near NPL sites to be well-informed, Congress included provisions in SARA to establish a Technical Assistance Grant (TAG) Program intended to foster informed public involvement in decisions relating to site-specific cleanup strategies under Superfund.

In addition to regulatory and legal requirements, decisions concerning cleanup initiatives at NPL sites must take into account a range of technical considerations. These might include:

- Analytical profiles of conditions at the site;
- The nature of the wastes involved; and
- The kinds of technology available for performing the necessary cleanup actions.

The TAG Program provides funds for qualified citizens' groups to hire independent technical advisors to help them understand and comment on such technical factors in cleanup decisions affecting them.

Basic Provisions of the Technical Assistance Grants Program

- Grants of up to $50,000 are available to community groups for the purpose of hiring technical advisors to help citizens understand and interpret site-related technical information.
- The group must cover 20 percent of the total costs of the project to be supported by TAG funds.
- The group must budget the expenditure of grant funds to cover the entire cleanup period (which averages six years).
- There may be only one TAG award per NPL site; however, the grant may be renewed.

Printed on Recycled Paper

USES OF TECHNICAL ASSISTANCE GRANTS

Citizen groups may use grant funds to hire technical advisors to help them understand information that already exists about the site or information developed during the Superfund cleanup process. Acceptable uses of these grant funds include payments to technical advisors for services such as:

- Reviewing site-related documents, whether produced by EPA or others;
- Meeting with the recipient group to explain technical information;
- Providing assistance to the grant recipient in communicating the group's site-related concerns;
- Disseminating interpretations of technical information to the community;
- Participating in site visits, when possible, to gain a better understanding of cleanup activities; and
- Traveling to meetings and hearings directly related to the situation at the site.

TAG funds may <u>not</u> be used to develop new information (for example, additional sampling) or to underwrite legal actions in any way, including the preparation of testimony or the hiring of expert witnesses.

You can obtain a complete list of eligible and ineligible uses of grant funds by contacting your EPA Regional Office or the Headquarters information number listed at the end of this pamphlet. In addition, this information is included in the EPA publication entitled *The Citizens' Guidance Manual for the Technical Assistance Grant Program* (OSWER Directive 9230.1-03), also available from your Regional EPA Office.

WHO MAY APPLY

As stated in the 1986 Superfund amendments, groups eligible to receive grants under the TAG program are those whose membership may be affected by a release or threatened release of toxic wastes at any facility listed on the NPL or proposed for listing, and where preliminary site work has begun. In general, eligible groups are groups of individuals who live near the site and whose health, economic well-being, or enjoyment of the environment are directly threatened. Any group applying for a TAG must be nonprofit and incorporated or working towards incorporation under applicable State laws. Applications are encouraged from:

- Groups that have a genuine interest in learning more about the technical aspects of a nearby hazardous waste site; and
- Groups that have, or intend to establish, an organization to manage a grant efficiently and effectively.

For example, such groups could be:

- Existing citizens' associations;
- Environmental or health advocacy groups; or
- Coalitions of such groups formed to deal with community concerns about the hazardous waste site and its impact on the surrounding area.

Groups that are <u>not</u> eligible for grant funds are:

- Potentially responsible parties: any individuals or companies (such as facility owners or operators, or transporters or generators of hazardous waste) potentially responsible for, or contributing to, the contamination problems at a Superfund site;
- Academic institutions;
- Political subdivisions; and
- Groups established and/or sustained by governmental entities (including emergency planning committees and some citizen advisory groups).

HOW TO APPLY FOR A GRANT

Requirements – When applying for a TAG, a group must provide information to EPA (or to the State, if the State is administering the TAG program) to determine if the group meets specific administrative and management requirements. The application also must include a description of the group's history, goals, and plans for using the technical assistance funds. Factors that are particularly important in this evaluation process include:

- The group's ability to manage the grant in compliance with EPA grant and procurement regulations;
- The degree to which the group members' health, economic well-being, and enjoyment of the environment are adversely affected by a hazardous waste site;
- The group's commitment and ability to share the information provided by the technical advisor with others in the community;
- Broad representation of affected groups and individuals in the community; and;
- Whether the applicant group is nonprofit and incorporated for TAG purposes. (Only incorporated groups may receive grants. Groups must either be incorporated specifically for the purpose of addressing site-related problems or incorporated for broader purposes if the group has a substantial history of involvement at the site.)

In general, a group must demonstrate that it is aware of the time commitment, resources, and dedication needed to successfully manage a TAG. Applicant groups should consult *The Citizens' Guidance Manual For The Technical Assistance Grant Program* for detailed instructions on how to present such information.

Notification Procedures and Evaluation Criteria – The 1986 Superfund amendments state that only one TAG may be awarded per site. To ensure that all eligible groups have equal access to technical assistance and an equal opportunity to compete for a single available grant (if a coalition of groups proves to be impossible), EPA has established a formal notification process, which includes the following steps:

- Groups wishing to apply for a technical assistance grant must first submit to EPA a short letter stating their group's desire to apply and naming the site(s) involved. If site project work is already underway or scheduled to begin, EPA will provide formal notice through mailings, meetings, or other public notices to other interested parties that a grant for the site soon may be awarded.
- Other potential applicants would then have 30 days to contact the original applicant to form a coalition.
- If potential applicants are unable to form a coalition, they will notify EPA within this time period and EPA will accept separate applications from all interested groups for an additional 30-day period.
- EPA would then award a grant to the application that best meets the requirements described above.

The maximum grant that can be awarded to any group is $50,000. The actual amount depends on what the group intends to accomplish. A group's minimum contribution of 20 percent of the total costs of the technical assistance project can be covered with cash and/or "in-kind" contributions, such as office supplies or services provided by the group. These services might include, for example, publication of a newsletter or the time an accountant donates to managing the group's finances. The value of donated professional services is determined based on rates charged for similar work in the area.

In special cases where an applicant group intends to apply for a single grant covering multiple sites in close proximity to each other, EPA can allow a waiver of the $50,000 grant limit. In such cases, however, the recipient cannot receive more than $50,000 for each site to which it intends to apply funds (example: 3 sites x $50,000 = maximum grant amount of $150,000).

CHOOSING A TECHNICAL ADVISOR

When choosing a technical advisor, a group should consider the kind of technical advice the group needs most and whether a prospective advisor has the variety of skills necessary to provide all of the advice needed. Each technical advisor must have:

- Knowledge of hazardous or toxic waste issues;
- Academic training in relevant fields such as those listed above; and
- The ability to translate technical information into terms understandable to lay persons.

In addition, a technical advisor should have:

- Experience working on hazardous waste or toxic waste problems;
- Experience in making technical presentations and working with community groups; and
- Good writing skills.

Technical advisors will need specific knowledge of one or more of these subjects:

Chemistry: Analysis of the chemical constituents and properties of wastes at the site;

Toxicology: Evaluation of the potential effects of site contaminants upon human health and the environment;

Epidemiology: Evaluation of the pattern of human health effects potentially associated with site contaminants;

Hydrology and Hydrogeology: Evaluation of potential contamination of area surface water and ground-water wells from wastes at the site;

Soil Science: Evaluation of potential and existing soil contamination;

Limnology: Evaluation of the impact of site runoff upon the plant and animal life of nearby streams, lakes, and other bodies of water;

Meteorology: Assessment of background atmospheric conditions and the potential spread of contaminants released into the air by the site; and/or

Engineering: Analysis of the development and evaluation of remedial alternatives and the design and construction of proposed cleanup actions.

A grant recipient may choose to hire more than one technical advisor to obtain the combination of skills required at a particular site. For example, a group may be unable to find a single advisor experienced in both hydrology and epidemiology, two of the skills most needed at its site. Another approach would be to hire a consulting firm that has experience in all the needed areas. *The Citizens' Guidance Manual for the Technical Assistance Grant Program* identifies other issues that citizens' groups may wish to consider in hiring a technical advisor.

ADDITIONAL INFORMATION

For further information on the application process or any other aspect of the TAG program, please contact your EPA Regional Office or call the national information number, both of which are listed below. An application package is available free by calling the EPA Regional Office for your State (see map on back cover). Each application package includes all the necessary application and certification forms as well as a copy of *The Citizen's Guidance Manual For The Technical Assistance Grant Program*. This manual contains sample forms with detailed instructions to assist you in preparing a TAG application.

EPA Superfund Offices

EPA Headquarters
Office of Emergency & Remedial Response
401 M Street, SW
Washington, DC 20460
(202) 382-2449

EPA Region 1
Emergency and Remedial Response Division
John F. Kennedy Building
Boston, MA 02203
(617) 573-5701
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

EPA Region 2
Superfund Branch
26 Federal Plaza
New York, NY 10278
(212) 264-4534
New Jersey, New York, Puerto Rico, Virgin Islands

EPA Region 3
Superfund Branch
841 Chestnut Building
Philadelphia, PA 19106
(215) 597-4081
Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia

EPA Region 4
Emergency and Remedial Response Branch
345 Courtland Street, NE
Atlanta, GA 30365
(404) 347-2234
Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

EPA Region 5
Emergency and Remedial Response Branch
230 S. Dearborn Street
Chicago, IL 60604
(312) 886-1660
Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

EPA Region 6
Superfund Program Branch
Allied Bank Tower
1445 Ross Avenue
Dallas, TX 75202-2733
(214) 655-2200
Arkansas, Louisiana, New Mexico, Oklahoma, Texas

EPA Region 7
Superfund Branch
726 Minnesota Avenue
Kansas City, KS 66101
(913) 236-2803
Iowa, Kansas, Missouri, Nebraska

EPA Region 8
Waste Management Division
1 Denver Place
999 18th Street
Denver, CO 80202-2413
(303) 564-7040
Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming

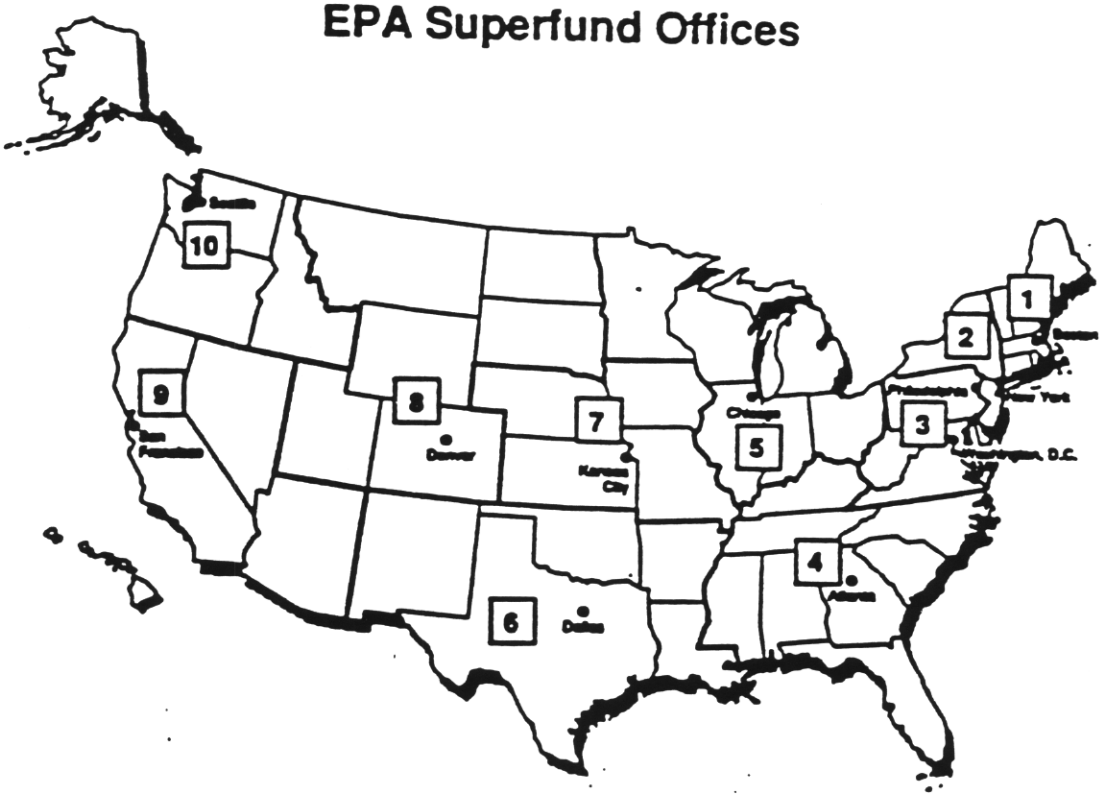
EPA Region 9
Superfund Programs Branch
215 Fremont Street
San Francisco, CA 94105
(415) 454-744-1766
Arizona, California, Guam, Hawaii, Nevada, American Samoa

EPA Region 10
Superfund Branch
1200 6th Avenue
Seattle, WA 98101
(206) 442-0603
Idaho, Oregon, Washington, Alaska

Superfund/RCRA Hotline
(800) 424-9346 or 382-3000
in the Washington, DC, metropolitan area (for information on programs)

National Response Center (800) 424-8802
(to report releases of oil and hazardous substances)

EPA Superfund Offices



FUSRAP

Fact Sheet

FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

U.S. DEPARTMENT OF ENERGY • FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM • OCTOBER 1995

This fact sheet has been prepared to address community outreach requirements set by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management.

WHAT IS FUSRAP?

During the 1940s, 1950s, and 1960s, work was performed at sites throughout the United States as part of the nation's early atomic energy program. Some sites' activities can be traced back as far as World War II and the Manhattan Engineer District (MED); other sites were involved in peacetime activities under the Atomic Energy Commission (AEC). Both MED and AEC were predecessors of DOE.

Generally, sites that became contaminated during the early atomic energy program were cleaned up under the guidelines in effect at the time. Because those cleanup guidelines were not as strict as today's, trace amounts of radioactive materials remained at some of the sites. Over the years, contamination was spread to other locations, either by demolition of buildings and movement of materials, or by natural processes.

DOE began FUSRAP in 1974 to study these sites and take appropriate cleanup action. When a site is thought to be contaminated, old records are reviewed and the site is surveyed. If contamination is found that is connected to MED or AEC activities, cleanup is authorized under FUSRAP. Some sites with industrial contamination similar to that produced by MED or AEC activities have also been added to FUSRAP by Congress.

Since starting FUSRAP, DOE has examined records or performed surveys on more than 400 sites. Most were not contaminated, but 46 sites in 14 states have been found to be contaminated with radioactivity that exceeds current cleanup guidelines.

Limited cleanup began at some sites in 1979, and major remedial action has been under way since 1981. Cleanup has been completed at 22 of the sites; 12 others have been partially cleaned up. And more than 175 vicinity properties, including homes, parks, and streams, have been cleaned.

HOW HAZARDOUS ARE FUSRAP SITES?

Even though FUSRAP sites contain levels of radioactivity above current DOE guidelines, none of the sites poses an immediate health risk to the public or environment given current land uses. The contaminated materials have very low concentrations, and people are not exposed to them for long periods of time. Although these materials are not a hazard, they will remain radioactive for thousands of years, and health risks could increase if the use of the land were to change. Under FUSRAP, each site is cleaned to levels acceptable for most, if not all, future uses for the land, such as residential development, crop production, and the installation of drinking water wells.

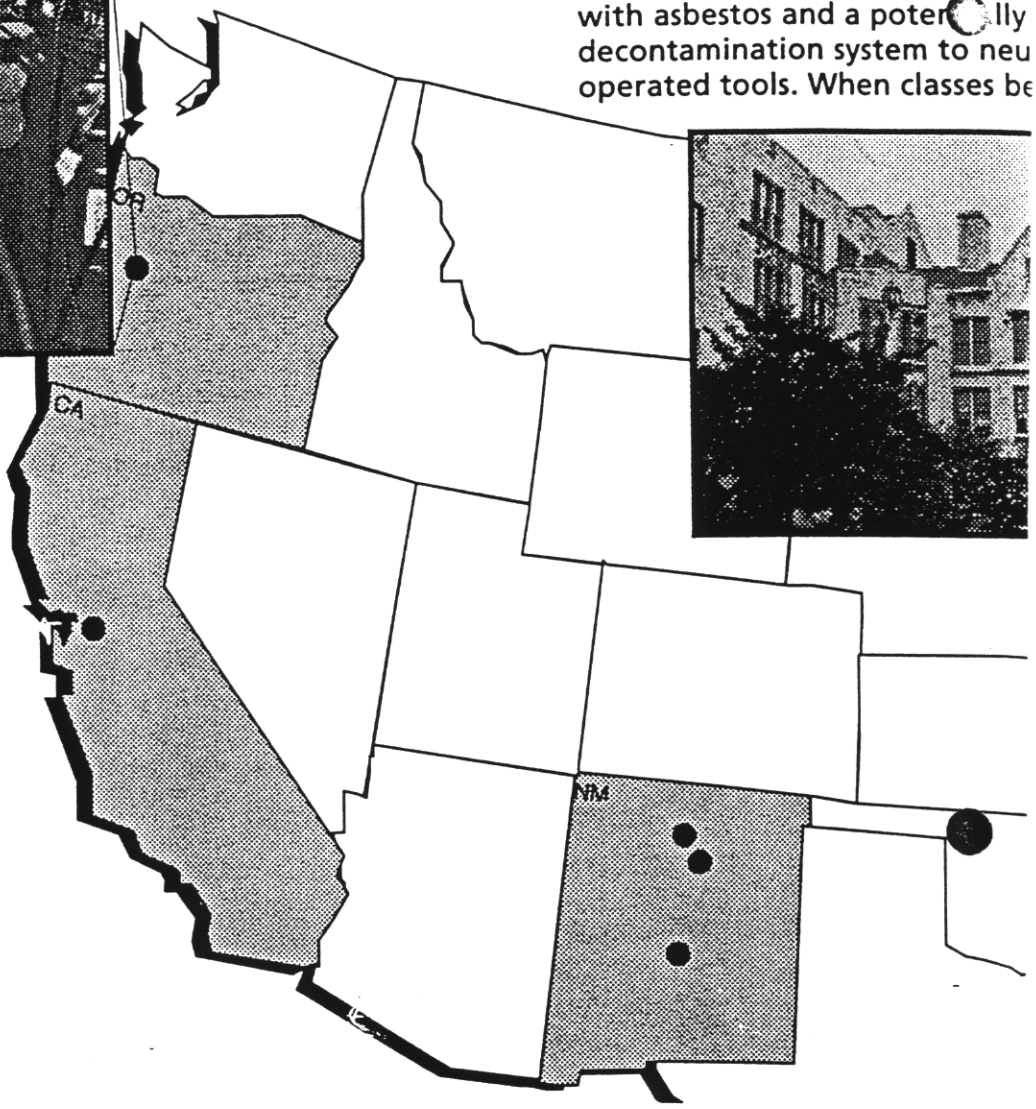
WHAT ARE FUSRAP'S OBJECTIVES?

The objectives of FUSRAP are to:

- Find and evaluate sites that supported MED/AEC nuclear work and determine whether they need cleanup and/or control.

Albany Research Center
This facility in Albany, Oregon, opened in 1943 to conduct metallurgical research. DOE contractors performed several investigations and cleanups to find and remove the contamination, which was in soil, inside the building, and in drainage pipes. The contaminated material was transported to a disposal facility out of state.

University of Chicago
A laboratory at the university th
nated exhaust system. Radioacti
with asbestos and a poten lly
decontamination system to neu
operated tools. When classes be



Elza Ga

This site was once a staging area for uranium shipped to Oak Ridge, Tennessee, a to
built by the government in the 1940s to produce parts for the atomic bomb. Three wa
houses at Elza Gate stored radioactive materials. After the buildings were torn dov
contamination remained in dirt and on debris. DOE removed the contaminated mater
and sent it to a disposal facility. The site is now home to an industrial pa

MISSOURI SITES
Latty Avenue Properties, Hazelwood
St. Louis Airport Site, St. Louis
St. Louis Airport Site Vicinity Prop., St. Louis
St. Louis Downtown Site, St. Louis

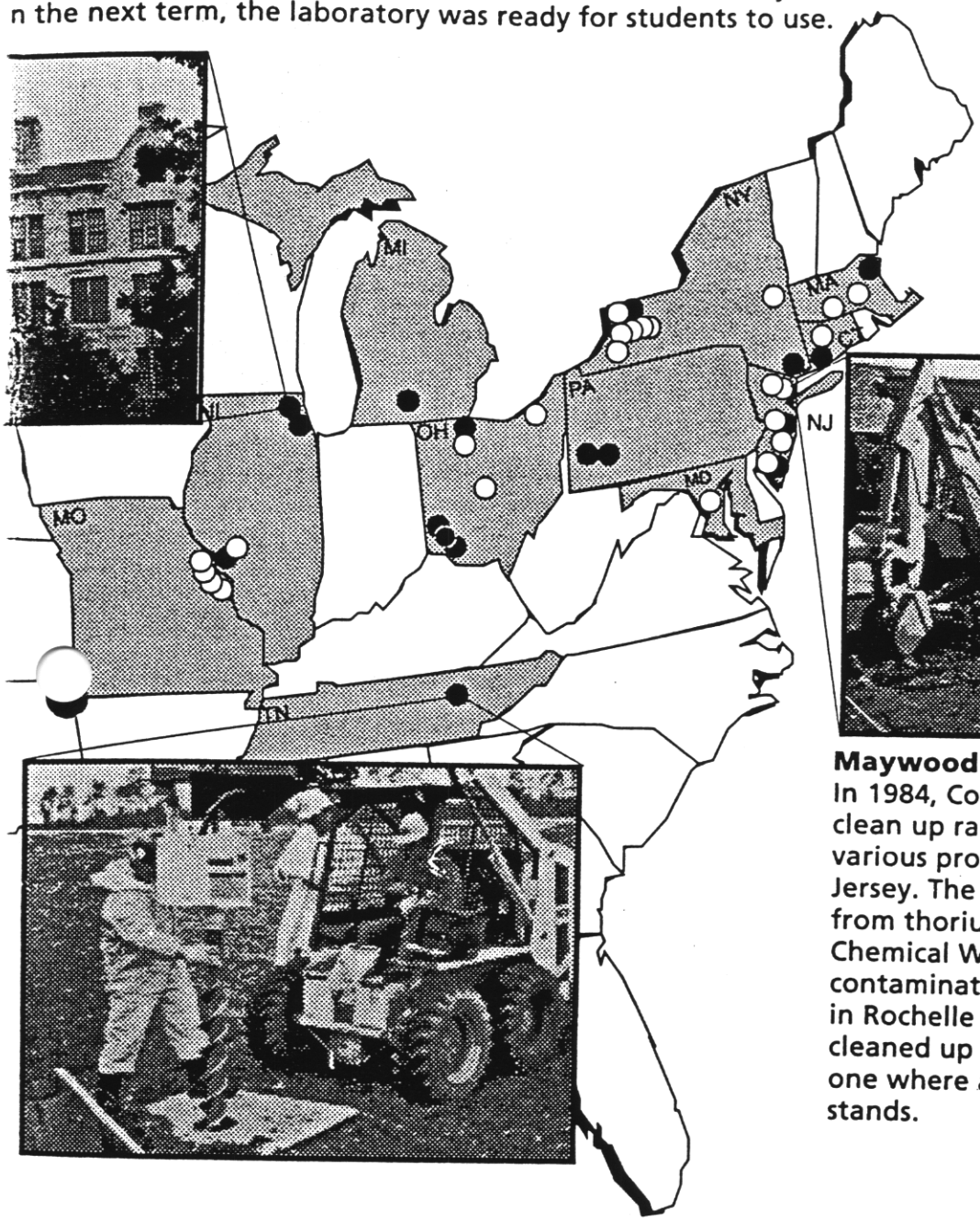
OHIO SITES
B & T Metals, Columbus
Luckey Site, Luckey
Painesville Site, Painesville

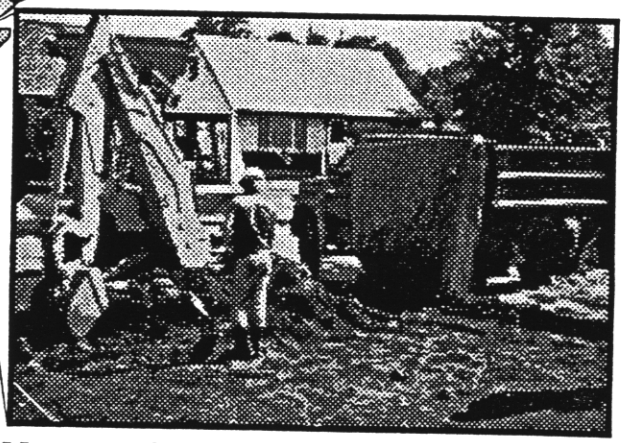
NEW JERSEY SITES
Maywood Site, Maywood
Wayne Site, Wayne/Pequannock
Middlesex Sampling Plant, Middlesex
New Brunswick Site, New Brunswick
Du Pont & Company, Deepwater

NEW YORK SITES
Niagara Falls Storage Site, Lewiston
Colonie Site, Colonie
Ashland 1, Tonawanda
Ashland 2, Tonawanda
Praxair, Tonawanda
Seaway Industrial Park, Tonawanda
Bliss & Laughlin Steel, Buffalo

○ *Remedial Action Ongoing or Planned*
● *Remedial Action Completed*

was used in early atomic energy work contained a contami-
m ial had built up inside the duct work and was mixed
olo chemical. DOE's contractor designed an innovative
lize the chemicals and remove the radiation with remotely
n the next term, the laboratory was ready for students to use.





Maywood
In 1984, Congress authorized DOE to clean up radioactive contamination on various properties in Maywood, New Jersey. The contamination had resulted from thorium processing at Maywood Chemical Works from 1916 to 1959. The contamination spread to residential areas in Rochelle Park and Lodi. DOE has cleaned up several properties, including one where a retirement home now stands.

ADDITIONAL SITES
Madison Site, Madison, IL
CE Site, Windsor, CT
Shpack Landfill, Norton, MA
Ventron Corporation, Beverly, MA
W.R. Grace & Company, Curtis Bay, MD

COMPLETED SITES (22)
Kellex/Pierpont, Jersey City, NJ (1981)
Acid/Pueblo Canyon, Los Alamos, NM (1982)
Bayo Canyon, Los Alamos, NM (1982)
University of California, Berkeley, CA (1982)
Chupadera Mesa, White Sands Missile Range, NM (1984)
Middlesex Municipal Landfill, Middlesex, NJ (1986)
Niagara Falls Storage Site Vicinity Prop., Lewiston, NY (1986)
University of Chicago, Chicago, IL (1987)
National Guard Armory, Chicago, IL (1988)
Albany Research Center, Albany, OR (1991)
Elza Gate Site, Oak Ridge, TN (1992)
Seymour Specialty Wire, Seymour, CT (1993)
Baker and Williams Warehouses, New York, NY (1993)
Granite City Steel, Granite City, IL (1993)
Aliquippa Forge, Aliquippa, PA (1994)
C.H. Schnoor, Springdale, PA (1994)
Alba Craft, Oxford, OH (1995)
HHM Safe Co., Hamilton, OH (1995)
Associate Aircraft, Fairfield, OH (1995)
General Motors, Adrian, MI (1995)
Chapman Valve, Indian Orchard, MA (1995)
Baker Brothers, Toledo, OH (1995)

- Clean up or maintain these sites so that they meet current DOE guidelines.
- Dispose of or stabilize contamination in a way that is safe for the public and the environment.
- Perform all work in compliance with appropriate federal laws and regulations, and comply with state and local environmental laws and land-use requirements.
- Certify the sites for appropriate future use.

HOW DOES FUSRAP WORK?

Under most circumstances, FUSRAP sites undergo several steps that lead to cleanup. First, information about the site is collected and reviewed. Then, a remedial investigation/feasibility study is conducted. The remedial investigation is made to identify the type and location of the contamination. The feasibility study develops and evaluates cleanup alternatives. Throughout the remedial investigation/feasibility study process, the public is informed about the progress toward a decision on the cleanup alternative.

When a cleanup alternative is chosen, a proposed plan is written to explain why it was chosen. Members of the public are asked to comment on all the cleanup options, including the selected alternative. After public comments are considered, a final decision is made and documented in a record of decision. The remedial design follows the record of decision and includes technical drawings and specifications that show how the cleanup will be conducted.

Cleanup begins after the remedial design is complete. This phase involves site preparation and construction activities. When these activities are completed, verification surveys are conducted to ensure that cleanup objectives for the site have been met.

LAWS THAT GOVERN FUSRAP

Every step of the FUSRAP cleanup process is regulated by a number of federal laws. Chief among these is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the National Environmental Policy Act (NEPA).

CERCLA provides the framework for a systematic investigation, remedial design, and cleanup of contaminated sites. NEPA requires federal agencies to consider the effect on the environment when making cleanup decisions. Both CERCLA and NEPA generally require that the public be informed and involved in the decision-making process.

It is typical for many FUSRAP sites to be subject to multiple regulations, depending upon the type and extent of contamination at the site. Other laws include the Resource Conservation and Recovery Act, the Toxic Substances Control Act, the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, the National Emission Standards for Hazardous Air Pollutants, and state and local regulations.

HOW IS FUSRAP ORGANIZED?

Technical, administrative, and financial management of FUSRAP activities are the responsibility of the Former Sites Restoration Division of the DOE Operations Office in Oak Ridge, Tennessee. DOE hires companies to manage and perform FUSRAP activities. A project management contractor conducts site investigations and cleanups. An environmental services contractor plans site investigations, evaluates cleanup alternatives, and ensures that all FUSRAP activities comply with environmental requirements.

HOW CAN I GET MORE INFORMATION?

In performing FUSRAP work, DOE implements community outreach programs to keep the public informed. DOE's public information efforts include fact sheets, public meetings, and contacts with media, citizens groups, and public officials.

Additional information can be obtained by contacting:

Formerly Utilized Sites Remedial Action Program
U.S. Department of Energy
Former Sites Restoration Division
P.O. Box 2001
Oak Ridge, Tennessee 37831-8723

DOE also maintains a 24-hour, toll-free telephone number

1-800-253-9759.

Printed on recycled paper.

H3A 7061

FUSRAP Laws and Regulations That Affect FUSRAP

U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

December 1993

This fact sheet has been prepared to address community outreach requirements set by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management.

The Formerly Utilized Sites Remedial Action Program (FUSRAP) is an important Department of Energy (DOE) environmental cleanup program. This fact sheet describes FUSRAP and explains the laws and regulations that guide program activities and protect human health and the environment.

WHAT IS FUSRAP?

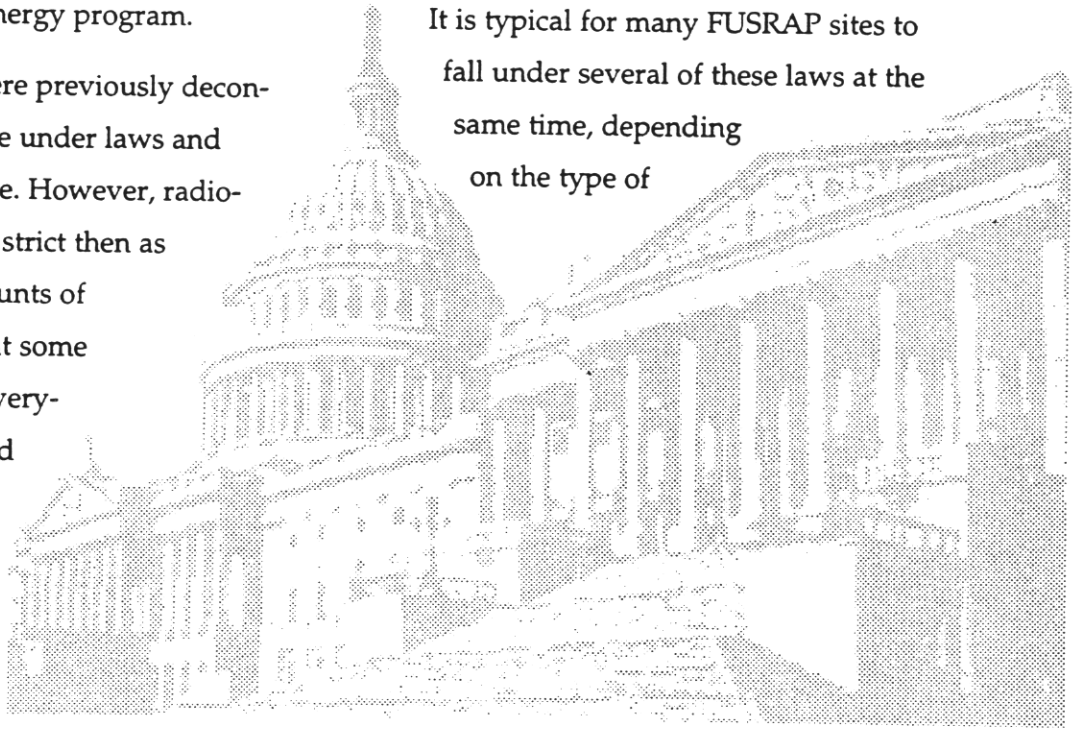
DOE created FUSRAP in 1974 to identify, investigate, and clean up or control sites where contamination above today's guide-lines remains from the early years of the nation's atomic energy program.

Many of the FUSRAP sites were previously decontaminated and released for use under laws and regulations in effect at the time. However, radiological guidelines were not as strict then as they are today, and trace amounts of radioactive materials remain at some sites. Also through normal, everyday use of these properties and movement of materials over the years, some contamination has spread onto nearby properties. These areas also require cleanup.

Since 1974, FUSRAP has examined old records, interviewed previous employees, and performed radiological surveys on more than 400 suspected sites across the nation. Most have been found to be clean, but more than 40 sites in 14 states have been identified as needing cleanup under FUSRAP.

WHICH LAWS GUIDE FUSRAP?

A number of federal laws guide every step of the FUSRAP cleanup process—from initial site identification right through to final certification. It is typical for many FUSRAP sites to fall under several of these laws at the same time, depending on the type of



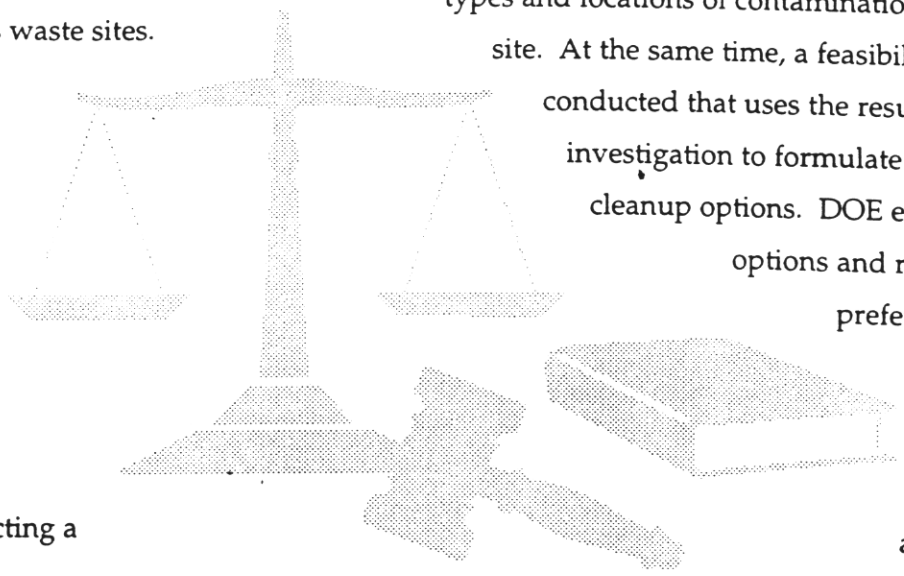
contamination and the actions required to clean it up. Because so many different federal laws apply to environmental cleanup, compliance with these laws becomes very complex. Under certain circumstances, for example, the act of excavating contaminated soil could be affected by all of the laws discussed in this fact sheet. A general description of the main federal laws that apply to FUSRAP follows. While the focus of each law is different, their goals are the same: to protect human health and the environment.

"While the focus of each law is different, their goals are the same: to protect human health and the environment."

CERCLA

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 is the main law governing cleanup of many FUSRAP sites. Major changes were made to this federal law in 1986—the Superfund Amendments and Reauthorization Act was enacted to study and to clean up uncontrolled hazardous waste sites. The CERCLA (or *Superfund*) process consists of three phases:

1. Preliminary assessment
2. Studying the site, evaluating cleanup alternatives, and selecting a cleanup plan
3. Designing and implementing the chosen plan



The preliminary assessment is used to decide which sites should be added to the *National Priorities List (NPL)*, which identifies the most serious uncontrolled hazardous waste sites. Sites are scored based on their impact on public health and the environment, and those sites that exceed a certain score are added to the NPL.

The Environmental Protection Agency (EPA) oversees CERCLA activities at most NPL sites. Cleanup at FUSRAP NPL sites is guided by *federal facilities agreements (FFAs)* between DOE, and EPA, with input from states where the sites are located. DOE policy is to integrate CERCLA with other laws that apply to the site. The FFA also sets cleanup priorities; defines agency responsibilities, document review, and interaction among agency officials; and establishes a schedule for work at a site.

CERCLA mandates specific steps for investigating contaminated sites. After an initial planning period, workers begin a remedial investigation to identify the types and locations of contamination present at the site. At the same time, a feasibility study is conducted that uses the results of the remedial investigation to formulate a range of cleanup options. DOE evaluates these options and recommends a preferred alternative for cleaning up the site.

CERCLA allows and encourages public involvement at all stages in the process that leads to a decision for

cleaning up a site. The public has an opportunity to comment on the results of the remedial investigation and the analysis of alternatives. To keep the public informed, DOE also uses various community outreach programs, including public information centers, public meetings, and periodic fact sheets. Key documents used in making a cleanup decision at a site make up an *administrative record*, which is available to the public at a location near the site.

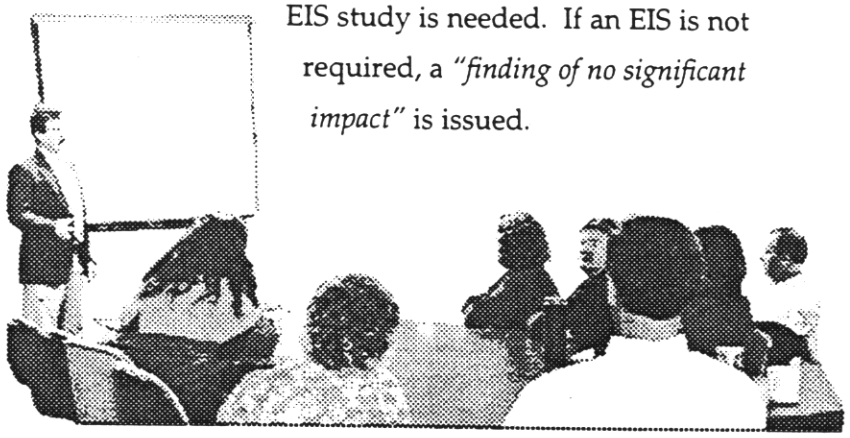
After the comment period on the proposed plan is closed, DOE prepares a draft *Record of Decision* and submits it to EPA. For NPL sites, EPA concurs or makes the final decision on site cleanup after considering input from the state and from the public and the decision is final when the regulators and DOE sign a legally binding *Record of Decision*. For non-NPL sites, DOE makes the final cleanup decision, also with input from the public. A remedial design/remedial action is then conducted to carry out the decision and monitor the performance of the environmental cleanup.

NEPA

The *National Environmental Policy Act (NEPA)* sets basic national policy on environmental protection. This 1969 federal law established a process for determining if a proposed federal action will have significant environmental effects. NEPA requires that federal agencies consider environmental effects before proceeding with proposed actions.

On FUSRAP, actions proposed for a site are evaluated in light of NEPA guidelines to determine potential environmental effects and the level of NEPA documentation required. Depending on the results of initial findings, NEPA specifies several options: if an action will clearly have no significant impact, no further studies are required. If an action may have an impact on the environment, an *environmental assessment* or an *environmental impact statement (EIS)* may be required.

In preparing an environmental assessment, information is gathered and studied to decide whether impacts are great enough to mean a more complete EIS study is needed. If an EIS is not required, a *"finding of no significant impact"* is issued.



To keep the public involved and informed, FUSRAP conducts numerous meetings, workshops, and availability sessions in the affected communities.

When an EIS is required for an action at a site, NEPA requires public input early in the process of studying site conditions and cleanup options. Public involvement at all stages of the process helps ensure that problems are identified, focuses energies and efforts on those areas that must be resolved, and makes for a balanced and complete EIS.

THE CERCLA/NEPA PROCESS

Because many requirements of CERCLA and NEPA are similar or over-lapping, most FUSRAP sites are cleaned up under an integrated CERCLA/NEPA process. Community relations activities are combined under the more comprehensive provisions of

CERCLA and incorporate the special requirements of NEPA where necessary. Coordination of CERCLA and NEPA requirements results in a means for open decision-making that involves the public, as well as local, state, and federal agencies. Site investigations, analyses, and documentation requirements of these two laws are integrated to simplify regulatory review, reduce paperwork, and increase cost-effectiveness.

RCRA

In addition to CERCLA and NEPA, a number of other federal regulations apply to some FUSRAP sites, such as the *Resource Conservation and Recovery Act (RCRA).* Passed in 1976 as an amendment to the Solid Waste Disposal Act, RCRA establishes a "cradle to grave" system for controlling hazardous waste from the time it is generated until its ultimate disposal. Contaminated materials at some FUSRAP sites contain both hazardous and radioactive waste; this *mixed waste* presents special challenges to the FUSRAP program. RCRA provides very specific requirements of how mixed waste can be managed, treated, and disposed of. RCRA also requires appropriate systems for permits and waste management at all FUSRAP sites that involve hazardous waste.

OTHER REGULATIONS

Each FUSRAP site is unique and must meet the requirements of many other specific laws designed to apply to certain types of contaminants or to particular types of cleanup circumstances. For example, if performing an excavation that may release contaminated dust particles into the air, FUSRAP must comply with the requirements of the *Clean Air Act.* Other laws that must be complied with under some situations include the *Toxic Substances Control Act*, the *Clean Water Act*, and the *Safe Drinking Water Act.* In addition, there are many other federal, state, and local standards that may apply.

FOR MORE INFORMATION

If you need additional information about FUSRAP or the laws that regulate it, DOE has a toll-free public access number. An answering machine will take your messages and all calls will be returned. Call **1-800-253-9759**.

Printed on recycled paper.

FUSRAP
The St. Louis Site
St. Louis, Missouri

U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

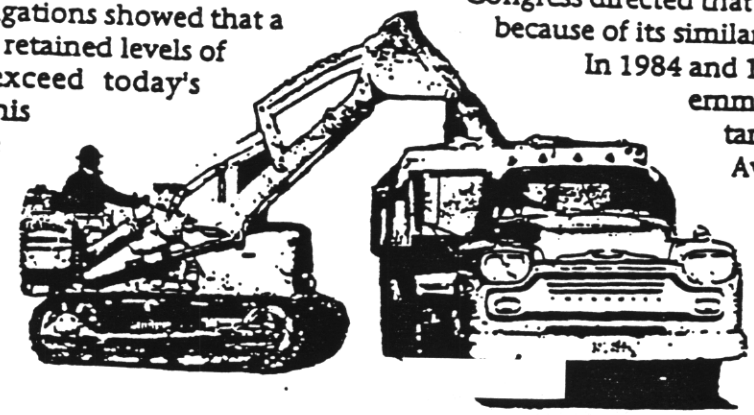
May 1993

The U.S. Department of Energy (DOE) is implementing a cleanup program for four groups of properties in the St. Louis area that are contaminated with low levels of radioactivity. The properties are 1) the St. Louis Downtown Site (SLDS), 2) the St. Louis Airport Site (SLAPS), 3), several nearby or "vicinity" properties associated with SLAPS, and 4) the Latty Avenue Properties, which include the Hazelwood Interim Storage Site (HISS).

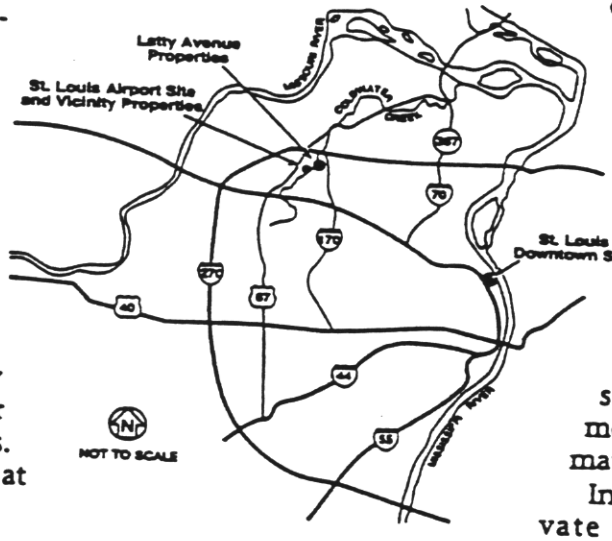
The properties, collectively referred to as the St. Louis Site, are among more than 40 sites throughout the U.S. that are being addressed u[nder] DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). DOE began FUSRAP in 1974 to find, control, and clean up sites where radioactive contamination that exceeds current guidelines remains from the early years of our nation's atomic energy program. Other sites have been added to the program by Congress. The St. Louis properties were added to FUSRAP at various times between 1981 and 1984.

How did the sites become contaminated?

From 1942 to 1957, the Manhattan Engineer District (MED) and Atomic Energy Commission (AEC) contracted with the Mallinckrodt Chemical Works to process uranium compounds at a plant in St. Louis. As a result of these activities, parts of the property became contaminated. When MED/AEC operations stopped, the facilities were decontaminated according to the standards at the time. However, later investigations showed that a portion of the facility retained levels of radioactivity that exceed today's stricter guidelines. This portion of the Mallinckrodt property is called the St. Louis Downtown Site (SLDS). Six vicinity properties also contain areas of residual contamination.



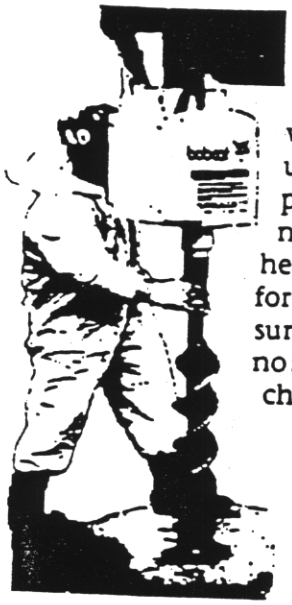
In 1946, MED acquired the St. Louis Airport Site (SLAPS), just north of the St. Louis airport, as a storage area for residues and other materials from SLDS. In subsequent years, the SLAPS Vicinity Properties became contaminated as the result of erosion and movements of materials.



In 1966, a private company purchased the residues and hauled them from SLAPS to a site about one-half mile north on Latty Avenue in Hazelwood. The residues were stored for several months, then were sold and shipped to another private company in Colorado. However, in 1977, surveys showed that the owner had left contamination on the property and that it had begun to spread offsite. Even though DOE was not responsible for this contamination, Congress directed that DOE add this site to FUSRAP because of its similarity to other FUSRAP sites.

In 1984 and 1986, DOE assisted local governments in the excavation of contaminated soil from along Latty Avenue to allow construction of stormwater and sewer lines. The contaminated soil was moved to an onsite storage pile. The site is now known as the Hazelwood Interim Storage Site (HISS).

Together, HISS and the remaining offsite contaminated properties are called the Latty Avenue Properties.



How hazardous are the sites?

The sites are contaminated with very low levels of thorium, uranium, and radium. Given present land uses, the sites pose no significant threat to public health or the environment. Performing remedial action will ensure that the properties will pose no significant risk should land uses change in the future.

At HISS, DOE carries out an environmental monitoring program to ensure that the contaminated material stored there is not a threat to the public or the environment. DOE publishes the monitoring results yearly in a report that is available to the public.

What is DOE doing to clean up the sites?

DOE is moving forward in a process that will lead to a decision for remediating the sites. The process complies with federal laws and follows steps outlined in an agreement with the Environmental Protection Agency (EPA).

In October 1989, EPA placed SLAPS and the Latty Avenue Properties on its National Priorities List, which means that EPA has authority over cleanups. In 1990, DOE and EPA signed a Federal Facilities Agreement that laid out the specific requirements and a schedule for the cleanup evaluation.

All work in connection with the sites will conform with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). The CERCLA/NEPA process is lengthy, but it ensures that when a decision is made on cleanup for the St. Louis sites, that decision will reflect due consideration for environmental, public health, and safety concerns.

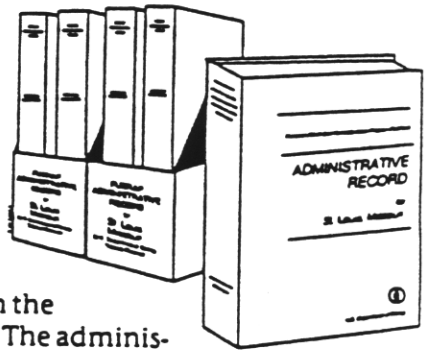
The process requires a remedial investigation/feasibility study and environmental impact statement. DOE has completed the remedial investigation phase. Each site has been investigated to determine the amounts and locations of contamination and the possible ways it could spread or pose a risk to the public. The feasibility study-environmental impact statement will present and assess various alternatives for remediating the properties. Data from the investigations will be used in evaluating the alternatives.

DOE expects to issue a draft of the feasibility study-environmental impact statement and a proposed plan in 1994. DOE will solicit public review and comment on this document before making a remediation decision.

The decision, which must be approved by EPA, will be published in a document called the Record of Decision, which DOE expects to issue in May 1995. After the Record of Decision, DOE will proceed with designing and implementing the selected remedy.

How can I obtain more information?

DOE maintains a Public Information Center to provide site information and offer opportunities for the public to participate in the review process. At the office, DOE maintains a publicly available administrative record of the documents that contain information that will be considered in the Record of Decision. The administrative record also is available at the St. Louis Public Library, 1301 Olive Street in St. Louis, and at the St. Louis County Library, 915 Utz Lane in Hazelwood.

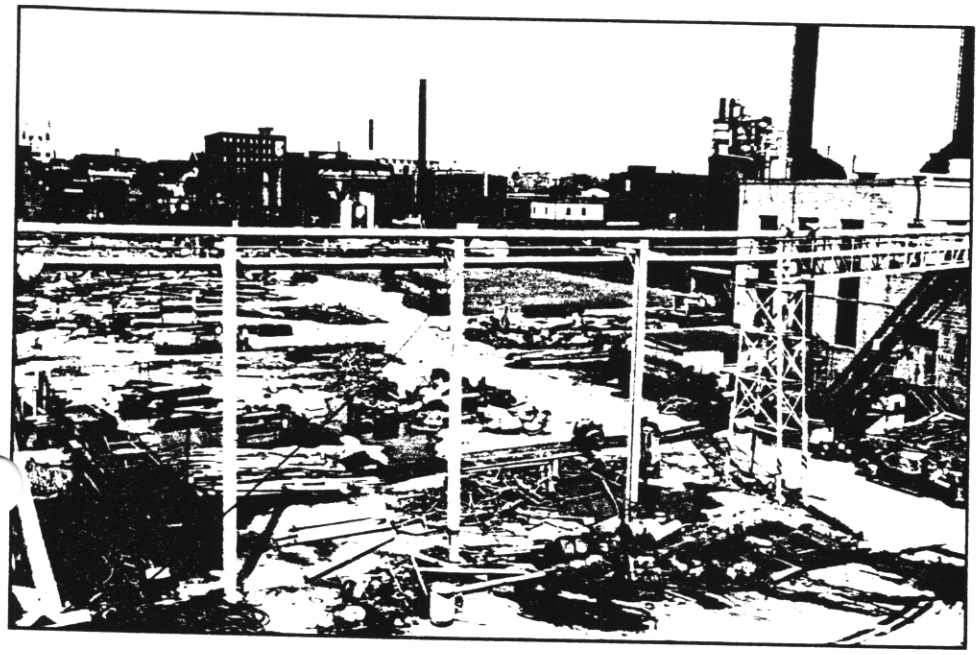


For information, or to be added to the site mailing list, contact:

DOE Public Information Center
9200 Latty Avenue
Hazelwood, Missouri 63042
(314) 524-4083

DOE also maintains a 24-hour, toll-free telephone number. An answering machine records comments or questions, and all calls are returned. The number is 1-800-253-9759.

This fact sheet has been prepared to address community outreach requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management.



Uranium processing for government nuclear projects began during World War II at this site in downtown St. Louis.

The four sites in St. Louis that are slated for cleanup under the Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP) were contaminated as a result of activities conducted in the 1940s and 50s as part of the nations's defense program.

In those early years, most uranium, the principal source of nuclear fuel, was extracted from foreign ores. Uranium is an element that occurs naturally, usually in combination with other elements. In its raw form, uranium ore cannot be used as a fuel. The uranium must be separated from all other elements, and the part that is used as fuel, called fissionable uranium, must be concentrated.

Much of the government-sponsored research and development in the 1940s was conducted at national laboratories and universities, with commercial firms producing the needed raw and finished material.

One of these commercial firms was the Mallinckrodt Chemical Works that had already been operating in downtown St. Louis for more than 50 years.

MCW processes uranium

From 1942 to 1957, the Manhattan Engineer District/Atomic Energy Commission contracted with Mallinckrodt to perform several operations, including processing and producing various forms of uranium compounds and pure uranium metal. As a result of these activities, materials, equipment, buildings, and parts of the property became contaminated with naturally occurring radioactive materials.

At completion of the MED/AEC operations, the facilities were cleaned up and decontaminated according to the standards and survey methods in effect at the time. However, later radiological surveys showed that portions of the facility retain levels of radioactivity in excess of current, more stringent, federal guidelines.

DOE to clean up

The Department of Energy, which is the successor agency of the AEC, has taken the lead for cleanup of contamination that occurred as a result of government operations on that site and on the other sites that became contaminated as a result of transporting and storing the contaminated materials from the downtown site.

The portion of the Mallickrodt property included in DOE's cleanup operation is referred to as the St. Louis Downtown Site. Six vicinity

properties also exhibit residual areas of contamination.

Residues taken to North County

In 1946, the MED acquired a 21-acre site just north of the St. Louis Airport for storage of residues from uranium processing conducted at SLDS. Residue from uranium processing and from cleanup of buildings at the plant was taken to the St. Louis Airport Site for storage. The property was fenced to prevent public access.

No permanent buildings or facilities remain at SLAPS. They were demolished and buried on site under 1-3 feet of clean material in 1969.

SLAPS is sometimes mentioned as a possible permanent disposal cell location for the St. Louis sites. This is because Congress directed DOE to acquire SLAPS for this purpose in the 1985 Energy and Water Development Appropriations Act. However, under the comprehensive process required by federal law prior to cleanup and disposal, DOE is directed to consider other options in addition to the directions of Congress.

Residues reach Latty Ave.

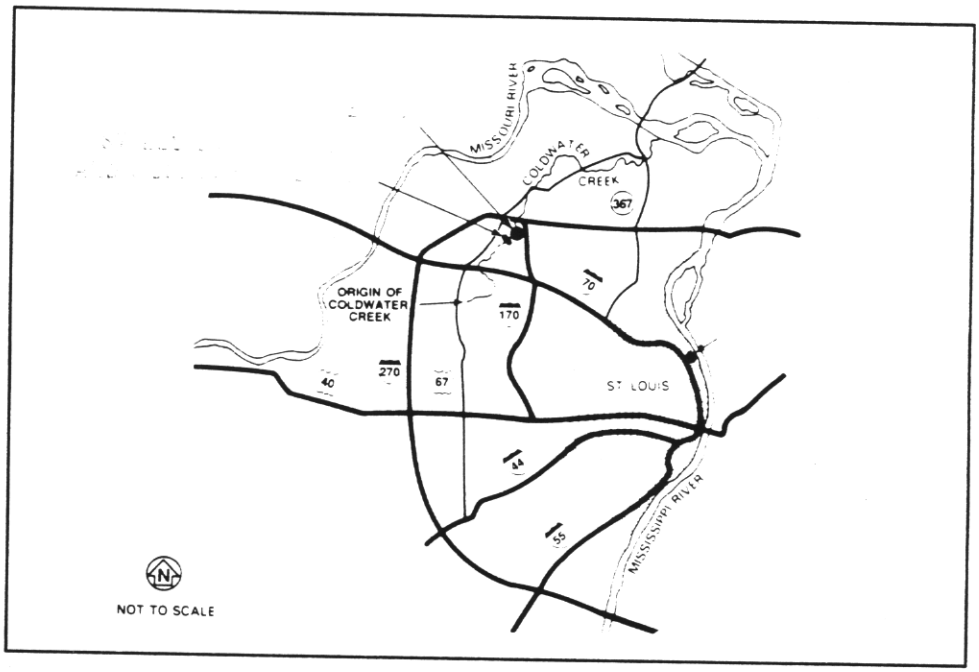
In 1966, Continental Mining and Milling of Chicago, Illinois, purchased process residues at SLAPS for its commercial value and hauled it in trucks about one-half mile to a site on Latty Avenue, just north of the airport site. These residues contained valuable metals in addition to the uranium.

As a result of hauling practices that would not be allowed today, some of these residues blew off the trucks and randomly contaminated vicinity properties such as highway rights-of-way and portions of private properties along the haul routes. Continental stored the residues at the Latty Avenue properties during 1966-67. A successor firm, Commercial Discount Corporation, dried and shipped the material to a new owner, the Cotter Corporation in Colorado.

Later, Cotter purchased the remaining materials at Latty Avenue and continued shipments to their property in Colorado.

Surveys and a renovation were conducted at the Latty Avenue properties in the late 1970s. The contaminated soil and debris from these decontamination efforts are currently stored at the portion of the Latty Avenue properties called the Hazelwood Interim Storage Site (HISS). The piles at HISS also contain material from a cleanup along Latty Avenue, some of which was in support of a storm sewer installation.

The primary radioactive contaminant on the St. Louis sites is thorium-230. Analyses have also identified the presence of uranium-238 and radium-226. Given present land use, the low-level radioactivity found on these properties poses no immediate threat to public health or the environment. However, performing remedial action and achieving cleanup standards will ensure that the contamination poses no significant risk if land use changes in the future.



Locations of FUSRAP properties in the St. Louis, Missouri, area.

Cleanup process underway

In October 1989, the Environmental Protection Agency placed SLAPS and the Latty Avenue properties on the National Priorities List. This action requires cleanup to proceed under the authority of EPA and the guidelines of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Comprehensive cleanup measures will be preceded by a complete environmental review process as required by CERCLA and the National Environmental Policy Act (NEPA).

In 1990, DOE and EPA signed an agreement that outlines the environmental review process, referred to as the remedial investigation/feasibility study (RI/FS), that leads to a decision on cleanup alternatives on the St. Louis sites.

DOE is well into the RI/FS process and anticipates release of the draft Feasibility Study-Environmental Impact Statement and the Proposed Plan in early 1994.

Selection of a final cleanup strategy will not be made until after public review of the RI/FS and the record of decision, which is currently scheduled for mid-1995. DOE will design and begin the cleanup after a record of decision has been reached.

The RI/FS process is lengthy, but it assures that when a decision is made on cleanup for the St. Louis sites that it will have been reached after consideration of all aspects of environmental, public health, and safety concerns.

Principal Laws and Regulations Affecting the FUSRAP Cleanup Program

U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

This fact sheet has been prepared to address community outreach requirements set by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management on the FUSRAP project.

Several federal laws guide environmental restoration in the United States. Each has a different emphasis, but together, they target the most pressing hazardous waste sites in the nation. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980—also known as Superfund—provides for the funding, study, and implementation of cleanup efforts. Another applicable law is the National Environmental Policy Act (NEPA) of 1969, which requires federal agencies to consider possible environmental effects when making decisions. Both laws require public involvement under a well-defined set of activities and schedules. It is the policy of the Department of Energy (DOE) that community relations requirements be combined under the more comprehensive CERCLA umbrella. Investigations, analyses, and documentation for these two laws will also be combined and integrated to streamline regulatory review and reduce paperwork.

The Environmental Protection Agency (EPA) emphasizes that the cleanup process is dynamic and flexible, and is tailored to the specific circumstances of each site. A phased approach of study is used to help maximize efforts. Researchers first collect available data to learn about the general conditions at a site. As a basic understanding is reached, they begin to identify possible cleanup alternatives. To fill in gaps of information and to test potential cleanup methods, they collect additional data, which is used to focus researchers' understanding and to refine alternatives. This interactive progression of study goes back and forth between data collection and testing, and the development and refinement of alternatives, until enough information has been collected to identify sound alternatives. The goal of gathering this information is not to remove all uncertainty (an impossible task), but to gather enough information to make and support an informed decision on which remedy appears to be the most appropriate for a given site.

Descriptions of the principal federal laws under which FUSRAP operates are provided in this fact sheet. While provisions vary in detail, the end goal remains constant—to protect the safety of human health and the environment.

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amened by the Superfund Amendments and Reauthorization Act (SARA) of 1986

CERCLA is a 1980 federal law that was extensively amended in 1986. The act created a special tax that goes into a trust fund, commonly known as Superfund, to investigate and to perform remediation of abandoned or uncontrolled hazardous waste sites. CERCLA consists of three phases: (1) a preliminary assessment, (2) a thorough study of the site, exploration of alternatives, and selection of a remedial action plan, and (3) design and implementation of the chosen plan.

1) The CERCLA preliminary assessment/site inspection (PA/SI) is used to determine which sites should be placed on the National Priorities List (NPL). The NPL identifies the most serious uncontrolled or abandoned hazardous waste sites. The assessment focuses on the potential for contamination. If the assessment determines that further action is needed, a site inspection is performed to assess the threat to the public and the environment. The site is scored using a brief, on-site investigation. Sites that exceed a certain score are added to the NPL.

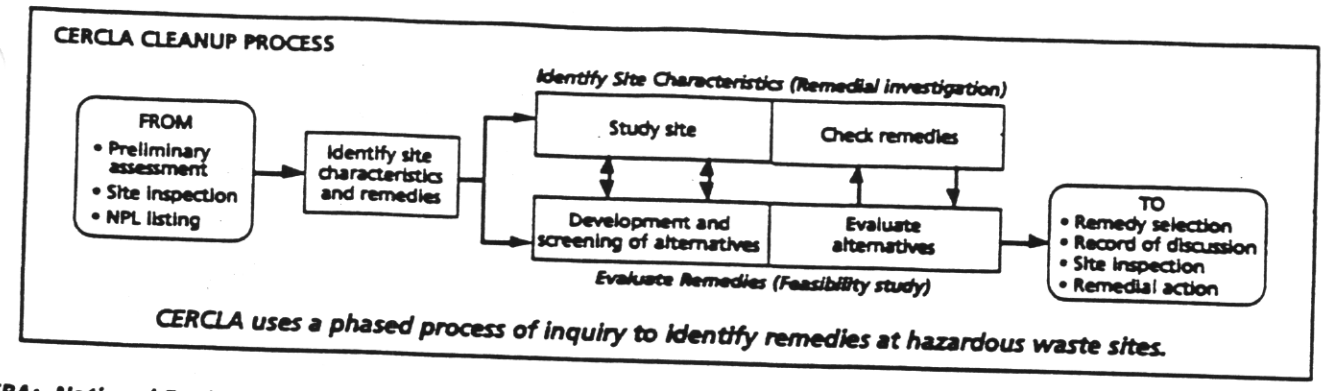
   The NPL may also list hazardous sites named by states as their top priority sites and sites determined to pose a significant threat to public health, welfare, or the environment.

2) A remedial investigation/feasibility study (RI/FS) is conducted for sites placed on the NPL. The RI/FS has several components.

The first stage involves planning. All work performed during the RI/FS follows general principles developed during a scoping, or planning, phase. Existing data on a hazardous waste site is evaluated to develop a cleanup strategy, identify likely objectives, and prepare a work plan. A sampling analysis plan is developed so that any decisions made are developed using the most accurate and best documented data possible.

The next step is the remedial investigation portion of the cleanup, during which extensive sampling and analysis activities are performed. The feasibility study, which is performed simultaneously, uses the data to develop a range of alternatives for remediation. One alternative is selected, and entered into the record of decision (ROD), which records the preferred method and manner of remediation. The record also considers public comments and community concerns.

3) A remedial design/remedial action (RD/RA) is conducted to implement the decision, and to monitor the performance of the environmental restoration.



CERCLA uses a phased process of inquiry to identify remedies at hazardous waste sites.

NEPA: National Environmental Policy Act (NEPA) of 1969

NEPA is the federal law that sets basic policy on protection of the environment. The principal purpose of NEPA is to determine if a major federal action has significant environmental effects. NEPA requires federal agencies to evaluate all environmental impacts before implementing actions.

If an action clearly has no significant impact, a categorical exclusion fulfills the obligation. If an action may have environmental consequences, an environmental assessment (EA) or an environmental impact statement (EIS) may be necessary. In preparing an EA, data are collected and analyzed to determine whether impacts are sufficient to justify the preparation of the more complete EIS study, or whether a "finding of no significant impact" is found.

If an EIS is required, NEPA requires public participation early in the process of identifying conditions at the site and in the assessment of alternatives. Public involvement, or "scoping," ensures that real problems are identified early, concentrates energies and effort on those areas requiring resolution, and provides for a balanced and thorough EIS. The NEPA scoping process is different from that of CERCLA. NEPA scoping focuses on public participation, while CERCLA scoping concentrates on planning.

As part of the CERCLA/NEPA process, DOE establishes an administrative record containing all documents that form the basis for the selection of a response action. A copy of the administrative record is made available to the public at a location near the site, usually a library. Availability and location of the administrative record are announced in newspaper advertisements and fact sheets.

Other Laws and Standards

A variety of other laws or standards may also apply to specific sites. Brief summaries follow:

- The Toxic Substances Control Act regulates certain classes of chemicals, including polychlorinated biphenyls (PCBs).
- The Resource Conservation and Recovery Act created a management system for hazardous wastes, requiring that safe and secure procedures be used in treating, transporting, storing, and disposing of hazardous wastes. Facilities must hold permits to handle these wastes and are required to operate within specific guidelines.
- The Clean Air Act is a federal law that controls emissions of waste into the air. Special protective equipment and permits are required.
- The Clean Water Act is a similar federal law that controls the amount of waste that can be released into surface water bodies or publicly owned treatment systems.
- The Safe Drinking Water Act is designed to protect drinking water resources. This law is incorporated into CERCLA provisions dealing with groundwater protection.
- National Emission Standards for Hazardous Air Pollutants limit air emissions of pollutants.

Cleanup activities are regulated by a federal facilities agreement (FFA) between DOE, EPA, and the state. The agreement prioritizes cleanup activities, assigns agency roles and responsibilities, and establishes procedures for document review and interaction among the agency officials.

Combined Investigations

Many laws and regulations have been enacted to ensure the protection of human health and the environment. Often, they are written to regulate particular discharges under particular circumstances, such as chemical releases into groundwater. At any one waste site, one or more laws may apply, or none, depending on the extent of contamination and the types of contaminants. The regulations and standards that pertain to a particular site are determined early to ensure that all applicable and/or appropriate requirements are met.

On FUSRAP, it is not unusual for a site to require environmental restoration under multiple regulations. DOE plans to integrate technical and community relations activities under provisions of CERCLA, making adjustments to incorporate special requirements of NEPA where necessary.

Acronyms Used

CERCLA	Comprehensive Environmental Response, Compensation, and Liabilities Act
DOE	Department of Energy
EA	environmental assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
FFA	federal facilities agreement
NEPA	National Environmental Policy Act
NPL	National Priorities List
PA/SI	preliminary assessment/site investigation
PCBs	polychlorinated biphenyls
RD/RA	remedial design/remedial action
RI/FS	remedial investigation/feasibility study
ROD	record of decision

FUSRAP
Formerly Utilized Sites Remedial Action Program

U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

This fact sheet has been prepared to address community outreach requirements set by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management.

The Formerly Utilized Sites Remedial Action Program (FUSRAP) is one of several U.S. Department of Energy (DOE) programs created to address radiological contamination in excess of guidelines at a number of sites throughout the United States. DOE and its predecessor agencies, the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC), used many of these sites for processing and storing uranium and thorium ores during the 1940s, 1950s, and 1960s. Some of these sites were owned by the federal government; others were owned by universities or other institutions; and still others were privately owned.

Generally, sites that became contaminated through the uranium and thorium operations during the early period of the nation's nuclear program were decontaminated and released for use under the regulations in effect at the time. Since radiological guidelines were not as strict then as today, trace amounts of radioactive materials remained at some of the sites. Erosion and building demolition and construction resulted in some of the radioactive residues mixing with large volumes of soil and rubble, thereby spreading the contamination.

To further assess these sites and take appropriate remedial action, the federal government initiated FUSRAP in 1974. Initial site activities focus on reviewing old records and surveying sites to determine if contamination exists and if remedial action is required. If this survey determines that the site requires remedial action, it is authorized under FUSRAP. Limited remedial action began at some sites in 1979, and major remedial action has been under way since 1981. Currently, FUSRAP includes 33 sites in 13 states (see map). Remedial action has been completed at nine of the sites, and partial remedial action has been completed at nine others.

Objectives

The objectives of FUSRAP are to:

- Identify and evaluate all sites formerly used to support early MED/AEC nuclear work and determine whether the sites need decontamination and/or control.
- Decontaminate and/or apply controls to these sites so that they conform to current applicable guidelines.
- Dispose of and/or stabilize all generated residues in a radiologically and environmentally acceptable manner.
- Accomplish all work according to appropriate federal laws and regulations, local and state environmental and land-use requirements to the extent permitted by federal law, and applicable DOE orders, regulations, standards, policies, and procedures.
- Certify the sites for appropriate future use.

Organization

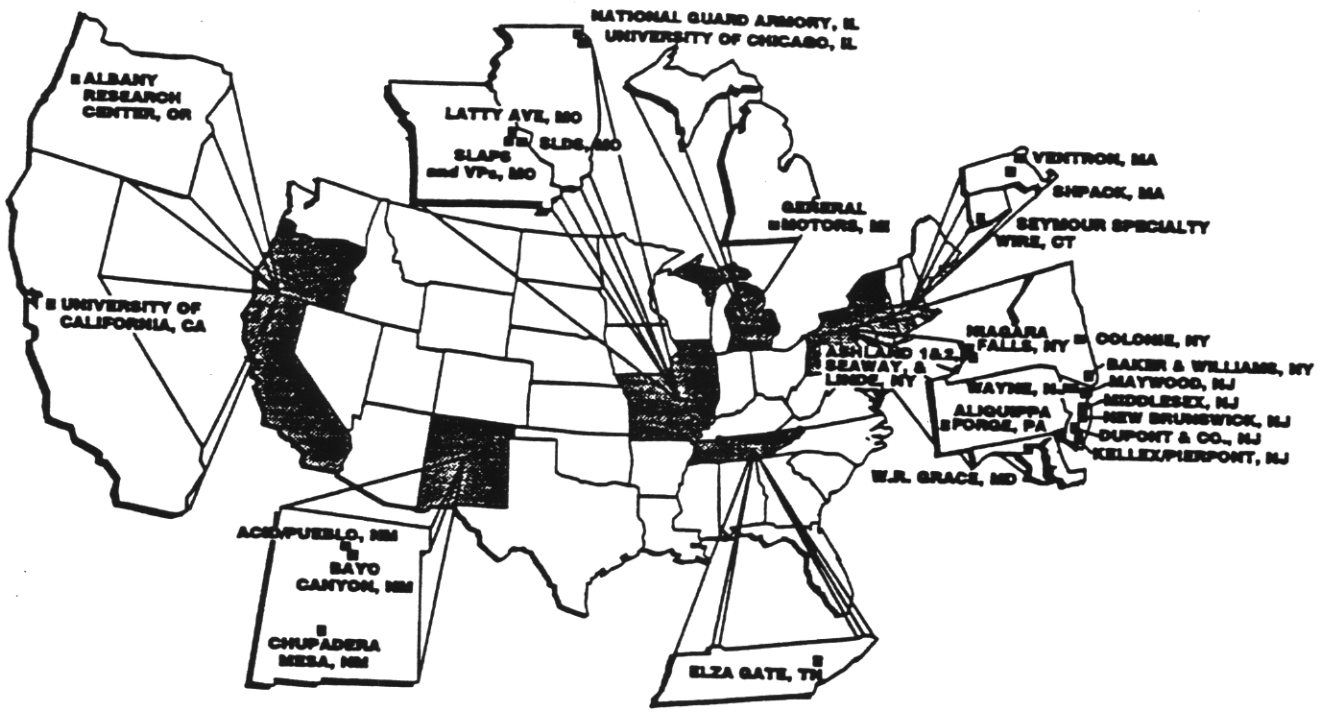
At DOE Headquarters, FUSRAP falls under the responsibility of the Director, Office of Environmental Restoration and Waste Management.

Technical, administrative, and financial management of FUSRAP field activities are the responsibility of the Former Sites Restoration Division (FSRD) of the DOE Oak Ridge Operations Office (ORO). Bechtel National, Inc., (BNI) the FUSRAP project management contractor, is responsible to FSRD for planning and implementing FUSRAP activities. BNI analyzes site conditions and evaluates and implements appropriate remedial actions; it also conducts environmental monitoring before, during, and after remedial action. BNI also administers subcontracts, coordinates the sequence of operations, controls the relationships among subcontractors, and ensures execution and documentation of project work in accordance with DOE guidance.

Argonne National Laboratory participates in preparing environmental compliance documentation required by NEPA and CERCLA to ensure that all feasible remedial action alternatives for a site have been evaluated and that the approach chosen is environmentally acceptable.

The radioactivity at FUSRAP sites does not present an immediate health hazard under current land use because the materials have very low concentrations and people are not exposed to them for prolonged periods of time. Although these materials are not a hazard, they will remain radioactive for thousands of years, and could cause a potential for increased health risks if the use of the land were to change.

Under the guidelines established for FUSRAP, the sites will be remediated to a very conservative standard that takes into consideration possible future land uses, such as residential development, crop production, and the installation of drinking water wells.



FUSRAP Sites

Acronyms Used

AEC	Atomic Energy Commission
BNI	Bechtel National, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	Department of Energy
FSRD	Former Sites Restoration Division
FUSRAP	Formerly Utilized Sites Remedial Action Program
MED	Manhattan Engineer District
NEPA	National Environmental Policy Act
ORO	Oak Ridge Operations Office

Administrative Record Requirements for FUSRAP

U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

The Formerly Utilized Sites Remedial Action Program (FUSRAP) is one of several U.S. Department of Energy (DOE) programs created to address radioactive contamination exceeding guidelines at sites throughout the U.S. FUSRAP is responsible for 33 sites in 13 states — some of the FUSRAP sites are Superfund sites. This fact sheet has been prepared to address community outreach requirements set by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management.

An administrative record is a collection of documents that forms the basis for selecting a response action at a Superfund site. Under Section 113(k) of CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), the Environmental Protection Agency (EPA) requires the establishment of an administrative record for every Superfund response action and that a copy of the record be made available for public review at or near the site. DOE is committed to performing response actions at all FUSRAP sites in compliance with CERCLA, whether they are Superfund sites.

CERCLA requires that the administrative record be reasonably available for public review during normal business hours. The record should be treated as a noncirculated reference document (i.e., it may not be removed from the repository), thus allowing the public greater access to the record and minimizing the risk of loss or damage. Documents will be added to the record as the site work progresses. People may photocopy documents contained in the record according to the photocopying procedures at the local repository.

If the documents in the administrative record become damaged or lost, the local repository manager may request replacement documents from the DOE site manager. Periodically DOE may send relevant supplemental documents and indexes directly to the local repository to be placed with the initial record.

The administrative record will be maintained at the local repository until further notice. Questions about maintenance of the record should be directed to the DOE site manager. DOE welcomes comments on documents in the administrative record.

DOE may hold formal public comment periods at certain planning stages of response actions. The public is encouraged to use these formal review periods to submit comments. Send any such comments or site-related questions (please indicate the site location) to the following address:

Formerly Utilized Sites Remedial Action Program
U.S. Department of Energy
Former Sites Restoration Division
P.O. Box 2001
Oak Ridge, Tennessee 378310-8723

A toll-free long distance public access number is available for use in areas where there are FUSRAP sites. The public access number is answered in Oak Ridge, Tennessee, by an answering machine, which records calls and takes messages. The answering machine is checked frequently and calls are returned. The public access number is one of the ways DOE provides opportunities for the public to receive site information. To make comments or ask questions, leave a message on the answering machine by calling 1-800-253-9759.

Printed on recycled paper.

4.64.5033.1.10/91

FUSRAP
The St. Louis Site
St. Louis, Missouri

U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

This fact sheet has been prepared to address community outreach requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA). Fact sheets are one part of an effort to provide public information on environmental restoration and waste management.

The Department of Energy (DOE) is implementing a comprehensive cleanup program for three groups of properties in the St. Louis area under the DOE Formerly Utilized Sites Remedial Action Program (FUSRAP). The properties are (1) the St. Louis Downtown Site (SLDS), (2) the St. Louis Airport Site (SLAPS) and its vicinity properties, and (3) the Latty Avenue Properties, which includes the Hazelwood Interim Storage Site (HISS). The three groups of properties, collectively referred to as the St. Louis site, were ...ed under FUSRAP at various times from 1981 to ...84. DOE established FUSRAP in 1974 to cleanup or control sites where radioactive contamination exceeding DOE guidelines remains from early years of the nation's atomic energy program.

During World War II, a chemical plant operated by Mallinckrodt in downtown St. Louis (near the McKinley Bridge) processed and produced various forms of uranium compounds and recovered uranium metals for the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC). Residue from that processing and from the cleanup of buildings at the plant was stored at an AEC-owned, 21-acre parcel of land on McDonald Boulevard, just north of the Lambert-St. Louis International Airport.

In 1966, a private firm purchased some of the residue for its commercial value and hauled it in trucks about one-half mile to a site on Latty Avenue, just north of SLAPS. As a result of transporting this residue, the three properties referred to as the St. Louis site became radioactively contaminated at levels exceeding DOE guidelines and require some type of remedial action. These properties are now under FUSRAP. DOE has identified additional residential and com...ial properties, as well as more than 70 properties ...g roads in the airport area that may be contaminated as a result of hauling the residue.

The primary radioactive contaminant at the site is thorium-230. Analyses have also identified the presence of uranium-238 and radium-226. Given present land use at the site, the low-level radioactivity found at these properties pose no threat to public health or the environment. Performing remedial action and achieving cleanup standards will ensure that the properties pose no significant risk if land use changes in the future.

Under FUSRAP, DOE has analyzed core samples from the properties to determine the nature of the contamination, a process called **characterization**. Characterization has been completed at SLDS, HISS, and SLAPS and its vicinity properties.

Much of the characterization work was performed on soil and sediment samples taken along the haul roads and from a section of Coldwater Creek between Banshee Road and Old Halls Ferry Road. Work along the haul roads indicated some contamination on road shoulders and adjacent properties. In general, any contamination found along the haul roads has been low-level and at depths of less than one foot. Although the characterization is essentially complete, some additional investigation will be needed in these two areas.

DOE recently completed a radiological characterization report for properties located in Berkeley, Hazelwood, and St. Louis. DOE sent notification to owners of those properties detailing results of the surveys. DOE has also called and met with some owners whose properties have contamination exceeding DOE guidelines to discuss the nature of the contamination and the cleanup process. Data from this characterization and other surveys will be used to design a cleanup program for long-term management of these wastes.

In October 1989, the Environmental Protection Agency (EPA) placed SLAPS and the Latty Avenue Properties on the National Priorities List (NPL). Placement on the NPL requires cleanup to proceed under

the authority of EPA and the guidelines of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Comprehensive cleanup measures will be preceded by a complete environmental review process as required by CERCLA and the National Environmental Policy Act (NEPA).

In 1990, DOE and EPA signed an agreement that outlines the environmental review process, referred to as the remedial investigation/feasibility study (RI/FS) process. The RI/FS process is used to determine the ultimate disposition of radioactive materials from the St. Louis site. The goal of the RI/FS process is to reach a formal record of decision (ROD), which describes the selected cleanup alternative. A range of alternatives, including off-site and on-site disposal, will be evaluated. Opportunities will be provided for the public to comment on and participate in the environmental review process. Selection of a disposal site will not be made until completion of a full environmental review, currently scheduled for 1994. DOE will design and begin the cleanup after a ROD has been reached.

If funding is available, DOE may perform an interim cleanup of some of the residential and commercial properties while this review process is being conducted to prevent further spread of contamination.

In response to requests by St. Louis residents to make site information more readily available, DOE opened its Public Information Office at 9200 Latty Avenue in Hazelwood, Missouri. In addition to offering site information, the office provides opportunities for the public to comment on and participate in the environmental review process. The public will be asked to review and comment on any remedial action plan proposed by DOE.

DOE has also opened for public review an administrative record containing documents related to the St. Louis site. Decisions about the cleanup of the site will be based on these documents. This record and general information repositories are available for review during normal business hours at:

St. Louis Public Library —
Government Information Section
1301 Olive Street
St. Louis, Missouri, 63103

St. Louis County Library —
Prairie Commons Branch
915 Utz Lane
Hazelwood, Missouri, 63042

and

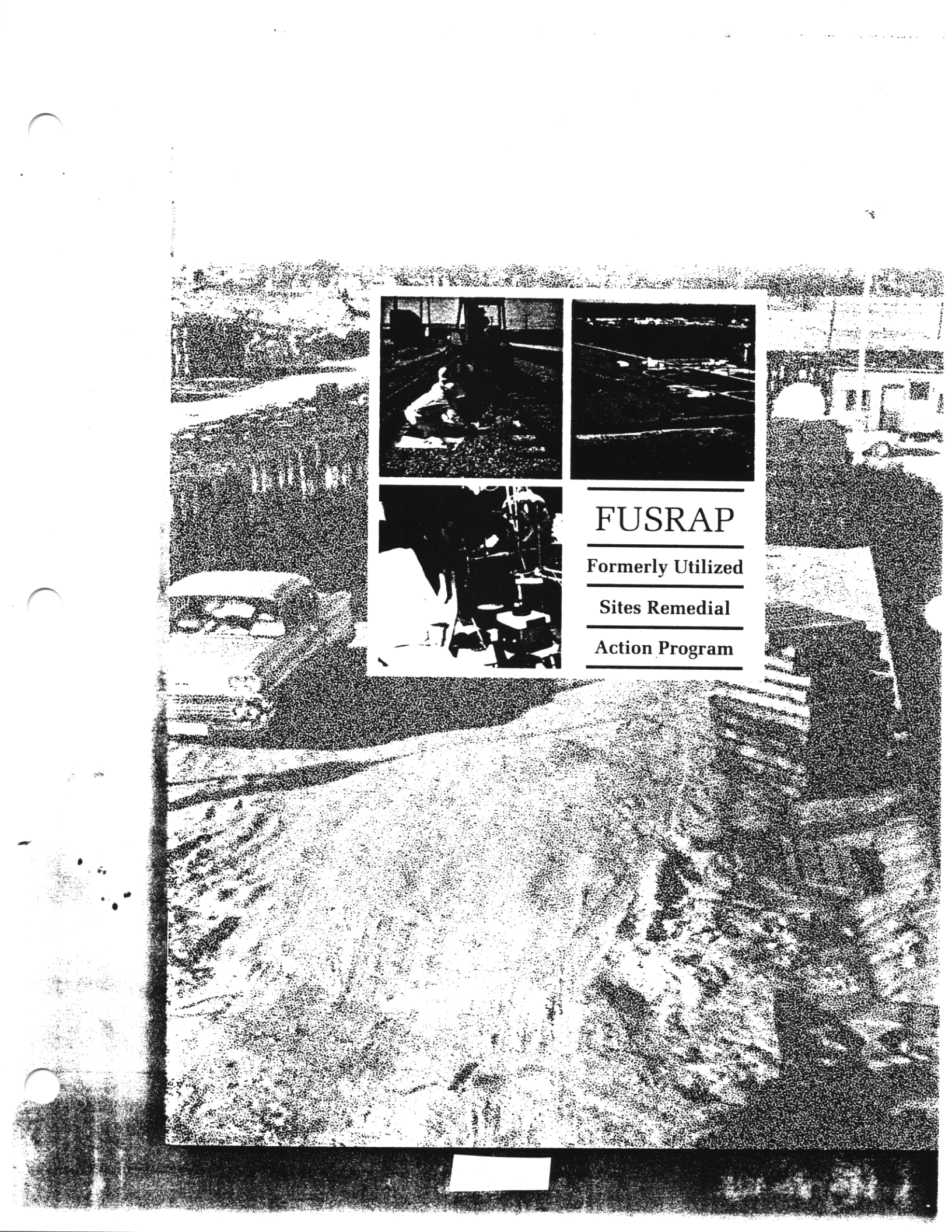
DOE Public Information Office
9200 Latty Avenue
Hazelwood, Missouri, 63042
(314) 524-4083

For more information or to be included on the site mailing list, write or call the DOE Public Information Office or:

David G. Adler, St. Louis Site Manager
U.S. Department of Energy
Former Sites Restoration Division
P.O. Box 2001
Oak Ridge, Tennessee 37831-8723
(615) 576-0948

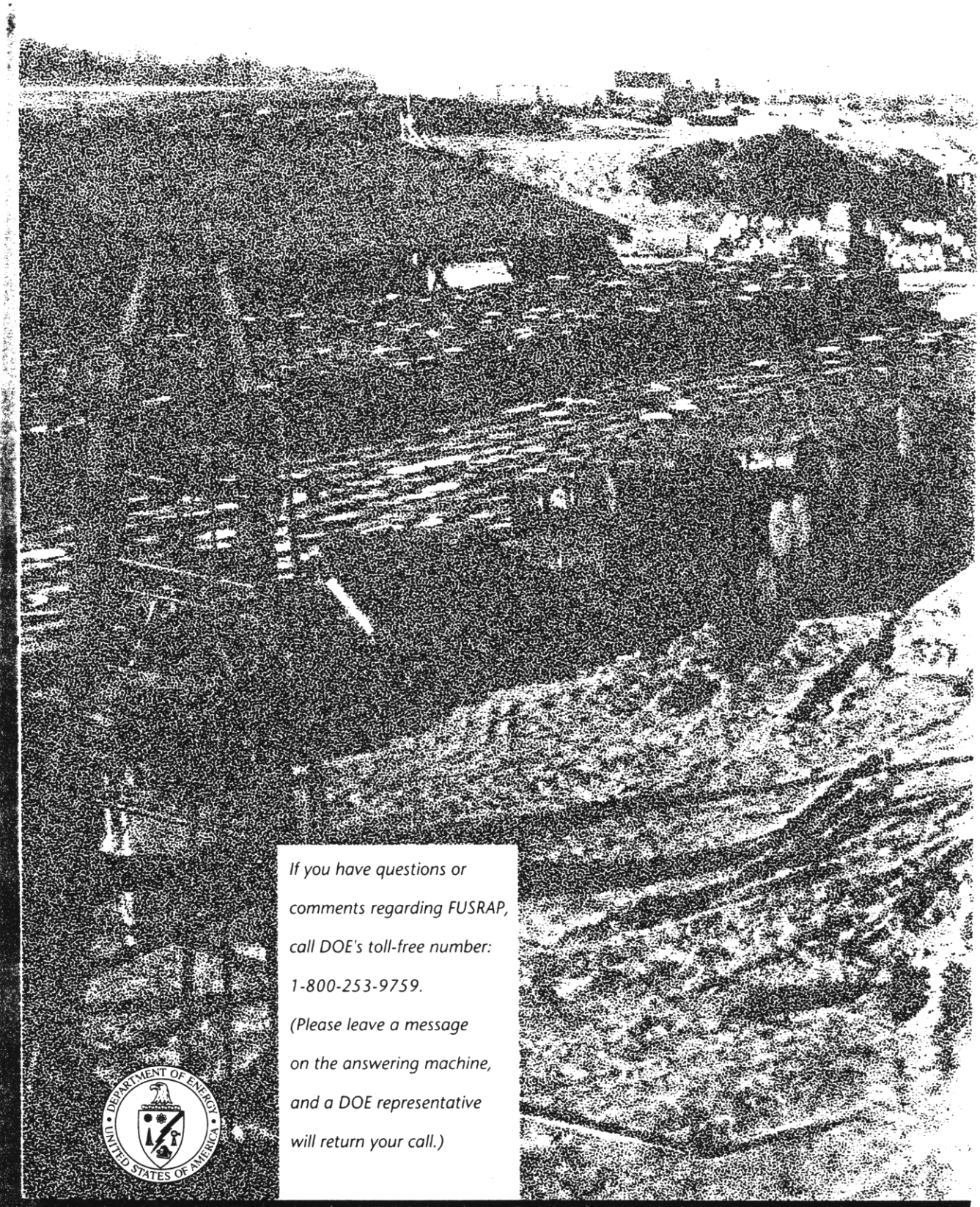
ACRONYMS USED

AEC	Atomic Energy Commission
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	Department of Energy
EPA	Environmental Protection Agency
FUSRAP	Formerly Utilized Sites Remedial Action Program
HISS	Hazelwood Interim Storage Site
MED	Manhattan Engineer District
NPL	National Priorities List
NEPA	National Environmental Policy Act
RI/FS	remedial investigation/feasibility study
ROD	record of decision
SLAPS	St. Louis Airport Site
SLDS	St. Louis Downtown Site



FUSRAP

Formerly Utilized Sites Remedial Action Program



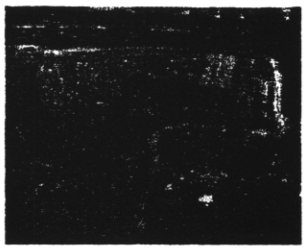
If you have questions or comments regarding FUSRAP, call DOE's toll-free number: 1-800-253-9759. (Please leave a message on the answering machine, and a DOE representative will return your call.)

WHAT REMAINS TO BE DONE?

While FUSRAP has been successful in cleaning many sites and vicinity properties, much work remains. Many residential and commercial properties still require cleanup. Also the interim storage piles that have received the wastes removed from properties already cleaned are a source of local concern. Permanent disposal sites and methodologies are needed to permanently isolate the contamination from the environment.

Almost 2 million cubic yards of contaminated material eventually will need to be addressed. The majority of this material is in the states of Missouri, New Jersey, and New York. Selecting and developing appropriate permanent disposal sites and methodologies is the biggest challenge facing DOE, the states, and the people living in the affected communities.

WHAT HAS FUSRAP DONE SO FAR?



Since it began in 1974, FUSRAP has made significant progress. Of the 44 sites identified as requiring remedial action, 14 have been completely cleaned up and partial remedial action has taken place at 16 others. Information about the nature and extent of contamination at the other 14 sites is being gathered as part of the environmental review process that will lead to remedial action. (This status is current as of early 1994.)

In addition, more that 173 other properties — residences, businesses, or public lands also contaminated over the years — have been cleaned up. Houses in Maywood, New Jersey; Colonie, New York; and elsewhere are now free of contamination.

© Lawrence Migdale

A commercial property in Rochelle Park, New Jersey, that couldn't be developed because of contamination is now the site of a nursing home that provides jobs and tax revenues to the community.

And a recreation field in Wayne, New Jersey, that sat idle for years is now back in use.

At the Niagara Falls Storage Site in Lewiston, New York, contamination has been consolidated from a 191-acre DOE-owned site and about 25 adjacent private properties. The wastes are now contained in a disposal cell designed to preclude any exposure to humans and prevent migration into groundwater.

More than 150,000 cubic yards of contaminated materials have been removed from residential and commerial properties and stored at DOE-controlled and monitored interim storage sites. These interim storage sites are in Maywood, Middlesex, and Wayne, New Jersey; Colonie, New York; and Hazelwood, Missouri.

DOES FUSRAP WORK?

ment, the plan is issued for public comment. DOE then reaches a decision as to what remedial action will be taken. Only after this process is complete can the site be cleaned up.

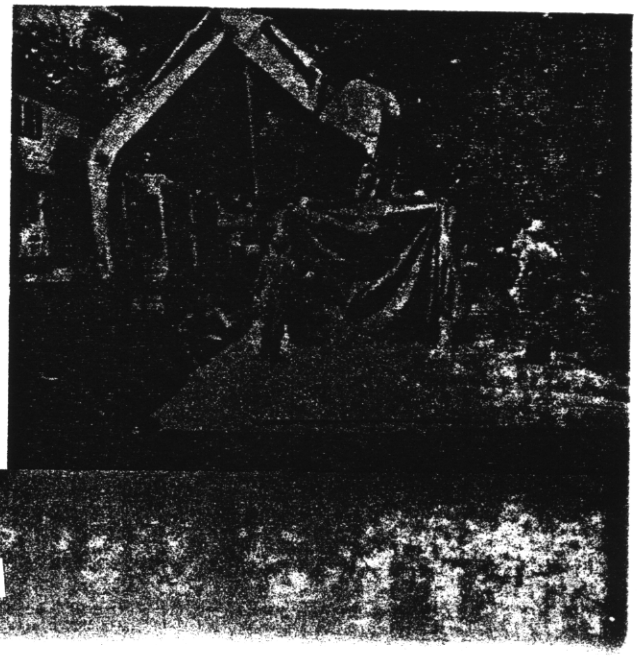
Throughout the entire remedial action process there are opportunities for public participation. A community relations plan is usually developed at the beginning of the process, and the public is asked to provide information about the site, identify options, and comment on DOE's evaluation of the options. State and local governments and property owners also are key participants in this process. State governments help suggest appropriate and acceptable disposal sites that DOE should consider for the wastes and ensure compliance with applicable state regulations. Local governments help inform the public about remedial activities.

Program guidance for FUSRAP is provided by DOE Headquarters, and day-to-day FUSRAP activities are managed by the DOE operations office in Oak Ridge, Tennessee. A project management contractor engineers and manages the field activities and construction necessary for remedial action. An environmental studies contractor is responsible for analysis of the environmental issues and options for cleanup. Other contractors independently verify that each remedial action has, in fact, cleaned up the site or property.

In 1942, the University of Chicago was involved in the Manhattan Project. Needing more room, researchers used the nearby National Guard Armory for storage and processing of uranium metals. Later, the building reverted to the Illinois National Guard, but the site remained contaminated with wastes resulting from the uranium processing.

When remedial action began in 1988, the FUSRAP team cleaned up the armory, filling 32 drums with radioactive sludge. This waste was shipped to DOE's Hanford Reservation for disposal. However, another 16 drums of material contained both radioactive waste and volatile organic compounds (VOCs), which are highly flammable materials. Regulations required that as long as the drums were onsite, the property could not be released for unrestricted use. However, there were no federal or commercial disposal facilities licensed to receive such wastes.

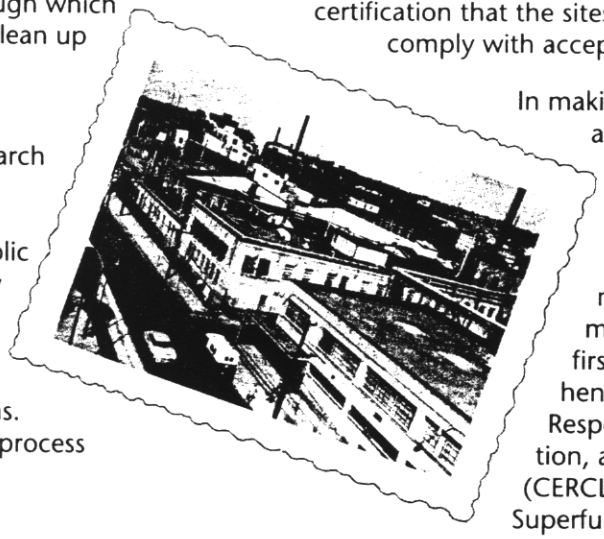
FUSRAP solved the problem by "processing" the wastes at the armory. The project team developed an idea for heat-treating the waste to boil off the volatile chemicals. After pilot tests, the technique was implemented at the armory, and the treatment was completed in under 6 weeks. The resultant radioactive waste, minus VOCs, was disposed at the Hanford Reservation, and the site is now "clean" for use without radiological restrictions.



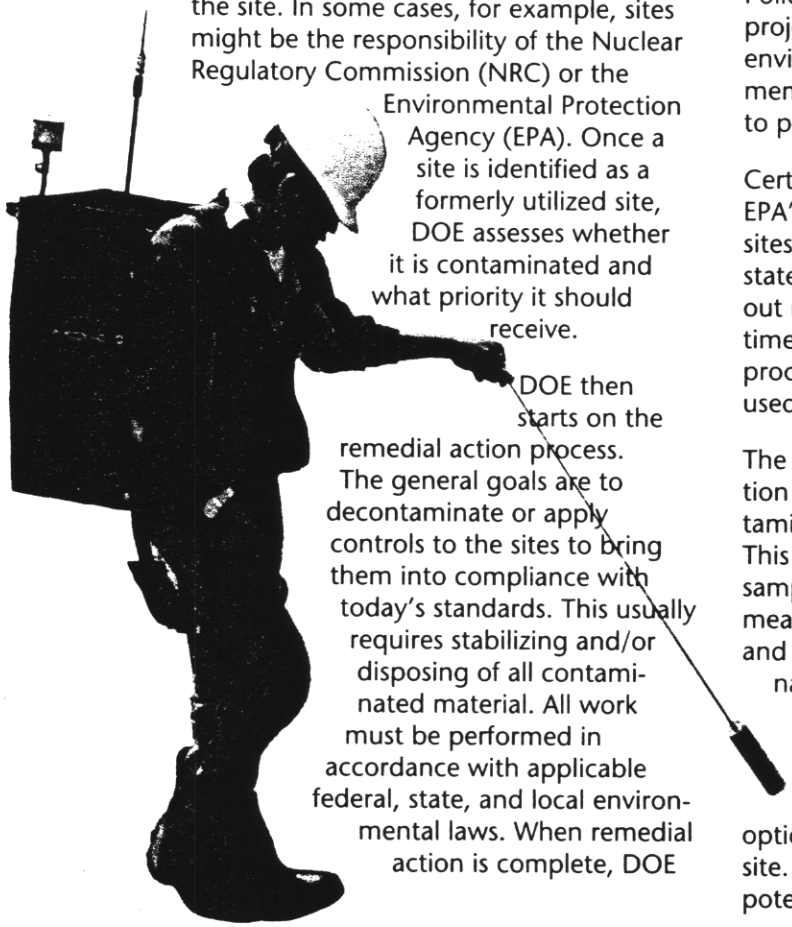
HOW

Although each site is different, there is a general sequence of events through which FUSRAP operates to clean up contaminated sites.

The first step, already mentioned, is to research historical records and review information submitted by the public or industry to identify sites used in the Manhattan Project and Atomic Energy Commission programs. This historical review process has almost been completed.



DOE must determine if it is responsible for the site. In some cases, for example, sites might be the responsibility of the Nuclear Regulatory Commission (NRC) or the Environmental Protection Agency (EPA). Once a site is identified as a formerly utilized site, DOE assesses whether it is contaminated and what priority it should receive.



DOE then starts on the remedial action process. The general goals are to decontaminate or apply controls to the sites to bring them into compliance with today's standards. This usually requires stabilizing and/or disposing of all contaminated material. All work must be performed in accordance with applicable federal, state, and local environmental laws. When remedial action is complete, DOE obtains independent certification that the sites comply with accepted guidelines.

In making decisions about remedial action at FUSRAP sites, DOE's processes comply with two major environmental laws. The first is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund. The second is the National Environmental Policy Act, or NEPA. These laws ensure that projects like FUSRAP are conducted in an environmentally sound manner and that members of the public have opportunities to participate.

Certain FUSRAP sites have been placed on EPA's National Priorities List (NPL). For those sites, DOE and EPA consult with affected states and enter into an agreement to spell out roles and responsibilities and establish timetables. The environmental cleanup process for FUSRAP is the same process used by EPA for all sites on the NPL.

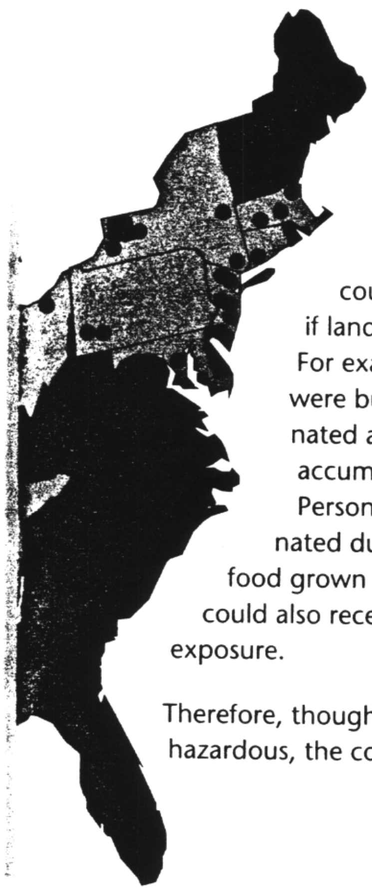
The first part of the process is an investigation to obtain a clear picture of the contamination problems that exist at a site. This usually involves taking surface soil samples and/or drilling sampling holes to measure levels of contamination at a site and determine exactly where the contamination is located.

After data are collected and analyzed, options for cleaning up the site are evaluated. This evaluation of options leads to a plan for cleaning up the site. If the planned cleanup option has the potential to affect the public or the environ-

F or the most part, the radioactively contaminated materials at FUSRAP sites do not pose a threat to public health or the environment. In fact, under present conditions at most FUSRAP sites,

WHY IS FUSRAP IMPORTANT?

concentrations of radioactivity are so low that the greatest annual exposure to a member of the public is about 1 or 2 millirems per year. This is less than 1 percent of the exposure we receive from other sources of radiation in our daily lives.



However, there are circumstances under which unacceptable radiation exposures could occur—particularly if land use were to change. For example, if a residence were built on a contaminated area, radon gas could accumulate in the house. Persons breathing contaminated dust particles or eating food grown in contaminated soil could also receive unacceptable exposure.

Therefore, though not immediately hazardous, the contaminated FUSRAP sites must be cleaned up. Highest priority is given to actions that reduce radiation exposure to the public. Cleaning up these areas not only eliminates potential health hazards, but often also allows previously unusable or restricted property to be returned to uses that benefit the community. When a site has been cleaned to DOE standards, people can live on the property, drink water from onsite wells, grow crops or livestock for food, and still not receive radiation exposures that exceed the health guidelines established by the International Commission on Radiological Protection.

© Lawrence Migdale

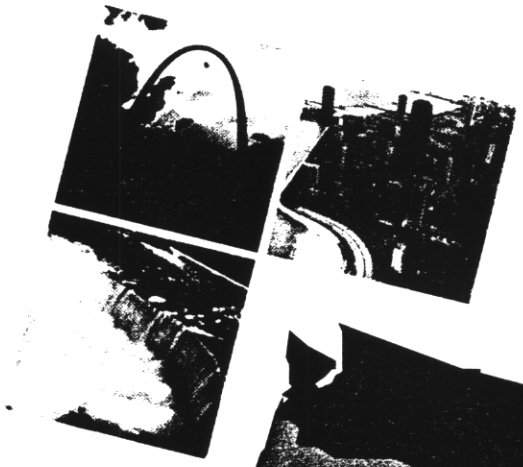
On a pleasant, sprawling piece of land in Rochelle Park, New Jersey, several dozen retirees make their home. However, not too many years ago, this property was contaminated with thorium, and the land was not useable.

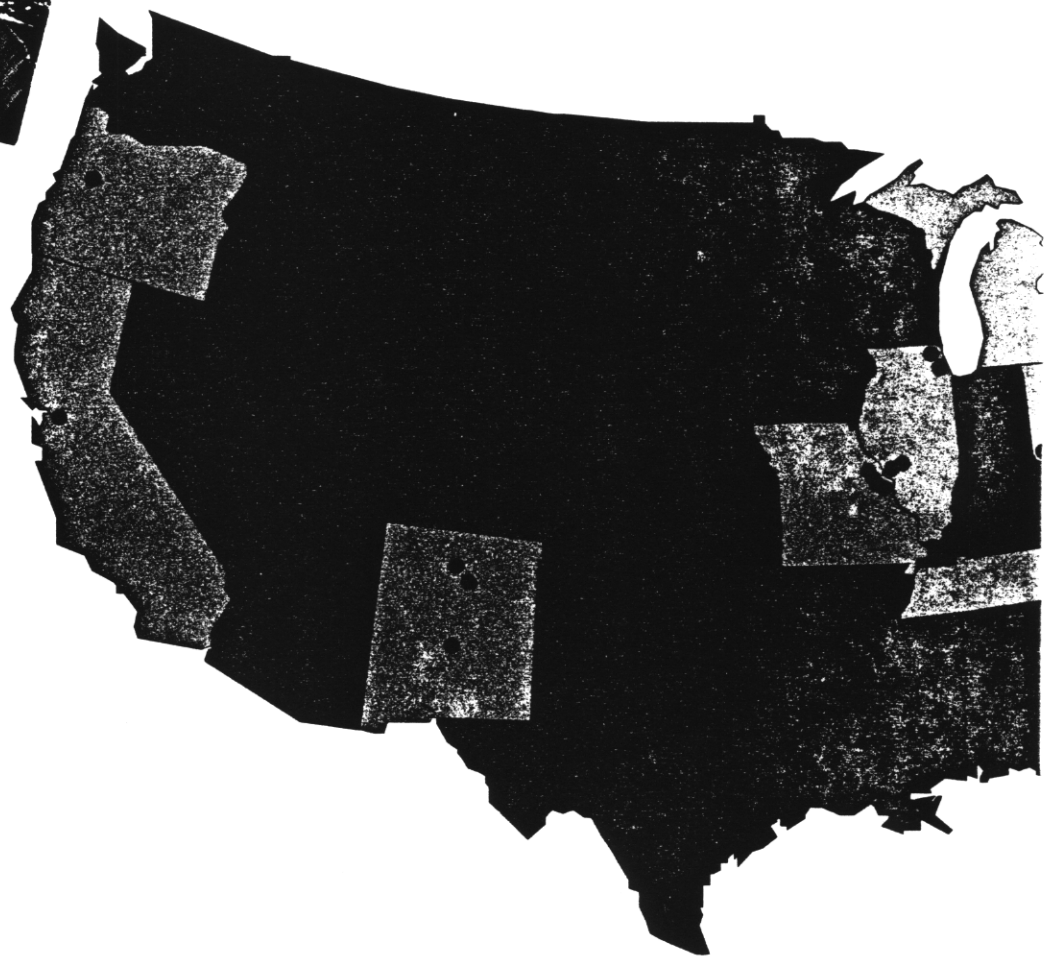
In 1983, Congress directed DOE to clean up the contamination resulting from commercial operations at the Maywood Chemical Works, which processed thorium ores from 1916 to the 1950s. Wastes from the operations were pumped to the nearby area, and over the years, the land became overgrown, and the wastes were largely forgotten. Private developers later purchased the property only to find they could not develop it after the thorium contamination was discovered in the late 1970s.

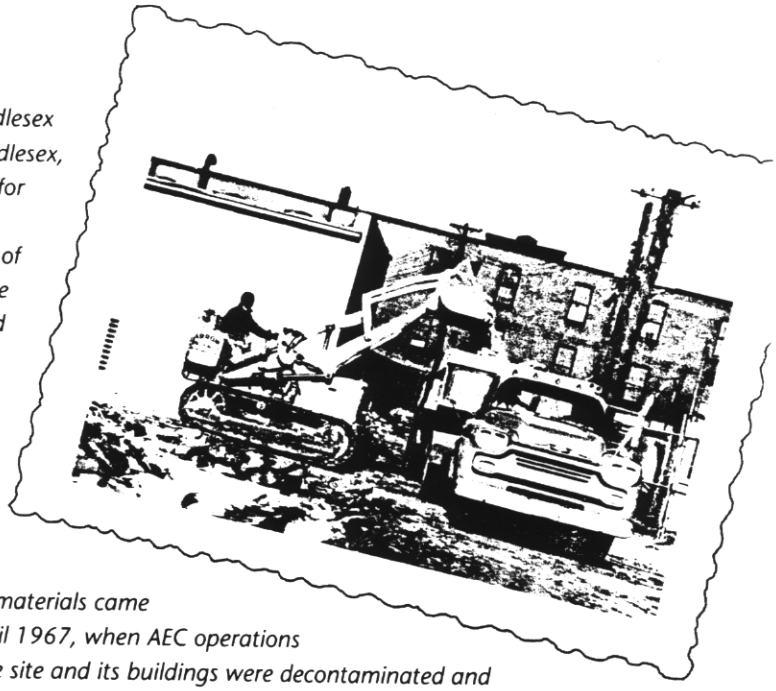
As part of its work at the Maywood site, FUSRAP cleaned up the property (and the backyards of several neighboring homes), allowing construction of the nursing home to begin.

Early FUSRAP activities focused on combing through historical records just to identify sites involved in the Manhattan Project or early Atomic Energy Commission work. DOE has examined almost 400 such sites, reviewing old records and then performing radiological surveys. Most of these sites have been found to be clean, but by early 1994, 44 sites in 14 states had been identified as needing cleanup. Additional sites are added from time to time as DOE review continues.

Cleanup work (remedial action) has been under way since 1979, and 14 sites have been completely remediated.







As early as 1943, the Middlesex Sampling Plant (MSP) in Middlesex, New Jersey, was a busy hub for Manhattan Project activities. The plant received shipments of uranium and other radioactive ores, which were sampled and assayed, then packaged and shipped to other facilities across the country for processing.

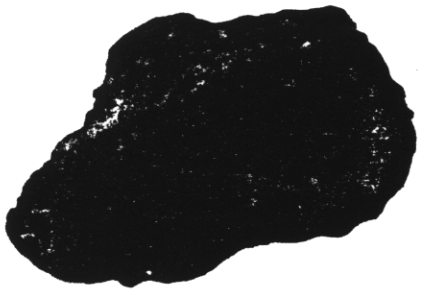
After the war, MSP continued similar activities as part of the nation's atomic energy program. Radioactive materials came and went from the facility until 1967, when AEC operations there ceased. At that time, the site and its buildings were decontaminated and certified for use with no radiological restrictions under the criteria in effect at that time.

Overlooked during the decontamination, however, was the fact that, over the years, traces of contaminated materials gradually had been carried offsite by wind and rain. The radioactive materials accumulated in the yards of neighboring homes. A close look at MSP records later revealed that some radioactive materials apparently were trucked from MSP to the Middlesex Municipal Landfill a half-mile down the road.

From 1969 to 1979, MSP was used as a training center by the Marine Corps. When it was returned to DOE in 1980, immediate action started under FUSRAP to clean up the residential properties. Radioactive materials were removed from yards and brought back to MSP, where they were stored on a specially constructed pad. By the end of 1981, the 31contaminated properties had been cleaned, and 35,000 cubic yards of contaminated materials had been placed in storage at MSP.

Meanwhile, at the Middlesex Municipal Landfill, radiological surveys had concluded that while there was no immediate danger, the level of contamination exceeds current guidelines. Therefore, in 1984 DOE began remedial action at the landfill. The contaminated material was excavated and returned to MSP from where it came. By 1986 the landfill was clean, and an additional 31,000 cubic yards of material had been stored at MSP.

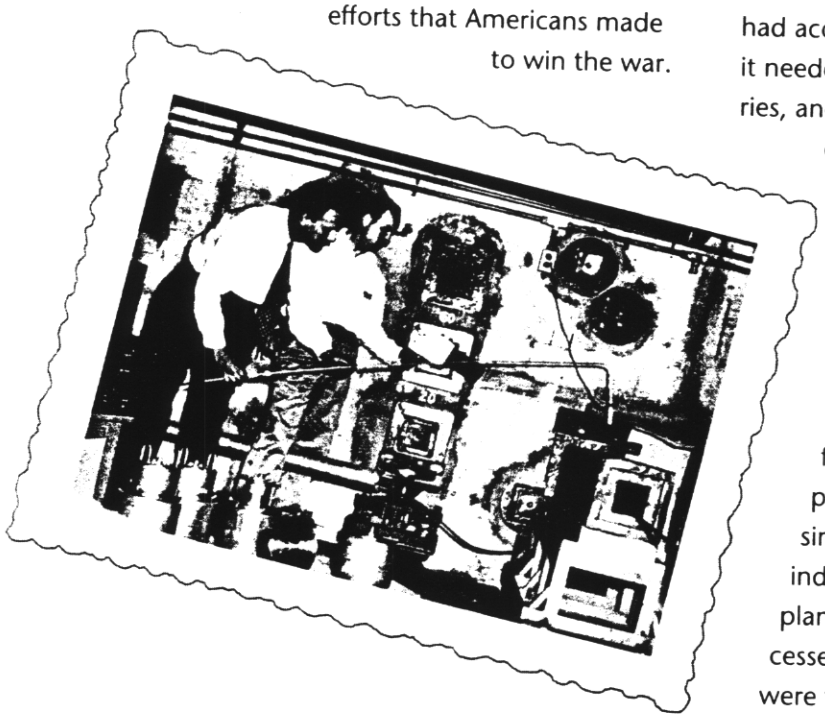
Presently, MSP awaits final remedial action. The approximately 65,000 cubic yards of contaminated material removed from the residences and the landfill remain at the site in two carefully monitored storage piles. DOE publishes an annual environmental surveillance report on MSP (and similar sites around the country) to assure the public that the stored materials and the site itself pose no environmental threat. When a final remedy is selected for the low-level radioactive material, MSP will be cleaned up, and its story—after almost 50 years—will end. (See "What Remains to be Done.")



Because of the disposal methods and the subsequent demolition of buildings and earthmoving activities over the years, most of the radioactive wastes became dispersed throughout large volumes of soil and rubble. At some sites, wastes were spread by erosion or wind, and many offsite areas became contaminated. In addition, contamination remained on walls and building surfaces.

In the years since the war, as scientists have learned more about radiation, the waste disposal practices of the 1940s and 1950s are no longer acceptable. Consequently, those older sites—formerly used sites—must be cleaned up, and the cleanup is the responsibility of the Department of Energy, the agency that evolved from the Manhattan Project and the Atomic Energy Commission (AEC). To clean up the sites, the Formerly Utilized Sites Remedial Action Program, FUSRAP, was started in 1974.

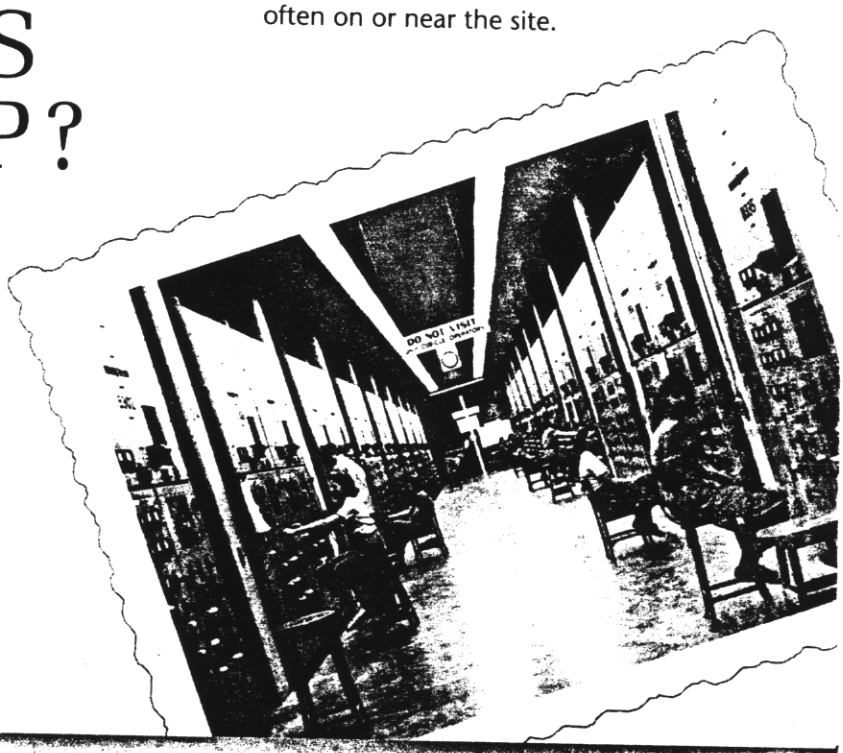
For most Americans, World War II is a distant memory or a lesson in a history book. But those who lived during that period remember the extraordinary efforts that Americans made to win the war.



A major part of the war effort was the Manhattan Project, a secret program to develop an atomic weapon that would end the conflict. The Manhattan Project had access to virtually all the resources it needed. Chemical plants, laboratories, and production facilities throughout the country processed uranium ore and other radioactive materials as part of the urgent research and development efforts.

During those wartime years and the Cold War era that followed, wastes from uranium processing were handled in ways similar to wastes from other industrial processes. At the various plants or laboratories that processed uranium ore, waste materials were then disposed of in ways that were thought at the time to be safe—often on or near the site.

WHAT IS FUSRAP?



This brochure is published by the United States Department of Energy (DOE). It explains the origins, goals, and accomplishments of the Department's Formerly Utilized Sites Remedial Action Program (FUSRAP), a major environmental effort to clean up sites contaminated from past activities involving radioactive materials. FUSRAP has made significant progress in cleaning up these sites and ensuring that they meet today's environmental standards. This brochure is intended to provide members of the public, government officials, and affected property owners with basic information about FUSRAP and to improve understanding of the program's goals and activities.

The U.S. Department of Energy Formerly Utilized Sites Remedial Action Program

DOE FUSRAP Fact Sheet St. Louis Sites

July 1990

DOE, EPA sign agreement to coordinate St. Louis cleanup activities

Summary

- DOE has established a program to cleanup residual radioactivity at the St. Louis Downtown Site, the St. Louis Airport Site and the Latty Avenue Properties
- Results of extensive sampling studies conducted at the St. Louis Sites demonstrate that existing contamination poses no health hazard under current land use conditions
- DOE has signed an agreement with EPA outlining the environmental review process, setting roles and responsibilities, and establishing a schedule
- In August, St. Louis site information will be available at the FUSRAP Information Trailer located at 9200 Latty Avenue

The Department of Energy (DOE) and the U. S. Environmental Protection Agency (EPA) signed an agreement in July that outlines the environmental review process to be used in making a decision on the ultimate disposition of radioactive materials from the St. Louis Airport Superfund Site, and associated contaminated propeties. The goal of this process is to reach a Record of Decision which describes the selected cleanup alternative. As a key element of the process, the public is provided opportunities to comment on and participate in the decision-making process.

A range of alternatives, including offsite disposal and onsite disposal will be evaluated. Selection of a disposal site will not be made until completion of a full environmental review, currently scheduled for 1994. DOE will design and implement the cleanup after a Record of Decision has been reached.

For more information or to be included on the mailing list for updates about the site call or write : **David Adler, St. Louis Site Manager**

In St. Louis, MO
FUSRAP Information Trailer
9200 Latty Avenue
Hazelwood, Mo 63033
(314) 524-4083

In Oak Ridge, TN
Department of Energy
Technical Services Division P.O. Box 2001
Oak Ridge, TN 37831-8723
(615) 576-0948

FUSRAP Program

The St. Louis Airport Site (SLAPS) and the Latty Avenue Properties, as well as the St. Louis Downtown Site (SLDS) are all part of the DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The objectives of FUSRAP are to identify sites that were used by the government or its contractors in the early years of the nation's atomic energy program and ensure that those sites meet current environmental standards. FUSRAP presently includes 31 sites in 13 states.

History

During World War II, uranium was processed at a chemical plant operated by Mallinckrodt in downtown St. Louis. Residues from that processing and from the cleanup of buildings at the plant were stored at a 21-acre parcel of land that was owned by the Atomic Energy Commission on McDonnell Boulevard just north of the Lambert-St. Louis International Airport. In 1966, some of the residues were purchased by a private firm for their commercial value and trucked to a site on Latty Avenue, about a half-mile north of the airport site.

As a result of these activities, three FUSRAP sites in the Greater St. Louis area contain levels of radioactivity above current standards and require some type of remedial action. DOE has also identified more than 70 "haul route" properties in the general airport area that may be contaminated as a result of hauling materials from the airport site to Latty Avenue. The low- level radioactivity found at these sites poses no threat to public health or the environment, given current land use.

Work to Date

In the past several years DOE has accomplished a great deal of work at the St. Louis sites. This work consisted primarily of characterization (sampling and analysis to determine the nature and extent of contamination). Characterization has been completed at SLAPS, the Hazelwood Interim Storage Site (HISS) and at the St. Louis Downtown Site. Recently completed work focused on Coldwater Creek and about 70 "haul route" properties. Work on Coldwater Creek involved collection and analysis of soil samples from the creek between Pershall Road and Old Halls Ferry Road. Contamination, at low levels, was found at some sampling locations. Work along the haul routes indicated some contamination on road shoulders and adjacent properties. In general, where contamination was found the levels were low and at shallow depths (less than one foot). While the characterization is essentially complete, some additional investigation in the creek and along the haul routes will be needed.

Site Information

In August, DOE will establish a FUSRAP Information Trailer at 9200 Latty Avenue in St. Louis. Additionally, DOE has established an Administrative Record containing the body of information upon which decisions about the cleanup will be based. This record and a general information repository are available for review, during normal business hours, in the Government Information Section at the St. Louis Public Library, 1301 Olive Street, St. Louis, MO 63103, and at the St. Louis County Library, Prairie Commons Branch, 915 Utz Lane, Hazelwood, MO 63042.

The U.S. Department of Energy Formerly Utilized Sites Remedial Action Program

DOE FUSRAP Fact Sheet St. Louis Sites

October 1990

DOE responds to resident requests for site information

Residents of St. Louis now have a convenient location where they can gain information about the sites in St. Louis that are subject to environmental clean up.

In response to resident requests to make St. Louis site information more readily available, the Department of Energy (DOE) has opened a Public Information Office at 9200 Latty Avenue, Hazelwood, Missouri. Site information will be available on the St. Louis Downtown site(SLDS), the St. Louis Airport site (SLAPS), and the Latty Avenue properties. The office has been established to provide opportunities for the public to comment on, and participate in, the environmental review process that will eventually lead to a decision on site clean up.

Summary

- DOE has established a program to clean up residual radioactivity at the St. Louis Downtown Site, the St. Louis Airport Site, and the Latty Avenue Properties.
- Radiological characterization surveys have been conducted along Latty Avenue, McDonnell Boulevard, Hazelwood Avenue, Pershall Road, Coldwater Creek , and the St. Louis Airport Site areas.
- Results of characterization surveys and other extensive sampling studies conducted at the St. Louis sites demonstrate that existing contamination poses no health hazard under current land use conditions.
- When appropriate environmental reviews are completed, affected areas will be cleaned up as necessary to ensure long-term protection of human health and the environment.
- St. Louis site information is available at the Public Information Office located at 9200 Latty Avenue.

DOE has also recently completed radiological characterization report summarizing sampling and analysis results for properties located in Berkeley, Hazelwood, and St. Louis. Some of the properties are believed to have residue waste from uranium processing activities conducted in downtown St. Louis several decades ago. Notification has been sent to property owners detailing the results of the survey conducted on their property. Data from these and other surveys will be used to design a cleanup program for long-term management of these wastes.

For more information or to be included on the mailing list for updates about the site call or write : **David Adler, St. Louis Site Manager**

Public Information Office
9200 Latty Avenue
Hazelwood, MO 63033
(314) 524-4083

U.S. Department of Energy
Technical Services Division
P.O. Box 2001
Oak Ridge, TN 37831-8723
(615) 576-0948

Review Process

The Environmental Protection Agency (EPA) and DOE signed an agreement in July that outlines the environmental review process to be used in making a decision on the ultimate disposition of radioactive materials from the St. Louis Airport Superfund Site and associated contaminated propeties. The goal of this process is to reach a Record of Decision that describes the selected cleanup alternative.

A range of alternatives, including off-site and on-site disposal will be evaluated. Selection of a disposal site will not be made until completion of a full environmental review, currently scheduled for 1994. DOE will design and implement the cleanup after a Record of Decision has been reached.

FUSRAP Program

SLAPS, SLDS, and the Latty Avenue Properties are all part of the DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The objectives of FUSRAP are to identify sites that were used by the government or contractors in the early years of the nation's atomic energy program and ensure that those sites meet current environmental standards. FUSRAP presently includes 33 sites in 13 states.

History

During World War II, uranium was processed at a chemical plant operated by Mallinckrodt in downtown St. Louis. Residues from that processing and from the cleanup of buildings at the plant were stored at a 21-acre parcel of land that was owned by the Atomic Energy Commission on McDonnell Boulevard, just north of the Lambert-St. Louis International Airport. In 1966, some of the residues were purchased by a private firm for their commercial value and trucked to a site on Latty Avenue, about a halfmile north of the airport site.

As a result of these activities, three FUSRAP sites in the Greater St. Louis area contain levels of radioactivity in excess of current standards and require some type of remedial action. DOE has identified more than 70 haul route properties in the general airport area that may be contaminated as a result of hauling materials from the airport site to Latty Avenue. The low-level radioactivity found at these sites poses no threat to public health or the environment, given current land use. Achieving cleanup standards will ensure that the sites pose no significant risk, even if land use changes.

Work to Date

In the past several years, DOE has accomplished a great deal of work at the St. Louis sites. This work consisted primarily of characterization (sampling and analysis to determine the nature and extent of contamination). Characterization has been completed at SLAPS, the Hazelwood Interim Storage Site (HISS), and SLDS. Much of the work completed has focused on Coldwater Creek and about 70 haul route properties. Work on Coldwater Creek involved collection and analysis of soil samples from the creek between Pershall Road and Old Halls Ferry Road. Contamination, at low levels, was found at some sampling locations. Work along the haul routes indicated some contamination on road shoulders and adjacent properties. In general, where contamination was found, the levels were low and at shallow depths (less than one foot). Although the characterization is essentially complete, some additional investigation will be needed in the creek and along the haul routes.

Site Information

DOE has opened an Administrative Record containing the body of information upon which decisions about the cleanup will be based. This record and a general information repository are available for review, during normal business hours, in the Government Information Section at the St. Louis Public Library, 1301 Olive Street, St. Louis, Missouri 63103; the St. Louis County Library, Prairie Commons Branch, 915 Utz Lane, Hazelwood, Missouri, 63042; and at the Public Information Office, 9200 Latty Avenue, Hazelwood, Missouri, 63033.

4.37 2258.1

The U.S. Department of Energy Formerly Utilized Sites Remedial Action Program

DOE FUSRAP Fact Sheet St. Louis Sites

September 1990

DOE, EPA sign agreement to coordinate St. Louis cleanup activities

Summary

- DOE has established a program to cleanup residual radioactivity at the St. Louis Downtown Site, the St. Louis Airport Site and the Latty Avenue Properties
- Results of extensive sampling studies conducted at the St. Louis Sites demonstrate that existing contamination poses no health hazard under current land use conditions
- Once appropriate environmental reviews are completed, affected areas will be cleaned up as necessary to ensure long-term protection of human health and the environment.
- In October, St. Louis site information will be available at the FUSRAP Public Information Office located at 9200 Latty Avenue

The Department of Energy (DOE) and the U. S. Environmental Protection Agency (EPA) signed an agreement in July that outlines the environmental review process to be used in making a decision on the ultimate disposition of radioactive materials from the St. Louis Airport Superfund Site, and associated contaminated properties. The goal of the process is to reach a Record of Decision which describes the selected cleanup alternative. As a key element of the process, the public is provided opportunities to comment on and participate in the decision-making process.

A range of alternatives, including offsite disposal and onsite disposal will be evaluated. Selection of a disposal site will not be made until completion of a full environmental review, currently scheduled for 1994. DOE will design and implement the cleanup after a Record of Decision has been reached.

For more information or to be included on the mailing list for updates about the site call or write : **David Adler, St. Louis Site Manager**

In St. Louis, MO
FUSRAP Information Office
9200 Latty Avenue
Hazelwood, Mo 63033
(314) 524-4083

In Oak Ridge, TN
Department of Energy
Technical Services Division P.O. Box 2001
Oak Ridge, TN 37831-8723
(615) 576-0948

The U.S. Department of Energy Formerly Utilized Sites Remedial Action Program

DOE FUSRAP Fact Sheet St. Louis Sites

August 1990

DOE, EPA sign agreement to coordinate St. Louis cleanup activities

Summary

- DOE has established a program to cleanup residual radioactivity at the St. Louis Downtown Site, the St. Louis Airport Site and the Latty Avenue Properties
- Results of extensive sampling studies conducted at the St. Louis Sites demonstrate that existing contamination poses no health hazard under current land use conditions
- Once appropriate environmental reviews are completed, affected areas will be cleaned up as necessary to ensure long-term protection of human health and the environment.
- In September, St. Louis site information will be available at the FUSRAP Information Office located at 9200 Latty Avenue

The Department of Energy (DOE) and the U. S. Environmental Protection Agency (EPA) signed an agreement in July that outlines the environmental review process to be used in making a decision on the ultimate disposition of radioactive materials from the St. Louis Airport Superfund Site, and associated contaminated propeties. The goal of the process is to reach a Record of Decision which describes the selected cleanup alternative. As a key element of the process, the public is provided opportunities to comment on and participate in the decision-making process.

A range of alternatives, including offsite disposal and onsite disposal will be evaluated. Selection of a disposal site will not be made until completion of a full environmental review, currently scheduled for 1994. DOE will design and implement the cleanup after a Record of Decision has been reached.

For more information or to be included on the mailing list for updates about the site call or write : **David Adler, St. Louis Site Manager**

In St. Louis, MO
FUSRAP Information Office
9200 Latty Avenue
Hazelwood, Mo 63033
(314) 524-4083

In Oak Ridge, TN
Department of Energy
Technical Services Division P.O. Box 2001
Oak Ridge, TN 37831-8723
(615) 576-0948

The St. Louis Airport Site (SLAPS) and the Latty Avenue Properties, as well as the St. Louis Downtown Site (SLDS) are all part of the DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The objectives of FUSRAP are to identify sites that were used by the government or its contractors in the early years of the nation's atomic energy program and ensure that those sites meet current environmental standards. FUSRAP presently includes 32 sites in 13 states.

History

During World War II, uranium was processed at a chemical plant operated by Mallinckrodt in downtown St. Louis. Residues from that processing and from the cleanup of buildings at the plant were stored at a 21-acre parcel of land that was owned by the Atomic Energy Commission on McDonnell Boulevard just north of the Lambert-St. Louis International Airport. In 1966, some of the residues were purchased by a private firm for their commercial value and trucked to a site on Latty Avenue, about a half-mile north of the airport site.

As a result of these activities, three FUSRAP sites in the Greater St. Louis area contain levels of radioactivity above current standards and require some type of remedial action. DOE has also identified more than 70 "haul route" properties in the general airport area that may be contaminated as a result of hauling materials from the airport site to Latty Avenue. The low-level radioactivity found at these sites poses no threat to public health or the environment, given current land use. Achieving cleanup standards will ensure that the sites pose no significant risk, even if land use changes significantly.

Work to Date

In the past several years DOE has accomplished a great deal of work at the St. Louis sites. This work consisted primarily of characterization (sampling and analysis to determine the nature and extent of contamination). Characterization has been completed at SLAPS, the Hazelwood Interim Storage Site (HISS) and at the St. Louis Downtown Site. Recently completed work focused on Coldwater Creek and about 70 "haul route" properties. Work on Coldwater Creek involved collection and analysis of soil samples from the creek between Pershall Road and Old Halls Ferry Road. Contamination, at low levels, was found at some sampling locations. Work along the haul routes indicated some contamination on road shoulders and adjacent properties. In general, where contamination was found the levels were low and at shallow depths (less than one foot). While the characterization is essentially complete, some additional investigation in the creek and along the haul routes will be needed.

Site Information

In September, DOE will establish a FUSRAP Information Office at 9200 Latty Avenue in St. Louis. Additionally, DOE has established an Administrative Record containing the body of information upon which decisions about the cleanup will be based. This record and a general information repository are available for review, during normal business hours, in the Government Information Section at the St. Louis Public Library, 1301 Olive Street, St. Louis, MO 63103, and at the St. Louis County Library, Prairie Commons Branch, 915 Utz Lane, Hazelwood, MO 63042.

4.37 2258.1

The U.S. Department of Energy Formerly Utilized Sites Remedial Action Program

DOE

FUSRAP Fact Sheet St. Louis Sites

January 1990

DOE evaluating three sites in St. Louis area

Summary

- DOE is responsible for cleanup of residual radioactivity at the St. Louis Downtown Site, the St. Louis Airport Site and the Latty Avenue properties
- Given the type of radioactive contamination and the current use of the site there is no foreseeable hazard.
- DOE is developing an agreement with EPA, in conjunction with the State of Missouri, to outline the environmental review process, set roles and responsibilities, and establish a schedule
- While the environmental review is in process, DOE plans to conduct interim action on selected properties to prevent further spread of contamination

The U. S. Department of Energy (DOE) is responsible for cleaning up residual radioactive contamination at several locations in the St. Louis area as part of DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The objectives of FUSRAP are to identify sites that were used by the government or its contractors in the early years of the nation's atomic energy programs and ensure that at those sites meet current environmental standards. FUSRAP presently includes 31 sites in 13 states.

This fact sheet gives a brief history of the St. Louis sites and describes the process that will be used by DOE, in conjunction with the Environmental Protection Agency and the State of Missouri, to identify and carry out the appropriate cleanup measures.

BACKGROUND

During World War II, uranium was processed at a chemical plant operated by Mallinckrodt in downtown St. Louis. Residues from that processing and from the cleanup of buildings at the plant were stored at a 21-acre parcel of land that was owned by the Atomic Energy Commission on McDonnell Boulevard just north of the Lambert-St. Louis International Airport.

In 1966, some of the residues were purchased by a private firm for their commercial value and trucked to a site on Latty Avenue, about a half-mile north of the airport site. The residues were then sent by rail to a plant in Colorado for processing. The City of St. Louis acquired the property from the Atomic Energy Commission, a predecessor agency to DOE, in 1973.

DOE has also identified more than 60 "haul route" properties in the general area north of the airport that may be contaminated as a result of hauling materials from the airport site to Latty Avenue.

As a result of these activities, there are three FUSRAP sites in the Greater St. Louis area which contain levels of radioactivity above current standards and, therefore, require some type of remedial action. They are (1) the St. Louis Downtown Site (SLDS); (2) the St. Louis Airport Site (SLAPS) and its contaminated vicinity properties, and (3) the Latty Avenue Properties.

There are two other similar sites in the St. Louis area that are not part of FUSRAP. One is the Weldon Spring site in St. Charles County, which is being managed by a separate DOE program. The other is the West Lake Landfill in St. Louis County, where residues from the Latty Avenue facility were disposed of by a commercial firm. The West Lake Landfill has been proposed by EPA for inclusion on the National Priorities List (Superfund). The Nuclear Regulatory Commission is presently responsible for regulating the contamination at the landfill.

AUTHORIZING LEGISLATION

Several different laws provide DOE with authority and responsibility for remedial action at these sites. The basic authority for the Downtown and SLAPS properties comes from the Atomic Energy Act of 1954, as amended. The conference report accompanying the Energy and Water Development Appropriations Act of 1984 provided DOE authority for the Latty Avenue Properties. Public Law 98-360, passed in 1985, directed DOE to reacquire the airport property from the City of St. Louis and develop it as a disposal site, in a manner acceptable to the City. This legislation does not mean that the site will automatically become a disposal cell upon transfer of the land to DOE. Selection of a disposal site will not be made until completion of a full environmental review, including review of alternative disposal sites. Selection of a preferred site will be based upon site suitability and all applicable laws.

In October of 1989, EPA placed the airport site and the Latty Avenue Properties on the National Priorities List (Superfund). This Superfund listing will mean that cleanup can proceed under Superfund authority, that certain time schedules must be met, and that EPA and the State of Missouri will have a greater role in oversight of DOE activities.

WORK TO DATE

In the past several years DOE has accomplished a great deal of work at the St. Louis sites. This has consisted primarily of characterization (sampling and analysis to determine the nature and extent of contamination). Characterization has been completed at SLAPS, the Hazelwood Interim Storage Site (HISS) and at the St. Louis Downtown Site. Recently completed work focused on Coldwater Creek and about 70 "haul route" properties. Work on Coldwater Creek, a portion of which was funded by the Corps of Engineers, involved collection and analysis of soil samples from the creek between Pershall Road and Old Halls Ferry Road, a distance of almost 7 miles. Contamination, at low levels, was found at some sampling locations. Work along the haul routes indicated some contamination on road shoulders and adjacent properties. In general, where contamination was found the levels were low and at shallow depths (less than 1 foot). While the characterization is essentially complete, some additional investigation in the creek and along the haul routes will be needed.

In addition to characterization, DOE has performed some interim cleanup activity to prevent the spread of contamination or remove contamination from the route of utility construction. Contamination from the Latty Avenue Properties and from the Latty Avenue right-of-way has been cleaned. This material is in interim storage at the HISS on Latty Avenue. DOE also repaired erosion along the west end of the airport site and installed a gabion wall to prevent further erosion of soil into Coldwater Creek. (Gabions are rock-filled wire baskets used to control erosion.)

DOE conducts environmental monitoring around the airport site and HISS, testing the air, groundwater, surface water, and direct radiation on a quarterly basis. Annual site environmental monitoring reports are published and made available to the public.

FUTURE ACTIVITIES

With the placement of sites on Superfund DOE began discussions that will lead to an agreement with EPA, with input from the

a[illegible]f Missouri. This agreement will out[illegible] environmental review process to be [illegible] in making a decision on the ultimate disposition of radioactive materials from the St. Louis sites. The agreement will list responsibilities of the various parties and set out a schedule for accomplishing the work.

The environmental review process will comply with all applicable laws and regulations. The two primary laws involved are the National Environmental Policy Act (NEPA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). The environmental documentation accomplished under NEPA is called an Environmental Impact Statement (EIS). Documentation done under CERCLA/SARA is called a Remedial Investigation/Feasibility Study (RI/FS). DOE will combine these two processes and produce a joint RI/FS-EIS.

The goal of this process is to reach a "Record of Decision" describing the cleanup [illegible]done. The process starts with scoping and planning, which includes an opportunity for the public to comment on alternatives that should be considered in the study. A range of alternatives including offsite disposal and onsite disposal will be evaluated.

After scoping and planning have been completed, a remedial investigation will be conducted, followed by a remedial investigation report. A feasibility study will be conducted to evaluate various alternatives, and a proposed plan will be issued for public review and comment. DOE will then issue a Record of Decision, which will include responses to comments received from the public. After a Record of Decision has been reached, DOE will design and implement the cleanup.

In the interim, while this review process is being conducted, DOE is planning to clean up some of the residential and commercial properties in order to prevent further spread of the contamination. The contaminated material from this cleanup would be placed with other material already in storage at HISS.

SUMMARY

The low levels of residual radioactivity identified by FUSRAP pose no significant health hazards given current land use activities. This conclusion is supported by results from extensive characterization activity and an ongoing environmental monitoring program at the SLAPS and HISS sites.

A great deal of work has been accomplished by DOE to identify the extent of residual radioactive contamination in the Greater St. Louis area. DOE is committed to fully evaluating alternatives for cleaning up these sites, in cooperation with EPA, the State of Missouri, and local officials. During this process, there will be numerous opportunities for public participation. While this environmental review process is being conducted, DOE is planning interim action to prevent further spread of contamination.

In the meantime, DOE has established an Administrative Record containing the body of information upon which decisions about the cleanup will be based. The record is available for review, during normal business hours, in the Government Information Section at the St. Louis Public Library, 1301 Olive Street, St. Louis, MO 63103, and at the St. Louis County Library, Prairie Commons Branch, 915 Utz Lane, Hazelwood, MO 63042.

For more information or to be included on the mailing list for updates about the site; call or write:

David Adler
Technical Services Division
Department of Energy
P.O. Box 2001
Oak Ridge, TN 37831-8723
(615) 576-0948