

APPENDIX A
CHRONOLOGY OF COMMUNITY INVOLVEMENT ACTIVITIES TO DATE

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APPENDIX A
CHRONOLOGY OF COMMUNITY INVOLVEMENT ACTIVITIES TO DATE

<i>Date</i>	<i>Major Activity</i>	<i>Activity Description</i>
October 1989	National Priorities List (NPL) Listing	St. Louis Airport Site (SLAPS) and Hazelwood Interim Storage Site (HISS) placed on the NPL by EPA
January 1990	Fact Sheet	U.S. Department of Energy (DOE) Evaluating Three Sites in St. Louis Area
January 1990	Fact Sheet	U.S. Environmental Protection Agency (EPA) Superfund Technical Assistance Grants
July 1990	Fact Sheet	DOE, EPA Sign Agreement to Coordinate St. Louis Cleanup Activities
August 1990	Fact Sheet	DOE, EPA Sign Agreement to Coordinate St. Louis Cleanup Activities
September 1990	Fact Sheet	DOE, EPA Sign Agreement to Coordinate St. Louis Cleanup Activities
October 1990	Fact Sheet	DOE Responds to Resident Requests for Site Information
November 1990	Fact Sheet	DOE Responds to Resident Requests for Site Information
June 1991	Press Release	DOE announces the opening of a public comment period on the St. Louis Downtown Site (SLDS) engineering evaluation/cost analysis (EE/CA)
June 1991	Public Notice	DOE posts newspaper display ad announcing the availability of the administrative record files
June 1991	Public Notice	DOE posts newspaper display requesting public comment and announcing a public meeting for an EE/CA for SLDS removal activities

June 1991	Public Notice	Federal Register floodplain notice for remedial work on HISS Vicinity Properties (VPs)
January 1992	Public Notice	Federal Register Notice of Intent to prepare a Remedial Investigation (RI)/ Feasibility Study (FS) - Environmental Impact Statement
January 1992	Press Release	DOE announces a public meeting to discuss the development of environmental studies
January 1992	Public Notice	DOE posts newspaper display ad announcing a public meeting to review environmental studies being developed
April 1992	Newsletter	FUSRAP Update: The St. Louis Site
April 1992	Public Notice	DOE posts newspaper display ad announcing a public meeting to review an EE/CA for cleanup of HISS VP's
August 1992	Fact Sheet	FUSRAP
August 1992	Fact Sheet	Principal Laws and Regulations Affecting the FUSRAP Cleanup Program
August 1992	Fact Sheet	Administrative Record Requirements for FUSRAP
August 1992	Newsletter	FUSRAP Update: The St. Louis Site
August 1992	Newsletter	FUSRAP Update: The St. Louis Site
February 1993	Newsletter	FUSRAP Update: The St. Louis Site
May 1993	Press Release	DOE announces availability of Speakers Bureau
May 1993	Fact Sheet	FUSRAP: The St. Louis Site, St. Louis, Missouri

June 1993	Public Workshop	Public workshop held for government officials and staff members to receive update on DOE cleanup and disposal options developed in the FS
July 1993	Open House	DOE open house at the Public Information Office at HISS
July 1993	Newsletter	FUSRAP Update: The St. Louis Site
September 1993	Document	DOE issues a revised Community Relations Plan
December 1993	Newsletter	FUSRAP Update: The St. Louis Site
March 1994	Newsletter	FUSRAP Update: The St. Louis Site
August 1994	Press Release	DOE announces plans to begin remediation efforts in St. Louis
November 1994	Newsletter	FUSRAP Update: The St. Louis Site
Fall 1995	Newsletter	FUSRAP Update: The St. Louis Site
Spring 1996	Newsletter	FUSRAP Update: The St. Louis Site
March 1997	Fact Sheet	FUSRAP: St. Louis Sites, St. Louis, Missouri
Spring 1997	Newsletter	FUSRAP Update: The St. Louis Site
June 1997	Press Release	DOE announces technology demonstration to be held at SLAPS
August 1997	Public Notice	DOE posts newspaper display ad announcing a public meeting to review a SLAPS EE/CA
Summer 1997	Newsletter	FUSRAP Update: The St. Louis Site
December 1997	Press Release	U.S. Army Corps of Engineers (USACE) announces the completion of SLAPS Phase I-A activities
February 1998	Newsletter	FUSRAP Update: The St. Louis Site

March 1998	Fact Sheet	Summary of Activities at SLAPS
March 1998	Fact Sheet	Summary of Activities at HISS
March 1998	Public Notice	USACE posts newspaper display ad announcing a public meeting to be held for a SLAPS EE/CA and a HISS EE/CA
March 1998	Public Notice	USACE posts newspaper display ad announcing the public availability of the SLAPS EE/CA and HISS EE/CA
March 1998	Public Meeting	Meeting to discuss SLAPS EE/CA and HISS EE/CA
April 1998	Fact Sheet	Summary of Activities at SLDS
April 1998	Fact Sheet	SLDS FS
April 1998	Fact Sheet	SLDS Proposed Plan (PP)
April 1998	Public Notice	Federal Register Notice announcing the availability of the SLDS FS/PP and the intent to hold a public meeting to discuss the documents
April 1998	Public Notice	USACE legal notice announcing the public meeting to discuss the SLDS FS/PP
April 1998	Public Meeting	Meeting to discuss the SLDS FS/PP
June 1998	Newsletter	FUSRAP Update: The St. Louis Site
October 1998	Public Notice	USACE legal notice announcing the availability of the administrative record for SLDS
December 1998	Newsletter	FUSRAP Update: The St. Louis Sites
January 1999	Document	USACE issues the revised St. Louis Sites Community Relations Plan

February 1999	Newsletter	FUSRAP Update: The St. Louis Sites
February 1999	Public Notice	USACE notice announcing an open house for the start of work on SLDS
February 1999	Fact Sheet	SLDS Record of Decision (ROD)
February 1999	Fact Sheet	SLDS Remedial Action/Remedial Design
February 1999	Open House	USACE holds an open house at Henry Clay Elementary School near SLDS to discuss the beginning of remedial action/remedial design work
May 1999	Newsletter	FUSRAP Update: The St. Louis Sites
June 1999	Fact Sheet	What Is FUSRAP?
August 1999	Newsletter	FUSRAP Update: The St. Louis Site
September 1999	Public Notice	USACE announces the availability of the Speakers Bureau
November 1999	Newsletter	FUSRAP Update: The St. Louis Sites
December 1999	Website	USACE releases the updated St. Louis District FUSRAP Website for public access
January 2000	Document	USACE issues the updated version of the revised St. Louis Sites Community Relations Plan
January 2000	Public Notice	Federal Register Notice announcing availability of the Madison RI/FS and PP and intent to hold a public meeting to discuss the documents
January 2000	Public Notice	USACE posts newspaper display ad announcing the availability of the Madison RI/FS and PP and intent to hold a public meeting to discuss the documents

February 2000	Public Meeting	Meeting to discuss the Madison RI/FS and PP
February 2000	Fact Sheet	Summary of the Madison Site RI Report
February 2000	Fact Sheet	Summary of the Madison Site FS
February 2000	Fact Sheet	Summary of the Madison Site PP
April 2000	Public Notice	Madison Site ROD/administrative record completion
May 2000	Newsletter	FUSRAP Update: The St. Louis Sites
September 2000	Newsletter	FUSRAP Update: The St. Louis Sites
September 2000	Public Notice	Madison Site Closeout Report
November 2000	Newsletter	FUSRAP Update: The St. Louis Sites
December 2000	Website	St. Louis District FUSRAP Website is updated for public access
January 2001	Document	USACE issues the updated version of the revised St. Louis Sites Community Relations Plans
February 2001	Newsletter	FUSRAP Update: The St. Louis Sites
April 2001	Exhibit	St. Louis Earth Day – Forest Park
June 2001	Newsletter	FUSRAP Update: The St. Louis Sites
June 2001	Correspondence	Landowner/tenant contamination reminder
October 2001	Newsletter	FUSRAP Update: The St. Louis Sites
December 2001	Newsletter	FUSRAP Update: The St. Louis Sites
February 2002	Newsletter	FUSRAP Update: The St. Louis Sites
March 2002	Correspondence	Landowner/tenant contamination reminder

April 2002	Exhibit	St. Louis Earth Day - Forest Park
July 2002	Public Notice	Madison Site completion, closure report issuance, and transfer of site long-term stewardship responsibilities
August 2002	Public Notice	USACE posts newspaper display ad announcing environmental training for the public
August 2002	News Release	Announcing environmental training for the public
August 2002	Workshop	Two-day environmental training session
August 2002	Fact Sheets	Radiation Basics, Risk Assessment, Applicable or Relevant and Appropriate Requirements, Risk Range, Release, Cleanup, Long-Term Stewardship
September 2002	Correspondence	Forwarding copies of the August 2002 fact sheets to landowners/tenants
November 2002	Newsletter	FUSRAP Update: The St. Louis Sites
April 2003	Public Notice	Five-Year Review
April 2003	Correspondence	Letters to landowners/tenants on the activity of the North County FS/PP Spring 2003 Newsletter FUSRAP Update: The St. Louis Sites
May 2003	Interviews	Five-Year Review community interviews
May 2003	Public Notice	Federal Register Notice announcing the availability of the St. Louis North County Site FS/PP for 30-day review
May 2003	Public Notice	USACE posts newspaper display ad announcing the availability of the St. Louis North County Site FS/PP for 30-day review
May 2003	Web Site	St. Louis North County site web page is launched for public access
May 2003	Fact Sheet	North County FS

May 2003	Fact Sheet	North County PP
May 2003	Fact Sheet	North County FS/PP Overview
May 2003	Newsletter	FUSRAP Update: The St. Louis Sites
May 2003	Public Meeting	St. Louis North County Site FS/PP
September 2003	Newsletter	FUSRAP Update: The St. Louis Sites
December 2003	Document	USACE issues the updated version of the revised St. Louis Sites Community Relations Plan
Spring 2004	Newsletter	FUSRAP Update: The St. Louis Sites
June 2004	Document	Draft Five-Year Review Report
Fall 2004	Newsletter	FUSRAP Update: The St. Louis Sites
October 2004	Document	Five-Year Review Report: Initial Five-Year Review
October 2004	Document	Derivation of Site-Specific Derived Concentration Guideline Levels (DCGLs) for North County Structures
Winter 2005	Newsletter	FUSRAP Update: The St. Louis Sites
Fall 2005	Newsletter	FUSRAP Update: The St. Louis Sites
November 2005	Press Release	Announcing open house regarding the North St. Louis County Sites ROD
November 2005	Open House	USACE holds an open house regarding the North St. Louis County Sites ROD from 3:00 to 6:30 p.m. at the FUSRAP Project Office in Berkeley
Spring 2006	Newsletter	FUSRAP Update: The St. Louis Sites
May 2006	Meeting	St. Louis Oversight Committee met with representatives from DOE's Office of Legacy

		Management, USACE, Missouri Department of Natural Resources (MDNR), St. Louis County Government, and the cities of Berkeley and Hazelwood to discuss long- term stewardship issues
Spring 2007	Newsletter	FUSRAP Update: The St. Louis Sites
May 2007	Press Release	Announcing the SLAPS closeout and ceremony to be held at SLAPS on May 30 at 10:00 a.m.
May 2007	Ceremony	SLAPS closeout ceremony commemorating the completion of one of the nation's Superfund sites
Spring 2008	Newsletter	FUSRAP Update: The St. Louis Sites
June 2008	Document	Completed Draft of Community Involvement Plan for the St. Louis FUSRAP Sites, Revision 5
October 2008	Public Meeting	USACE announces start of second Five-Year Review
November 2008	Meeting	St. Louis Oversight Committee
Fall 2008	Newsletter	FUSRAP Update: The St. Louis Sites
Summer 2009	Newsletter	FUSRAP Update: The Site Louis Sites
November 2009	Meeting	St. Louis Oversight Committee
Winter 2009	Newsletter	FUSRAP Update: The St. Louis Sites
February 2010	Meeting	St. Louis Oversight Committee
September 2010	Public Notice	USACE posts newspaper display ad announcing availability of the second Five-Year Review
Winter 2010	Newsletter	FUSRAP Update: The St. Louis Sites
Summer 2010	Newsletter	FUSRAP Update: The St. Louis Sites

July 2010	Meeting	St. Louis Oversight Committee
Winter 2011	Newsletter	FUSRAP Update: The St. Louis Sites
Winter 2011	Public Notice	USACE newsletter, second Five-Year Review available to public in administrative record
February 2011	Meeting	St. Louis Oversight Committee
Summer 2011	Newsletter	FUSRAP Update: The St. Louis Sites
Winter 2012	Newsletter	FUSRAP Update: The St. Louis Sites
April 2012	Meeting	St. Louis Oversight Committee
March 2012	Website	USACE updates public website, new URL
Summer 2012	Newsletter	FUSRAP Update: The St. Louis Sites
October 2012	Document	Third Five-Year Review and update to Community Involvement Plan begins
November 2012	Meeting	St. Louis Oversight Committee
Winter 2013	Newsletter	FUSRAP Update: The St. Louis Sites
April 2013	Meeting	St. Louis Oversight Committee
Summer 2013	Newsletter	FUSRAP Update: The St. Louis Sites
December 2014	Public Notice	USACE posts newspaper display ad announcing availability of PP for Group 1 Inaccessible Soil Operable Unit (ISOU)
January 2014	Meeting	USACE presented PP for Group 1 ISOU at a public hearing/St. Louis Oversight Committee meeting
Winter 2014	Newsletter	FUSRAP Update: The St. Louis Sites
Summer 2014	Newsletter	FUSRAP Update: The St. Louis Sites

January 2015	Meeting	St. Louis Oversight Committee
Winter 2015	Newsletter	FUSRAP Update: The St. Louis Sites
Summer 2014	Newsletter	FUSRAP Update: The St. Louis Sites
January 2015	Meeting	St. Louis Oversight Committee
Winter 2016	Newsletter	FUSRAP Update: The St. Louis Sites
Summer 2016	Newsletter	FUSRAP Update: The St. Louis Sites
February 17, 2016	Meeting	St. Louis Oversight Committee Meeting
June 29, 2016	Meeting	Public Meeting
Winter 2017	Newsletter	FUSRAP Update: The St. Louis Sites
February 16, 2017	Meeting	Public Meeting
Summer 2017	Newsletter	FUSRAP Update: The St. Louis Sites
Winter 2018	Newsletter	FUSRAP Update: The St. Louis Sites
February 22, 2018	Meeting	Public Meeting
Summer 2018	Newsletter	FUSRAP Update: The St. Louis Sites
Winter 2019	Announcement	USACE announces start of fourth Five-Year Review
Winter 2019	Newsletter	FUSRAP Update: The St. Louis Sites
February 28, 2019	Meeting	Open house at Hazelwood Civic Center
Summer 2019	Newsletter	FUSRAP Update: The St. Louis Sites
July 2019	Interviews	Five-Year Review community interviews
Winter 2020	Newsletter	FUSRAP Update: The St. Louis Sites

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APPENDIX B
COMMUNITY INTERVIEWS

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2019 - 2020 COMMUNITY INTERVIEWS for Five-Year Review

Property Owner/Citizen #1

How are you familiar with the St. Louis FUSRAP sites?

1 I am part of the coldwater creek group

What is your overall impression of the project?

2 thorough and complete

What contacts have you had with representatives from FUSRAP?

Were they responsive to your concerns?

3 have not had any contact or reason to communicate with.

But everyone has always been very respectful when together in meetings.

Do you have any current concerns about the site?

If so, what are they?

4 when the community sees workers out taking soil samples causes concern

And of course rumors because they're not familiar or understand what is

Going on. Many are uninformed and this causes rumors and social media

Negative Discussion.

What effects of the site operations had on your business/property?

5 fortunately there has been no affect for me or my business, although

My business is retired since 2011. The fear of the unknown and not

Being informed could have an adverse affect.

Do you think site operations have had an effect on the community?

If so, what are they?

6. Yes there is fear in the community primarily because of lack of knowledge

And not understanding in simple terms. Everyone jumps to conclusions

And always assumes the worst. In general the community is very simple minded

And public updates/town hall meetings, with a simple explanation would be

Beneficial. Possibly area mailings of such a meeting would be a benefit.

Inviting the public would be proactive.

Are you aware of the community concerns regarding site operations and administration?

If so, please provide details.

7 when the community sees soil testing in the process it is easy for the community

To make assumptions. Most of which are negative caused from fear of the

Unknown/lack of knowledge. Typically the only avenue is social media if they

are face book familiar. These discussions become very negative and Foster

Uneducated rumors. These discussions are sporadic and not routine.

Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?

8 yes I attend

Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?

9 the general public are not engineers or educated environmentalists. It is like speaking with
A medical professor and hard to understand in a simple mind what is going on at some of
The public meetings. For the most part people have simple questions, such as,
"does this affect me", which I understand is a hard question to address, but it is valid.
While I understand the government wants to do everything top notch and professional
Some presentations give the interpretation of bureaucracy and the runaround. Presenters
Need to speak at the audience level of understanding.

Do you feel that FUSRAP has reached out to inform the community regarding the project operations?

10 NO I do not, I believe more communication needs to be done at possibly in a direct way.
I receive information because I'm signed up e-mail wise. The majority is not. Possibly consider
More public meetings and direct mail.

Do you feel well informed about FUSRAP?

11 I do because I take an interest in what is going on and engage in involvement.

Do you have any suggestions for how information concerning the sites should be distributed to the community?

12 as stated above, email is not for everyone, at it takes an invitation by mail to get people
Engaged to become more educated.

Do you have any comments, suggestions, or recommendations regarding the site's operations or management?

13 I understand public meetings of such a sensitive nature can be difficult to manage.
A strong Sargent of arms, and consistency during a meeting can achieve this.
A printed copy of the meetings rules needs to be handed to everyone coming in the door,
The rules do not need to be lengthy and in bullet points of the structure and courtesy.
Information should be given in understandable terms.
Audience questions should be addressed publicly if able quickly and simply.
Arguments debates and emotions should swiftly be addressed, in order to keep the meeting moving.
I understand managing a potentially unruly crowd is difficult, that is cause by emotions.
The meeting needs to be very clear, this discussion is on coldwater creek, no other project.
It means to be stated on the rules sheet, this is coldwater creek discussion-no other.
If an attempt is made to discuss another project, it should be voice this is not part of tonight's discussion.
I realize I am making suggestions regarding a public meeting and not site operations.
I do not have anything to offer regarding operations or management of the site. Just public meetings.

**2019 - 2020 COMMUNITY INTERVIEWS
for Five-Year Review**

Property Owner/Citizen #2

1. How are you familiar with the St. Louis FUSRAP sites?
I became aware of the project in 2011 after my Son was diagnosed with PMP Cancer in 2011
2. What is your overall impression of the project?
The work FUSRAP is doing is performing is very positive. But, it should have never been necessary in the first place.
3. What contacts have you had with representatives from FUSRAP? Were they responsive to your concerns?
I have had contact with Management of FUSRAP since 2013 as a member of the FUSRAP Oversight committee. Everyone has been very open and as direct as they could be.
4. Do you have any current concerns about the site? If so, what are they?
Not the sites in general, but the soil that has been removed over the years and has been deposited outside the cleanup sites.
5. What effects of the site operations had on your business/property?
STL North County is the wasteland of St. Louis because of the dumping and lower income communities. Property values are lower than other sections of the region because of these practices. No one will admit this to be fact but, we all know it is true.
6. Do you think site operations have had an effect on the community? If so, what are they?
YES!! See the answer to the 5th question.
7. Are you aware of the community concerns regarding site operations and administration? If so, please provide details.
I think most are concerned more about property values, exposure, and health issues. Coldwater Creek just the facts Please, has documented higher cancer rate than the national averages. The ATSDR has reviewed our findings and will not confirm them but, they do not deny them.
8. Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?
Yes, I do not have any suggestions.
9. Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?
I would like to see you address the health aspect but it would only create panic. It is also not your responsibility.
10. Do you feel that FUSRAP has reached out to inform the community regarding the project operations?
Yes!! And you are doing a good job of it.

11. Do you feel well informed about FUSRAP?

Yes

12. Do you have any suggestions for how information concerning the sites should be distributed to the community?

I cannot think of anything that you are not doing.

13. Do you have any comments, suggestions, or recommendations regarding the site's operations or management?

NO

**2019 - 2020 COMMUNITY INTERVIEWS
for Five-Year Review**

Carrie Dickhans (St. Louis County Department of Public Health)

State and Local Governments:

Carrie Dickhans, Director

Division of Environmental Services St. Louis County Department of Public Health

How are you familiar with the St. Louis FUSRAP sites?

Relatively familiar

What is your overall impression of the project?

A significant project that is being done in an effective manner.

What contacts have you had with representatives from FUSRAP?

Community information meetings with the USACE. County DPH meetings with the USACE.

What are your current concerns about the site?

Disruptions to the residents during investigation and remediation activities. Potential long term health impacts for those with continued long-term exposure.

If applicable, what effects have site operations had on property owned by your organization?

Do you think site operations have had an effect on the community? If so, what are they?

Traffic disruptions, economic impact, lowered property values. In addition, there is a certain level of psychological impact evident with this type of remediation due to fear of health effects.

Have there been routine communications or activities conducted by your office at the FUSRAP site (site visits, inspections, reporting activities, etc.)?

If so, please give purpose and results.

We have not routinely conducted any inspections or had contact onsite with the remediation team.

Have there been any complaints, or other incidents related to the site requiring a response by your office? If so, please give details.

Not within the past 5 years since I have been in my current role with the department.

Do you currently have any unaddressed comments, suggestions, or recommendations regarding the site's management and operations?

More frequent informational meetings with the community and with County DPH officials would be helpful.

**2019 - 2020 COMMUNITY INTERVIEWS
for Five-Year Review**

Nora Estopare (MSD)

1. How are you familiar with the St. Louis FUSRAP sites?
MSD is familiar with the St. Louis FUSRAP sites through communication with the USACE. The SLAPS and SLDS sites are marked in our GIS system to alert MSD staff to contact the FUSRAP remedial managers when work activities need to be conducted within these boundaries.
2. What is your overall impression of the project?
The remedial approach is sound and has been well executed. The project has been complicated by Coldwater Creek contamination that has been carried out of the creek and deposited in surrounding areas during flooding events.
3. What contacts have you had with representatives from FUSRAP? Were they responsive to your concerns?
MSD has ongoing contact with the FUSRAP remedial managers under the terms of the Utility Support Agreement. FUSRAP representatives are responsive to MSD's requests for support.
4. Do you have any current concerns about the site? If so, what are they?
There are no current concerns about the site.
5. What effects of the site operations had on your business/property?
Extra steps are necessary for completing MSD work activities in the FUSRAP site boundaries.
6. Do you think site operations have had an effect on the community?
If so, what are they? Yes, the same effect that any construction project would have. Additionally, site operations have caused community concern for radiological contamination exposure.
7. Are you aware of the community concerns regarding site operations and administration?
If so, please provide details.
MSD is aware of the community concerns that are covered in news reports.
8. Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?
MSD receives the FUSRAP newsletter.
9. Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?
10. Do you feel that FUSRAP has reached out to inform the community regarding the project operations?

Ample information is available on the St. Louis Sites FUSRAP website, but MSD is uncertain to what extent additional efforts have been made by FUSRAP to inform the community regarding project operations.

11. Do you feel well informed about FUSRAP?

Yes, MSD has ongoing contact with the FUSRAP remedial managers under the terms of the Utility Support Agreement.

12. Do you have any suggestions for how information concerning the sites should be distributed to the community?

No suggestions

13. Do you have any comments, suggestions, or recommendations regarding the site's operations or management?

No suggestions

2019 - 2020 COMMUNITY INTERVIEWS for Five-Year Review

Erin Evans (ATSDR)

1. How are you familiar with the St. Louis FUSRAP sites?
ATSDR performed a public health assessment on the St. Louis Airport Site/ Hazelwood Interim Storage Site/ Futura NPL site in 1994. ATSDR became re-engaged in approximately 2015 at the request of the community. In 2019, ATSDR released the final version of another public health assessment focusing on recreational and residential exposures along Coldwater Creek.
2. What is your overall impression of the project?
ATSDR supports FUSRAP's continued investigation and cleanup of areas potentially affected by historical activities at the site, especially Coldwater Creek.
3. What contacts have you had with representatives from FUSRAP?
ATSDR regional staff participate in regular meetings with FUSRAP staff related to North County FUSRAP sites. FUSRAP staff provided data, site information to ATSDR regional and headquarters staff for ATSDR's latest activities, and took ATSDR staff on a site visit.
4. What are your current concerns about the site?
No data exist to characterize many miles of Coldwater Creek and its floodplain downstream from the historical former waste sites. ATSDR supports timely investigation and cleanup, if necessary, of these areas.
5. If applicable, what effects have site operations had on property owned by your organization?
Not applicable. ATSDR owns no property in the area.
6. Do you think site operations have had an effect on the community? If so, what are they?
Frequent, long-term exposure to site contaminants in recreational and residential areas along the creek may have increased the risk of certain types of cancer, especially in the past. Perception of continued risk adds stress and fear; this is why ATSDR supports timely investigation, cleanup, and communication of site findings to the community.
7. Have there been routine communications or activities conducted by your office at the FUSRAP site (site visits, inspections, reporting activities, etc.)? If so, please give purpose and results.
ATSDR regional staff participate in FUSRAP regulator calls and public meetings, as requested. ATSDR regional and headquarters staff participated in multiple non-routine public meetings and site visits during development and release of the 2019 public health assessment.
8. Have there been any complaints, or other incidents related to the site requiring a response by your office? If so, please give details.
ATSDR's recent public health assessment related to Coldwater Creek was initiated in response to concerns raised by the community. ATSDR received numerous public comments on the 2018 draft public health assessment which are published in the final report.

9. Do you currently have any unaddressed comments, suggestions, or recommendations regarding the site's management and operations?

ATSDR recommends that FUSRAP continue investigating and cleaning up Coldwater Creek sediments and floodplain soils to meet regulatory goals. To increase knowledge about contaminant distribution and allay community concerns, ATSDR recommends future sampling include

- areas reported to have received soil or sediment moved from the Coldwater Creek floodplain (such as fill used in construction)
- areas with possible soil or sediment deposited by flooding of major residential tributaries to Coldwater Creek
- indoor dust in homes where yards have been cleaned up or require cleanup
- sediment or soil remaining in basements that were directly flooded by Coldwater Creek in the past

ATSDR also recommends that authorities install signs to inform residents and visitors of potential exposure risks in areas around Coldwater Creek not yet investigated or remediated and that public health agencies continue to evaluate, to the extent possible, community concerns about exposure and educate the community about radiological exposures and health. We recognize all these recommendations may not be within FUSRAP authority.

**2019 - 2020 COMMUNITY INTERVIEWS
for Five-Year Review**

Dan Fuehn (Ameren)

How are you familiar with the St. Louis FUSRAP sites? I had 3 projects in 10 years

What is your overall impression of the project? Seems organized

What contacts have you had with representatives from FUSRAP? Kurtis and George
Were they responsive to your concerns? Yes

Do you have any current concerns about the site? no
If so, what are they?

What effects of the site operations had on your business/property?none

Do you think site operations have had an effect on the community?I don't know
If so, what are they?

Are you aware of the community concerns regarding site operations and administration?
If so, please provide details.no

Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?no

Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?no

Do you feel that FUSRAP has reached out to inform the community regarding the project operations?
I don't know

Do you feel well informed about FUSRAP? somewhat

Do you have any suggestions for how information concerning the sites should be distributed to the community?no

Do you have any comments, suggestions, or recommendations regarding the site's operations or management?no

2019 - 2020 COMMUNITY INTERVIEWS for Five-Year Review

Ben Grossman (Great Rivers Greenway)

How are you familiar with the St. Louis FUSRAP sites?

Familiar with the project site, but not with details of the project itself. Cleanup site is adjacent to the Mississippi Greenway: Riverfront Trail in which our organization is not the direct maintenance partner (St. Louis City is) but we do supplement maintenance of the facility.

What is your overall impression of the project?

Project had an impact on our trail as there was a detour for some time, today the project has no impact on our operation.

What contacts have you had with representatives from FUSRAP?

At the end of the project we had contact with representatives, when coordinating the removal of the detour barriers.

What are your current concerns about the site?

We have no concerns about the site, however we have no information or data as to potential risks associated with the site. We only know what we know.

If applicable, what effects have site operations had on property owned by your organization?

The cleanup/mitigation efforts caused a re-route of our trail system so users were temporarily detoured around the work area.

Do you think site operations have had an effect on the community? If so, what are they?

We are not aware of any impacts to the community.

Have there been routine communications or activities conducted by your office at the FUSRAP site (site visits, inspections, reporting activities, etc.)?

If so, please give purpose and results.

Routing visual inspections by park operations, not exclusive to the site but the 13 miles of trail along the riverfront in general.

Have there been any complaints, or other incidents related to the site requiring a response by your office? If so, please give details.

No.

Do you currently have any unaddressed comments, suggestions, or recommendations regarding the site's management and operations?

No.

2019 - 2020 COMMUNITY INTERVIEWS for Five-Year Review

Property Owner/Citizen #3

How are you familiar with the St. Louis FUSRAP sites? Yes – been aware for multiple decades

What is your overall impression of the project? My impression of the action taken on our HISS site has been completed with excellent communication, organization, with a good contracting firm and with a clear schedule with timely updates.

What contacts have you had with representatives from FUSRAP?

- 1) Josephine Wade COE
- 2) Tony Bryant – Shaw / APTIM

Were they responsive to your concerns?

Yes – Both responded all our past calls or emails. Very impressed working with Tony over the last ~10 years during the clean up process. Very accommodating to make sure that clean up process did not negatively impact the functions of our business.

Do you have any current concerns about the site? Some

If so, what are they? What do we as a property owner to with the remaining contamination that is under the buildings and around the perimeter of the building footings. We can probably never sell the property in the future. When we sell or wind down our businesses in the next 5-10 years – what do we do with the property.

What effects of the site operations had on your business/property? Our entire property was cleaned up over a 2+ year period of time. Our entire parking lot and trucking lanes were affected at some point. However, Shaw did a good job of accommodating our business and providing alternative options that kept things working. So while the clean up was definitely disruptive, the process was workable

Do you think site operations have had an effect on the community? Since our property is somewhat isolated, I am not sure how much the community is aware of our property and the process. If so, what are they?

Are you aware of the community concerns regarding site operations and administration? No
If so, please provide details.

Do you receive the FUSRAP Newsletter or attend any of the Public Meetings? We no longer get the Newsletter I guess since our property has been cleaned up, but we received it for years prior to that. I was very informative (even though we already had the notebooks outlining the plans and schedules.)

Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings? Nothing specific, it has been at least 2-4 years since we received the last newsletter.

Do you feel that FUSRAP has reached out to inform the community regarding the project operations?
Yes – between meetings and the newsletter and website – I think things were publicized adequately

Do you feel well informed about FUSRAP? I did during our clean up process

Do you have any suggestions for how information concerning the sites should be distributed to the community? I am not up to date with the present methods that currently being done. Are email campaigns being done?

Do you have any comments, suggestions, or recommendations regarding the site's operations or management? Keep up the present process – they were working during our process.

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Jeffrey Murl (DOE)

1. How are you familiar with the St. Louis FUSRAP sites?
I have been with DOE for 3 years and directly involved with St Louis Sites for 8 months. I have reviewed our historical documents and participated in site visits, annual meetings, and bimonthly calls.
2. What is your overall impression of the project?
I am impressed by the overall coordination between the USACE and property owners. This has led to opportunities to cleanup previously inaccessible soils and ultimately lowering the government's liabilities and long term costs. This also results in less effort for DOE to maintain the final remedy once the sites transfer, including less chance of having the USACE return to the site many years after transfer if inaccessible soils are exposed.
3. What contacts have you had with representatives from FUSRAP?
I have routine contact with FUSRAP representatives from site visits, annual meetings, and bimonthly calls. I feel like I can ask questions any time and get a prompt response.
4. What are your current concerns about the site?
DOE-LM is concerned that status of the FUSRAP cleanup is not being documented within city/county databases, i.e., the final status survey for each parcel is not recorded with the property deed. This would ensure property owners are informed about FUSRAP activities on the property regardless of future ownership. It would extinguish potential tort claims against the government by documenting UU/UE or LUC restrictions as private property owners sell and/or subdivide a property in the future.
5. If applicable, what effects have site operations had on property owned by your organization?
N/A
6. Do you think site operations have had an effect on the community? If so, what are they?
USACE coordinates activities with property owners and local governments to ensure that site operations have minimal effects. Without such communication, I can envision mass hysteria from owners not understanding the true risks.
7. Have there been routine communications or activities conducted by your office at the FUSRAP site (site visits, inspections, reporting activities, etc.)? If so, please give purpose and results.
DOE LM routinely participated in site visits, annual meetings, and bimonthly calls.
8. Have there been any complaints, or other incidents related to the site requiring a response by your office? If so, please give details.
No
9. Do you currently have any unaddressed comments, suggestions, or recommendations regarding the site's management and operations?

USACE should investigate recording the final status survey for each parcel with the city/county so that it runs with the property deed.

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Mark Nankivil (St. Louis Water Division)

How are you familiar with the St. Louis FUSRAP sites?

Our only location which we have had involvement in is the Mallinckrodt/Tyco site, specifically Destrehan Street from Hall to the east. WE had earlier involvement along Angelrodt but I beleive that was previous to this 5 year review.

What is your overall impression of the project?

Our involvement has been pretty basic and straightforward. The contractors and those overseeing the work have been professional and easy to work with.

What contacts have you had with representatives from FUSRAP?
Were they responsive to your concerns?

Our interaction has been at planning sessions prior to work being done and has been professional and quite satisfactory. Good people to work with.

Do you have any current concerns about the site?
If so, what are they?

None.

What effects of the site operations had on your business/property?
Nothing directly on a day to day basis. Long term issues regarding our underground facilities in the site are being addressed by the work that is ongoing.

Do you think site operations have had an effect on the community?
If so, what are they?

This is a rather isolated site/location and well away from residential housing. Other than with Mallinckrodt/Tyco employees and operations, any impact should be minimal to nonexistent.

Are you aware of the community concerns regarding site operations and administration?
If so, please provide details.

I am not directly aware of any community concerns.

Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?

I have not.

Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?

None.

Do you feel that FUSRAP has reached out to inform the community regarding the project operations?

Don't have any opinion or input on this.

Do you feel well informed about FUSRAP?

I do when it concerns Water Division facilities in the site.

Do you have any suggestions for how information concerning the sites should be distributed to the community?

None.

Do you have any comments, suggestions, or recommendations regarding the site's operations or management?

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Rebecca Roberts (Navarro/DOE contractor)

1. How are you familiar with the St. Louis FUSRAP sites?
I have worked on FUSRAP for approximately 15 years, nearly 10 of those were with the USACE verification contractor. Now, as a contractor for the Department of Energy (DOE) Office of Legacy Management (LM), our team will be responsible for the long-term stewardship of the St. Louis FUSRAP sites they transfer from USACE to LM.
2. What is your overall impression of the project?
The project managers at USACE have increased coordination with property owners and local government agencies to perform additional remediation and/or investigation as required to ensure that the amount of inaccessible soils remaining in place will be minimized prior to transfer to LM. These efforts show commitment to completion of the project with dedication to protection of human health and the environment.
3. What contacts have you had with representatives from FUSRAP?
As a contractor for LM, we have routine contact with FUSRAP representatives. The USACE FUSRAP program and project managers have been responsive to questions posed to them about the sites as well as to allowing LM representatives visit the sites as requested.
4. What are your current concerns about the site?
As the long-term steward of the FUSRAP sites, LM is concerned that status of the FUSRAP cleanup is not being documented within city/county databases, i.e., the final status survey for each parcel is not recorded with the property deed. This would ensure future property owners are not only informed about FUSRAP but also understand if there are any limitations to the use of their property.
5. If applicable, what effects have site operations had on property owned by your organization?
N/A
6. Do you think site operations have had an effect on the community? If so, what are they?
USACE coordinates activities with property owners and local governments to ensure that site operations have minimal effects.
7. Have there been routine communications or activities conducted by your office at the FUSRAP site (site visits, inspections, reporting activities, etc.)? If so, please give purpose and results.
LM routinely communicates with the USACE, attends USACE FUSRAP public meetings and performs annual site visits.
8. Have there been any complaints, or other incidents related to the site requiring a response by your office? If so, please give details.
No

9. Do you currently have any unaddressed comments, suggestions, or recommendations regarding the site's management and operations?
USACE should investigate recording the final status survey for each parcel with the city/county so that it runs with the property.

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Property Owner/Citizen #4

1. How are you familiar with the St. Louis FUSRAP sites?
Highly familiar with the St. Louis Airport site. Others a passing interest.
2. What is your overall impression of the project?
Professionally run; capable staff; project absolutely essential to public perception of health and safety
3. What contacts have you had with representatives from FUSRAP? Were they responsive to your concerns?
Interaction occurs near annually or more depending on need. FUSRAP reps have always been responsive to concerns. They display a willingness to find compromise on issues, but always remain focused on the program objective.
4. Do you have any current concerns about the site? If so, what are they?
None
5. What effects of the site operations had on your business/property?
No impact on aviation activity. Loss of potential revenue generation, but viewed as inconsequential when compared to value provided the general public.
6. Do you think site operations have had an effect on the community? If so, what are they?
Positive effect: the program is a clear display of commitment to public health and welfare.
Negative effect: a stigma – if the government allowed radioactive contamination to be readily scattered in the St. Louis region, what else awaits to be discovered.
7. Are you aware of the community concerns regarding site operations and administration?
If so, please provide details.
 - Long term community health risks due to prolonged exposure
 - Safety/security of contaminated product during transport to SLAPS
 - Future funding commitment for program completion
8. Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?
Newsletter received. Attendance at public meetings is nominal.
9. Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?
Discussion of safety features during product transport. Discussion about disposition of product at the disposal site.

10. Do you feel that FUSRAP has reached out to inform the community regarding the project operations?

The community involvement plan identifies fifteen (15) action activities that are in effect. The USACE convenes biannual public meetings/biannual newsletters/routine website updates. The program is achieving outreach.

11. Do you feel well informed about FUSRAP?

There is sufficient information available to make rational judgements and decisions.

12. Do you have any suggestions for how information concerning the sites should be distributed to the community?

None

13. Do you have any comments, suggestions, or recommendations regarding the site's operations or management?

None

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Property Owner/Citizen #5

1. How are you familiar with the St. Louis FUSRAP sites?
Founding member of the Coldwater Creek Group
2. What is your overall impression of the project?
Very pleased with the cleanup activities
3. What contacts have you had with representatives from FUSRAP?
Close contact through email and phone with Jo Anne Wade, Bruce Munholand over the past several years. Brief phone conversation with Scott Ross once.
4. Were they responsive to your concerns?
Bruce and Jo Anne have always been very responsive and helpful. However, we are very disappointed in the lack of communication from Scott Ross, and the disregard for several concerns that we brought forth to him as a group.
5. Do you have any current concerns about the site?
Yes
If so, what are they?
Biggest concern is lack of testing in the tributaries, which we believe may have been contaminated from past flooding. We fear that contamination may now be "land locked in several of these tributaries due to past MSD projects.
6. What effects of the site operations had on your business/property?
None
7. Do you think site operations have had an effect on the community? If so, what are they?
I believe that remediation is having an overall positive effect on the community
8. Are you aware of the community concerns regarding site operations and administration?
Yes
If so, please provide details.
Many residents do not understand the construction / testing process or that annual testing is limited based on project funding. As a group, we have tried to help educate the community, with some progress... unfortunately, there are many who are unwilling to listen to factual information
9. Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?
Yes, both when I can make it into town.

10. Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?

The biggest question we get from folks regarding FUSRAP are requests for updates on testing. Many folks only skim the newsletter, at best. It might be helpful to include a visual color coded picture of remediation activities along the creek in the newsletter or website that categorizes the various stages of the project (completed, current remediation, future remediation). It doesn't have to be too detailed, just something simple ... such as an AutoCAD layer over an imported map of the creek

11. Do you feel that FUSRAP has reached out to inform the community regarding the project operations?

I believe that FUSRAP does their best to inform the community during their semi-annual meetings. But beyond that, there has not been much community outreach. Given the volatile/emotional nature of the topic, and the incidents with public officials at past meetings, I believe that this is an acceptable public response. It would be nice to see an improved open line of communication between FUSRAP public relations and the oversight committee. I am not sure how frequently FUSRAP meets with city officials, but hopefully they receive a regular face to face update on ongoing activities.

12. Do you feel well informed about FUSRAP?

Yes

13. Do you have any suggestions for how information concerning the sites should be distributed to the community?

It is not easy to sign up for the newsletter. Is there a way to incorporate a form on your homepage where community members can sign up? Perhaps a monthly Q&A post on the Army Corps of Engineers facebook page? One comment we often receive from our community members when we direct them to your site is that they are not receiving call backs for their concerns. I imagine that there are times when FUSRAP receives a high volume of calls (especially after any news/ press releases)... this may be alleviated through more effective online communication with residents.

14. Do you have any comments, suggestions, or recommendations regarding the site's operations or management?

I think that overall, FUSRAP is doing a great job! Thank you for all that you have done to improve the overall wellbeing of the community. I would really like to see testing of some of the main tributaries and potentially a few areas where we know the creek was rerouted during subdivision construction and creek sediment was used in landscaping (ie., Wedgewood, Shoveltown, and Paddock Estates)

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Property Owner/Citizen #6

1. How are you familiar with the St. Louis FUSRAP sites?
I lived for 27 years in the SLAPS/HISS/Coldwater Creek/North County area, and am very familiar with the FUSRAP activity pertaining to this vicinity.
2. What is your overall impression of the project?
Overall, I am very satisfied with the level of scientific methodology/support and the FUSRAP North County STL team members themselves. I am pleased they take time to listen to community concerns and patiently answer questions. They return phone calls, emails, etc., and are easy to converse with about both technical and human-impact issues concerning the project.
3. What contacts have you had with representatives from FUSRAP? Were they responsive to your concerns?
I have spoken frequently with JoAnne Wade, Bruce Munholand, Angela Bonstead, former public relations personnel Amanda Kruse and Mike Petersen, and Jonathan Rankins. Yes, all individuals listed above were very responsive to my concerns and I commend them for a job very well done. Unfortunately, I did not experience the same professionalism from Scott Ross in public relations and was quite disappointed in his lack of communication and respect to the affected SLAPS/HISS/Coldwater Creek community.
4. Do you have any current concerns about the site? If so, what are they?
Yes, I have remaining concerns (but am thrilled with FUSRAP listening and acting on other concerns I raised with Sharon Cotner (*former FUSRAP North County sites Project Manager*) in 2012/2013 before FUSRAP planned to extensively test north of Highway 270). Remaining big concerns:
 - Despite what the Coldwater Creek watershed historical flooding data suggests (unsure of the former flood source data at this moment), myself and thousands of other present and former community members clearly remember creek flooding events where the creek flowed “backward” up several tributaries and flowed up into hundreds (or more) of local residential basements. In addition, during these flooding events water flooded external properties of some homes. (Some homes had both external and internal flooding, other homes had only internal basement flooding from the then-connected sewer and Coldwater Creek system which was later corrected with a federal multi-several hundred-million-dollar project authorized by U.S. Congress pushed by Lacey Clay Sr. in the 1990s. Note USACE did not participate in this project despite requests for their expertise due to their concern about the presence of radionuclides due to the nuclear weapons waste). These properties are not currently planned for contaminants of concern testing to my knowledge. Please know we

citizens have located numerous news articles and photos in old community newspapers supporting our reporting of the creek's extensive flooding. FUSRAP should consider the 50-year flood plain data instead of the 10-year flood plain data. The failure to consider the height of flooding history (before the above-referenced project occurred and corrected the flooding problems in order for the more recent flooding to not be as extensive) is extremely concerning to community members, as this extensive flooding occurred during the period of higher risk of possible exposure to contaminants of concern as found by the ATSDR in their Public Health Assessment finalized in 2018.

- We have federal US Govt satellite photos of the area from 1958 onward. One can easily see the massive amount of soil movement in the areas contiguous to the original creek path throughout the period of highest risk for possible exposure to contaminants of concern as recently reported by the ATSDR's Public Health Assessment finalized in 2018. Former builders and developers in the area report they filled dump trucks of the soil/sediment of Coldwater Creek (when the contaminants were flowing freely) as it was believed to be very fertile soil...and they deposited this soil to backfill homes in a few Florissant and Hazelwood subdivisions as well as other specified locations. Why is FUSRAP not testing these areas when the builder has specifically described where he knew the contaminated soil was moved to (unbeknownst at that time to contain anything dangerous)?
- The St. Louis Metropolitan Sewer District (MSD) was heavily involved in the Flooding Control project beginning in the 1990s mentioned above authorized by U.S. Congress as during the period of highest possibility of inhalation of contaminants of concern (per ATSDR) the sewer system was interlaced with Coldwater Creek. In looking at satellite images from the U.S. Govt immediately before and after the project, one can see the extensive movement and removal of large areas of soil/sediment in the creek, the creek banks, and creek contiguous properties. Metropolitan Sewer District oversaw much of this work with soil we know contained the contaminants of concern (per the Bruce Drive report and 1987/88 thorium 230 elevated report along the entire corridor of Coldwater Creek...citizens have copies of these reports). This quasi-governmental organization has failed to comply with FUSRAP requests for information. FUSRAP thus is unable to locate where these thousands of contaminated soil tons were moved during this project (FUSRAP did not opt to participate in due to their radionuclide presence concerns). It is my firm opinion this issue be elevated in order for MSD to comply and properly provide any records on this soil movement, especially as the ATSDR has reported the increased likelihood of developing cancer from exposure to the contaminants of concern in their PHA finalized in 2018.

5. What effects of the site operations had on your business/property?

None

6. Do you think site operations have had an effect on the community?

Yes

7. If so, what are they?

Some people were dubious of the operations due to the nature of what was allowed to occur in this community (regarding contaminants of concern) from 1947 until remediation began in the late 1990s. At this time, it seems most residents realize the remediation is a positive boost to their area (but only if the contaminants of concern are tracked down and removed from unaddressed areas in the Original Record of Decision workplan and scope....created before all of the flooding, soil movement, and creek/sewer reconfiguration projects were fully known and/or considered in the testing methodology).

8. Are you aware of the community concerns regarding site operations and administration? If so, please provide details.
No concerns to my knowledge at this moment. I have asked many questions over the years (I am a former auditor), and am very satisfied with the site operations.
9. Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?
Yes-both.
10. Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?
Please continue to provide detailed information on recent testing, recent remediation efforts in process, recent remediation efforts completed, etc.
11. Do you feel that FUSRAP has reached out to inform the community regarding the project operations?
Yes; however, I am disappointed media and local municipalities have not taken a more active role in communicating to the community when FUSRAP meetings take place, etc.
12. Do you feel well informed about FUSRAP?
Yes.
13. Do you have any suggestions for how information concerning the sites should be distributed to the community?
I am certain this is a sensitive topic due to budgetary constraints. Perhaps social media announcements (where comments are disabled), pamphlets for distribution at city offices, local announcement boards at places like Panera, and distribution to local houses of worship for inclusion in their weekly community bulletins to their members, and emails sent to all of the email addresses gathered over the years at meetings, etc.
14. Do you have any comments, suggestions, or recommendations regarding the site's operations or management?
I commend the dedicated FUSRAP employees I mentioned earlier. They carry out their mission and tasks well, and have built a level of trust with myself and many in the community who have had a difficult walk with health issues and deaths of loved ones possibly linked to the contaminants of concern exposure mentioned by the ATSDR in their finalized Public Health Assessment related to the materials FUSRAP is removing and areas being remediated. Very impressed with these individuals...I heartily thank them and wish them well for their service and devotion to this most important project!

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Matt Zimmerman (Manager, City of Hazelwood)

1. How are you familiar with the St. Louis FUSRAP sites?
Somewhat in Hazelwood. Very little in other communities.
2. What is your overall impression of the project?
It is a critically needed project to clean up dangerous soil and water in North County. I believe the Corp is taking all of the proper testing and remediation efforts as required.
3. What contacts have you had with representatives from FUSRAP?
I have met with the project coordinators, including Joann Wade, Jacob Prebianca, and Bruce Munholand. City staff, including myself, has met with the public affairs program managers, including Andrea Wales, to host community outreach and informational meetings. I have met with the Colonel for the St. Louis District at the informational meetings.
4. What are your current concerns about the site?
There are still hotspots in Hazelwood that I would like to see cleaned up. Also, the creek bed and sides are still not remediated.
5. If applicable, what effects have site operations had on property owned by your organization?
One City park had to be closed for several months. Several City streets were impacted by trucks removing material. But overall the impact has been minimal.
6. Do you think site operations have had an effect on the community? If so, what are they?
Some homes were affected on Palm Dr. as backyards were remediated. The City fully closed one park during remediation. Otherwise, the biggest impact was psychological as many residents expressed concerns about the impact of the radioactive materials on their health as well as the safety of the remediation plans. I am glad the ATSFd started attending meetings to discuss long-term health impacts from the original storage of radioactive materials. That seemed to help address a lot of the concerns.
7. Have there been routine communications or activities conducted by your office at the FUSRAP site (site visits, inspections, reporting activities, etc.)?
If so, please give purpose and results.
City crews inspected the restoration of grounds following completion of the remediation. The City was pleased with the restoration efforts.
8. Have there been any complaints, or other incidents related to the site requiring a response by your office? If so, please give details.
Residents on the east side of Coldwater Creek were blocked from crossing the bridge over the creek and into St. Cin Park during remediation. This caused a hardship as residents had to walk up to an extra mile during the closure. Also, the concerns expressed by residents as described in Question 6, which had a significant impact on the City's response during remediation. Otherwise, no other complaints or concerns were expressed.

9. Do you currently have any unaddressed comments, suggestions, or recommendations regarding the site's management and operations?
No.

**2019 - 2020 COMMUNITY INTERVIEWS
for Five-Year Review**

Property Owner/Citizen #7

1. How are you familiar with the St. Louis FUSRAP sites?
I am quite familiar with the FUSRAP sites since I followed the FUSRAP efforts as a representative of the St. Louis County Public Health Department for ~18 years prior to my retirement in 2016.
2. What is your overall impression of the project?
The main drawback to progress seems to continually be funding.
3. What contacts have you had with representatives from FUSRAP? Were they responsive to your concerns?
In the 'early years', I regularly attended the FUSRAP Oversight Committee meetings and staff were responsive and transparent. Since 2016, I haven't kept up with the project.
4. Do you have any current concerns about the site? If so, what are they?
My only concern was (is) the lack of funding which has delayed project completion.
5. What effects of the site operations had on your business/property?
N/A
6. Do you think site operations have had an effect on the community? If so, what are they?
Community members seem to be greatly concerned about exposure during their youth while growing up around (and playing in) Coldwater Creek. I believe that FUSRAP is trying to address those concerns in the only way that FUSRAP can – by characterizing and delineating the extent of contamination at this time and remediating it.
7. Are you aware of the community concerns regarding site operations and administration? If so, please provide details.
See response to 6th question above.
8. Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?
I receive (and read) the FUSRAP Newsletter but I no longer attend Public Meetings.
9. Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?
Not at this time.
10. Do you feel that FUSRAP has reached out to inform the community regarding the project operations?
I can't speak about current efforts but I do believe that FUSRAP did inform the community when I was more involved.
11. Do you feel well informed about FUSRAP?
I believe that I am (was) informed as much as I could have been.

12. Do you have any suggestions for how information concerning the sites should be distributed to the community?

No further suggestions.

13. Do you have any comments, suggestions, or recommendations regarding the site's operations or management?

Not at this time.

**2019 - 2020 COMMUNITY INTERVIEWS
for Five-Year Review**

Property Owner/Citizen #8

1. How are you familiar with the St. Louis FUSRAP sites?
As a former resident, I grew up along Coldwater Creek. I became aware of the FUSRAP sites in 2011.
2. What is your overall impression of the project?
I have many mixed feelings on the project. While I am thankful for clean up activities, I wish the project could move faster.
3. What contacts have you had with representatives from FUSRAP? Were they responsive to your concerns?
I have had many contacts with FUSRAP representatives through the years. In the beginning of my involvement (2011) FUSRAP, as well as other agencies, were not very responsive. This changed over time when contamination was found in residential areas. FUSRAP became much more responsive to community concerns when it was discovered contamination was present in residential areas and the clean up program was expanded to include the entire length of the creek. Over the past year or so; however, there has been some changing of the guard and communication between FUSRAP and the community has not been as open as it has been in the past; specifically with the FUSRAP PR department. Thankfully, there are other FUSRAP team members I can call that are very responsive to community questions/concerns.
4. Do you have any current concerns about the site? If so, what are they?
My main concern at this time is testing of the tributaries of Coldwater Creek. Unlike the main channel that washes out to the river, the tributaries dead end. I believe there is potential for contamination to be present in the tributaries and I would like the tributaries to be tested. I am hopeful that funding will become available to expand testing to tributaries in the future.
5. What effects of the site operations had on your business/property?
As a former resident that grew up along Coldwater Creek and spent much of my childhood playing in the creek; effects are more health related than business/property related.
6. Do you think site operations have had an effect on the community? If so, what are they?
Effects of the site for people who lived/grew up here during time of maximum exposure are immense. The exposure to nuclear weapons waste that sat out in the open next to the creek for decades has impacted the health of generations of community members. Countless loved ones have been taken from their friends and family too soon. I believe current site operations, although necessary, do have an impact on the community. When people in the community have lost so much, it's not a very comforting sight when we see you all in your moon suits.

7. Are you aware of the community concerns regarding site operations and administration? If so, please provide details.
Yes. I am an admin for the Facebook group Coldwater Creek Just the Facts. Many community concerns are posted daily to our facebook.
8. Do you receive the FUSRAP Newsletter or attend any of the Public Meetings?
Yes.
9. Is there any information or topics you think would be helpful to cover in the newsletter or at the public meetings?
I know this has been covered several times but I think it is important to regularly cover the soil testing/grid sampling process. Outsiders and “independent scientists” have descended upon the community offering such things as sticking a geiger counter in people’s soil for the low price of \$1200. Unfortunately, as with any tragedy, there are people looking to take advantage of others in this situation. I believe if people understand the process they are less likely to be taken advantage of by outsiders looking to make a buck.
10. Do you feel that FUSRAP has reached out to inform the community regarding the project operations?
For several years FUSRAP has reached out to inform the community and it has been satisfactory. When Mike Petersen and Amanda Kruse were with the FUSRAP St. Louis office, communication between FUSRAP and the community was at a very high point. It actually exceeded my expectations. Since their departure, communication has come to a screeching halt. About a year ago, a FUSRAP representative took part in a stunt, in which there was a lot of Creek community bashing. It was unwarranted, unprofessional and so far removed from the level of service I have come to expect from USACE. Unfortunately, I believe the relationship with this particular department of FUSRAP is beyond repair in its current state. I am hopeful this can be rectified in the future.
11. Do you feel well informed about FUSRAP?
Yes.
12. Do you have any suggestions for how information concerning the sites should be distributed to the community?
I am not sure if there is anything beyond distributing newsletters, keeping the website up-to-date and holding regular meetings that can be done.
13. Do you have any comments, suggestions, or recommendations regarding the site’s operations or management?
Please find a way to test the tributaries.

APPENDIX C
ADMINISTRATIVE RECORD LOCATIONS

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APPENDIX C

ADMINISTRATIVE RECORD LOCATIONS

St. Louis Public Library, Government Information Section

Mr. Jason Sutterfield (view by appointment)

1302 Olive Street, St. Louis, MO 63103

Telephone: (314) 539-0375

Email: jsutterfield@slpl.org

The FUSRAP administrative record files and the Administrative Records on CD may be viewed by appointment at the library. Please contact Mr. Sutterfield at least one day in advance of your visit.

U.S. Army Corps of Engineers, FUSRAP Project Office

U.S. Army Corps of Engineers (USACE)

114 James S. McDonnell Blvd., Hazelwood, MO 63042-3102

Telephone: (314) 260-3905 (by appointment only)

Email: STLFUSRAP@usace.army.mil

USACE Electronic Reading Room

www.mvs.usace.army.mil/Missions/FUSRAP/

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APPENDIX D
KEY POINTS OF CONTACT

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APPENDIX D KEY POINTS OF CONTACT

U.S. SENATE

Roy Blunt (R)

260 Russell Senate Office Building, Washington, DC 20510

Telephone: (202) 224-5721, Contact: www.blunt.senate.gov/public/index.cfm/contact-roy

St. Louis Office:

Thomas F. Eagleton U.S. Courthouse

111 South 10th Street, Suite 23.305, St. Louis, MO 63102

Telephone: (314) 725 4484

Josh Hawley (R - MO)

212 Russell Senate Office Building, Washington, DC 20510

Telephone: (202) 224-6154, Contact: www.hawley.senate.gov/contact-senator-hawley

St. Louis Office: 111 South 10th Street, Suite 23.305, St. Louis, MO 63102

Telephone: (314) 354-7060; Fax: (314) 436-8534

U.S. HOUSE OF REPRESENTATIVES

District 1 (St. Louis Downtown Site, St. Louis Airport Site, SLAPS Vicinity Properties (VPs), Hazelwood Interim Storage Site/Latty Avenue VPs): William Lacy Clay, Jr. (D)

2428 Rayburn House Office Building, Washington, DC 20515

Telephone: (202) 225-2406; Fax: (202) 226-3717, Contact: www.lacyclay.house.gov

St. Louis Office: 111 S. 10th Street, Suite 24.344, St. Louis, MO 63102

Telephone: (314) 367-1970; Fax: (314) 367-1341

District 2 (St. Louis Area): Ann Wagner (R)

2350 Rayburn Office Building, Washington, DC 20515

Telephone: (202) 225-1621, Contact: www.wagner.house.gov

Ballwin Office: 301 Sovereign Court, Suite 201, Ballwin, MO 63011

Telephone: (636) 779-5449

District 3 (St. Louis Area): Blaine Luetkemeyer (R)

2230 Rayburn House Office Building, Washington, DC 20515

Telephone: (202) 225-2956; Fax: (202) 225-5712, Contact: www.luetkemeyer.house.gov

Jefferson City Office: 2117 Missouri Boulevard, Jefferson City, MO 65109

Telephone: (573) 635-7232; Fax: (573) 635-8347

MISSOURI SENATE: State Capitol Bldg., Jefferson City, MO 65101, Contact: www.senate.mo.gov

5th District (St. Louis City): Jamilah Nasheed (D)

201 W Capitol Ave., Rm. 330, Jefferson City, Missouri 65101

Telephone: (573) 751-4415, Contact: Jamilah.Nasheed@senate.mo.gov

7th District (Hazelwood, Bridgeton, Chesterfield, Champ, Maryland Heights, Country Life Acres, Ballwin, Ellisville, and Clarkson Valley): VACANT

13th District (Florissant, Spanish Lake CDP, Bellefontaine Neighbors, Riverview):

Gina Walsh (D)

201 W Capitol Ave., Rm. 333, Jefferson City, Missouri 65101

Telephone: (573) 751-2420; FAX: (573) 751-1598, Contact: Gina.Walsh@senate.mo.gov

14th District (Berkeley, Ferguson, Calverton Park, Charlack, Norwood Court, Normandy, Pagedale, University City, Pine Lawn): Brian Williams (D)

201 W Capitol Ave., Rm. 425, Jefferson City, Missouri 65101

Telephone: (573) 751-4106

District Office: 7300 Dartmouth Ave, Suite 200, St. Louis, MO 63130

U.S. ARMY CORPS OF ENGINEERS

Formerly Utilized Sites Remedial Action Program (FUSRAP) Project Office,

St. Louis District/FUSRAP Area Office

114 James S. McDonnell Blvd., Hazelwood, MO 63042

Telephone: 314-260-3905, Contact: STLFUSRAP@usace.army.mil

U.S. Department of Energy, Office of Legacy Management

1000 Independence Avenue, SW, Washington, DC 20585

Telephone: (202) 586-7550; Fax: (202) 586-8403, Contact: LM@hq.doe.gov

STATE GOVERNOR

Michael L. Parson (R)

P.O. Box 720, Jefferson City, MO 65102

Telephone: (573) 751-3222; Fax: (573) 751-1495, Contact: governor.mo.gov

MISSOURI HOUSE OF REPRESENTATIVES

58th District (St. Louis City): David Wood (R)

201 West Capitol Avenue, Room 112, Jefferson City MO 65101

Telephone: (573)-751-2077, Contact: David.Wood@house.mo.gov

61st District (St. Louis City): Aaron Griesheimer (R)

201 West Capitol Avenue, Room 116-1, Jefferson City, MO 65101

Telephone: (573)-751-6668, Contact: Aaron.Griesheimer@house.mo.gov

70th District (Berkeley, Jennings): Paula Brown (D)

201 West Capitol Avenue, Room 106-A, Jefferson City, MO 65101

Telephone: 573-751-4163, Contact: Paula.Brown@house.mo.gov

74th District (Florissant): Michael Person (D)

201 West Capitol Avenue, Room 109 I, Jefferson City, MO 65101

Telephone: (573) 751-4726, Contact: Mike.Person@house.mo.gov

75th District (Florissant): Alan Gray (D)

201 West Capitol Avenue, Room 105 F, Jefferson City, MO 65101

Telephone: (573) 751-5538, Contact: Alan.Gray@house.mo.gov

76th District (Hazelwood): Chris Carter (D)

201 West Capitol Avenue, Room 105 E, Jefferson City, MO 65101

Telephone: (573) 751-7605, Contact: Chris.Carter@house.mo.gov

78th District (Hazelwood, Bridgeton): Rasheen Aldridge (D)

201 West Capitol Avenue, Room 135 BB, Jefferson City, MO 65101

Telephone: (573) 751-2383, Contact: Rasheen.Aldridge@house.mo.gov

79th District (Maryland Heights): LaKeySha Bosley (D)

201 West Capitol Avenue, Room 101 H, Jefferson City, MO 65101

Telephone: (573) 751-6800, Contact: LaKeySha.Bosley@house.mo.gov

80th District (Calverton Park, Ferguson): Peter Merideth (D)

201 West Capitol Avenue, Room 101 K, Jefferson City, MO 65101

Telephone: (573) 751-6736, Contact: Peter.Merideth@house.mo.gov

81st District (Spanish Lake): Steve Butz (D)

201 West Capitol Avenue, Room 106 B, Jefferson City, MO 65101

Telephone: (573) 751-0438, Contact: Steve.Butz@house.mo.gov

REGULATORY CONTACTS

Missouri Department of Natural Resources: Carol S. Comer, Director

P.O. Box 176, Jefferson City, MO 65102

Telephone: 800-361-4827; 573-751-3443, Contact: contact@dnr.mo.gov

Missouri Department of Health: Randall W. Williams, MD, FACOG, Director

912 Wildwood, PO Box 570, Jefferson City, MO 65102-0570

Telephone: (573) 751-6001, Contact: info@health.mo.gov

U.S. Environmental Protection Agency Region VII, Superfund and Emergency Management Division: James B. Gulliford, Regional Administrator

11201 Renner Blvd., Lenexa, KS 66219

Telephone: (913) 551-7003, Toll free: (800) 223-0425

Mary Peterson, Director, Superfund and Emergency Management Division

11201 Renner Blvd., Lenexa, KS 66219

Telephone: (913) 551-7003; Toll free: (800) 223-0425

Federal Emergency Management Agency: Paul J. Taylor, Region VII Administrator

Telephone: 816-283-7061, Contact: FEMARegion7info@fema.dhs.gov

Agency for Toxic Substances and Disease Registry:

Erin Evans, Environmental Health Scientist, Region VII Director

Telephone: (913) 551-1311, Contact: isb5@cdc.gov

LOCAL

City of St. Louis

City Hall, 1200 Market Street, St. Louis, MO 63103

Telephone: (314) 622-4800

The city of St. Louis is governed by a mayor and board of aldermen. The mayor is the chief executive, and the 28-member board (elected from wards; Wards 4 and 12 are currently vacant) is the legislative body. The Airport Authority is an independent agency that is part of the city government.

Mayor: Lyda Krewson; Telephone: (314) 622-3201

President of Board of Aldermen: Lewis Reed; Telephone: (314) 622-4114

Board of Aldermen: Sharon Tyus, Lisa Middlebrook, Brandon Bosley, Tammika Hubbard, Christine Ingrassia, Jack Coatar, Annie Rice, Dan Guenther, Joseph Vollmer, Sarah Martin, Beth Murphy, Carol Howard, Megan E. Green, Tom Oldenburg, Joseph D. Roddy, Jesse Todd, Marlene E. Davis, Cara Spencer, John Collins-Muhammad, Jeffrey L. Boyd, Joseph Vaccaro, Bret Narayan, Shane Cohn, Shameem Clark Hubbard, Pam Boyd, Heather Navarro

Public Safety Director: Jimmie Edwards

1200 Market Street; City Hall, Room 401, St. Louis, MO 63103

Telephone: (314) 622-3391; Fax: 622-4392

Comptroller: Darlene Green

City Hall, Room 212, St. Louis, MO 63103-2875

Telephone: (314) 622-4389; Fax: (314) 622-4026

St. Louis Department of Health: Fredrik L. Echols, M.D., Director of Health

1520 Market Street, Room 4051, St. Louis, MO 63178

Telephone: (314) 657-1528; (314) 612-5100; Fax: (314) 612-5105

Director of Airports: Rhonda Hamm-Niebruegge, Lambert-St. Louis International Airport

P.O. Box 10212, St. Louis, MO 63145-0212

Telephone: (314) 426-8000

City of Hazelwood

City Hall, 415 Elm Grove Lane, Hazelwood, MO 63042-1917

Telephone: (314) 839-3700

The city of Hazelwood is governed by a council/city manager system. The nine-member council consists of eight members elected from wards and a mayor elected at large.

Mayor: Matthew G. Robinson

723 Bellflower Drive, Hazelwood, MO 63042

Telephone: (314) 839-3700, Contact: mgrobinson@hazelwoodmo.org

City Council: Carol A. Stroker, Robert M. Aubuchon, Don Ryan, Tyler J. Wilson, Russell Todd, Warren H. Taylor, Rosalie M. Hendon, Mary G. Singleton

City Manager: Matthew Zimmerman

Telephone: (314) 513-5010; Contact: mdzimmerman@hazelwoodmo.org

City Clerk: Christine Thomas

Telephone: (314) 513-5020; Contact: cathomas@hazelwoodmo.org

City of Berkeley

City Hall, 8425 Airport Rd, Berkeley, MO 63134

Telephone: (314) 524-3313; Fax: (314) 264-2072

The city of Berkeley is a constitutional charter city council/manager form of government. The seven-member council consists of five members elected from wards, one member elected at large, and a mayor elected at large.

Mayor: Theodore Hoskins

Contact: hoskinst@ci.berkeley.mo.us

City Council: Margaret "Margo" Greene, Emmalene Mitchell, Brenda F. Williams, Lee Etta Hoskins, Willie Mae Anthony, Elias Hindeleh

City Manager: Debra M. Irvin

Telephone: (314) 524-3313; Contact: irvin@ci.berkeley.mo.us

City Clerk: Deanna Jones

Telephone: (314) 524-3313 ext. 3756

City of Florissant

City Hall, 955 Rue St. Francois, Florissant, MO 63031

Telephone: (314) 921-5700

The city of Florissant is governed by a council/mayor system. The council consists of nine members elected from wards and a mayor elected at large.

Mayor: Timothy J. Lowery; Email: tlowery@florissantmo.com

City Council: Andrew Harris, Paul Manganelli, Joseph Eagan, Jeff Caputa, Keith Schildroth, Gerard Henke, Jackie Pagano, Robert Parson, Jr., Tommy Slam

City Clerk: Karen Goodwin

Telephone: (314) 839-7630; Contact: kgoodwin@florissantmo.com

County of St. Louis

County Government Center, 41 South Central, Clayton, MO 63105

Telephone: (314) 615-5000, Contact: <https://www.stlouisco.com>

The county of St. Louis is governed by an elected county executive and a county council. The council consists of seven members elected from districts.

County Executive: Sam Page, M.D.

County Council Chairperson: Lisa Clancy

County Council: Rita Heard Days, Kelli Dunaway, Tim Fitch, Rochelle Walton Gray, Lisa Clancy, Ernie Trakas, Mark Harder

County Circuit Clerk: Joyce M. Gilmer

Telephone: (314) 615-8029

Department of Public Health: 6121 North Hanley Road, Berkeley, MO 63134

Telephone: (314) 615-1600

Chairman, Department of Public Health Advisory Board: Ravi Johar, M.D.

Environmental Services: Telephone: (314) 615-1698

Environmental Administration: Telephone: (314) 615-1698

NEWS MEDIA FOR ST. LOUIS AREA SITES

Newspapers

St. Louis Post-Dispatch

901 N. 10th Street, St. Louis, MO 63101

Telephone: (314) 340-8000; Website: www.stltoday.com

Suburban Journals of Greater St. Louis

901 N. 10th Street, St. Louis, MO 63101

Telephone: (314) 340-8000; Website: www.stltoday.com

Riverfront Times

308 N. 21st Street, Suite 300, St. Louis, MO 63103

Telephone: (314) 754-5966; Website: www.riverfronttimes.com

The Independent News

25 St. Anthony Lane, Florissant, MO 63031

Telephone: (314) 831-4645; Fax: (314) 831-4566; Website: www.flovalleynews.com

St. Louis Business Journal

Old Post Office, 815 Olive St., Suite 100, St. Louis, MO 63101

Telephone: (314) 421-6200; Fax: (314) 621-5031; Website: www.bizjournals.com

Television

KMOV-TV (CBS, Channel 4)

One Memorial Drive, St. Louis, MO 63102

Telephone: (314) 621-4444; Website: www.kmov.com

FOX 2 / KPLR 11 (CW affiliate, Channel 11)

2250 Ball Drive, St. Louis, Missouri 63146

Telephone: (314) 213-7831; Website: www.fox2now.com

WSDK Five on Your side (NBC, Channel 5)

1000 Market Street, St. Louis, MO 63101

Telephone: (314) 421-5055; Website: www.ksdk.com

KTVI-TV (FOX Channel 2)

2250 Ball Drive, St. Louis, Missouri 63146

Telephone: (314) 213-7831; Website: www.fox2now.com

Radio

Entercom Communications Corp. | St. Louis' News Radio KMOX (AM 1120)

1220 Olive Street, 3rd Floor, St. Louis, MO 63103

Telephone: (314) 621-2345; Fax: 314-588-1234; Website: www.kmox.radio.com

KWMU St. Louis Public Radio

3651 Olive Street, St. Louis, MO 63108

Telephone: (314) 516-5968; Website: www.stlpublicradio.org

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APPENDIX E
LIST OF ACRONYMS

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APPENDIX E
ACRONYMS FOR ST. LOUIS FUSRAP CIP

AEC	Atomic Energy Commission
ATSDR	Agency for Toxic Substances and Disease Registry
BNSF	Burlington Northern Santa Fe
CA	Cost Analysis
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	Community Involvement Plan
DOE	U.S. Department of Energy
E	East
EE	Engineering Evaluation
EH	East Half
EPA	U.S. Environmental Protection Agency
FFA	Federal Facilities Agreement
FS	Feasibility Study
FSSE	Final Status Survey Evaluation
FUSRAP	Formerly Utilized Sites Remedial Action Program
Futura	Futura Coatings Company
HISS	Hazelwood Interim Storage Site
IDOT	Illinois Department of Transportation
ISOU	Inaccessible Soil Operable Unit
LTS	Long-Term Stewardship
MDNR	Missouri Department of Natural Resources
MED	Manhattan Engineer District
MODOT	Missouri Department of Transportation
MOU	Memorandum of Understanding
MSD	Metropolitan St. Louis Sewer District
N	North
NCP	National Oil and Hazardous Substances Pollution Contingency Plan

NPL	National Priorities List
PDI	Pre-Design Investigation
PDIR	Pre-Design Investigation Report
PP	Proposed Plan
PRAR	Post-Remedial Action Report
UO2	uranium oxide
RI	Remedial Investigation
ROD	Record of Decision
S	South
SLAPS	St. Louis Airport Site
SLDS	St. Louis Downtown Site
SLSRTF	St. Louis Sites Remediation Task Force
USACE	U.S. Army Corps of Engineers
VP	Vicinity Property
W	West
WH	West Half

APPENDIX F
GLOSSARY OF TERMS

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APPENDIX F GLOSSARY OF TERMS

A

Administrative Record - The collection of documents that forms a basis of the agency cleanup decision. The administrative record will include significant comments received during the public review/comment period.

Administrative Record File - A temporary file that is maintained with all available information. The Administrative Record File documents current progress and provides the public with current data for the St. Louis Sites. It is available for public review and comment.

Action Memorandum - a concise written record of the selection and approval of a removal action. It describes the site's history, current activities, and health and environmental threats; outlines the action, cleanup levels (if applicable), and estimated costs; and documents approval of the proposed action by the proper Headquarters or Regional authority.

alpha radiation - The most energetic but least penetrating form of radiation. It can be stopped by a sheet of paper and cannot penetrate human skin. However, if an alpha-emitting isotope is inhaled or ingested, it will cause highly concentrated local damage.

ARARs - Applicable or relevant and appropriate requirements (federal and state environmental standards).

B

baseline risk assessment - The study and estimation of risk from taking no action. Involves estimates of probability and consequence.

beta radiation - High-energy electrons (beta particles) emitted from certain radioactive material. Can pass through 1 to 2 centimeters of water or human flesh and can be shielded against by a thin sheet of aluminum. Beta particles are more deeply penetrating than alpha particles but, because of their smaller size, cause less localized damage.

C

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act (also known as Superfund), the federal law that guides cleanup of hazardous waste sites. A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The act created a special tax that goes into a trust fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites.

characterization - Facility or site sampling, monitoring, and analysis activities to determine the nature and extent of a release. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

cleanup - The general term for environmental restoration, the process designed to ensure that risks to the environment and to human health and safety from waste sites either are eliminated or reduced to prescribed, safe levels.

community involvement - Activities required by CERCLA to strengthen communications with interested parties at cleanup sites.

D

decay - The process whereby radioactive particles undergo a change from one form, or isotope, to another, releasing radioactive particles and/or energy.

decay product - An element formed by the radioactive decay of another element; decay products are often radioactive themselves.

decontamination - The removal of unwanted material (typically, radioactive material) from facilities, soil, or equipment by washing, chemical action, mechanical cleansing, or other techniques.

E

EE/CA - An engineering evaluation/cost analysis is an activity performed as part of the CERCLA process that evaluates technically and administratively feasible alternatives to clean up a site.

environmental restoration - The process of environmental cleanup designed to ensure that risks to the environment and to human health and safety from waste sites either are eliminated or reduced to prescribed, safe levels.

erosion control - Methods to control land surface features to prevent erosion by surface water or precipitation runoff.

exposure - A measurement of the displacement of electrons from atoms caused by x-rays or by gamma radiation. Acute exposure generally refers to a high level of exposure of short duration; chronic exposure is lower-level exposure of long duration.

F

FFA - Federal Facility Agreement, an agreement signed in 1990 between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) outlining cleanup measures to be undertaken for the St. Louis Sites.

FS - Feasibility study, the Superfund study following a remedial investigation that identifies, develops, evaluates, and selects remedial action alternatives.

G

gabion wall - Anti-erosion construction of rock-filled, wire baskets.

gamma rays - Penetrating electromagnetic waves or rays emitted from nuclei during radioactive decay, similar to x-rays. Dense materials such as concrete and lead are used to provide shielding against gamma radiation.

groundwater - Water beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. Groundwater is a major source of water for agricultural and industrial purposes and is an important source of drinking water for about half of all Americans.

H

haul road - A road once used to haul materials from one of the St. Louis Sites to another.

I

interim removal action - A cleanup measure performed to protect human health and the environment. Performed before final, comprehensive cleanup actions.

ISOU - Inaccessible Soil Operable Unit includes inaccessible soil, sewers, buildings, and other permanent structures that will be addressed under a CERCLA action. The ISOU was excluded from the scope of the SLDS Record of Decision in 1998 because inaccessible soil did not present a significant threat in its current configuration. USACE subdivided the areas included in the ISOU into two groups: Group 1 and Group 2.

N

NCP - National Oil and Hazardous Substances Contingency Plan, the blueprint for implementing CERCLA, which specifies that cleanup remedies must protect human health and the environment. Remedies must also comply with all federal and state environmental standards.

NPL - National Priorities List, the list of the nation's worst Superfund sites. The St. Louis Airport Site (SLAPS) and the Latty Avenue properties were added to the NPL in October 1989.

P

PDIR/FSSE - Pre-Design Investigation Report/Final Status Survey Evaluations, a report on the findings of surveys that verify that the site meets ROD goals for properties not requiring remedial action.

pitchblende - An ore that contains small quantities of uranium.

PP - Proposed plan, a CERCLA document on which the public comments that summarizes what cleanup remedy has been selected and why.

PRAR/FSSE - Post Remedial Action Report/Final Status Survey Evaluation, a report on the findings of surveys that verify that the site meets ROD goals for properties requiring remedial action.

preliminary assessments - There are historical record reviews of activities at the site that are used to determine the probability of likely locations of hazardous waste disposal areas and that initially establishes the extent of contamination.

R

risk assessment - The study and estimation of risk from a current or proposed activity. Involves estimates of the probability and consequence of an action.

radiation - The emission and propagation of energy, examples of which include sound, heat, or radioactive energy.

radioactive - Giving off, or capable of giving off, radiant energy in the form of particles (alpha or beta radiation) or rays (gamma radiation) by the spontaneous disintegration of the nuclei of atoms. Radioisotopes of elements lose particles and energy through the process of radioactive decay. Elements can decay into different atoms or a different state of the same atom.

radium - Radioactive element with half-life of 1,620 years; highly toxic, water-soluble metal; one of the decay products of uranium; used in medicine, industrial radiography, and as a source of neutrons and radon.

raffinate - The portion of a liquid mixture that remains undissolved.

remedial action - Long-term cleanup activities.

remedial design - A phase of remedial action that follows the remedial investigation/feasibility study and includes development of engineering drawings and specifications for a site cleanup.

remediation - Those activities performed to remove or treat hazardous waste sites or to relieve their effects.

removal action - Short-term response intended to protect people from immediate threats posed by hazardous waste sites. Examples include excavating contaminated soil, erecting a security fence, or stabilizing a berm, dike, or an impoundment.

response action - A short-term removal action or a long-term remedial response, authorized under CERCLA, to address a release or threat of release of a hazardous substance.

Responsiveness Summary - A summary of oral and/or written public comments received during a comment period on key FUSRAP documents, and USACE's response to those comments.

RI - Remedial investigation, the CERCLA process of determining the extent of hazardous substance contamination and, as appropriate, conducting treatability investigations.

RI/FS - Two distinct, but related studies, the remedial investigation and feasibility study. Together, they characterize environmental problems and outline remedial actions to solve those problems.

ROD - Record of decision, a written decision that identifies the selected method for long-term cleanup of contamination at a site.

S

site closeout - Stage at which the site is inspected by the U.S. Environmental Protection Agency (EPA) to confirm the complete remediation of the contamination.

site evaluation - A physical inspection of the site to verify information obtained during the preliminary assessments.

T

thorium - Radioactive element; soft, heavy metal, insoluble in water but soluble in acids; one of the decay products of uranium; used in the manufacturing of sunlamps and as a potential source of nuclear energy.

treatment - Any activity that alters the chemical or physical nature of a waste to reduce its toxicity or prepare it for disposal.

U

uranium - The heaviest element found in nature. Approximately 997 out of every 1,000 uranium atoms are uranium-238. The remaining three atoms are the fissile uranium-235. The uranium-235 atom splits, or fissions, into lighter elements when its nucleus is struck by a neutron.

W

watershed - The drainage area of a stream.

APPENDIX G
FACT SHEETS ISSUED TO DATE

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**US Army Corps
of Engineers®**
St. Louis District

St. Louis Sites Fact Sheet

RIGHT OF ENTRY



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.

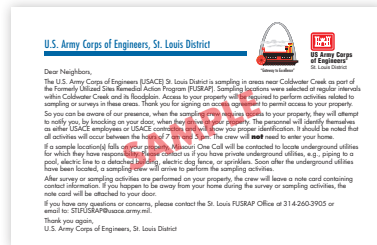
WHAT IS A RIGHT OF ENTRY?

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.

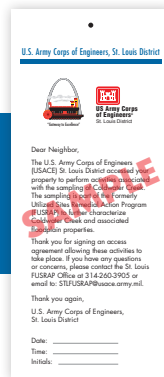
WHEN WILL USACE SEEK A RIGHT OF ENTRY? HOW LONG DOES IT LAST?

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.



Postcard Sent to Residents



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.

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.



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.



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MARSSIM-BASED SAMPLING



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.



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ENVIRONMENTAL MONITORING PROGRAM



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>.



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RISK ASSESSMENT



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:

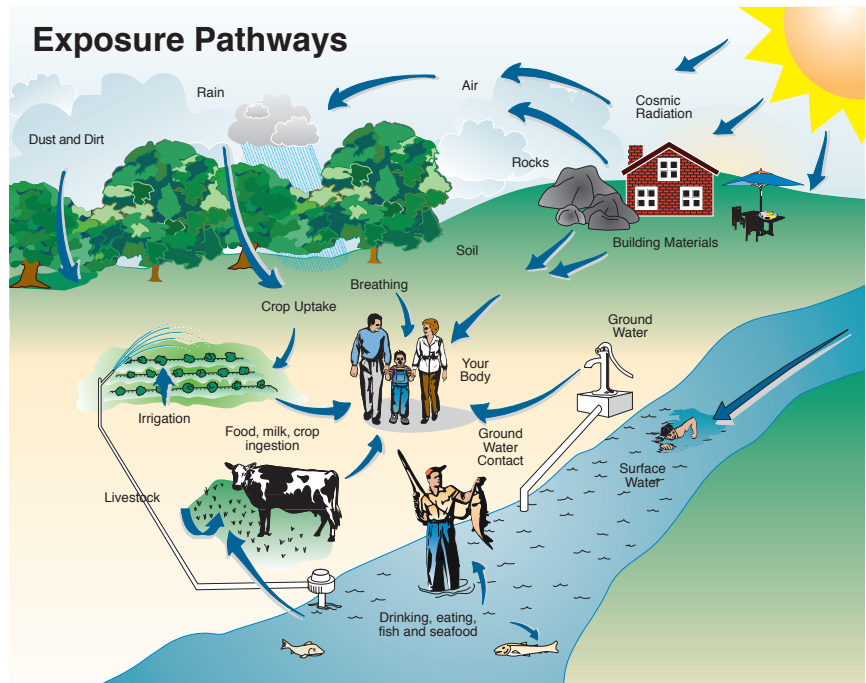
- Problem Formulation - identifies specific chemicals, animal, and plant species at a site, measures chemical levels present, and whether or not chemicals are moving off the site.
- Analyses - calculates how animals and plants might be exposed to site contaminants, at what levels, and over how many years 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.
- 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.



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.

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.

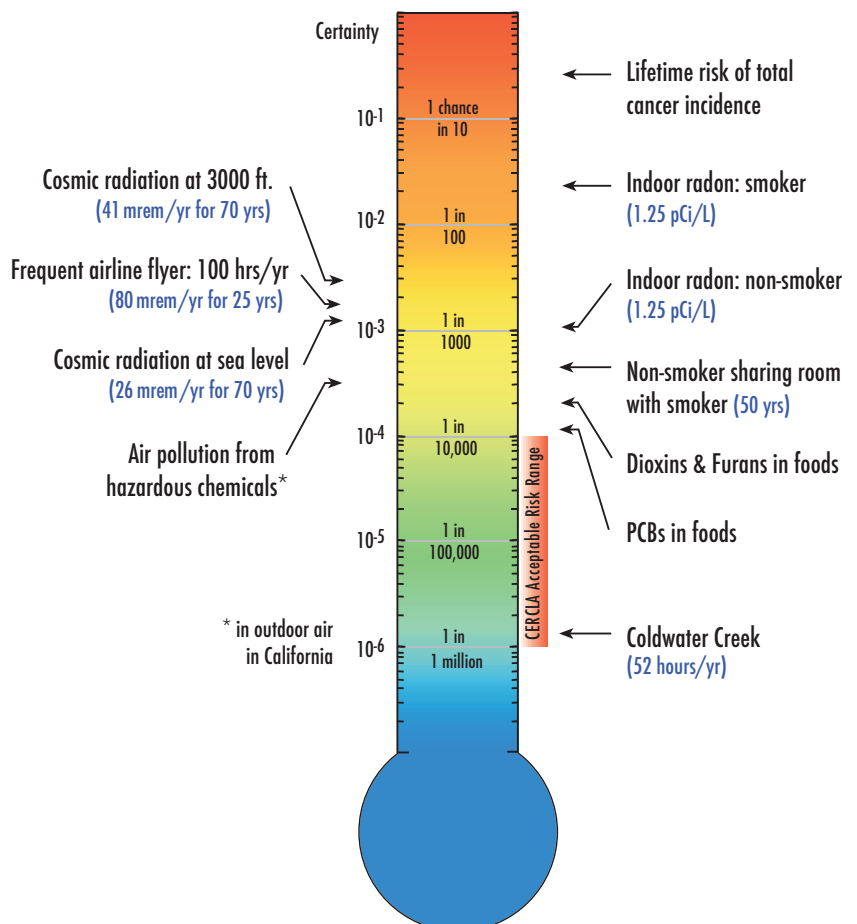
HOW LOW IS LOW?

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





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RISK RANGE



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.

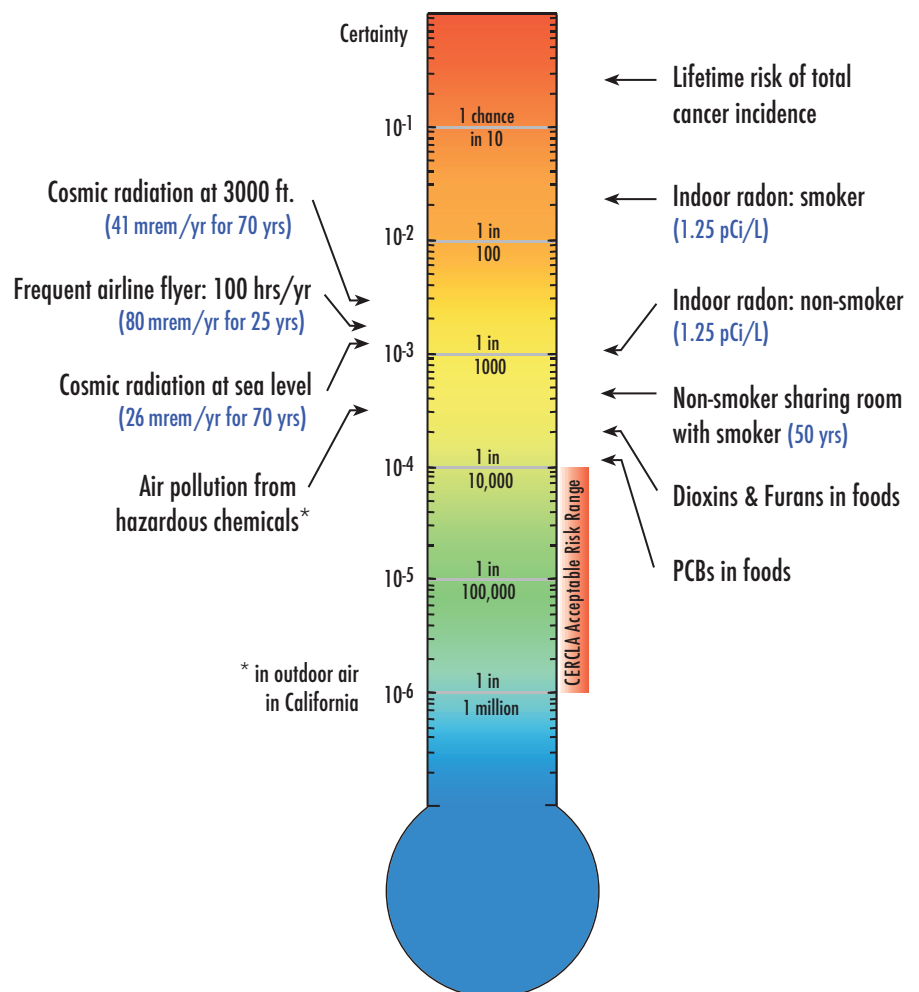
The risk range is used to determine the cleanup level when an ARAR level is determined not to be protective. A risk of 10^{-6} is used as the starting point for determining the most appropriate cleanup level for the hazardous substance and is referred to as the “Preliminary Remediation Goal” or PRG. 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.)

Lifetime Risk of Cancer Incidence





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CLEANUP



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 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.



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WHAT IS FUSRAP?



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 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.

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 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).





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St. Louis Sites Fact Sheet

RADON BASICS



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

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

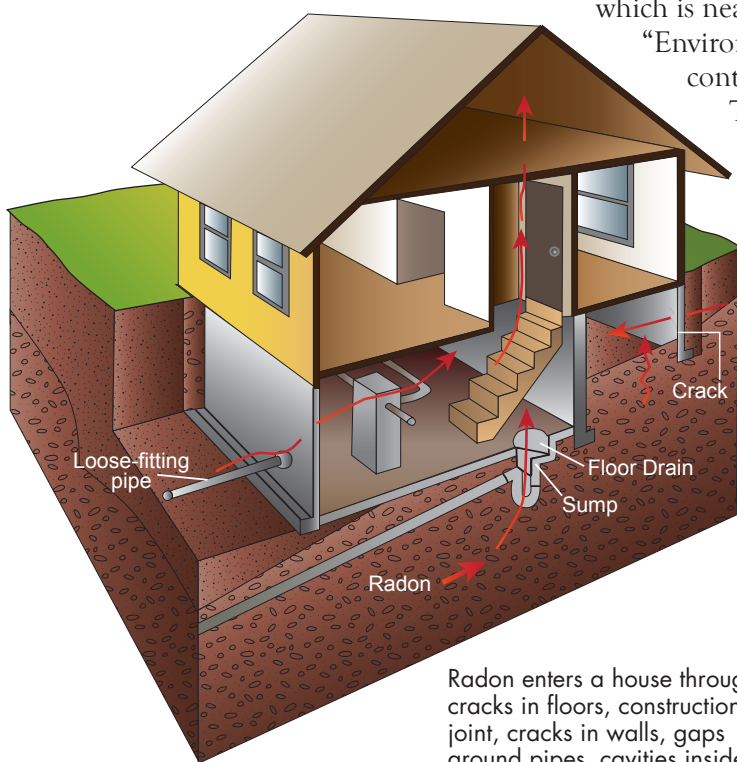
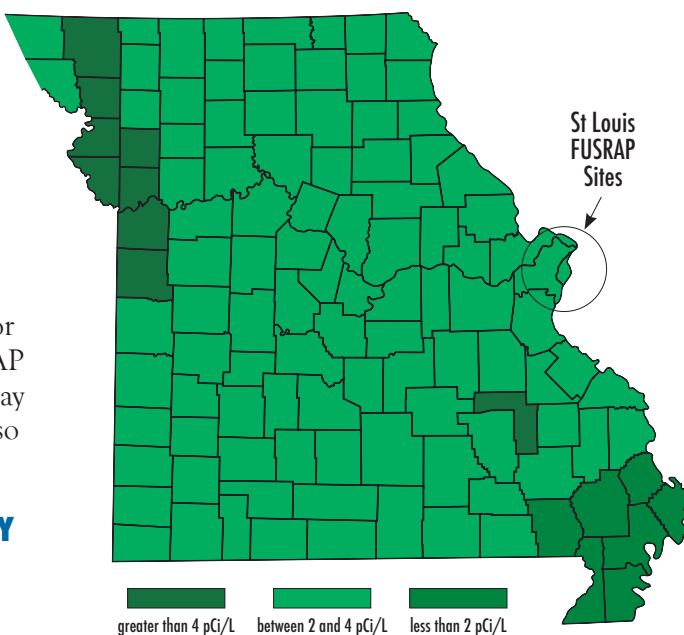
The measurement of time that it takes for radioactive elements to decay to half of their original amount is called a half-life. The speed of this change is random and different for each element. Radium-226 has a 1,600 year half-life. Radon-222 has a 3.8 day half-life. In the 1940s, the Manhattan Engineer 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.

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>

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



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.



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COLDWATER CREEK SAMPLING



"Gateway to Excellence"

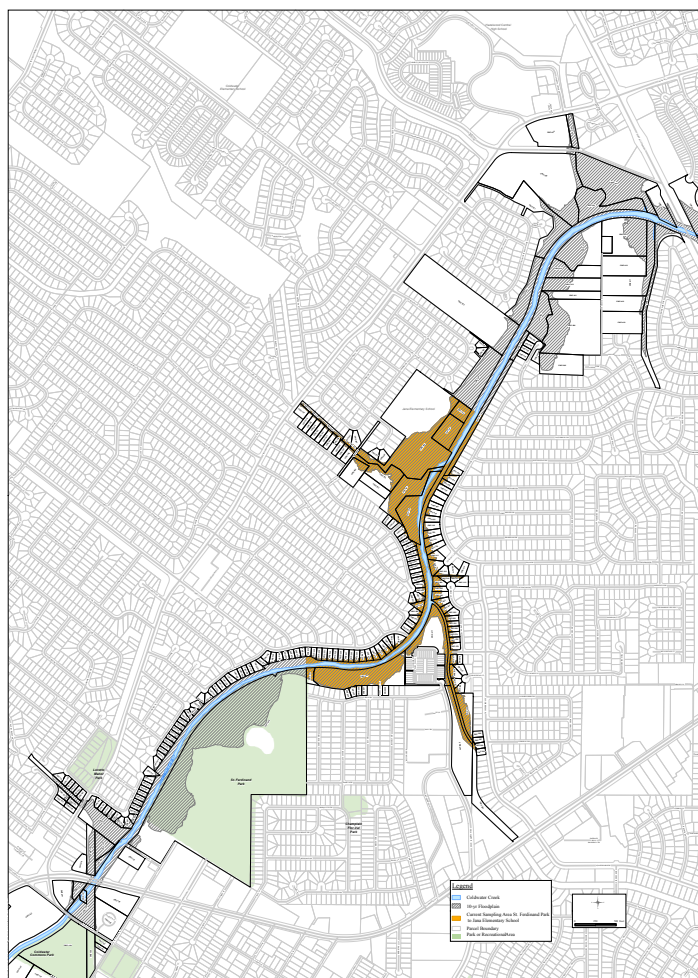
Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Army Corps of Engineers (USACE) environmental program known as the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes four Missouri sites (SLDS, SLAPS, Latty, and SLAPS VPs). These sites contain 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.

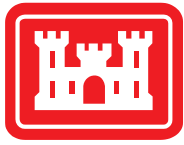
The CWC investigation identified contaminated soil within portions of the CWC Corridor and some flood plain properties (e.g., St. Cin Park, Duchesne Park, four backyards on Palm Drive, Chez Paree property, St. Ferdinand Cemetery and Metropolitan Sewer District property). Remedial activities have been 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.



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.

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/>



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St. Louis Sites Fact Sheet

FREQUENTLY ASKED QUESTIONS ABOUT FUSRAP



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?

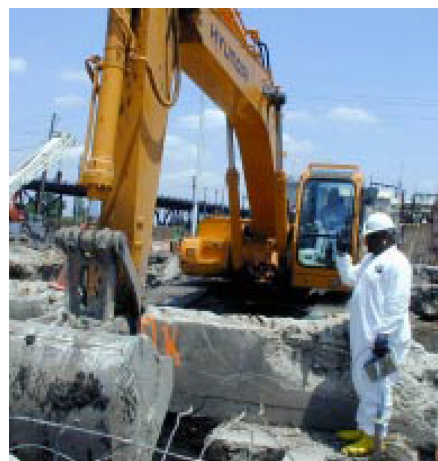
The St. Louis FUSRAP Sites consist of the St. Louis Downtown Site (SLDS) (Mallinckrodt and 37 vicinity properties [VPs]); the North St. Louis County Sites that include: the St. Louis Airport Site (SLAPS); the Latty Avenue properties (Hazelwood Interim Storage Site/Futura Coatings (HISS/Futura) and 8 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.

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.



Remedial activities at Duchesne Park are now complete.

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.

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.



SLDS required remediating 37 contaminated sites.



SLAPS required remediating 10 contaminated sites.



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>.



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St. Louis Sites Fact Sheet

CONCEPTUAL SITE MODEL AND COLDWATER CREEK



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.

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



Coldwater Creek

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.



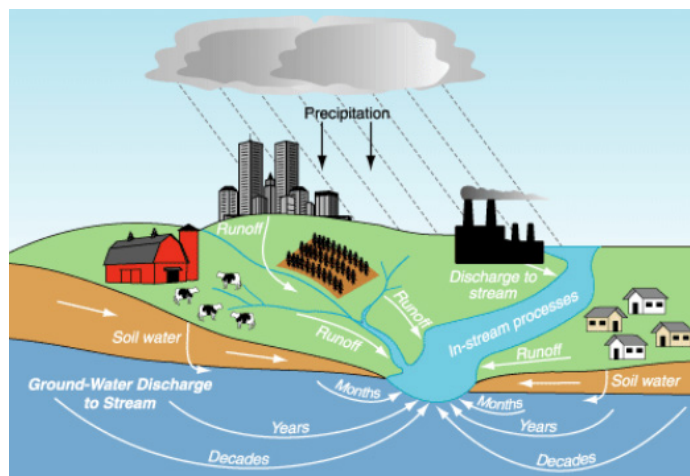
Coldwater Creek - Sampling Depositional Areas

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.





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LABORATORY ANALYSIS



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.

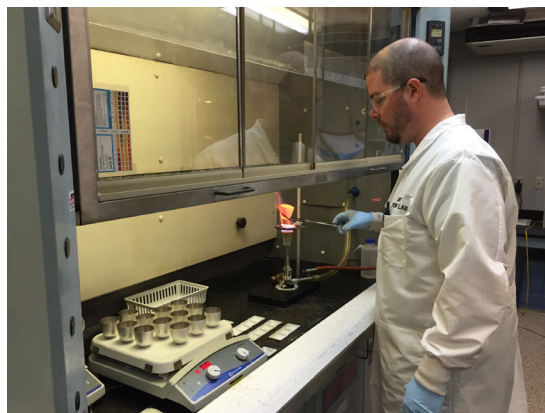
On each site sample, separate but identical processes are run to isolate these three isotopes. Lab workers then measure levels of ionizing radiation in the sample for each radium, thorium, or uranium isotope. The laboratory equipment is specialized to detect ionizing radiation, which includes alpha and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



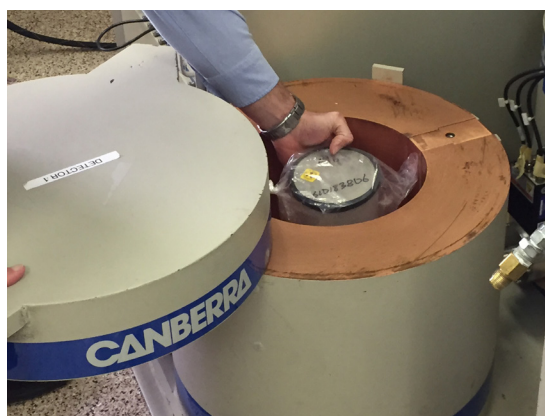
After soil and sediments are dried and ground into a powder, specially trained laboratory technicians begin the steps to isolate any radium, thorium or uranium from a sample.



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



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 1999 show 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

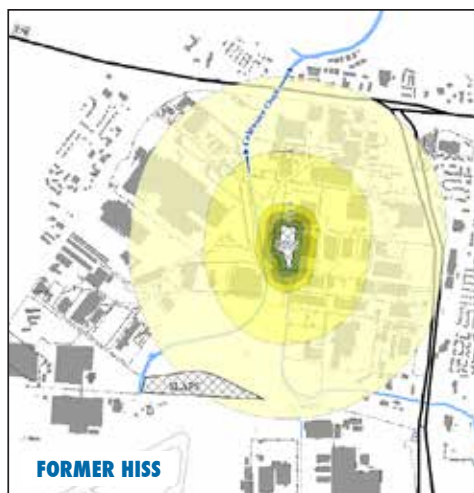
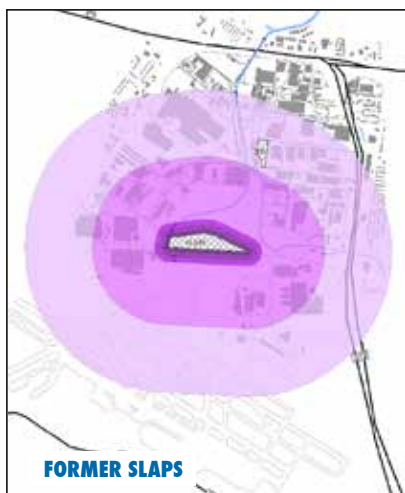
Because thorium-230 is the most common contaminant at SLAPS and HISS, USACE used it in the model. Thorium is a heavy element found in nearly all soils worldwide and is naturally radioactive. Thorium, like lead or uranium, is heavy. It cannot drift around like pollen, but thorium dust can move. USACE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



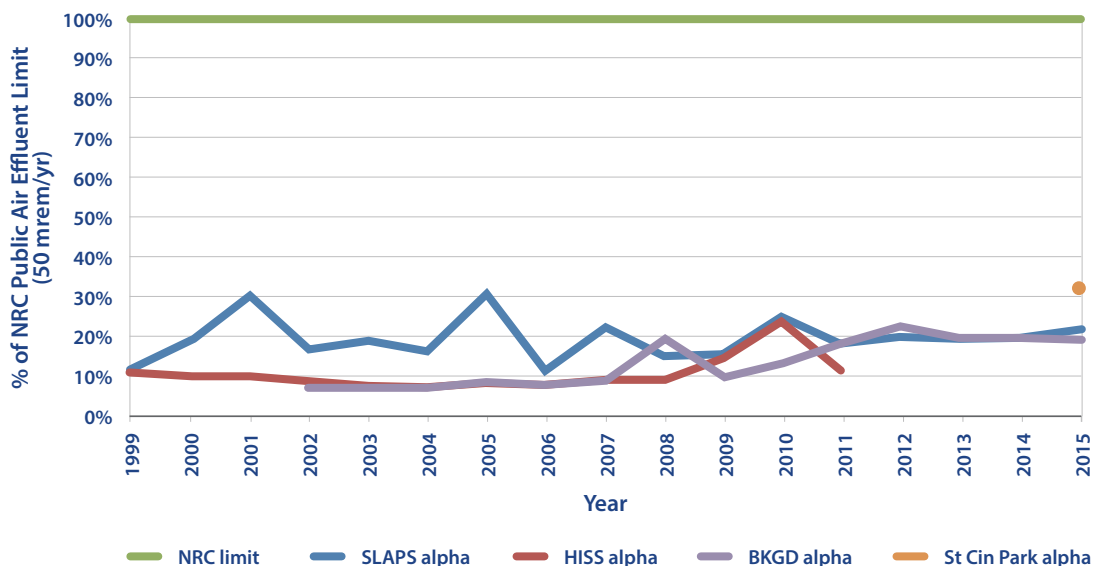
These maps show the worst case contamination levels during hypothetical severe weather. Thorium-230 was most concentrated in the centers of SLAPS and HISS. You can see in the maps that the highest concentrations are around the centers of the “donut” shapes. Concentrations lessen away from the centers.

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.



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St. Louis Sites Fact Sheet

COLDWATER CREEK SOIL SAMPLING AND ANALYSIS



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.

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.

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.

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.

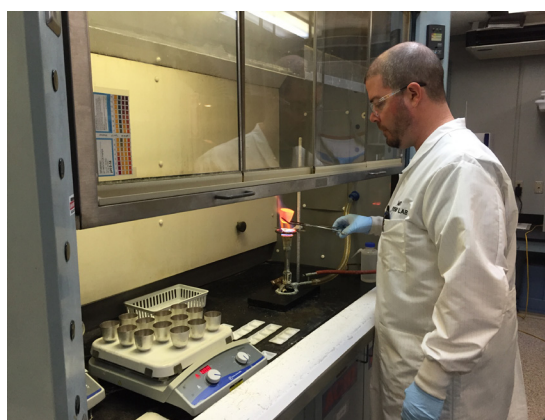
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Reports from lab analysis guide USACE in meeting the remediation goals set by each site's Record of Decision.



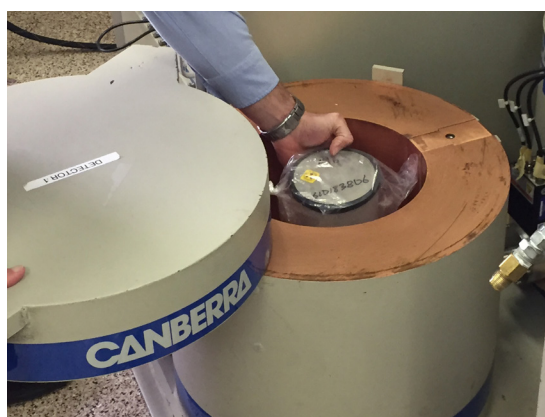
After soil and sediments are dried and ground into a powder, specially trained laboratory technicians begin the steps to isolate any radium, thorium, or uranium from a sample.



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.



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 rationale 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



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.

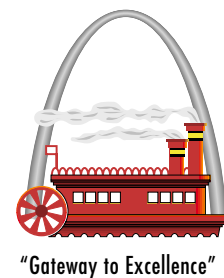
Monitoring of the ground water, surface water and sediment will consist of response-action monitoring and long-term monitoring. These types of monitoring will be conducted where contamination remains above remediation goals for unlimited use and unrestricted exposure.





St. Louis Sites Fact Sheet

NORTH ST. LOUIS COUNTY SITES RECORD OF DECISION



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 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*.

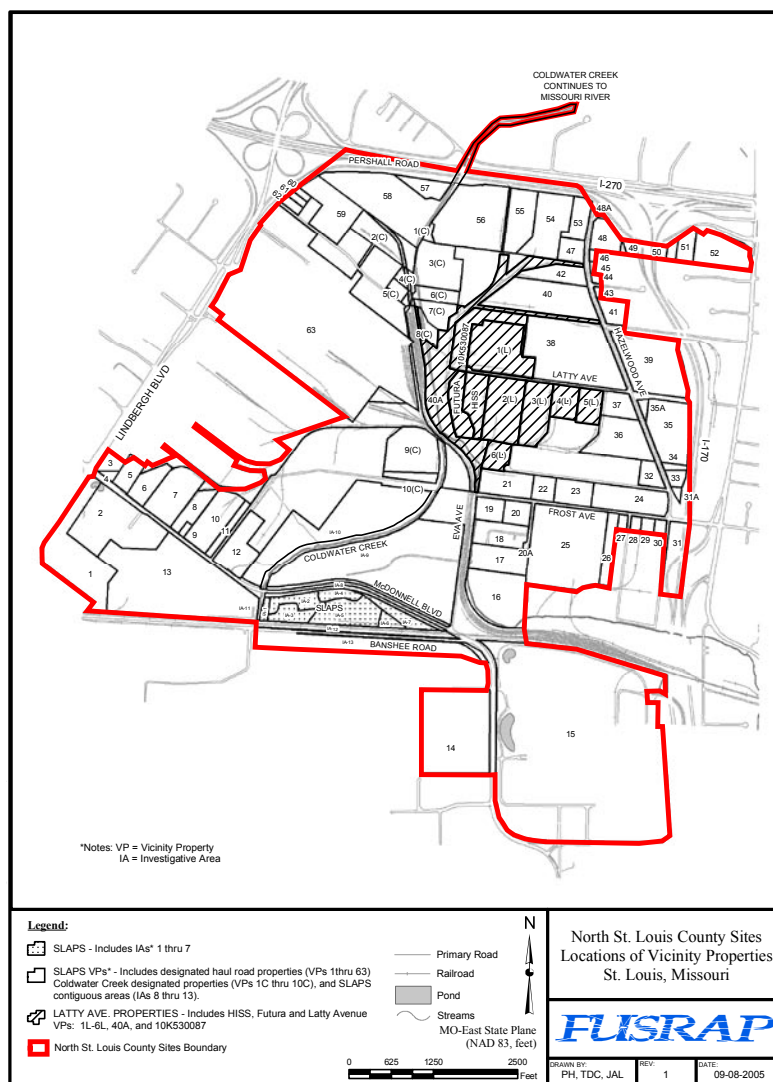
The major components of the selected remedy are:

- 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



Summary of Activities at the **ST LOUIS NORTH COUNTY SITE FEASIBILITY STUDY**



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.



Summary of Activities at the **ST LOUIS NORTH COUNTY SITE OVERVIEW**



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/enr/fusrap/home2.htm.



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

St. Louis Sites Fact Sheet

NORTH ST. LOUIS COUNTY SITES REMEDIAL ACTION



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.



Summary of Activities at the **ST LOUIS NORTH COUNTY SITE PROPOSED PLAN**



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.



Summary of Activities at the **ST LOUIS NORTH COUNTY SITE PROPOSED PLAN**



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

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St. Louis District, Corps of Engineers

FUSRAP Project Office

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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.



Summary of Activities at the **ST LOUIS NORTH COUNTY SITE OVERVIEW**



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/enr/fusrap/home2.htm.



Summary of Activities at the **ST LOUIS NORTH COUNTY SITE FEASIBILITY STUDY**



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.

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Jacqueline Mattingly at (314) 260-3924

Or write

St. Louis District, Corps of Engineers
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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.

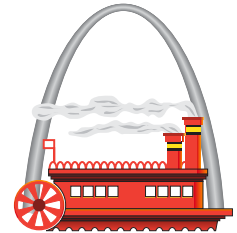
Written comments may be submitted to the USACE, at any time during the 30-day period. Oral comments will be recorded during the May 29, 2003 public meeting. The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) 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 being 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 controls 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 maintained 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 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.



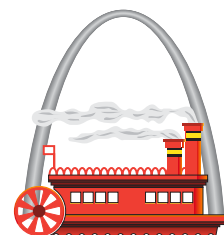
Implementation of the Long Term Stewardship Program will be a team effort involving property owners, local municipalities, and state and federal agencies.



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



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.

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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 addition 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?

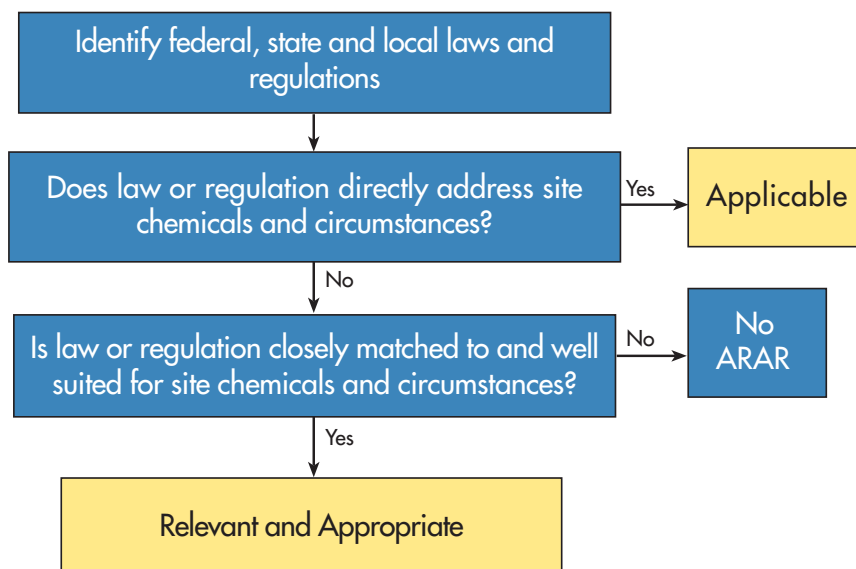
Different ARARs that may apply to a site and its remedial action are identified at multiple points in the remedy selection process. Generally, during the early stages of the Remedial Investigation and Feasibility Study and the site characterization phase, a list of potential ARARs is initially developed. 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.

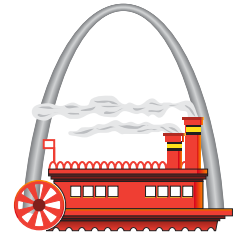




U.S. Army Corps of Engineers
St. Louis District

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.

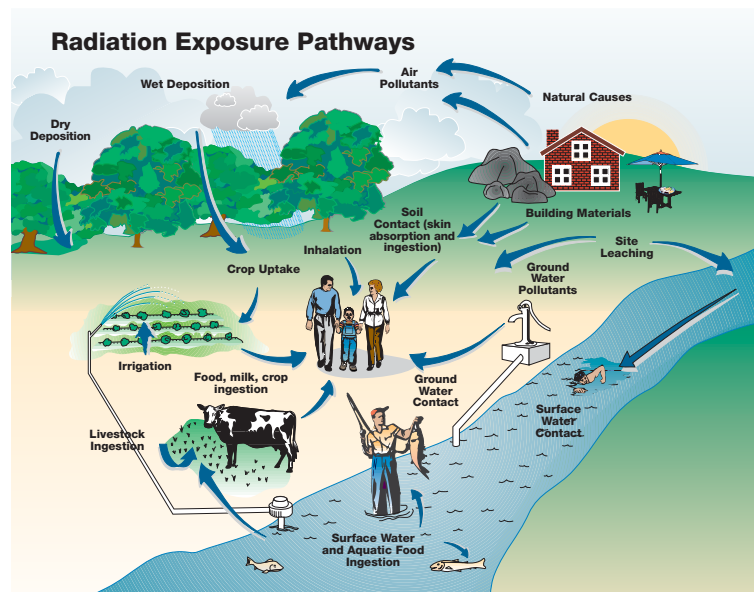
ECOLOGICAL RISK ASSESSMENT

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.



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RADIATION BASICS



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.

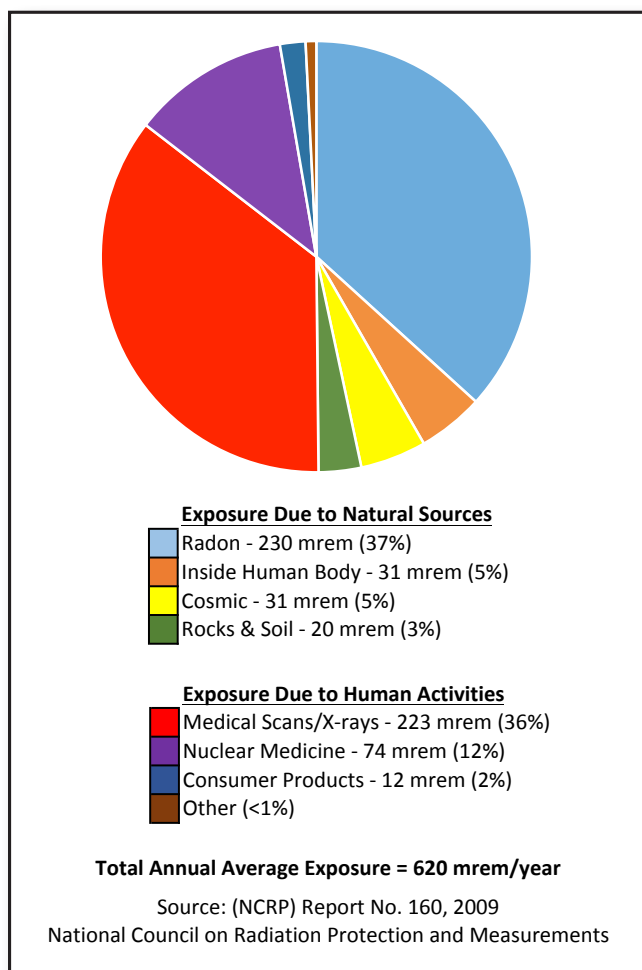
Each decay throws off particles and energy and is referred to as a “disintegration.” The number of disintegrations per second or per minute is the *activity* of a sample. Activity is expressed in curies. *One curie equals 37 billion disintegrations per second.* At the FUSRAP St. Louis Sites, activity 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).





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SLAPS VICINITY PROPERTIES



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.

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

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

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).

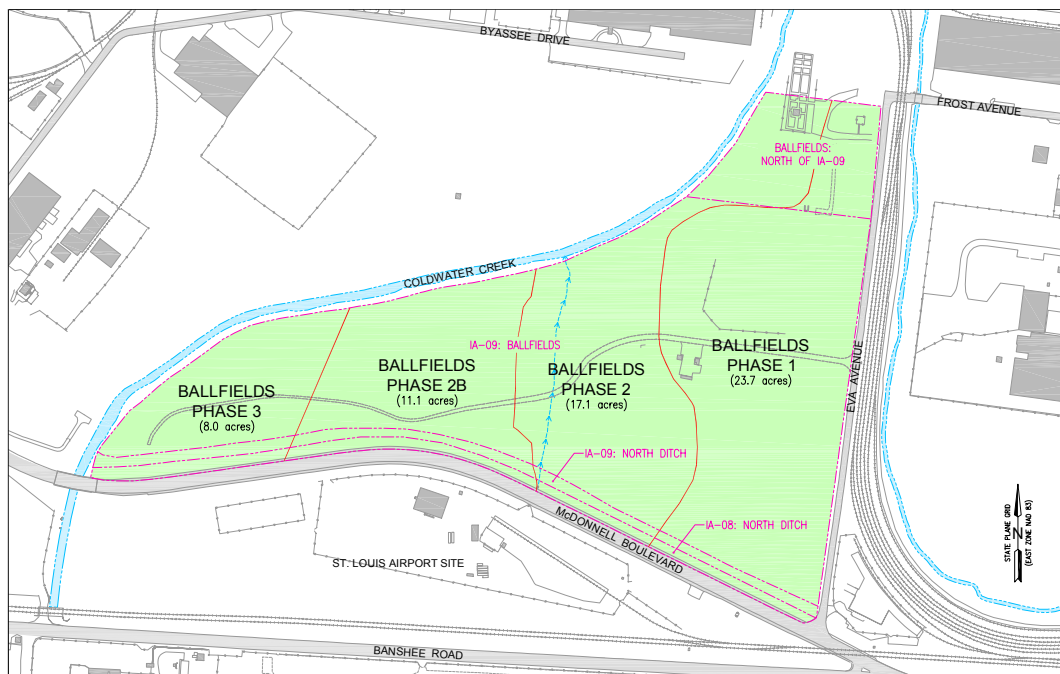
CURRENT ACTIVITIES

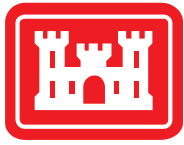
The USACE is currently remediating the “former Ballfields” (Ballfields) IA-09 property. The Ballfields are located north of the SLAPS and is bounded by Eva Avenue (Ave) to the east and McDonnell Boulevard (Blvd) to the south and CWC to the west and north. The Ballfields are owned by the St. Louis Airport 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





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.

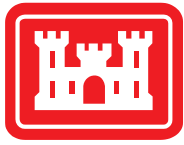
Inaccessible soils potentially affected by MED/AEC include soils in sewer lines, on building surfaces, and beneath buildings or other permanent structures such as roads and railroads. The St. Louis District has completed the characterization and investigation of the designated SLDS Inaccessible Soils 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>



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 FUSRAP 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

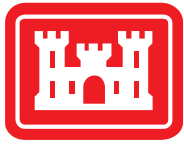
Remediation at the SLAPS was initiated in 1997 under Engineering Evaluation/Cost Analysis (EE/CAs) developed by DOE and the USACE. In September 2005, the North County Record of Decision (ROD) was finalized. The remainder of SLAPS was re mediated under the 2005 ROD. The area under the SLAPS rail spur 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/>



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

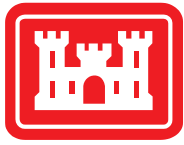
The selected remedy for soils, sediments and permanent structures is outlined in the North County Record of Decision (ROD) which was finalized in September 2005. To date over 65,000 cubic yards of contaminated soil have been removed from the SLAPS VPs. Currently 76 SLAPS VPs have been released for beneficial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



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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, VPIL, 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/>

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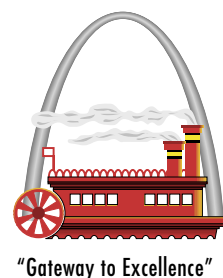
FUSRAP OFFICE: (314) 260-3905

<https://www.mvs.usace.army.mil/Missions/FUSRAP/>



Summary of the

MADISON SITE PROPOSED PLAN



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.

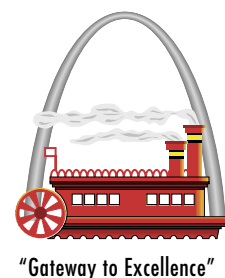
The USACE will respond to all significant comments and will consider these comments when working in cooperation with the regulators to make a final decision. The final remedy for the Madison Site will be selected after review and full consideration of all comments received during the public review period.





Summary of the

MADISON SITE FEASIBILITY STUDY



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

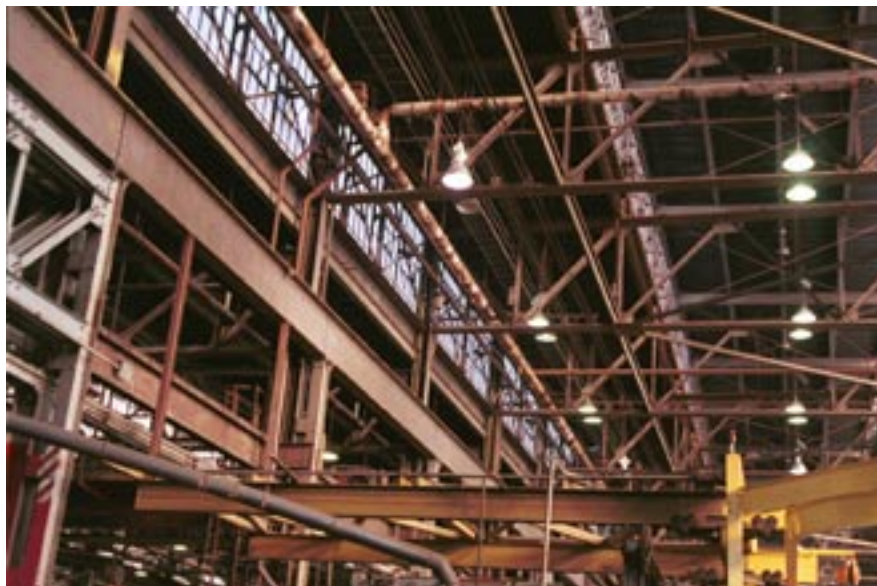
Alternative 4 includes decontamination of accessible uranium-contaminated surfaces at the 25-foot and 36-foot levels and the beams in the high-bay that are accessible from the windows. Inaccessible areas are defined as those surfaces that can not be accessed either from the high-bay crane or through 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.

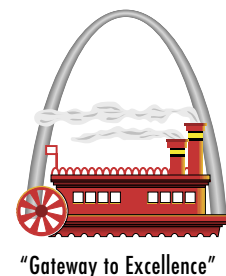
The USACE will respond to all significant comments and will consider these comments when working in cooperation with the regulators to make a final decision. The final remedy for the Madison Site will be selected after review and full consideration of all comments received during the public review period.





Summary of the

MADISON SITE REMEDIAL INVESTIGATION REPORT



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.

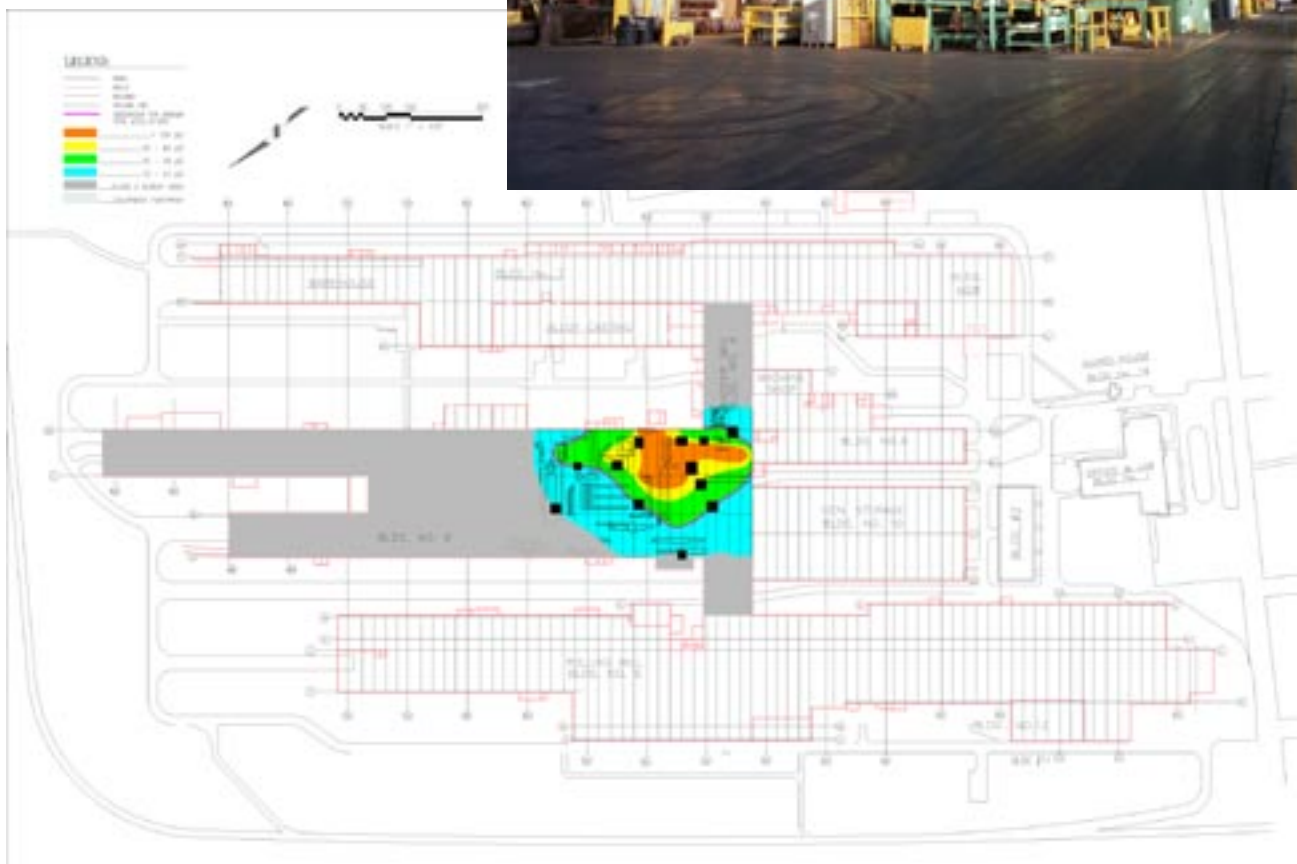
Survey Results

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.

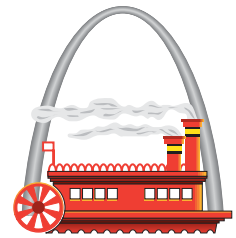




U.S. Army Corps of Engineers
St. Louis District

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.

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 - 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).

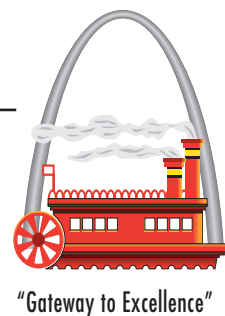




U.S. Army Corps of Engineers
St. Louis District

St. Louis Downtown Site Fact Sheet

REMEDIAL DESIGN/ REMEDIAL ACTION



Background

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.

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 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.



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.

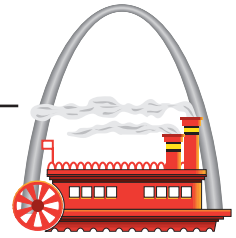
Remedial Actions are longer-term activities that complete the site cleanup. A Remedial Action may be performed at a site after a removal action if the removal action does not or cannot present a complete solution. Remedial Actions implement the final cleanup method(s) selected in the Record of Decision.



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

St. Louis Downtown Site Fact Sheet

RECORD OF DECISION (ROD)



"Gateway to Excellence"

Background

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.

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.

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.**

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:

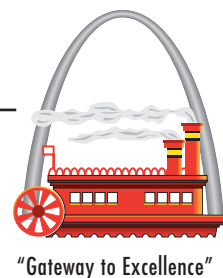
- Accessible soils will be excavated to a composite criteria* to a depth of 4-6 feet. Below 4-6 feet, soils will be cleaned to 50/100/150 pCi.
- Plant 7-area soil will be excavated and cleaned to a composite criterion of 5/5/50 pCi for the surface and 15/15/50 pCi for depths below 6 inches.
- Inaccessible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



Summary of Activities at the **ST. LOUIS DOWNTOWN SITE PROPOSED PLAN**



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 Manhattan 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.

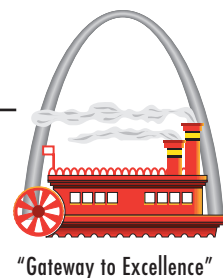
The USACE will respond to all significant comments and will consider these comments when working with the U.S. Environmental Protection Agency (EPA) to make a final decision. The final cleanup remedy will be outlined in the Record of Decision, which will be submitted to the EPA by July 3, 1998.



Loading material removed during preparation of buildings for demolition



Summary of Activities at the **ST. LOUIS DOWNTOWN SITE FEASIBILITY STUDY**



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 Manhattan 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 Laffy 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.

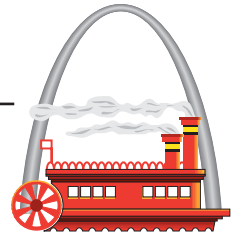
Comments on the proposed remedial action will be accepted for 30 days after the FS and Proposed Plan are issued. Verbal comments will be recorded during the April 21, 1998 public meeting and written comments may be submitted at any time during the 30-day comment period.

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 Manhattan 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-

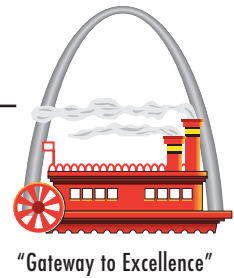


Aerial view of the St. Louis Downtown Site in St. Louis, Missouri.



U.S. Army Corps of Engineers

Summary of Activities at the **HAZELWOOD INTERIM STORAGE SITE**



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

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.

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

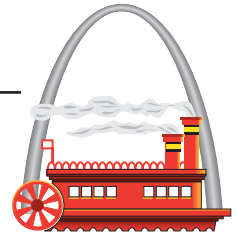
Chris W. Haskell
at (314) 524-3364,
or write

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



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 contaminated 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 and 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

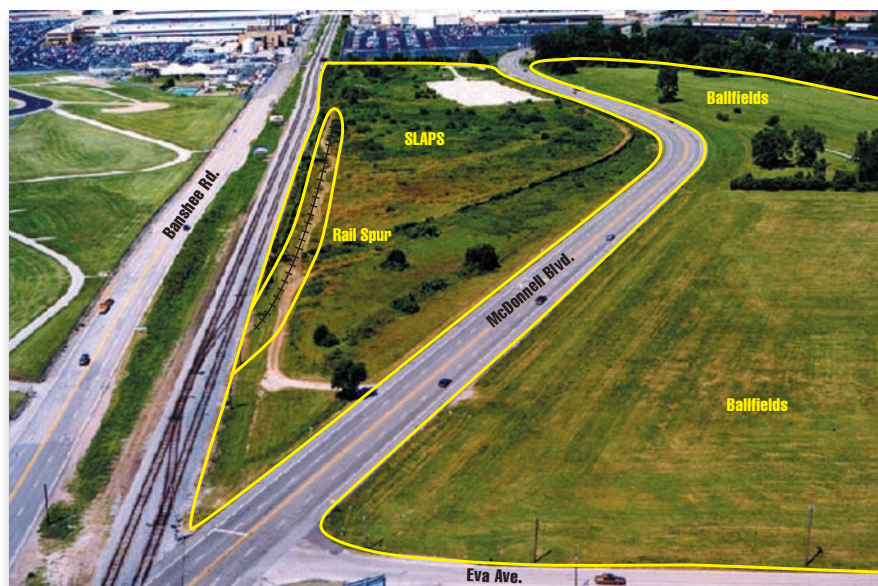
Chris W. Haskell
at (314) 524-3364,
or write

St. Louis District, Corps of Engineers
FUSRAP Project Office
9170 Laffey 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.



FUSRAP *Fact Sheet*

St Louis Site

St Louis, Missouri

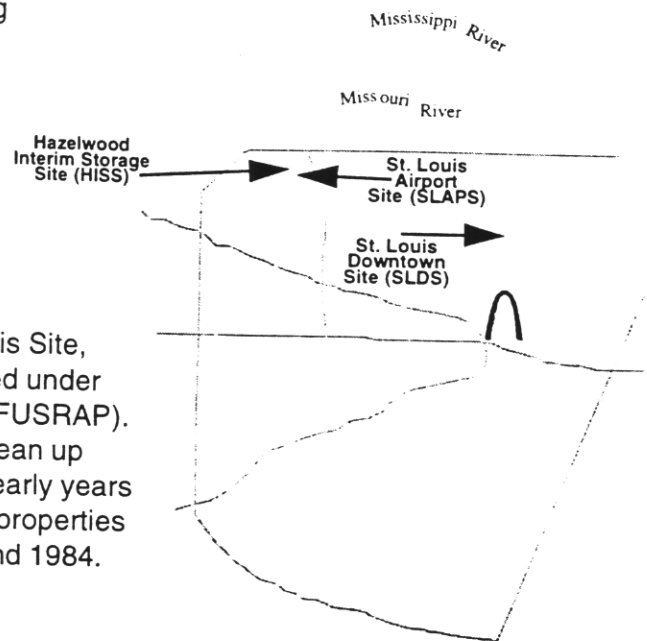
U.S. Department of Energy • Formerly Utilized Sites Remedial Action Program • March 1997

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.

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 cleanup 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.

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 not 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 not 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

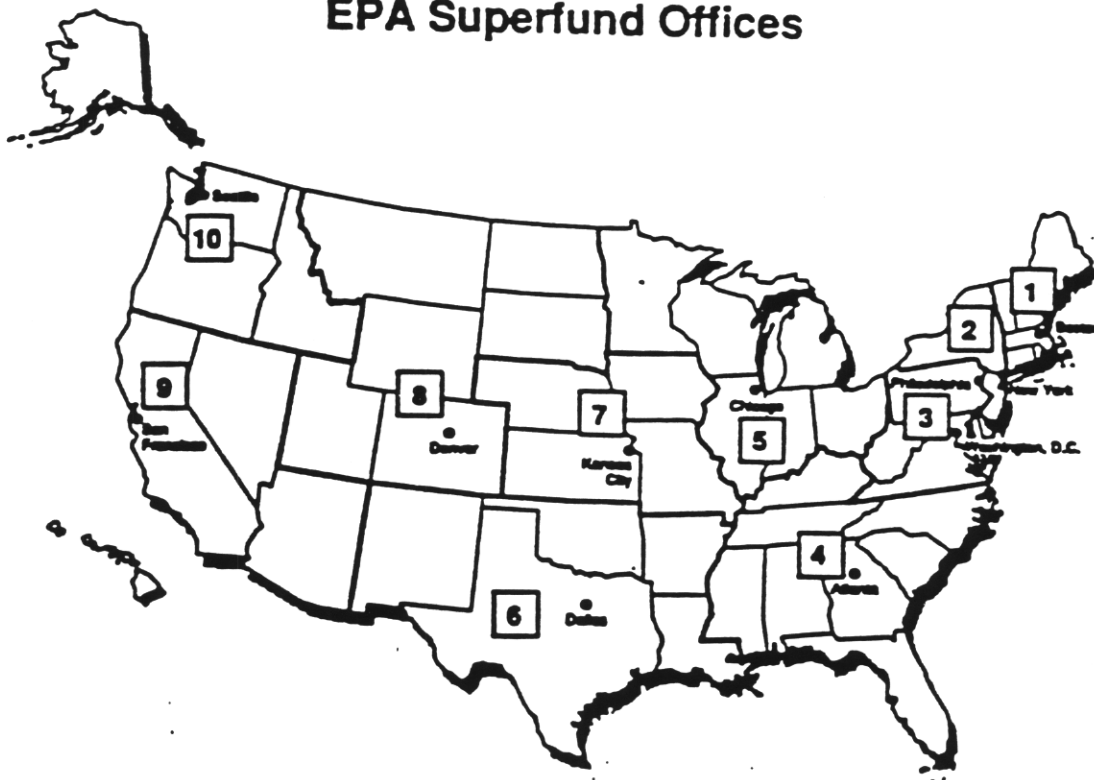
(800) 424-9346 or 382-3000

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

FactSheet

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.

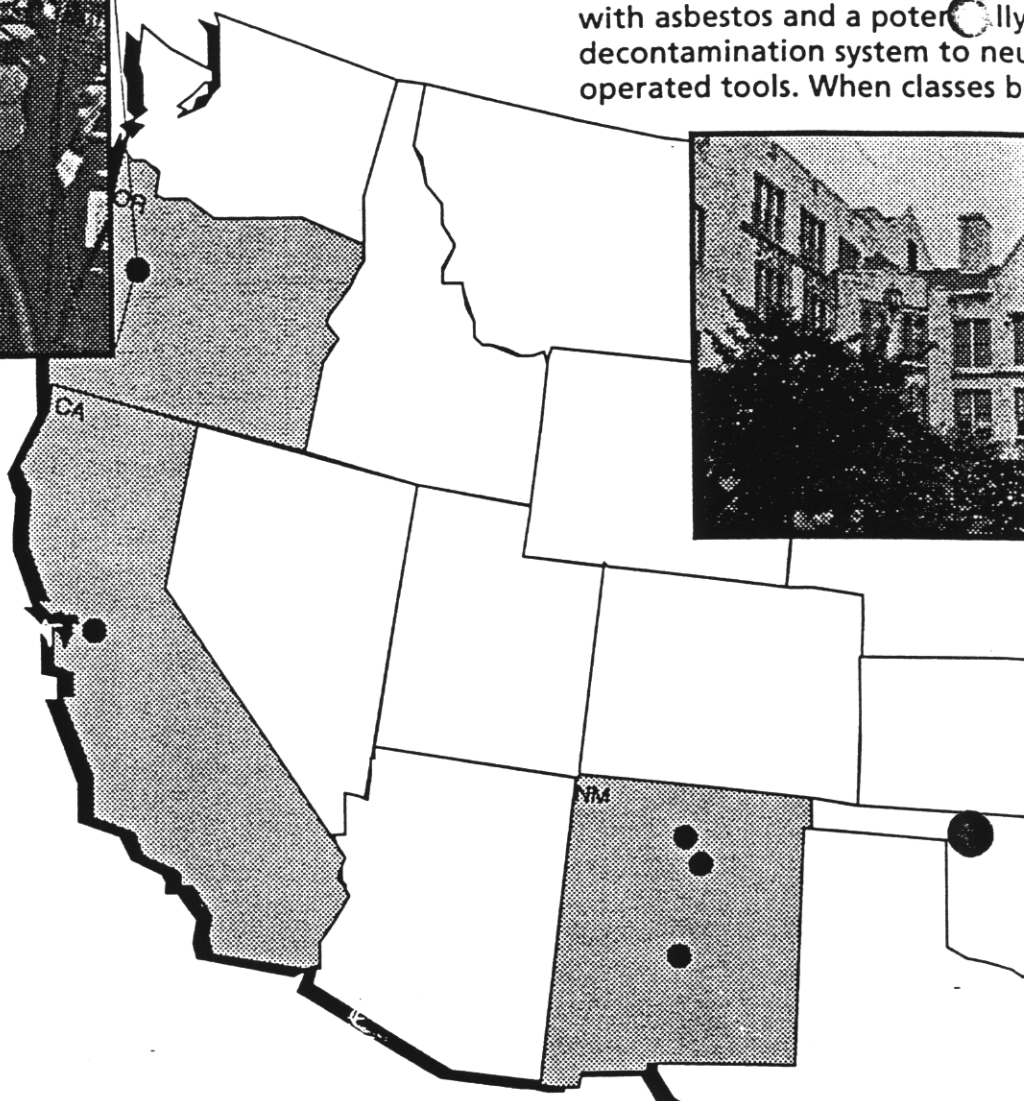


Albany Research Center

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 that had a contaminated exhaust system. Radioactive materials were removed with asbestos and a potentially hazardous decontamination system to neutralize the contaminated tools. When classes began, the facility was ready for use.



Elza Gate

This site was once a staging area for uranium shipped to Oak Ridge, Tennessee, a town built by the government in the 1940s to produce parts for the atomic bomb. Three warehouses at Elza Gate stored radioactive materials. After the buildings were torn down, contamination remained in dirt and on debris. DOE removed the contaminated material and sent it to a disposal facility. The site is now home to an industrial park.

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

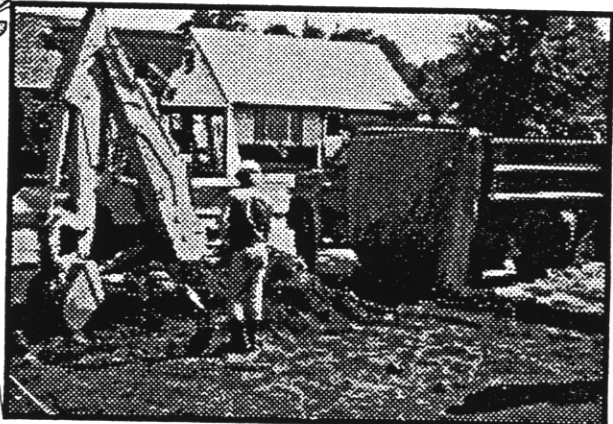
Maywood Site, Maywood
Wayne Site, Wayne/Pequannock
Middlesex Sampling Plant, Middlesex
New Brunswick Site, New Brunswick
Du Pont & Company, Deepwater

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 contaminant that had built up inside the duct work and was mixed with a chemical. DOE's contractor designed an innovative process to neutralize the chemicals and remove the radiation with remotely operated equipment. In 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)
- HMM 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.



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.

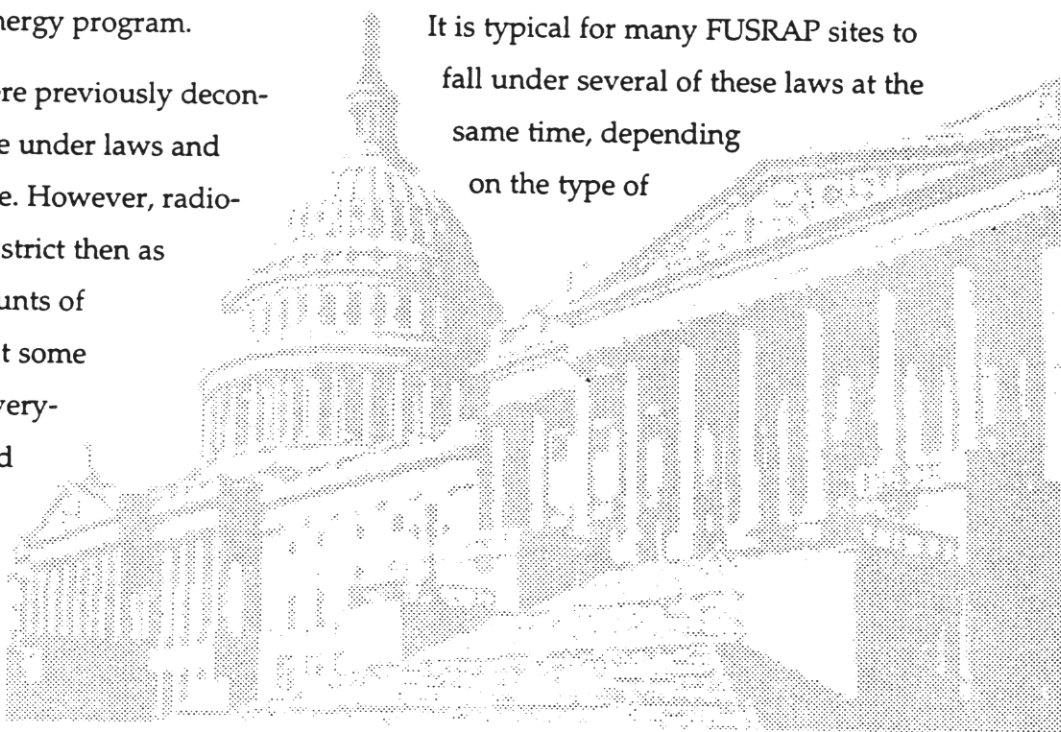
Many of the FUSRAP sites were previously decontaminated and released for use under laws and regulations in effect at the time. However, radiological guidelines were not as strict then as they are today, and trace amounts of radioactive materials remain at some sites. Also through normal, everyday use 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.

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

“While the focus of each law is different, their goals are the same: to protect human health and the environment.”

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.

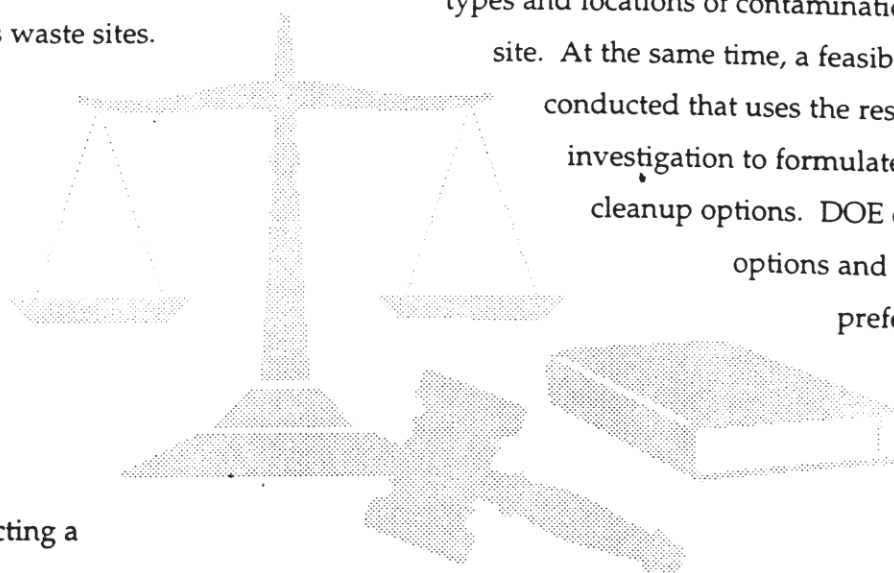
CERCLA mandates specific steps for investigating contaminated sites. After an initial planning period, workers begin a remedial investigation to identify the types and locations of contamination present at the

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.

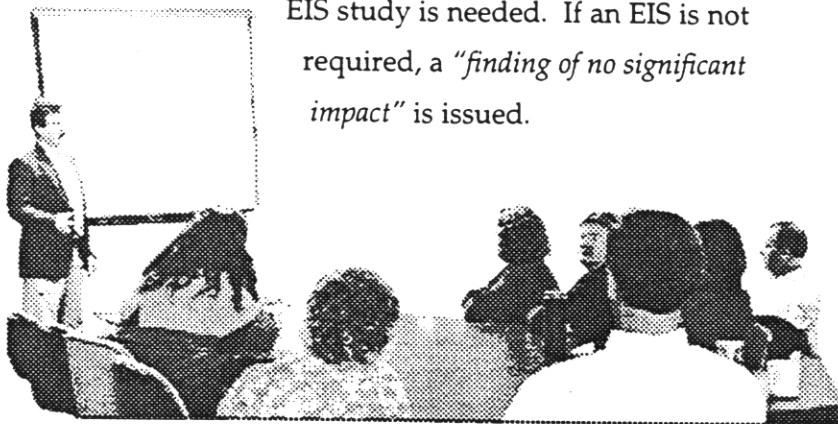
NEPA

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 overlapping, 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.



FUSRAP

The St. Louis Site

St. Louis, Missouri



U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

May 1993

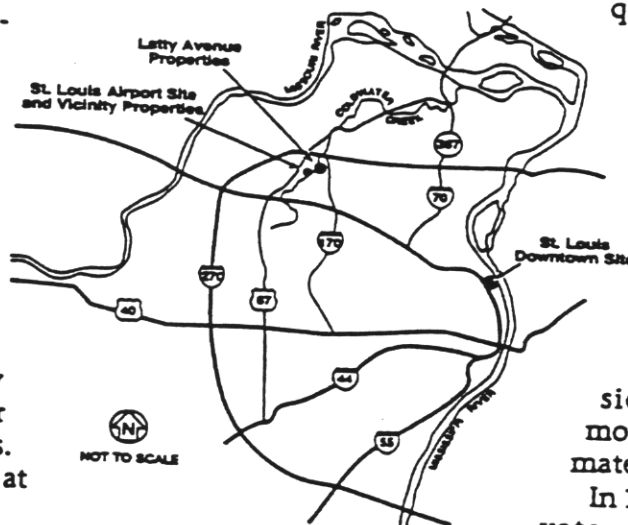
The U.S. Department of Energy (DOE) is implementing a cleanup program for four groups of properties in the St. Louis area that are contaminated with low levels of radioactivity. The properties are 1) the St. Louis Downtown Site (SLDS), 2) the St. Louis Airport Site (SLAPS), 3), several nearby or "vicinity" 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 under 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.

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

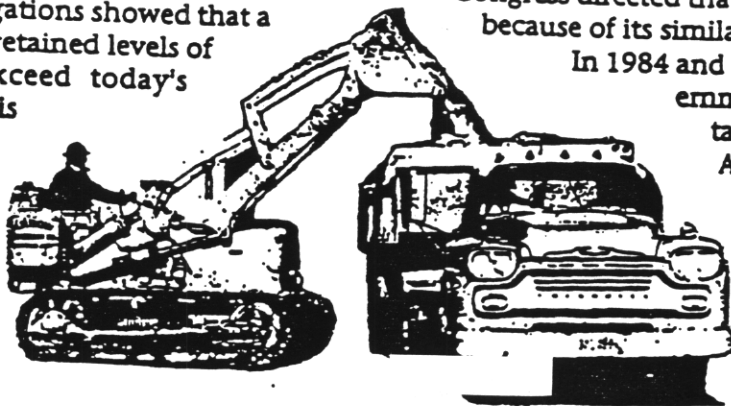


and hauled them from SLAPS to a site about one-half mile north on Latty Avenue in Hazelwood. The residues were stored for several months, then were sold and shipped to another private company in Colorado. However, in 1977, surveys showed that the owner had left contamination on the property and that 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.

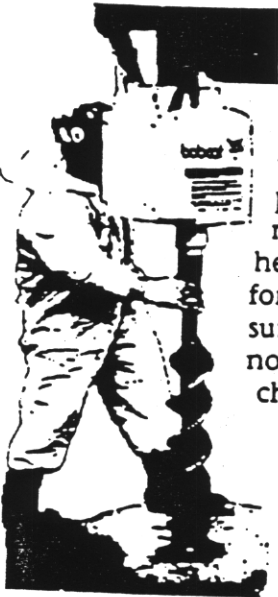
In 1984 and 1986, DOE assisted local governments in the excavation of contaminated soil from along Latty Avenue to allow construction of stormwater and sewer lines. The contaminated soil was moved to an onsite storage pile. The site is now known as the Hazelwood Interim Storage Site (HISS).

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, called the St. Louis Downtown Site (SLDS). Six vicinity properties also contain areas of residual contamination.



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 investiga-

tion 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 partici-

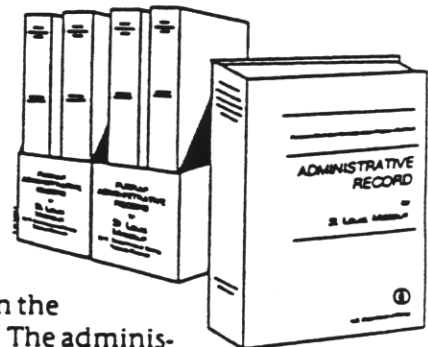
pate in the review process. At the office, DOE maintains a publicly available administrative record of the documents that contain information that will be considered in the

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.





Environmental contamination linked with atomic age



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 nation'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 Mallinckrodt 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.

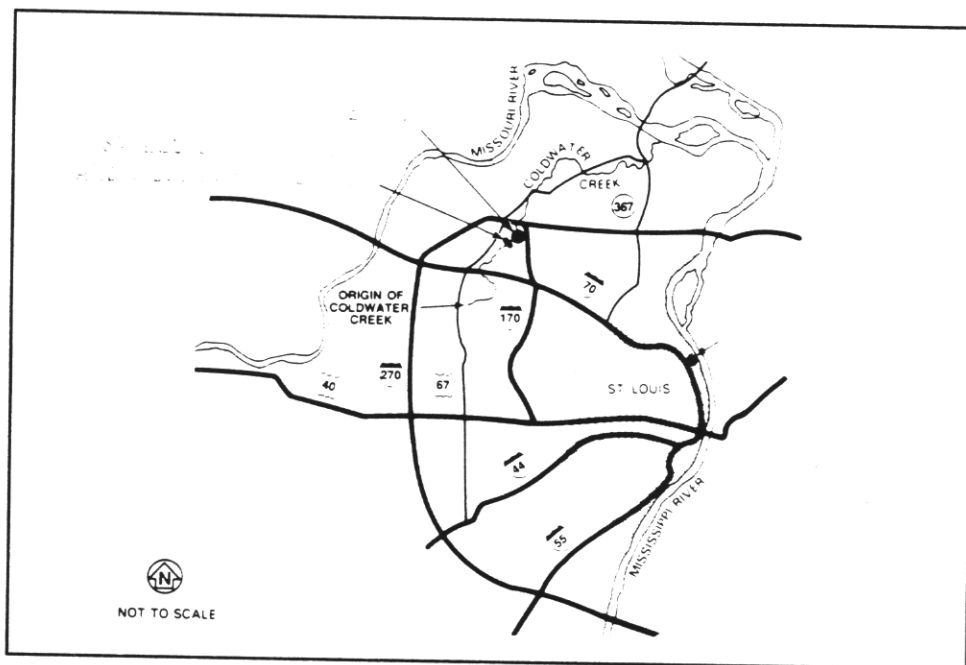
The primary radioactive contaminant on the St. Louis sites is thorium-230. Analyses have also identified the presence of uranium-238 and radium-226. Given present land use, the low-level radioactivity found on these properties poses no immediate threat to public health or the environment. However, performing remedial action and

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 cur-



Locations of FUSRAP properties in the St. Louis, Missouri, area.

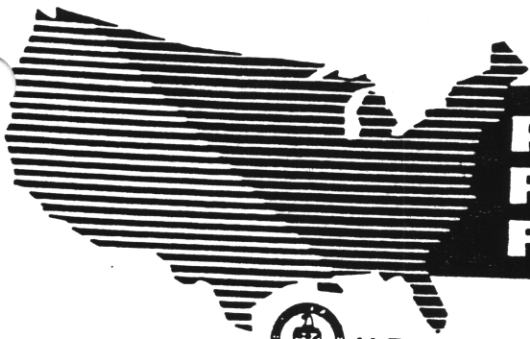
achieving cleanup standards will ensure that the contamination poses no significant risk if land use changes in the future.

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

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 amended 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.

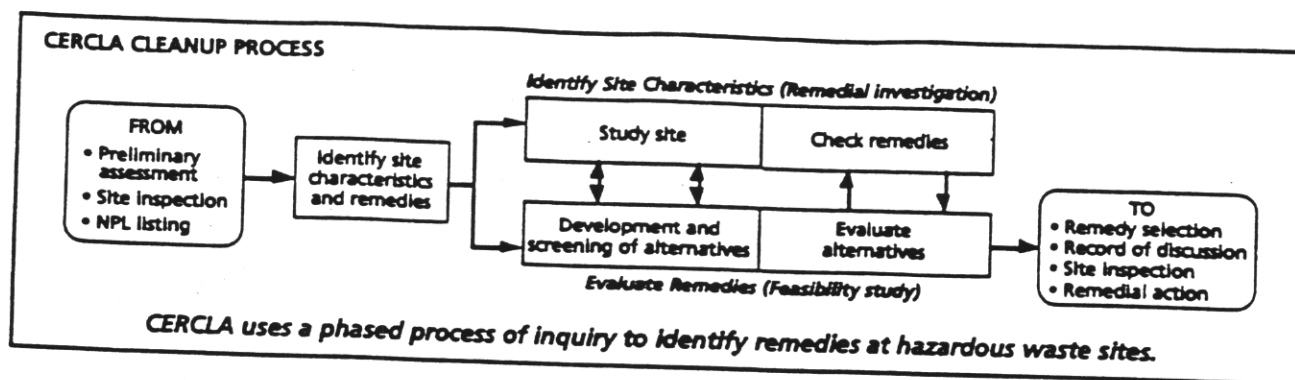
The NPL may also list hazardous sites named by states as their top priority sites and sites determined to pose a significant threat to public health, welfare, or the environment.

- 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.



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.
- 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

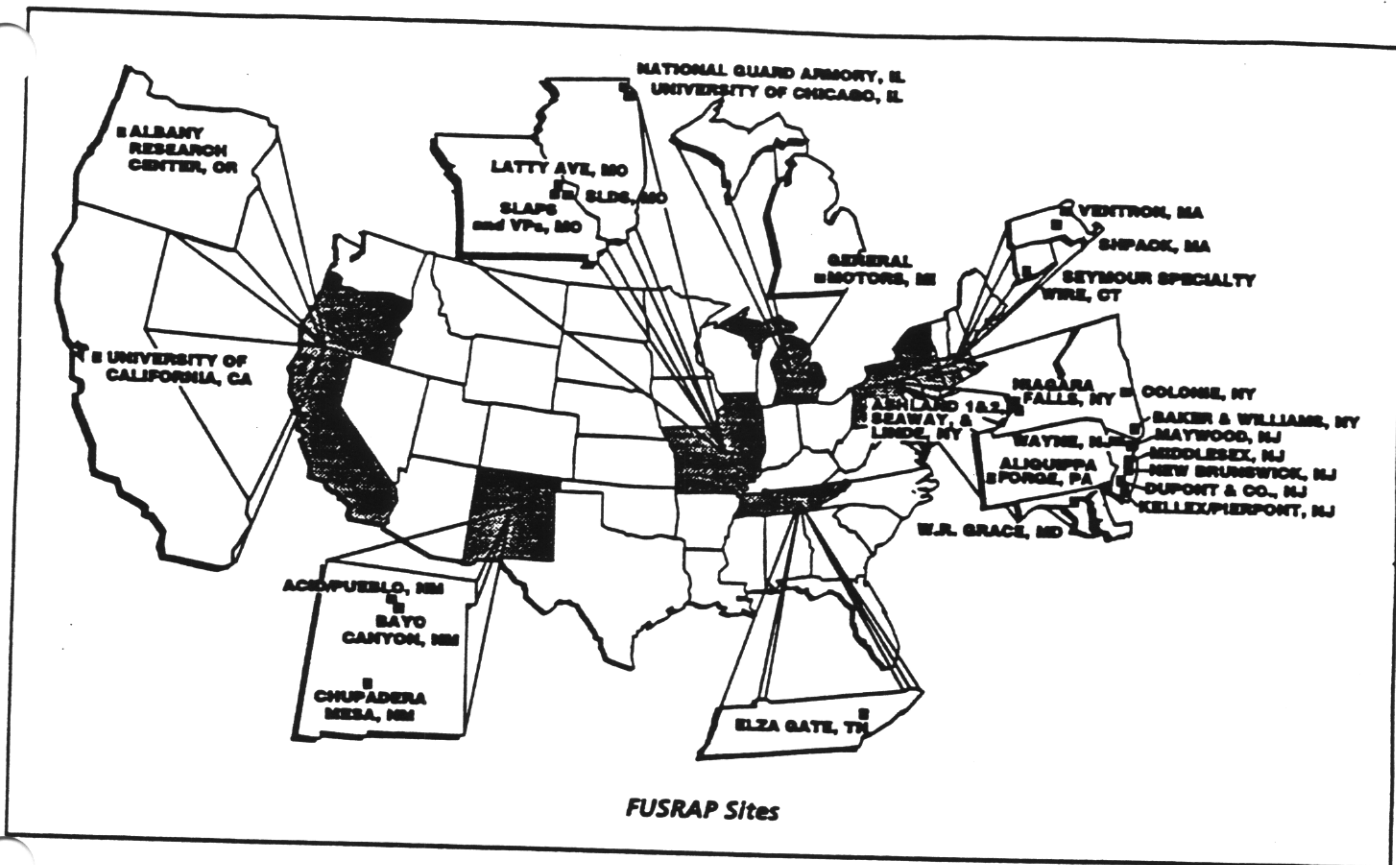
At DOE Headquarters, FUSRAP falls under the responsibility of the Director, Office of Environmental Restoration and Waste Management.

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.



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 37831-8723

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.





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 established under FUSRAP at various times from 1981 to 1984. 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 commercial properties, as well as more than 70 properties along 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 pres-

ence 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

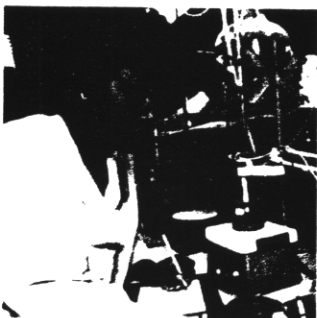
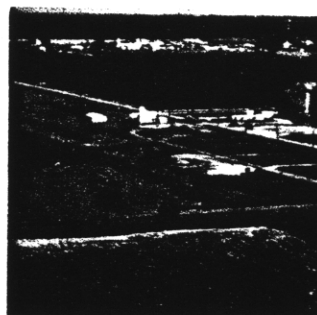
DOE Public Information Office
9200 Latty Avenue
Hazelwood, Missouri, 63042
(314) 524-4083

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.)*

W

hile 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.

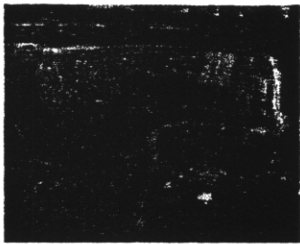
Almost 2 million cubic yards of contaminated material eventually will need to be addressed. The majority of this material is in the states of Missouri, New Jersey, and New York. Selecting and developing appropriate permanent disposal sites and methodologies is the biggest challenge facing DOE, the states, and the people living in the affected communities.



WHAT REMAINS TO BE DONE?



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 than 173 other properties — residences, businesses, or public lands also contaminated

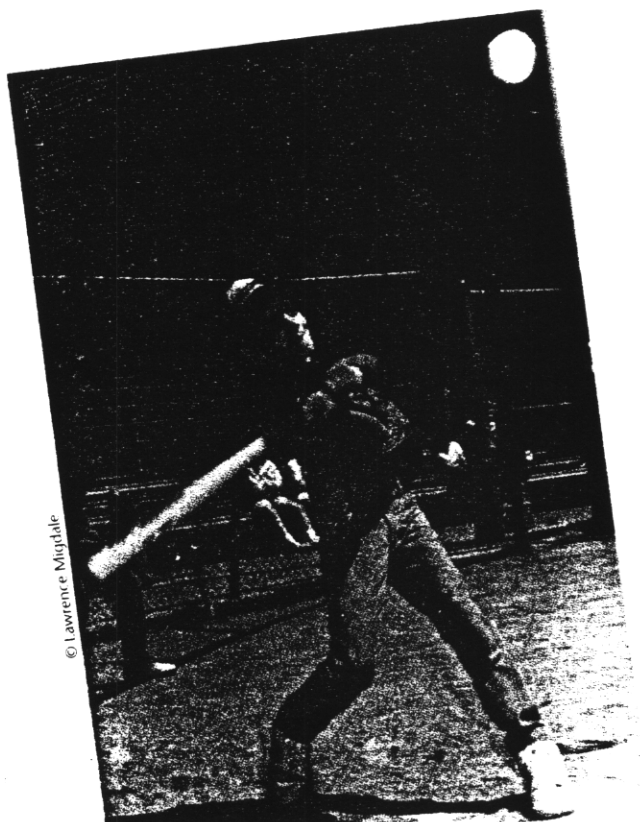
over the years — have been cleaned up. Houses in Maywood, New Jersey; Colonie, New York; and elsewhere are now free of contamination.

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 commercial 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?

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.

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.



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.

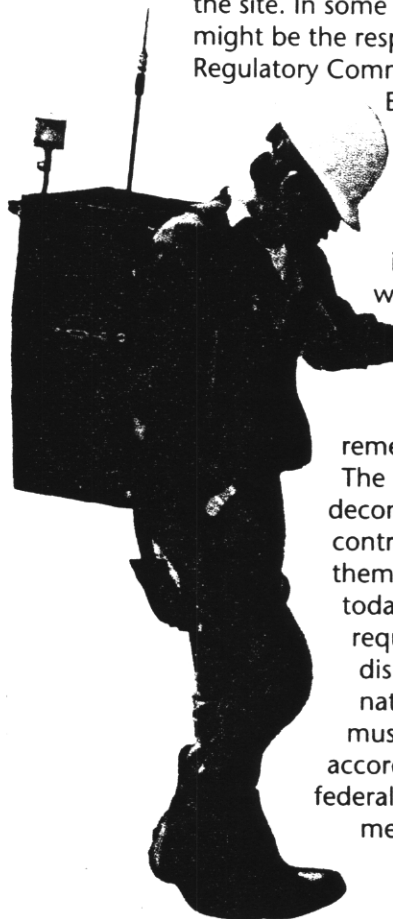
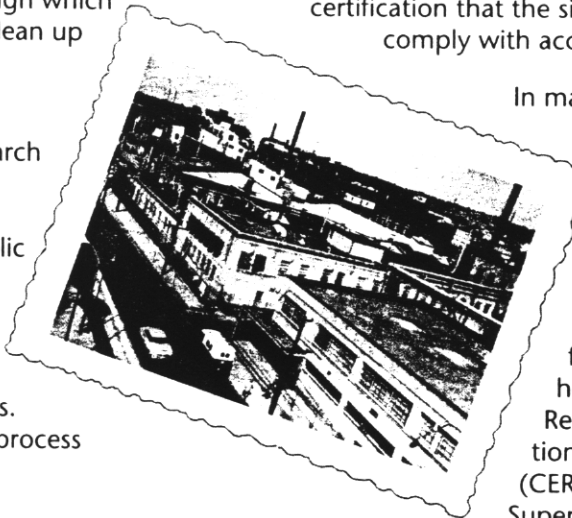
In making decisions about remedial action at FUSRAP sites, DOE's processes comply with two major environmental laws. The first is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund. The second is the National Environmental

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-



For 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



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.

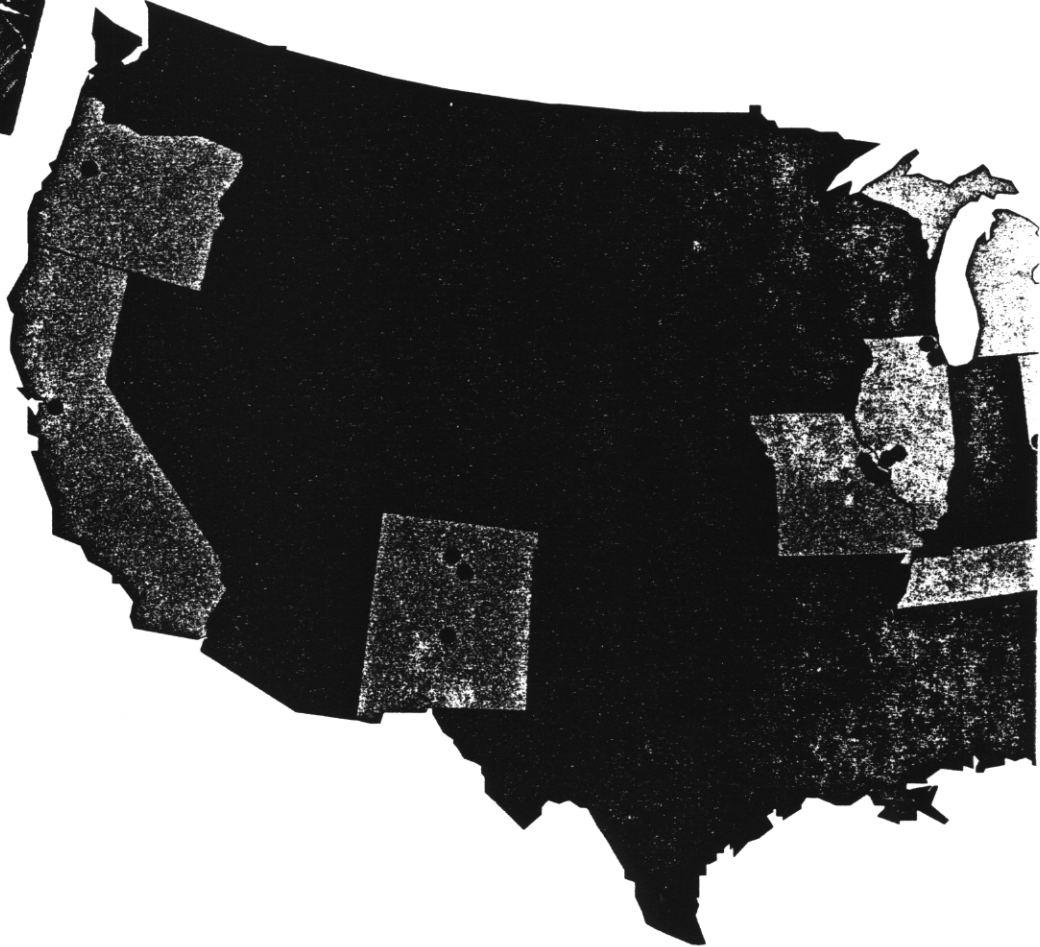
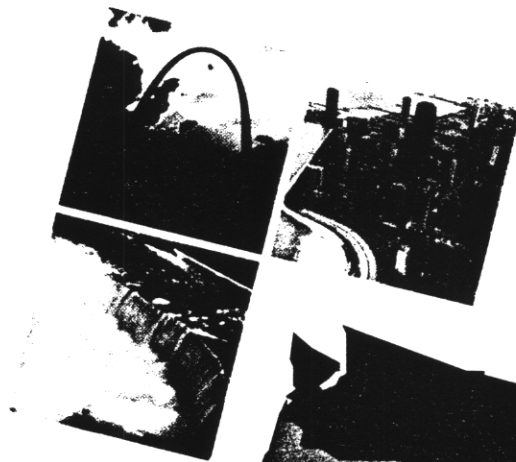
In 1983, Congress directed DOE to clean up the contamination resulting from commercial operations at the Maywood Chemical Works, which processed thorium ores from 1915 to the 1950s. Wastes from the operations were pumped to the nearby area, and over the years, the land became overgrown, and the wastes 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 cleared the area and the construction of several new homes, allowing residents of the area to move back in.

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.

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.

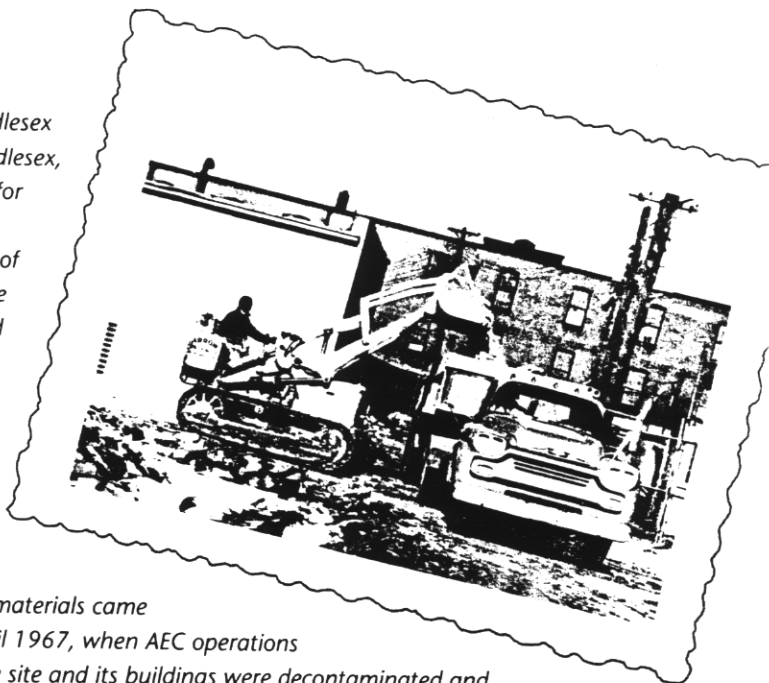
After the war, MSP continued similar activities as part of the nation's atomic energy program. Radioactive materials came and went from the facility until 1967, when AEC operations there ceased. At that time, the site and its buildings were decontaminated and certified for use with no radiological restrictions 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 31 contaminated 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.")



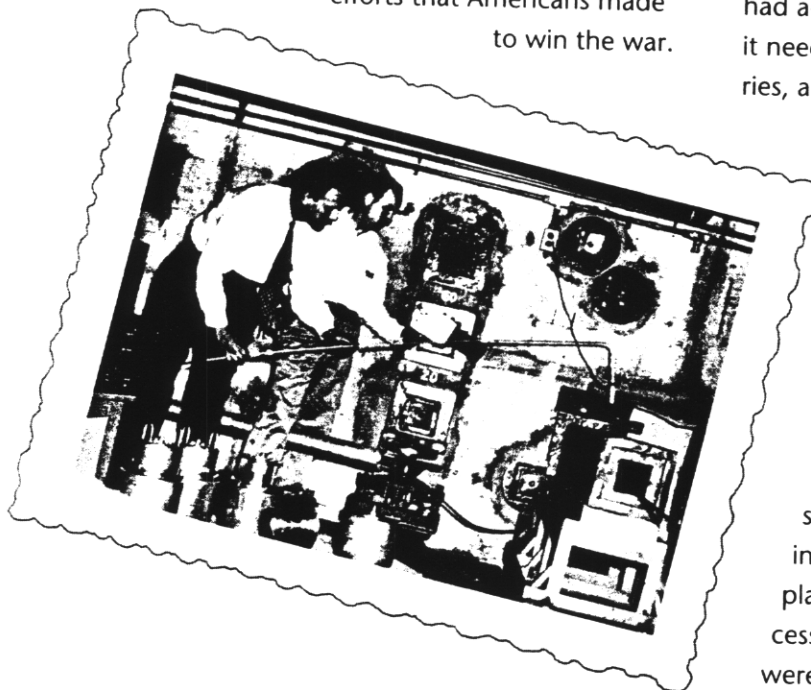
Because of the disposal methods and the subsequent demolition of buildings and earthmoving activities over the years, most of the radioactive wastes became dispersed throughout large volumes of soil and rubble. At some sites, wastes were spread by erosion or wind, and many offsite areas became contaminated. 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.



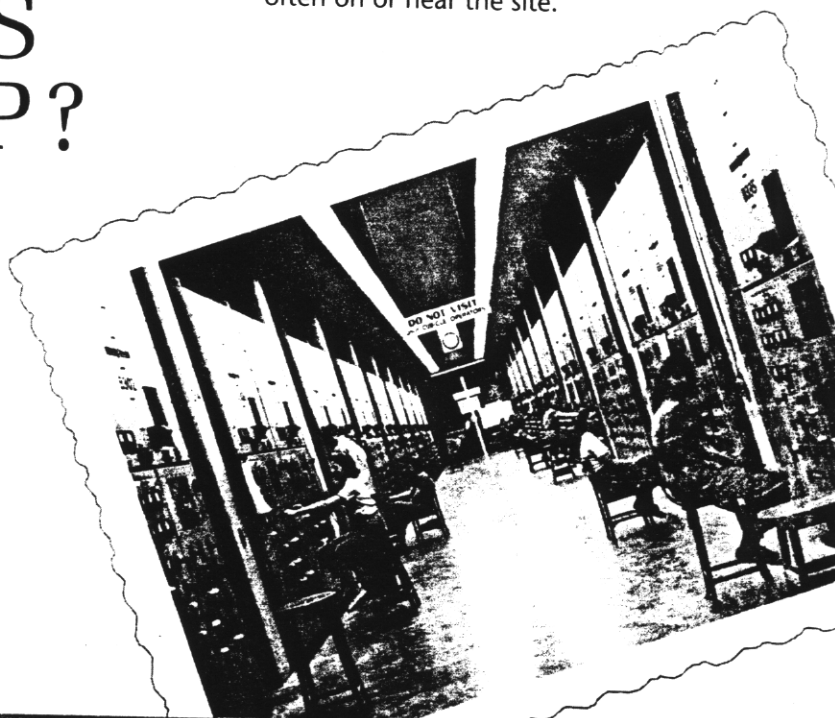
For most Americans, World War II is a distant memory or a lesson in a history book. But those who lived during that period remember the extraordinary efforts that Americans made to win the war.

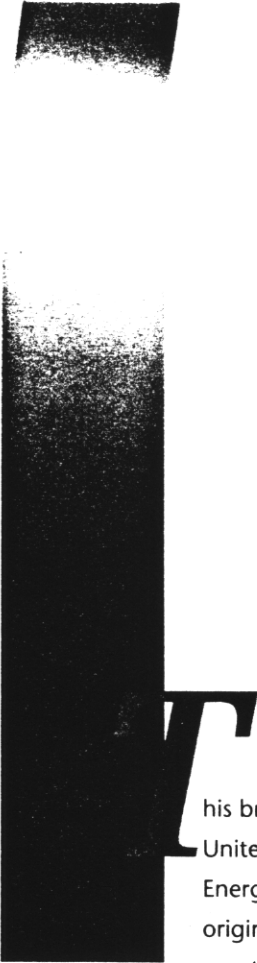


A major part of the war effort was the Manhattan Project, a secret program to develop an atomic weapon that would end the conflict. The Manhattan Project had access to virtually all the resources it needed. Chemical plants, laboratories, and production facilities throughout the country processed uranium 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?





his 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.

DOE FUSRAP Fact Sheet

St. Louis Sites

July 1990

DOE, EPA sign agreement to coordinate St. Louis cleanup activities

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 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.

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

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

The St. Louis Airport Site **FUSRAP** (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 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.

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.

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.

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.

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

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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.

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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 contami-

nated 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.

DOE FUSRAP Fact Sheet St. Louis Sites

September 1990

DOE, EPA sign agreement to coordinate St. Louis cleanup activities

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 contamination 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 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.

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

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

DOE FUSRAP Fact Sheet St. Louis Sites

August 1990

DOE, EPA sign agreement to coordinate St. Louis cleanup activities

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 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.

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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.

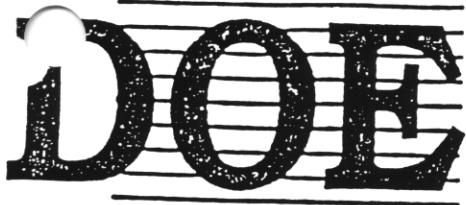
As a result of these activities, three FUSRAP sites in the Greater St. Louis area contain levels of radioactivity above current standards and require some type of remedial action. DOE has also identified more than 70 "haul route" properties in the general airport area that may be contaminated as a result 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.



FUSRAP Fact Sheet

St. Louis Sites

January 1990

DOE evaluating three sites in St. Louis area

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 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 Chas. F. Hallinckrodt 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

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

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

State of Missouri. This agreement will outline the environmental review process to be used 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 to be 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

APPENDIX H
NEWSLETTERS ISSUED TO DATE

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The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Winter 2020

314-260-3905/314-331-8000

www.mvs.usace.army.mil

FUSRAP efforts enable North County revitalization

After the Formerly Utilized Sites Remedial Action Program (FUSRAP) cleans up and restores properties that were contaminated as a result of America's early atomic programs, business owners take it from there.

The U.S. Army Corps of Engineers St. Louis District's FUSRAP has released for beneficial use 131 out of 148 St. Louis Airport Site vicinity properties (SLAPS VPs) identified in the September 2005 USACE North St. Louis County Record of Decision (ROD).

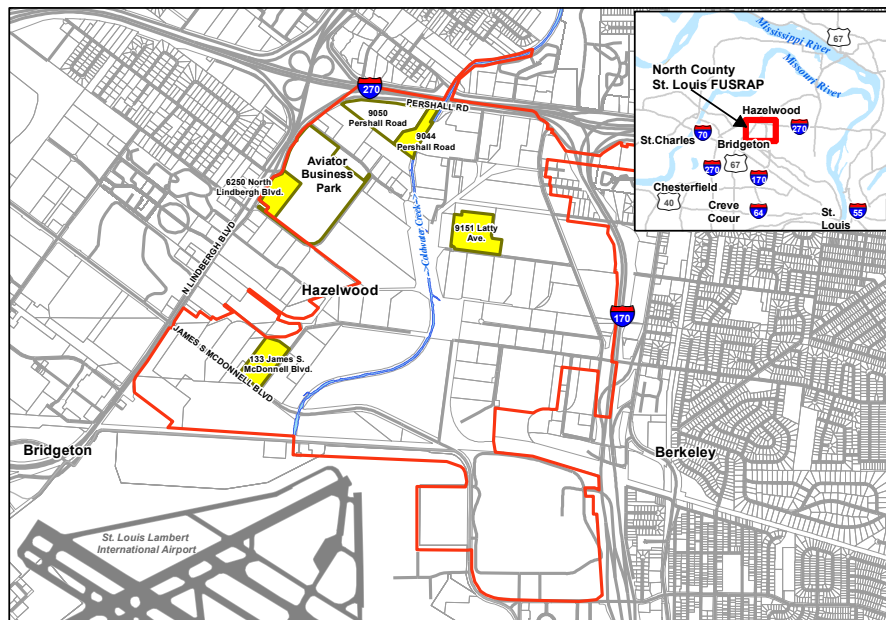
The FUSRAP team often uses heavy equipment like excavators and backhoes to accomplish the cleanup and restoration. Contaminated soil is loaded into covered gondola railcars and shipped to licensed, approved, out-of-state disposal facilities.

Following restoration, USACE notifies property owners that their property meets criteria for unlimited use and unrestricted exposure (UUUE).

FUSRAP cleanup efforts have, in part, set the stage for some of the development in the SLAPS VPs industrial area in Berkeley and Hazelwood, Missouri.

"Redevelopment of the remediated properties has helped create hundreds of jobs in Hazelwood," according to Rebecca "Becky" Ahlvin, the community and economic development coordinator for the city of Hazelwood.

Ahlvin quoted the 2019 business-license database, saying that about 280 jobs have been created in Aviator



The map of the SLAPS VPs industrial and commercial area shows four properties highlighted in yellow that FUSRAP cleaned up and released for beneficial use by owners.

Business Park alone. The appraised building values of the three Hazelwood sites featured in this article total more than \$56 million, she said.

The following properties are prime examples of how FUSRAP plays a part in North County's revitalization.

New and improved

The vacant FW Logistics warehouse at 9151 Latty Ave. in Berkeley was bought by Plumbers Supply Company in January 2019. FUSRAP completed remediation of the property, including the interior of the warehouse, in 2013 and released it for beneficial use.

The property suited the needs of the expanding company for a larger

Upcoming Events

Upcoming Meetings: The FUSRAP Open House will be held at Hazelwood Civic Center East, 8969 Dunn Road, Hazelwood, MO, Thursday, April 2, from 6 to 8 p.m. For updates, check <http://bit.ly/FUSRAPstl> or www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program and www.facebook.com/teamsaintlouis.

Information Releases: Summer newsletter – July 2020. FUSRAP issues this newsletter twice a year.



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St. Louis District



Leaders at NorthPoint Development plan for the warehouse build at 133 James S. McDonnell Blvd. in Hazelwood to be a source of manufacturing jobs.

warehouse. CEO John G.D. Dubuque had the property under contract, but he wanted more information about the remediated property before proceeding. After he called the St. Louis FUSRAP manager to discuss the work FUSRAP had done to clean up the site, Dubuque felt comfortable closing the deal, he said.

“Naturally, we were concerned when we first learned the history of the site we’d purchased for our distribution center,” Dubuque said. “Our first step was to reach out to the Army Corps of Engineers to get a detailed description of the cleanup that had been done at the site. After speaking with Bruce Munholand, I felt totally comfortable moving forward with our project.”

Following purchase, Dubuque invited members of the USACE FUSRAP team to a town-hall meeting for employees and their spouses to learn firsthand of the successful remediation. The presentation and question-and-answer session with FUSRAP specialists alleviated all concerns and put everyone at ease, he said.

“Since then, we’ve invested lots of money in the site and plan to be there for many years to come,” Dubuque said.

Starting from scratch

The concrete-and-steel behemoth of a building at 133 James S. McDonnell Blvd. in Hazelwood will be more than a warehouse if NorthPoint Development has its way. FUSRAP completed remediation of the property in 1999.

NorthPoint Development has partnered with the City of Hazelwood in developing the property, which had been vacant for more than 15 years, said NorthPoint’s Robert Jonathan “R.J.” Agee, director of development.

“While our prior projects in Hazelwood have attracted a lot of warehousing and distribution tenants, we believe that the property is strategically positioned for manufacturing users and the associated need for skilled labor,” Agee said.

Calm before the storm

After the property at 9050 Pershall Road in Hazelwood was subdivided, 9044 Pershall Road was remediated adjacent to Coldwater Creek ending in 2015 to allow the Metropolitan St. Louis Sewer District (MSD) to construct large overflow tanks as part of its combined sewer overflow project to handle excessive storm-water run-off. FUSRAP’s rapid remediation, restoration and release of the site enabled MSD to maintain schedule for its high-visibility project.

Doing business

What was once Ford Motor Company’s St. Louis Assembly Plant at 6250 North Lindbergh Blvd. in Hazelwood is now part of the 155-acre Aviator Business Park. The Aviator Business Park Redevelopment Corporation’s infill (land-recycling) development has several tenants (including Trans-Lux LED display and lighting solutions, International Foods, Weekends Only Furniture and Mattress, and Silgan Plastics) as well as sites that are still available for build-to-suit construction. FUSRAP finished remediating this property in 2010 and released it for beneficial use shortly thereafter.

By remediating these properties and others like them, FUSRAP helps build the future in North St. Louis County.

Keeping in Touch

Feedback - If you have any suggestions, questions or comments, contact the U.S. Army Corps of Engineers using any one of the following contact methods:

Phone: 314-260-3905/314-331-8000

Mail (New Address!): U.S. Army Corps of Engineers
St. Louis District
FUSRAP Area Office
114 James S. McDonnell Blvd.
Hazelwood, MO 63042

Read more about the FUSRAP Area Office’s new digs in this edition of “The St. Louis Sites.”

Email: STLFUSRAP@usace.army.mil

Mailing List - To receive newsletters and other printed communications, sign up for the FUSRAP mailing list or email list, using one of the contact methods above.

Home page - To reach the FUSRAP webpage, visit <http://bit.ly/FUSRAPstl> or <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/>.

Facebook - Visit the USACE St. Louis District page at www.facebook.com/teamsaintlouis.

Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Site

The U.S. Army Corps of Engineers, St. Louis District, continues remedial activities in accordance with the 1998 Record of Decision (ROD) for the accessible areas at the St. Louis Downtown Site, which includes the Mallinckrodt plant and 40 vicinity properties.

In calendar year 2019, the St. Louis District removed more than 9,625 cubic yards of contaminated material (nearly 5,150 cubic yards since FUSRAP's last newsletter) and shipped it to a licensed, out-of-state disposal facility. FUSRAP also finalized documents releasing three properties for beneficial use. Additional efforts consisted of continued remedial activities at Destrehan Street/Plant 7W, initiation of removal of contamination previously considered inaccessible at the Gunther Salt property, and continued evaluation of previously inaccessible areas inside the Mallinckrodt Plant.

The FUSRAP team anticipates completing the restoration of Destrehan Street, completing remediation at the Gunther Salt Dome 2 areas and issuing documents to release three additional areas during FY20. Additionally, FUSRAP will continue to evaluate the inaccessible soils in areas not included in the No Further Action Inaccessible Soils Operable Unit (ISOU) Group 1 ROD.

North St. Louis County Sites

The U.S. Army Corps of Engineers (USACE) continues to perform pre-design investigation sampling in Coldwater Creek corridor (banks and sediment) and properties adjacent to Coldwater Creek within the 10-year floodplain. More than 16,293 samples have been collected, and more than 270 properties from I-270 to New Halls Ferry Road have been investigated. Since 2016, USACE has released for beneficial use 99 Coldwater Creek properties and remediated two parks and six residential properties.

As the investigation on individual properties is completed, USACE is notifying the property owners of the status of their property. If USACE verifies Manhattan Engineer District/Atomic Energy Commission (MED/AEC) contamination, the FUSRAP team will request a meeting with the property owner to point out the location and depth of the contamination on the property, and to explain the risks.

USACE continues to remediate IA-09 Phase 3 (the former Ballfields). There is more than 90,000 cubic yards of contaminated material in Phase 3 of the former Ballfields. The remedial Phases 1, 2, and 2B of the former Ballfields have been completed. More than 25,000 cubic yards was removed and shipped to an off-site licensed facility.

FUSRAP move will improve long-term service to community

After 20 years on Latty Avenue in Berkeley, Missouri, the offices of the U.S. Army Corps of Engineers St. Louis District's Formerly Utilized Sites Remedial Action Program (FUSRAP) have moved 1 mile southwest to the St. Louis Airport Site (SLAPS) project site in Hazelwood.

The Latty Avenue facilities had been used well beyond their design life, so USACE had new facilities built. The FUSRAP team moved into the new building at 114 James S. McDonnell Blvd. (between Coldwater Creek and Eva Avenue) during the second week of October 2019.

"The new facilities provide a high-quality home for FUSRAP for the remaining 15 to 20 years of the program in St. Louis," according to Bruce Munholland, the program manager for St. Louis District FUSRAP.

FUSRAP's new home co-locates all disciplines required to solve multidisciplinary challenges, thereby ensuring the

highest-quality solutions, he said. The new location will also provide the public with much easier access to the FUSRAP knowledge base and Administrative Record.

In addition to other cost-cutting measures, the elimination of lease costs at the new site and reduced utility usage (because of more energy-efficient facilities) will mean more funds being used directly for remediation efforts.

In addition to modernized government offices, a state-of-the-art laboratory facility has been located at SLAPS, guaranteeing continued first-rate sample analysis for the duration of the projects. (The USACE St. Louis District FUSRAP Lab had been co-located with the FUSRAP offices on Latty Avenue.)

The new lab's larger size will allow its chemists to process more samples at a quicker pace, thereby contributing to better and faster decision-making.

Educational Information**Q: How does FUSRAP determine when and where signs need to be posted along Coldwater Creek?**

A: In determining when, where and what type of signage is appropriate, U.S. Army Corps of Engineers, St. Louis District, Formerly Utilized Sites Remedial Action Program (FUSRAP) applies the guidance provided by the Department of the Army Radiation Safety Program. The Army protocol follows regulations promulgated by the U.S. Nuclear Regulatory Commission (10 CFR 20.1301 Subpart D — Radiation Dose Limits for Individual Members of the Public).

The USACE FUSRAP Radiation Safety Officer (RSO) states that signs should only be posted when members of the general public exceed total exposure of 100 millirem total effective dose equivalent (TEDE) in a calendar year, or 2 mrem (0.02 milliSievert) in any one hour.

USACE continually monitors the air, groundwater, storm-water run-off and sediments of Coldwater Creek. No known areas approach or exceed the dose and exposure levels that would require signs or other markings to be posted. USACE will post signs in the future if any areas are found to exceed the levels described above.

The public may ask questions of FUSRAP by either calling 314-260-3905 or using email account STLFUSRAP@usace.army.mil.

This newsletter is printed on recyclable paper.



U.S. Army Corps of Engineers, St. Louis District
FUSRAP Area Office
114 James S. McDonnell Blvd.
Hazelwood, MO 63042

The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Summer 2019

(314) 331-8000

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FUSRAP uses proactive measures to protect community

Protecting human health and the environment is embedded in the mission statement of the U.S. Army Corps of Engineers, St. Louis District, Formerly Utilized Sites Remedial Action Program. FUSRAP employs operational procedures in its radiological-contamination investigation and cleanup activities to make it happen.

The activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) generated contamination during the development of atomic weapons in the 1940s and 1950s. FUSRAP removed the original sources of radioactive contamination in the North St. Louis County sites: The St. Louis Airport Site (SLAPS) was completed in 2007, and Hazelwood Interim Storage Site (HISS)/Futura was completed in 2013.

The highest-concentration contaminants have been confined to the industrial area between the St. Louis Airport Site (SLAPS) and Pershall Road/I-270, with remediation of the source piles at SLAPS and Latty Avenue Properties completed a few years ago. From the tens of thousands of samples taken along the first 4 miles of Coldwater Creek north of I-270, which transitions to predominantly commercial, residential and recreational use, the FUSRAP team has, thus far, found 10 pockets of contaminated soils in the creek banks and adjacent properties, ranging in depths from the surface to approximately 12 feet below ground surface. USACE will remediate contamination that is above remediation goals (RGs).

"Contamination above RGs that has the greatest chance of public contact is given the highest priority for remediation," said Bruce Munholand, the FUSRAP program manager.

FUSRAP standard practice has been to sample ALL tributaries to CWC, not just the major residential tributaries.



The contractor removes low-level radioactive material from Area 1 of the former Ballfields Phase 2B in North St. Louis County with a track-mounted excavator Wednesday, July 18, 2018.

Beginning at the mouth of the tributary, samples are taken proceeding upstream to the 10-year floodplain boundary limit in the tributary. If contaminated soil or sediment deposits are found, sampling proceeds upstream beyond the 10-year floodplain limit until no further contamination is detected. To date, FUSRAP has found contaminated soils or sediment in a handful of the tributaries, all within the 10-year floodplain.

Operational controls for dust suppression put in place during remedial activities include but are not limited to keeping soils moist, immediately cleaning up all soil spills, and covering exposed soil with geo-membrane or geotextile fabric. Continual perimeter air monitoring demonstrates that the operational controls being used are effectively preventing dust from leaving the remediation sites.

FUSRAP has a procedure to identify contaminants of concern (COCs) in structures. Aerial photographs are evaluated to determine the commercial and residential structures located within CWC's 10-year floodplain. For the purpose of initial evaluation, any building or structure that falls within or on the boundary of the CWC 10-year floodplain will be identified for further evaluation and possible testing in accordance with USACE radiological testing-method procedures.

Also, if an occupied building is located within or on the CWC 10-year floodplain boundary and CWC floodwater has entered the structure through a pathway other than a floor drain (e.g., a window, door, sill plate or wall), a reconnaissance survey will be performed on the building. (Floor drains can overflow due to high levels of rainfall.)

Upcoming Events

Upcoming Meeting: March/April 2020. Learn more in the [winter newsletter](#).

Information Releases: Winter newsletter – January 2020. FUSRAP issues this newsletter twice a year.

Planned Move: The FUSRAP Project Office will be moving in the fall. Learn more in the next issue.



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St. Louis District



Contractors perform remedial activities at the Gunther Salt Property on the St. Louis Downtown Site (SLDS) Monday, April 8, 2019.

St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Site

The St. Louis Downtown Site (SLDS) remedial-action construction activities are continuing at the Destrehan Street-East/Plant 7W area and the Gunther Salt Properties (DT-4) under the U.S Army Corps of Engineers (USACE) Formerly Utilized Sites Remedial Action Program (FUSRAP).

In addition, the FUSRAP team recently completed Pre-Design Investigation (PDI) sampling in the Plant 2 former Building 503 area. The team is currently performing data validation and review to assess the need for remediation.

Remedial activities at Destrehan Street-East/Plant 7W are nearing completion, with current activities focused in the section identified as Area 1. The FUSRAP team has removed approximately 25,000 cubic yards of contaminated material. The team is in the process of completing the last area prior to beginning the final phases of restoration.

Excavation is currently underway in and around the previously inaccessible salt-storage domes at the Gunther Salt Properties. At Dome 2, the FUSRAP team has removed about 400 cubic yards of contaminated material, with about 1,600 cubic yards still to be removed. At Dome 3, the team has removed about 1,200 cubic yards of contaminated material, with only a small amount remaining underneath the structural ring wall. To prevent compromising the integrity of the structure, the team is systematically removing the remaining contaminated material in small sections.

Keeping in Touch

Feedback - If you have any suggestions, questions or comments, contact the U.S. Army Corps of Engineers using any one of the following contact methods:

Phone: 314-260-3905/314-331-8000

Mail: U.S. Army Corps of Engineers, St. Louis District
FUSRAP Project Office
8945 Latty Ave., Berkeley, MO 63134-1024

The FUSRAP Project Office will be moving in summer/fall. Read more about it in the next edition of "The St. Louis Sites."

Email: STLFUSRAP@usace.army.mil

Mailing List - To receive newsletters and other printed communications, sign up for the FUSRAP mailing list or email list, using one of the contact methods above.

Home page - To reach the FUSRAP webpage, visit <http://bit.ly/FUSRAPstl> or <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/>.

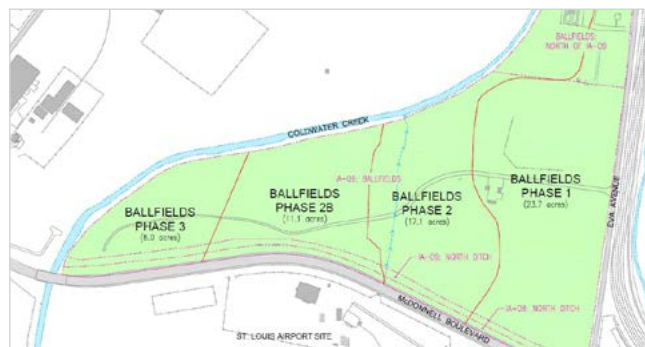
Facebook - Visit the USACE, St. Louis District, page at <http://www.facebook.com/teamsaintlouis>.

North St. Louis County Sites

The FUSRAP team completed remedial activities at Phase 2B in the former Ballfields (IA-09) near the intersection of James S. McDonnell Boulevard and Eva Road in June.

The FUSRAP team removed more than 23,000 cubic yards (cys) of material from the area. USACE started the excavation of Phase 2B briefly in 2014 and paused until 2017 when USACE resumed remedial activities. The FUSRAP team completed Phases 1 and 2 previously.

Remedial activities in Phase 3 of the former Ballfields (IA-09) started in June 2019. The FUSRAP team will excavate approximately 91,000 cys of material ranging from 1 foot to 15 feet below ground surface. Estimated time of completion for Phase 3 is four years.



A map of the former Ballfields area shows the phases of remediation.

USACE continues to sample Coldwater Creek banks, sediment and the adjacent properties within the 10-year flood plain. To date, USACE has collected 15,600 samples from CWC corridor and adjacent properties. USACE has completed more than 3.5 miles of CWC from I-270. The FUSRAP team is currently sampling from St. Ferdinand Park to the Jana School property adjacent to CWC.

Sampling CWC is more difficult the farther downstream the team goes. The banks of the creek get steeper making it harder to complete sampling activities. The FUSRAP team must complete several activities before it can actually collect samples.

1. First, the FUSRAP team develops a sampling plan called a Pre-Design Investigation Work Plan (PDI WP).
2. The farther down the creek that USACE samples, the more the travel time is increased.
3. The FUSRAP team inspects the area in the creek and adjacent properties.
4. Then the team removes the overgrowth and brush.
5. The team digs paths and stairs into the dirt to gain access to sampling areas on the creek banks.
6. The sampling locations are pinned/marked in the banks and adjacent properties.

7. When the FUSRAP team is ready to collect the samples, sampling equipment is loaded into vehicles and transported to the sampling locations. The equipment is heavy and difficult to carry.

8. The FUSRAP team conducts gamma walkover surveys to determine if there are additional small areas of radiological contamination. The team will collect biased surface soil samples in areas of elevated radioactivity in addition to the sample locations already determined in the sampling plan.

9. The team collects samples from the surface to 6 feet or deeper below ground surface. The FUSRAP team collects samples manually most of the time. Sometimes, the team must use a drill rig to collect deeper samples.

10. Heavy rains and flooding impact access to sampling locations in CWC because they wash away marker flags (which determine sampling locations) and conditions in the creek become slippery. Climbing up and down the creek banks with heavy sampling equipment becomes dangerous.

To alleviate the concerns of the property owners within Coldwater Creek's 10-year flood plain, USACE is sending letters to those property owners to provide updates on the status of their CWC property as FUSRAP samples the property and the data is completed. This fiscal year, USACE plans to complete documentation to release 40 properties.

DOE Legacy Management visits FUSRAP

The director of the Department of Energy's Office of Legacy Management visited the U.S. Army Corps of Engineers St. Louis District's Formerly Utilized Sites Remedial Action Program (FUSRAP) St. Louis Sites May 8.

During their visit, LM director Carmelo Melendez and some of his staff toured the on-site laboratory in Berkeley, Missouri, and various project sites in downtown St. Louis and North St. Louis County (NORCO). During the NORCO tour, the DOE contingent was able to watch a sampling crew from Leidos, a USACE contractor, taking samples from the banks of Coldwater Creek.

Two years after the remedy is completed at a FUSRAP project site, with or without inaccessible soils, its long-term management is turned over to DOE-LM.

"Our strong collaboration with the Corps is essential to accomplishing a smooth and efficient transition of the St. Louis area FUSRAP sites in the coming decades," Melendez said. "This site tour gave me — and the rest of the LM staff — the opportunity to observe how the Corps has managed the remediation challenges at these sites, as well as the issues that will remain when we take responsibility."

The FUSRAP program manager, Bruce Munholand, said that the DOE-LM site visit fostered a common understanding of the complexities of the FUSRAP sites and, as a result, what each site's end state may be upon transfer to LM.

"Our goal is to safely execute our remedial-action mission at all FUSRAP sites as efficiently as possible, optimizing current technology and industry practices to ensure all of our responsibilities have been addressed prior to turning the properties over to LM for long-term stewardship," he said.



During the site visit of Carmelo Melendez (center) and his staff from the Department of Energy's Office of Legacy Management Wednesday, May 8, 2019, FUSRAP lab manager Brad Wilson talks about how an isotopic-thorium sample is prepared for alpha-spectrometry analysis.

Educational Information

Q: What kind of sampling does FUSRAP do to identify areas of contamination along Coldwater Creek?

A: Prior to the start of actual sampling, the U.S. Army Corps of Engineers (USACE), St. Louis District, Formerly Utilized Sites Remedial Action Program (FUSRAP) develops a Pre-Design Investigation Work Plan (PDI WP), which is a sampling plan.

USACE considers several factors in selecting testing locations: 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.

The FUSRAP team initially conducts a gamma walkover survey (GWS) to determine if there are areas of radiological contamination near the ground surface. The team will collect biased surface-soil samples in areas of elevated gamma radioactivity. A biased sample is a sample taken based on the professional judgment of the sampling plan designers or the field sampling team. Biased samples aren't randomly located or determined by a sampling grid, but rather are targeted based upon perceived probability of contamination.

gamma walkover survey – Trained technicians using hand-held radiation detectors scan the ground to determine gamma-radiation levels.

soil-sample collection – Surface soil is typically sampled using a hand-held stainless-steel scoop or coring tool. Below six inches, technicians use extendable hand augers or coring tools where possible. A drill rig may be required for greater depths and more resistant subsurface materials. Technicians use tube-type samplers whenever an undisturbed soil core is needed.

structure radiological survey – Technicians use hand-held, alpha-beta-gamma detectors to survey buildings and other structures. In addition to random testing of the structure, focus areas include high-traffic areas, ventilation equipment, floor drains, dispositional surfaces, and shipping and receiving areas.

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The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Winter 2019

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USACE conducts Five-Year Review of St. Louis Sites

The U.S. Army Corps of Engineers (USACE), St. Louis District, Formerly Utilized Sites Remedial Action Program (FUSRAP) will begin its fourth Five-Year Review (FYR) of the St. Louis Sites in 2019. USACE will be contacting businesses, property owners, representatives from government agencies, utility companies and private citizens to interview. USACE anticipates the completion of the fourth FYR by July 2020.

The FYR is a tool to determine whether the cleanup response continues to be protective of human health and the environment. A team conducts an FYR when a remedial action leaves hazardous substances on the site at levels that do not allow for unlimited use and unrestricted exposure (UUUE). For example, this can occur when contamination remains under roads, railroads or buildings (inaccessible soils).

These reviews begin five years after the initiation of the first response and continue in five-year cycles in perpetuity or at least until the site is documented in an FYR to meet UUUE criteria.

How is a Five-Year Review conducted?

A team led by USACE with representatives from the U.S. Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources (MDNR) will conduct the FYR.

The FYR consists of six components: community involvement and notification, document review, data review and analysis, site inspection, interviews and assessment of response-action protectiveness.

The “document review” is a review of the key documents identifying the approved response actions, how they are being carried out, legal requirements influencing the response actions, impacts of the response action on human health and the environment, and community concerns. These documents include the records of decision (RODs), as-built drawings, site-monitoring information and the Federal Facilities Agreement (FFA).

The site-inspection process involves the team inspection of each site and identifies the condition of the site and surrounding area. The team verifies that key records, such



Contractors perform sampling activities along Coldwater Creek in North St. Louis County.

as health and safety plans, are on-site and available; verifies that access controls (fences, etc.) are in place; and notes the general condition of site features (i.e., cover material).

The team also seeks community input regarding the implementation of the response actions through site interviews. The team asks members of the community, site personnel, state/local authorities, community groups, property owners and neighboring residents/businesses to identify any problems that need to be addressed at the sites and to identify concerns regarding the impacts of the cleanup as it progresses.

Finding the results of the Five-Year Review

The results of FYRs are available to the public in the “Five-Year Review Report for the St. Louis FUSRAP Sites.”

You can find the third FYR of the St. Louis Sites (2015) on the FUSRAP webpage at <http://bit.ly/FUSRAPstl> or <https://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/> under “Five-Year Review.” The final report documents the methods, findings and conclusions of the review. If the cleanup status is found not to be protective of human health and the environment, recommendations to address any concerns will be documented in the report. After the fourth FYR of the St. Louis Sites is complete, the FUSRAP team will post the report to the FUSRAP webpage.



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St. Louis Formerly Utilized Sites Remedial Action Program Activities

North St. Louis County Sites

In fiscal year (FY) 2018, the U.S. Army Corps of Engineers, St. Louis District, continued remedial activities in accordance with a 2005 Record of Decision (ROD) for the three sites that comprise the North St. Louis County Sites:

- the Latty Avenue Properties, which include Hazelwood Interim Storage Site (HISS)/Futura Coatings Company and 10 vicinity properties;
- the St. Louis Airport Site (SLAPS); and
- the SLAPS Vicinity Properties, from St. Louis Lambert International Airport to the Missouri River.

Latty Avenue Properties

The Latty Avenue Properties comprise 10 vicinity properties plus the Hazelwood Interim Storage Site and Futura. Residues generated at the Mallinckrodt plant in St. Louis from 1942 through the late 1950s under contracts with the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) were moved to SLAPS. The residues from SLAPS were bought by a private company and hauled to Futura to extract more metals from the residue. The remaining wastes were shipped to Canon City, Colorado. The HISS piles were formed from 1979 to 1984 when the new property owner was preparing the property for use, demolishing one building, excavating portions of the western half of the property, paving certain areas and erecting several new buildings. Material excavated during these activities (approximately 13,000 cubic yards) was piled on the eastern portion of the property. USACE started removal of the HISS piles in spring 2000 and

Upcoming Events

Upcoming Meeting: Open house at Hazelwood Civic Center East Feb. 28 from 6 to 8 p.m. For updates, check <http://bit.ly/FUSRAPstl> or <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/> and <http://www.facebook.com/teamsaintlouis>.

Information Releases: Summer Newsletter – July 2019. FUSRAP issues this newsletter twice a year.

completed removal in fall 2001. Remedial activities on Latty Avenue Vicinity Properties were completed in 2013.

In FY 2018, the St. Louis District conducted groundwater monitoring and long-term management activities at the Latty Site. These activities will continue in 2019. Also in 2019, the St. Louis District will continue to prepare the land use controls to address the remaining contamination beneath the buildings on the Futura property. In December 2018, the St. Louis District began remediation of the approximately 100 cubic yards of contaminated material under the utility poles.

St. Louis Airport Site

In 1946, the MED acquired the 21.7-acre tract of land, now known as SLAPS, to store residues from uranium processing at the Mallinckrodt facility in St. Louis. Residuals from the uranium processing accumulated at SLAPS through 1957. A privately owned company bought the residues for recycling and moved the residues from SLAPS to a site on Latty Avenue. Contamination containing uranium-238, radium-226 and thorium-230 remained on the SLAPS property.

Remedial activities at SLAPS are complete, and the post-remedial action report was released in May 2009. Groundwater monitoring and long-term management activities began in 2010 and are ongoing.

The North County Load-Out facility is located at SLAPS. At the Load-Out, contaminated soil is loaded into specially equipped gondola railcars for out-of-state disposal at a federally permitted site.

St. Louis Airport Site Vicinity Properties

The main SLAPS Vicinity Properties are located in the cities of Hazelwood and Berkeley, Missouri. A 14.2-mile section of Coldwater Creek (CWC) located in North St. Louis County is a SLAPS Vicinity Property. The creek flows adjacent to SLAPS and the Latty Avenue Properties,

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north under Highway 270 through both residential and public recreational areas through the communities of Berkeley, Hazelwood, Florissant, Black Jack and unincorporated St. Louis County, and empties into the Missouri River.

The St. Louis District is currently sampling the CWC corridor and adjacent properties north of Highway 270. Uranium, radium and thorium contamination at the SLAPS Vicinity Properties is linked to both SLAPS and the Latty Avenue Properties. Over time, residues migrated from other sites or were deposited as the residues were hauled along transportation routes.

In FY 2018, the St. Louis District completed the cleanup of an additional area at Chez Paree Apartment Complex located in Hazelwood, continued remedial activities at IA-09 (Ballfields) Phase 2B, and completed the pre-design investigation sampling at Pershall Road and Highway I-270 areas and property adjacent to Eva Road. In FY 2019, the St. Louis District will work with the Missouri Department of Transportation and St. Louis County to remediate areas where road improvements will occur in the SLAPS Vicinity Properties.

In FY 2018, the St. Louis District continued sampling CWC and adjacent properties and issued documentation releasing 60 properties for beneficial use. The Remedial Design/Remedial Action Work Plan for IA-09 (Ballfields) Phase 3 and IA-10 was also released. During FY 2018, the district shipped 18,516 cubic yards of contaminated material from the North County SLAPS Vicinity Properties by rail to an off-site, licensed disposal facility. Progress since last newsletter: The district shipped 6,070 cubic yards in the months of July through December.

In 2019, the district will continue remedial activities at Ballfields Phase 2B, initiate remedial activities at Ballfields Phase 3 and remediate Pershall Road and Eva Avenue to support road improvements. In addition,



Contractors perform remedial activities at Ballfields Phase 2B across McDonnell Boulevard from the St. Louis Airport Site (SLAPS).



Remedial activities at the Heintz Steel property on the St. Louis Downtown Site.

the district will continue sampling CWC and adjacent properties. The St. Louis District also plans to issue documentation releasing 40 vicinity properties and ship 18,000 cubic yards of contaminated material to an out-of-state, licensed disposal facility.

St. Louis Downtown Site

The St. Louis District continues remedial activities in accordance with the 1998 Record of Decision (ROD) for the accessible areas at the St. Louis Downtown Site, which includes the Mallinckrodt plant and 42 vicinity properties.

In FY 2018, the St. Louis District removed 12,872 cubic yards of contaminated material and shipped it to an off-site, licensed disposal facility. Progress since last newsletter: The district shipped 1,578 cubic yards in the months of July through December. The district also finalized documents releasing three properties. Additional efforts consisted of continued remedial activities at Destrehan Street/Plant 7W and completion of remediation at the Mallinckrodt former Building 17 area inside Plant 1 and the Heintz Steel property.

The district anticipates completing the cleanup of Destrehan Street, initiating remedial action at the Gunther Salt property and issuing documents to release three additional areas during FY 2019. Additionally, the district will continue to evaluate the inaccessible soils in areas not included in the No Further Action Inaccessible Soils Operable Unit (ISOU) Group 1 ROD.

Read more about it and view the SLDS map on the FUSRAP webpage at <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program> by selecting “St. Louis Downtown Sites ISOU Group 1 Proposed Plan” under “Fact Sheets” in the right-hand column.

Educational Information

Q: What is a right of entry?

A: The U.S. Army Corps of Engineers St. Louis District's Formerly Utilized Sites Remedial Action Program (FUSRAP) uses rights of entry to conduct its work.

A right of entry (ROE) is legal authority to do a specified act or series of acts upon land that is not owned or controlled by the government.

An ROE is a legal document that furnishes evidence of the:

- permission granted by the landowner to the government to enter upon the owner's land; and
- obligations, responsibilities and liabilities assumed by the government when entering upon the land.

For FUSRAP, an ROE enables the government to:

- enter upon land to take soil samples or conduct other tests looking for radioactive contamination;
- if contamination is found, clean up and remediate the land;
- after testing and remediation are complete, restore the land to its previous condition; and
- in some cases, provide access to other lands so that they may be tested, remediated and restored.

The terms of an ROE cannot be easily changed or modified because they are set by government regulations.

An ROE is **NOT** an interest or estate in land like a deed or easement; instead, an ROE is only a contractual right.

An ROE does **NOT** have to be notarized; instead, a mere photocopied signature on an ROE is sufficient, and landowners can send signed ROEs to the government via email or fax.

If sampling, remediation and site restoration cannot be completed within the typical two-year ROE term, then successive ROEs may be necessary.

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The St. Louis Sites

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HS seniors explore careers at District HQ, FUSRAP

The U.S. Army Corps of Engineers (USACE), St. Louis District, held a farewell ceremony for six high-school interns April 30 at the Robert A. Young Federal Building in downtown St. Louis.

The ceremony brought the district's internship program to a close for the 2017-2018 school year. From January through May, the students from the Clyde C. Miller Career Academy had worked at the district headquarters and toured project field sites two to three days a week.

USACE has collaborated with Clyde C. Miller Career Academy for seven years running. Miller has placed high-school seniors as interns with businesses for about 20 years.

While at the St. Louis District, the interns learned how to communicate effectively in the workplace, pay attention to detail, prepare for briefings and work as a team. The internship gave students exposure to USACE, its missions and career opportunities.

At the ceremony, district commander Col. Bryan Sizemore praised the students for their hard work and predicted a bright future as a result of their participation in the Science, Technology, Engineering and Mathematics (STEM) program.

Students Jaylon Wheeler and Keyontay Lampkin, both 18, toured the St. Louis District's Formerly Utilized Sites Remedial Action Program (FUSRAP) Laboratory in Berkeley, Missouri, March 19. The lab analyzes samples to determine if they have low-level radiological contamination. FUSRAP addresses radiological contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) during the development of atomic weapons in the 1940s and 1950s.



Two students from the Clyde C. Miller Career Academy learn about testing samples from chemist Chelsea Jarrell at the U.S. Army Corps of Engineers (USACE), St. Louis District, Formerly Utilized Sites Remedial Action Program (FUSRAP) Laboratory in Berkeley, Missouri, Monday, March 19, 2018. Keyontay Lampkin and Jaylon Wheeler, both 18, toured the FUSRAP Lab as part of an internship with USACE through their high school.

"My favorite part of what we saw was when the chemist heated up the platinum crucible and made the liquid turn to 'glass,'" Wheeler said. The glass-like disk is the result of a two-step process. The chemist breaks down a soil sample with heat and a fluoride mixture. The chemist then uses heat, sulfuric acid and sodium sulfate to dissolve the fluoride "cake." When the melted pyrosulfate "cake" cools to room temperature, it looks like a glass circle.

"I'm learning a lot because I didn't know there was such a variety of things under civil engineering," he said. "It's pretty cool."

Lampkin explained that Clyde C. Miller Career Academy is a career and technical school, and its partnership with USACE allows the students to investigate even further the idea of engineering as a career.

"Our freshman and sophomore year, we cycle through all the programs to give us a feeling of the (technical) pathways to make sure that's really what we want to do," she said.

Through USACE's internship program, young men and women talk about engineering in a work setting, experience it firsthand and possibly choose it for a career.

Upcoming Events

Information Releases: Winter Newsletter – January 2019. FUSRAP issues this newsletter twice a year.

Upcoming Meetings: For updates, check <http://bit.ly/FUSRAPstl> or <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/> and <http://www.facebook.com/teamsaintlouis>.



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St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Site

The St. Louis Downtown Site (SLDS) remedial action (RA) construction activities are continuing at three separate locations in the Mallinckrodt LLC (Mallinckrodt) Plant: the Plant 6 former Building 101 area, the Destrehan Street-East/Plant 7W-North area, and the Plant 1 former Building 17 area. In addition, pre-design investigation (PDI) sampling is underway in the Plant 1 former Building 10 area. Planning/design is also underway for RA of previously inaccessible areas at Plant 2 North, Gunther Salt Properties, and Heintz Steel and Manufacturing Vicinity Property (DT-6).

In the Plant 6 former Building 101 area, the FUSRAP team has completed RA, and backfill is approaching planned final grades. However, final grading and turnover of the area will be completed with adjacent RA in Destrehan Street.

RA at Destrehan Street-East/Plant 7W-North is continuing, proceeding from east to west in four linear sections (Areas 1 through 4). The FUSRAP team has completed three of the four areas, including restoration of the water main and sewer line. RA in Area 2 included the removal and replacement of underground sewer lines that will be connected to upstream Plant 7W sewers. Demolition and removal of portions of the inactive concrete sedimentation structures was required. In addition, guided excavation within Plant 7W resulted in the ongoing removal of a portion of the 27-inch diameter underground sewer. The team continues to place backfill and grade it to base elevation for restoration of the Destrehan Street



An excavator operator from contractor HydroGeoLogic Inc. (HGL) performs remediation at Destrehan Street at the St. Louis Downtown Site (SLDS) Wednesday, April 18, 2018.

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pavement. However, the team won't install the pavement and drainage structures until all four areas are completed. Approximately 19,000 cubic yards of contaminated material have been removed and 1,500 cubic yards remain to complete the RA, which is projected for December.

RA at the previously inaccessible Plant 1 former Building 17 area is nearing completion. Excavation within the shored area included the removal of the collapsed portion of the Plant 1 sewer. Once RA was complete within the shored area, Mallinckrodt installed a new sewer, and the area was backfilled to interim elevation to allow for removal of the internal bracing system. RA is currently underway in the remaining Plant 1 area to the east of the shored area. The team has removed about 21,000 cubic yards of contaminated material, and approximately 200 cubic yards remain to be removed. Completion of RA in the Plant 1 former Building 17 area is currently scheduled for mid-2018.

Pre-design investigation of the previously inaccessible Plant 1 former Building 10 area is now underway to determine if RA will be necessary. Upon subsequent removal of buildings and structures at SLDS, other previously inaccessible areas are expected to become available for additional sampling.

North St. Louis County Sites

North County shipping to a licensed, out-of-state disposal facility has increased to 13,943 cubic yards shipped.

Chez Paree

An additional area of contamination was found north of the original contaminated area at Chez Paree Apartment Complex and east of the swimming-pool area. USACE, St. Louis District, completed the remediation April 19 and restoration (backfilling and adding grass seed) May 8.

Since the FUSRAP team started excavation on the additional area at Chez Paree in late January, it has removed more than 1,445 cubic yards of contaminated material above North County remediation goals.

The team completed remedial activities and restoration of this area earlier than expected. As a result, Chez Paree residents can conduct their summer activities without remedial activities interfering with them.

Ballfields Phase 2B

On April 28, after the completion of remedial activities at Chez Paree, the remedial activities at the Ballfields Phase 2B resumed. To date, the FUSRAP team has removed more than 18,400 cubic yards of contaminated material from Ballfields Phase 2B. Remedial activities will continue at the Ballfields this summer.



After finishing discharging water through a micron filter, the crew prepares to begin the remedial excavation and hauling of contaminated material from the Ballfields Phase 2B project to the load-out facility Tuesday, May 22, 2018.

Public health assessment relies on Corps of Engineers data

The Agency for Toxic Substances and Disease Registry recently released the public health assessment “Evaluation of Community Exposure Related to Coldwater Creek,” drawing on thousands of survey and soil test data points collected by the U.S. Army Corps of Engineers, St. Louis District, Formerly Utilized Sites Remedial Action Program over the past 20 years.

FUSRAP’s primary objective is to remediate radiological contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) during the development of atomic weapons in the 1940s and 1950s.

“Although FUSRAP has no direct medical support mission, we continue to pursue our assigned mission to protect human health and improve the environment for residents in the area,” said Bruce Munholand, the FUSRAP program manager. “Just recently, the 2018 federal budget for remediation of St. Louis sites was increased by \$12

million, which enables us to accomplish our goals at a quicker pace.”

Since USACE began monitoring in 1999, the waters of Coldwater Creek have never shown the presence of radiological contamination above the remediation goals (RG) set forth in the Record of Decision for the North St. Louis County Sites. (Visit the FUSRAP website for the North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Reports.) The FUSRAP team has identified isolated subsurface pockets of radiological contamination above RGs along the banks of Coldwater Creek. The environmental monitoring program continues to confirm that the creek is not being re-contaminated by these subsurface pockets.

USACE currently tests all properties within the 10-year floodplain of Coldwater Creek. If the FUSRAP team discovers contaminants near the 10-year floodplain boundary, it continues testing beyond the boundary until the limit of contamination is established.

“Where MED/AEC radiological contamination is found at or near the surface, orderly preparations are made for removing the contamination and reducing risk of exposure as quickly as we can,” he said.

Contamination found at depths that are inaccessible to the public will be scheduled for future remediation.

Where contaminated soils are known to exist in soils close to a home, USACE will test in the home if there is also a demonstrated transport pathway for contaminants to move with the soils into the home during flood situations.

FUSRAP has a plan for providing restricted-use signs when and where appropriate in accordance with local, state and federal regulations governing Hazardous, Toxic and Radioactive Waste (HTRW) posting requirements. Since the radiation levels along CWC are below the regulated levels that mandate signage, no restricted-use signs have been posted. This plan is currently under review.

Educational Information

Q: When does USACE contact residents who live in areas under evaluation for contamination?

A: The U.S. Army Corps of Engineers (USACE) requests a right of entry signed by the property/business owner about six to eight weeks before the scheduled sampling date. After receiving a signed ROE, USACE sends a postcard to the owner one to four weeks before sampling is scheduled to start. On the first day of sampling, before starting work, the USACE contractor will knock on the door to remind the owner of the sampling. The contractor will leave a leaflet on the door when sampling is complete.

If no contamination is found on the property above the North County Record of Decision (ROD) remediation goals, USACE sends a letter informing the property owner and giving notice that a Pre-Design Investigation Summary Report/Final Status Survey Evaluation will be prepared and provided in the future. Once the report is finalized, USACE sends it to the property owner. The report, which includes all the data from samples taken on the property, states that the data are below ROD RGs and the property meets the criteria for unlimited use and unrestricted exposure (UUUE).

If contamination is found on the property above ROD RGs, USACE makes an appointment with the property owner to discuss the results of sampling and to arrange for additional sampling, if needed. After the investigations, USACE will work with the property owner to develop a remedial design and schedule to remediate the property.

Once remediation is performed, USACE sends a letter to inform the property owner that the contamination has been remediated below ROD RGs and to expect a full report. Once the Post-Remedial Action Report/Final Status Survey Evaluation is completed, USACE provides a copy to the property/business owner. The report states that the contamination was remediated to ROD RGs and that the property meets the criteria for UUUE, which releases the property for beneficial use.

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USACE FUSRAP On-site Laboratory

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.

The U.S. Army Corps of Engineers (USACE) St. Louis District FUSRAP Laboratory (FUSRAP lab) measures samples' levels of radiological contaminants – uranium, radium and thorium. FUSRAP lab results help USACE identify where cleanup is needed and confirm where it has been successful. The lab serves USACE's mission to remove low-level radioactive contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission during and following World War II to levels protective of human health and environment. The FUSRAP lab is integral to accomplishing that goal.

A primary advantage of the on-site lab is its quick sample turn-around time. The FUSRAP lab is specifically designed for analyzing St. Louis FUSRAP-specific contaminants. Therefore, this dedicated lab's processes are specialized and efficient, often resulting in complete analysis of prioritized samples in fewer than three days. In fact, the lab can provide 24-hour sample turn-around for gamma spectroscopy results. An analysis of railcar information samples can be done within an hour of receipt. Commercial labs would typically require more time to process samples than the USACE FUSRAP lab because of their high volume of samples from numerous projects and customers.



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

The FUSRAP lab saves about \$1 million per year compared to using commercial laboratories when factoring in the accelerated sample turn-around. An accelerated turn-around is required when, for example, an excavated area is ready for clean backfill soil but confirmation of radiological status is essential. Commercial labs would typically triple the cost of accelerating those results.

However, quality standards are never sacrificed for speed. The FUSRAP lab is the only U.S. Department of Defense (DOD) Environmental Laboratory Accreditation Program-accredited USACE laboratory performing wet-chemical isotopic separations followed by alpha spectroscopy. The FUSRAP lab undergoes stringent DOD audits that evaluate the lab's quality management system. Additionally, the lab must successfully analyze unknown evaluation samples from the U.S. Department of Energy to assess the accuracy of reported lab results.

The FUSRAP lab is equipped with state-of-the-art nuclear instrumentation with calibrations traceable to National Institute of Standards and Technology. All technicians in the lab follow standard operating procedures (SOPs). The chemists, analysts and administrative staff have an average of 14 years of experience performing sample analysis at the FUSRAP lab, a cumulative total of 150 years of St. Louis FUSRAP experience.

Upcoming Events

Information Releases: Summer Newsletter - July 2018
FUSRAP issues this newsletter twice a year.

Upcoming Meetings: Public Meeting at Hazelwood Civic Center East Feb. 22 from 6:30 to 8:30 p.m. For updates, check <http://bit.ly/FUSRAPstl> or <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/> and <http://www.facebook.com/teamsaintlouis>.



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Even with this accumulated experience, lab management evaluates employees annually to test their proficiencies with SOPs and other processes. All sample results are reviewed by senior laboratory staff, approved by lab management and then sent for data validation against USACE requirements. All sample measurements must be accurate and comparably analyzed so that USACE can make the best decisions for the community and the environment.

St. Louis Downtown Site

At the St. Louis Downtown Site (SLDS), FUSRAP is currently performing remedial action (RA) construction activities at three separate locations in the Mallinckrodt LLC (Mallinckrodt) Plant: the Plant 6 area within the former Building 101 footprint, the Destrehan Street-East/Plant 7 W-North area, and the Plant 1 (former Building 17 area). In addition, planning is underway for RA in the Plant 1 Building 10 area, including the deferred western portion of the former Building 17 area.

In the Plant 6 former Building 101 area, RA is nearing completion. FUSRAP has placed backfill almost to finish grade as well as constructed a temporary haul route across the northern portion of the restored gravel area. This temporary haul route allows Mallinckrodt vehicles to access Building 103 and the Hazardous Waste Staging Area while their normal route on Destrehan Street is being excavated.

At Destrehan Street-East/Plant 7W-North, RA is continuing. The work is proceeding from east to west in four linear sections. Overhead electrical and communication utilities were relocated to allow the removal of inactive facilities along Destrehan Street and in Plant 7W as RA proceeds.



The FUSRAP team uses an excavator to remove contaminated soil within the shored portion of the St. Louis Downtown Site's Plant 1 Former Building 17 area Tuesday, Oct. 24, 2017.

Also, the inactive underground water, sewer and gas lines are being removed as excavation proceeds. The FUSRAP team has completed the excavation of the first three linear sections, removing approximately 13,000 of the projected 16,000 cubic yards of contaminated soil.

Excavation of the remaining linear section will include demolition and removal of inactive Plant 7 West concrete structures, as required. The water lines are being replaced in three sections as excavated areas are cleared for backfilling. Replacement of the first water-line section is nearing completion. Sewer-line replacement is also continuing as excavated areas are cleared for backfilling. The gas line will be replaced later by the utility company based on Mallinckrodt requirements. Final restoration of the Destrehan Street-East/Plant 7W-North area will include the replacement of active underground utilities as well as replacement of the paved street and adjacent street lights to pre-construction conditions. The FUSRAP team projects that the Destrehan Street-East/Plant 7W-North RA will be completed by the end of 2018.

Within Plant 1, Mallinckrodt recently removed Building 17 to provide space for the expansion of the adjacent Building 5. In April 2017, USACE began RA on the previously inaccessible Building 17 area with the installation of sheet-pile shoring to facilitate excavation in the limited space. Excavation is continuing in the eastern portion of the former Building 17 area, and approximately 50 percent of

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the projected volume of 3,100 cubic yards of contaminated soil has been removed. The excavation included removal of the collapsed portion of the Plant 1 sewer. This sewer will be replaced by Mallinckrodt as the area is cleared and backfill proceeds. Close coordination with other ongoing Mallinckrodt construction projects in the limited Plant 1 space has been required to proceed efficiently with this RA. USACE has deferred the RA of the western portion of the planned former Building 17 area because of the space constraints of overhead utility locations.

Mallinckrodt is now planning for the removal of Plant 1 Building 10 and some overhead utilities to the west of the current Plant 1 former Building 17 RA area. Pre-design investigations of the Building 10 area are now underway to determine RA requirements at that location. The subsequent removal of other Plant 1 buildings in the immediate area by Mallinckrodt may also allow RA in other previously inaccessible areas.

North St. Louis County

Palm Drive Properties

USACE completed the remediation and restoration of the six Palm Drive Properties Oct. 20, 2017. The FUSRAP team removed about 5,980 cubic yards of contaminated material. The team performed extensive preparatory work to ensure that the remediation was completed quickly and efficiently. Because of continuous contact with the property owners, the team maintained an excellent relationship with the residents throughout the remedial process.



FUSRAP program manager Bruce Munholland gives a tour of the Ballfields Phase 2B site to Maj. Gen. Richard Kaiser, the commander of the U.S. Army Corps of Engineers' Mississippi Valley Division (MVD), and Col. Bryan Sizemore, the commander of the St. Louis District under MVD, Wednesday, Dec. 13, 2017.

Pershall Road

The FUSRAP team completed the sampling and characterization of Pershall Road in late November 2017. Pershall Road became contaminated when residues were hauled along transportation routes and by flooding of Coldwater Creek. The North County Record of Decision describes the soils under Pershall Road as inaccessible. As such, they will be controlled through land-use restrictions. Because the anticipated future use of Pershall Road is continued transportation, the soils beneath the road will remain inaccessible, and, as a result, exposure of contaminated soils will be limited. Contaminated soils that are accessible in the ditches and rights of way adjacent to Pershall Road will be remediated.

Coldwater Creek

USACE continues investigative sampling the next areas of the Coldwater Creek corridor and adjacent properties within the 10-year flood plain north of the St. Denis Bridge. Delineation and bounding sampling continues south of St. Denis Bridge at areas in the creek and adjacent properties where initial sampling identified the presence of contamination. Delineation or bounding sampling will show the extent and depth of the contaminated area. This sampling will be used to help develop the design to remediate these areas.

Ballfields Phase 2B

In early December 2017, after the sampling of Pershall Road had been completed, USACE returned to remedial activities at the Ballfields Phase 2B area. Since resuming remediation activities at Ballfields Phase 2B, more than 1,500 cubic yards of contaminated material have been removed.

Chez Paree

An additional area of contamination was found north of the original contaminated area at Chez Paree Apartment Complex and east of the swimming-pool area. Investigation and sampling of this area identified approximately 1,300 cubic yards of contaminated material above the North County Record of Decision remediation goals. USACE anticipates that removal of the contamination will take about three months with site restoration occurring in the spring/early summer 2018 time frame. USACE completed the investigation of areas outside the 10-year flood plain at the Chez Paree Complex to ensure that the remediation area was fully delineated.

Educational Information - Five-Year Review

The U.S. Army Corps of Engineers, St. Louis District, plans to initiate activities for the next (fourth) Five-Year Review in 2018 to determine whether the cleanup response of all St. Louis Sites continues to be protective of human health and the environment. At hazardous waste sites where contaminants are present above levels that allow for unlimited use/unrestricted exposure, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that response actions be evaluated at least every five years following the start of cleanup at the site.

A team led by USACE with representatives from the U.S. Environmental Protection Agency and the Missouri Department of Natural Resources conducts the Five-Year Review. The review consists of four components: document review, site inspection, site interviews and assessment of response-action protectiveness. Representatives from USACE's Formerly Utilized Sites Remedial Action Program (FUSRAP) team will contact businesses, utility companies, property owners, officials from government agencies and private citizens to arrange interviews.

The Five-Year Review will be completed and signed by July 2020.

You can find the third Five-Year Review (dated July 2015) on the FUSRAP website at <http://bit.ly/FUSRAPstl> or <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/> under "Five-Year Review."

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St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Site

At the St. Louis Downtown Site (SLDS), the U.S. Army Corps of Engineers (USACE) has almost completed remedial activities at the Mallinckrodt, LLC (Mallinckrodt) Plant 6 area within the former Building 101 footprint and perimeter area. The Formerly Utilized Sites Remedial Action Program (FUSRAP) team completed excavation activities within the footprint of the former Building 101 in January 2017. Backfill activities are ongoing. The team is phasing the final restoration and grading of the remediated area to accommodate the remediation of the adjacent portions of Destrehan Street and Plant 7 West. This area is situated between Hall Street and the Burlington Northern/Santa Fe Railroad Vicinity Property at SLDS.

Remedial activities for Destrehan Street-East and Plant 7 West-North began in June 2016 and are continuing. To date, the FUSRAP team has removed approximately 8,500 cubic yards – about half of the planned excavation volume. The team recently completed preconstruction activities to relocate or abandon existing utilities along



The FUSRAP team excavated contaminated soil at former Building 17 at SLDS.

this portion of Destrehan Street. These utilities included overhead electrical and fire/security communication systems, as well as underground gas, sewer and water lines. The team removed the Destrehan Street Security Guard Station and will remove the abandoned Electric Substation Building as remediation nears that area. Destrehan Street remediation is scheduled to be completed in mid-to late 2018.

FUSRAP has begun remediation activities for the former Building 17 area, located in Mallinckrodt Plant 1. They completed site preparation and installation of sheet-pile shoring in the deeper excavation area May 29, 2017. A portion of the excavation to the east of the shored area was completed July 12, 2017. It was backfilled to interim grade to provide a stable work area for equipment during excavation within the shored area. The installation of the bracing system for the shored area of the former Building 17 remediation is planned for late summer 2017. Once the bracing system has been installed, excavation activities will resume within the shored area to design depth,

Upcoming Events

Information Releases: Winter Newsletter 2018

This newsletter is issued twice a year.

Upcoming Meetings: Public Meeting - Tentatively scheduled for February 2018. Check for updates at: <http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program>.



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USACE completed remedial activities at Duchesne Park in February 2017. More than 8,600 cubic yards of contaminated material were removed. The City of Florissant has re-opened the restored park to the public.

including removal of the Plant 1 sewer. After remediation activities are complete, the shored area will be backfilled to interim grade and Mallinckrodt will replace the Plant 1 sewer. As of July 27, 2017, the FUSRAP team has excavated about 860 cubic yards of the former Building 17 area's total planned excavation volume of about 3,100 cubic yards.

North St. Louis County Sites

Duchesne Park

The FUSRAP team completed remediation of Duchesne Park in February 2017. More than 8,600 cubic yards of contaminated material were removed and shipped to an out-of-state licensed disposal facility. In April, the team backfilled, seeded and mulched the remediated area, completing the restoration activities at the park. The City of Florissant has now reopened Duchesne Park to the public.

Palm Drive Properties

Remedial activities at the six Palm Drive Properties started on May 2, 2017. The FUSRAP team completed remediation of the properties in mid-June, removing more than 5,600 cubic yards of contaminated material. The team completed backfill activities in the area of excavation in July 2017. Restoration activities, including seeding and mulching the area, are underway.

This was the first time FUSRAP remediated an area located in the backyards of residences. USACE worked closely with the Palm Drive residents to ensure they were informed and updated on remedial activities on their properties. USACE took every precaution to protect the residents and the public during the excavation of the properties and to ensure the remediation would take place quickly, efficiently and safely. The excavated area was cordoned off from the public and several air-monitoring stations were placed around the excavation to obtain air dispersion data during excavation and loading activities.

Coldwater Creek

USACE's FUSRAP team continues investigating and sampling the next 1-mile section of Coldwater

Creek (CWC) banks, sediment and adjacent properties within the 10-year flood plain north of St. Denis Bridge. Sediment sampling usually takes place in the summer or fall when the water temperature is above 50°F. In shallow water depths (less than 3 feet), sample collection is done by wading and using a hand-held core sampler. At water depths over 3 feet, a special floating platform is used to collect sediment samples.

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If you have any suggestions, questions or comments, contact the U.S. Army Corps of Engineers.

Delineation/bounding sampling is taking place south of St. Denis Bridge at areas in the creek and adjacent properties where initial sampling identified the presence of contamination. Delineation or bounding sampling will show the extent and depth of the contaminated area. This sampling will be used to help develop a remedial design to remediate these areas.

Ballfields Phase 2B

USACE has resumed the remediation of Investigation Area (IA)-09 (Ballfields) Phase 2B. The depth of the excavated areas will vary to a maximum of approximately 7 feet below ground surface. The team will remove approximately 17,300 cubic yards of contaminated material in Phase 2B. As stated in the 2005 North County Record of Decision (ROD), IA-09 and IA-08 remediation will include radiological and non-radiological contaminants of concern (COCs). IA-08 to IA-13 are the only St. Louis Airport Site (SLAPS) Vicinity Properties that have non-radiological COCs.

Evaluation of Structures along Coldwater Creek (CWC)

At this time, USACE is not sampling within homes adjacent to CWC because contamination has not been found immediately adjacent to residential structures. However, if a demonstrated transport mechanism is found, future sampling in homes may be required.

FUSRAP developed a conceptual site model (CSM) that explains the physical, chemical, and biological processes controlling the transport, migration, and actual/potential impacts of contamination (in soil, air, ground water, surface water, and sediments) to human or ecological receptors. The original sources of contamination for CWC were SLAPS, the Hazelwood Interim Storage Site/Futura (HISS/Futura), and the transportation of the material by truck from the SLAPS to the Latty Avenue Sites.

Potential transport mechanisms are ways by which material could move from

SLAPS, HISS/Futura, and roads into CWC. These mechanisms include surface water (storm-water runoff), ground water seepage from beneath storage areas to CWC, windblown emissions in the immediate vicinity, and physical movement (spillage of contaminated material during transport).

After evaluating these transport mechanisms and how material moved by water into CWC, USACE developed the current sampling strategy to investigate CWC, the CWC corridor, and adjacent properties within the 10-year flood plain. Thus far, sampling has not shown contamination immediately adjacent to homes bordering CWC.

USACE uses a standard, accepted methodology when reviewing potential for impact to structures that was developed in the Final Status Survey Plan for Structures. It requires that the land surrounding the structures be evaluated to determine the potential for structure impacts. This process has been used throughout the St. Louis Sites and has shown that significant soil contamination levels must be very close to a structure in order to potentially impact that structure. This finding was shown to be true at the HISS/Futura Sites. To date, elevated soil contamination levels immediately adjacent to residential foundations along CWC has not been found. More than 20 surveys were performed on exterior structural materials — such as concrete, asphalt, buildings, homes, and playgrounds — within the CWC flood plain. No contamination was found on any of these structures surveyed.

Therefore, based on an evaluation of the contaminant migration pathways and existing data, there is no indication that Manhattan Engineer District and Atomic Energy Commission-related contamination would have entered homes. However, if soil immediately adjacent to a home exhibits levels of contaminants above remedial goals, and evidence shows that CWC did flood into a home, then sampling within that home may be warranted.

USACE is developing a fact sheet that includes a more detailed explanation.



Educational Information

Q: What can you tell me about thorium-230 in soil on residential properties along Coldwater Creek?

A: Thorium-230 (Th-230) is a radiological contaminant that is being addressed by FUSRAP according to the ROD for the North St. Louis County Sites. The storage sites where contamination originated have already been cleaned up. FUSRAP cleanup is occurring on other properties, including properties along the part of CWC north of I-270.

Th-230 alpha particles are stopped by 2 inches of air and thin layers of materials (like clothing or skin). Radiation from Th-230 is only a hazard if it is eaten or breathed. Th-230 in the environment essentially locks onto soil particles and doesn't dissolve easily in water. Water has to move soil particles to move the Th-230. Water from rain moved soil particles from the storage sites to CWC. Then, soil particles with Th-230 settled from the creek onto downstream soil. Other sediment or fill may have settled on top of that.

North of I-270, the highest sample result in the upper 6 inches of soil on a residential property is 73 pCi of Th-230 per gram of soil. This level is five times the cleanup goal. The risk from Th-230 for this property is slightly less than the upper bound of the risk range under the federal law that applies to this cleanup. However, because the ROD cleanup goals are exceeded, this soil will be removed.

To date, the FUSRAP team removed contaminated soil from two recreational properties, four residential properties, and one undeveloped property north of I-270. Removal of contaminated soil on one residential property north of I-270 is in progress. So far, 23 residential properties north of I-270 have been evaluated and found to meet established cleanup goals.

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St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Site

The U.S. Army Corps of Engineers (USACE) remedial activities at the Mallinckrodt LLC (Mallinckrodt) Plant 6 area within the former Building 101 footprint and perimeter area are nearing completion. Building 101, once the Bulk Shipping Center, was removed in 2012. To date, USACE has removed and disposed of approximately 57,000 cubic yards (cy) of contaminated soils and has removed an additional volume of approximately 9,400 cy of soil from layback areas.

In summer 2016, USACE began remedial activities at Destrehan Street – East and Plant 7 West – North, between Mallinckrodt Plants 6 and 7 at the St. Louis Downtown Site (SLDS). To date, USACE has removed approximately 2,000 cy of contaminated soils. Remedial activities include approximately 450 feet of the 24-foot wide roadway area, and additional area(s) adjacent to Plant 7 West, with construction proceeding in four segments from east to west. Significant coordination with utility companies and Mallinckrodt continues as the need for remediation activities around above- and below-ground utilities at Destrehan Street will require the modification or removal of these utilities. By the



Sampling activities where Mallinckrodt's Building 17 once stood.

completion of remedial activities, USACE expects to remove and dispose of approximately 16,000 cy of contaminated soil from this area.

USACE has investigated and sampled the area of the recently removed Building 17 in Mallinckrodt Plant 1, and has identified the presence of approximately 2,500 cy of contaminated soil which will require removal and disposal. USACE is coordinating with Mallinckrodt to schedule remedial activities in this area. USACE continues to investigate and sample the soils around and adjacent to the Plant 1, Plant 2, and Plant 4 (currently Plant 10) historical sewer lines to assess the need for remedial activities in these areas.

Upcoming Events

Information Releases: [Summer Newsletter - 2017](#)
This newsletter is issued twice a year.

Upcoming Meetings: [Public Meeting - Feb 16, 2017](#)
6:30 - 8:30 p.m. at Hazelwood Civic Center East 8969 Dunn Road Hazelwood, MO 63042.

St. Louis Airport Site Vicinity Properties

The North County Sites ended Fiscal Year 2016 with the release of five St. Louis Airport Site Vicinity Properties (SLAPS VPs) for beneficial use and shipping 11,136 cy of contaminated material to an out-of-state licensed facility.

In July 2016, USACE FUSRAP completed remediation of St. Cin Park. Over 3,400 cy of contaminated material was removed and shipped to an out-of-state licensed facility. St. Cin Park was re-opened by the City of Hazelwood.



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Remedial Activities at Duchesne Park in the city of Florissant.

In July 2016, USACE began remedial activities at Duchesne Park in the City of Florissant. To date, >5,000 cy of contaminated material has been removed and shipped to an out-of-state licensed facility.

Palm Drive Properties in Hazelwood

The Palm Drive Properties consists of: 4 residential properties, the Chez Paree Apartment Complex and the St. Louis Metropolitan Sewer District (MSD) Coldwater Creek (CWC) right of way (ROW). Sampling identified low-level radiological contamination in the backyards of the residential properties, in the MSD ROW and in the back of the Chez Paree Apartment complex adjacent to CWC.

USACE completed the remedial design to remediate the Palm Drive Properties in June 2016. USACE anticipates

starting remedial activities at the Palm Drive Properties in March 2017. Extensive preparatory work is necessary before remediation can begin. Once the utility companies have completed relocation activities of the utility poles, USACE will be able to remove trees in the remediation area, relocate fences, and build a haul road.

FUSRAP Questions

Many citizens have questions regarding FUSRAP. For the next several Newsletters, USACE will address as many of these questions as possible. An updated FUSRAP fact sheet is also in the works.

1. What is FUSRAP?

FUSRAP stands for the Formerly Utilized Sites Remedial Action Program. It was initiated in 1974 to identify, investigate and clean up or control sites throughout the United States that became contaminated as a result of the Nation's early atomic energy program during the 1940s, 1950s and 1960s.

2. How many sites are there?

There are currently 47 sites in 14 states that are in the program, and none of them pose an immediate threat to



Extensive preparatory work must be done before USACE begins remediation at the Palm Drive properties.

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Backyards of residential property on Palm Drive where low-level radiological contamination was found. USACE will start remediation of these yards in March 2017.

human health or the environment. At about half of them, remediation has been completed. At the other half, remedial action is planned, underway or pending final closeout.

3. How did the sites become contaminated?

During the 1940s, 1950s and 1960s, private companies throughout the United States under contract with the Government performed work during World War II for the Manhattan Engineer District (MED) and during peacetime for the Atomic Energy Commission (AEC). Both the MED and AEC were predecessors to the present day U.S. Department of Energy.

4. What kinds of work were these organizations contracted to do?

It varies. Because it was important to national security at the time to keep the contracts and plans as secret as possible, many companies had a relatively small task to do. We now know that each individual task was an integral step in the larger process of developing and understanding atomic energy.

5. Were any of the sites cleaned up right after the MED and AEC work was completed?

Most sites that became contaminated during the early atomic energy program were cleaned up under guidelines in effect at the time. Because in most cases those cleanup guidelines were not as strict as today's, trace amounts of radioactive material remained at some of those sites.

Over the years at some sites, contamination was spread to other locations, either by demolition of buildings, intentional movement of materials, or by natural forces.

6. What contaminants are at FUSRAP sites?

FUSRAP sites are generally contaminated with low levels of uranium, thorium and radium and their associated decay products. Mixed wastes are sometimes also present. It is important to understand that these materials are contaminated with low-levels of residual radioactivity since the raw product was shipped offsite at the time. In most cases, the contaminants currently pose no risk to

human health or the environment given their current land uses. Generally speaking at St. Louis FUSRAP sites, the contamination is in soil that is several inches below ground level, capped with vegetation and/or is in areas that are restricted from the general public.

7. How dangerous are the 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.

More questions about FUSRAP will be addressed in the Summer 2017 Newsletter.



Sampling on CWC with boat platform to take sediment samples.

Educational Information

Q: What is Risk Assessment?

A: A risk assessment is performed for hazardous, toxic, and radioactive waste sites to estimate the potential risks to human health and the environment posed by radioactive substances and chemicals in the environment. Information from the risk assessment is used to determine whether action is necessary to address those radioactive substances or chemicals. Risk assessments are site specific and may vary in detail and in the degree of quantitative analysis used, depending on the site's complexity. The U.S. Environmental Protection Agency developed the procedures that USACE follows for the risk assessment process. These assessments are conservative estimates that ensure protection of human health and the environment.

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Berkeley, Missouri 63134

The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Summer 2016

(314) 331-8000

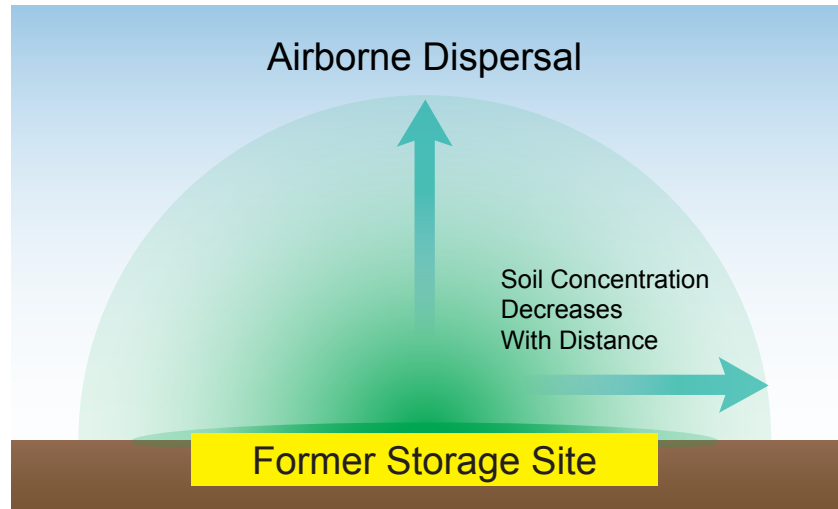
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Air Dispersal

North St. Louis County historic storage 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.

USACE has modeled potential air dispersal of soil from the historic storage sites to off-site locations. Scientists used actual soil sampling data from the two sites in a computer program called RESRAD. RESRAD stands for RESidual RADioactivity. RESRAD produces a simulated model that shows the pathways radionuclides use to move through the environment and the risk of them coming into contact with people.

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, but thorium dust can move. USACE used the concentration of thorium-230 in soil samples taken to calculate movement and potential health risks.



Precipitation and gravity drop contaminants from the air to the ground.

Modeling showed that thorium concentrations in the air decreased as air moved away from the sites and that almost all of the thorium dropped back down to the ground within a few hundred feet of the sites.

Accounting for extreme weather

USACE modeled results using this extreme worst case scenario:

- very dusty, windy conditions for entire duration of waste storage at SLAPS and HISS.
- highest contamination sample values 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 significant role in contaminant movement leading to human exposure.

North County has had some short-term, severe weather conditions. For example, the F1 tornado in 2004 had wind speeds up to 112 mph. Actual air monitoring being performed during this tornado showed no significant airborne contaminants migrated off the sites during this event.

Upcoming Events

Information Releases: Winter Newsletter - 2017

This newsletter is issued twice a year.

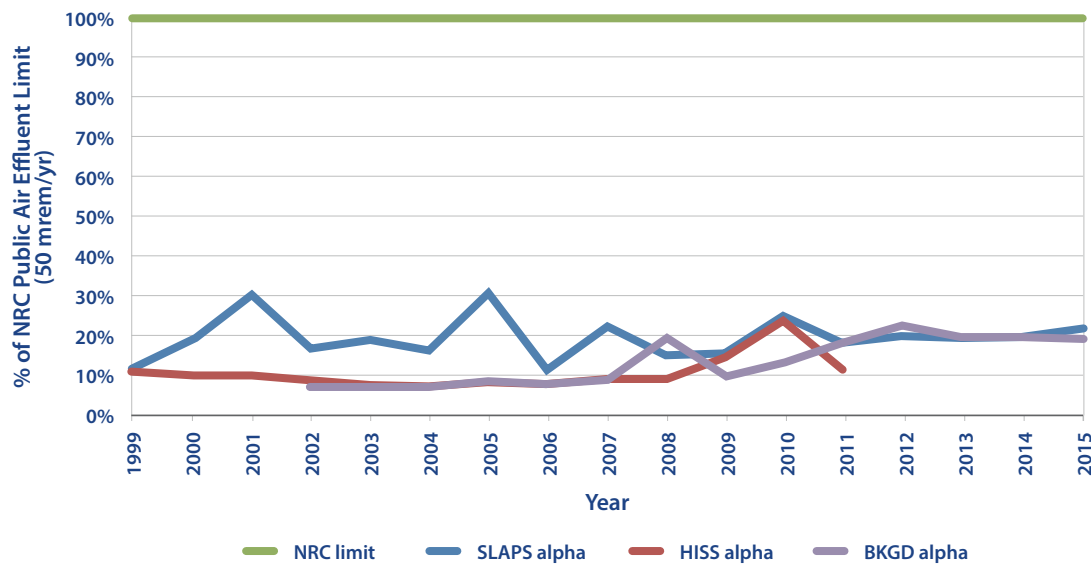
Upcoming Meetings: Public Meeting - June 29, 2016

6:00 - 8:00 p.m. at James J. Eagan Community Center, Florissant
Civic Center Gym; 1 James J. Eagan Drive, Florissant.



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Measured concentration of contaminants as alpha particle radiation at the SLAPS and HISS fenceline for 16 years is shown in this graph. The site values are well below the NRC public safety limit and are comparable to background.

St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Sites

Recent Remedial Action Construction Activities

USACE continues remedial construction activities at the St. Louis Downtown Sites (SLDS) at the Mallinckrodt LLC Plant 6 area within the former Building 101 footprint. Building 101, once the Bulk Shipping Center, was removed in 2012. To date, USACE has removed approximately 52,000 cubic yards of contaminated soils

and has backfilled much of the eastern and northern portions of Building 101 area. Construction now includes installing sheet pile shoring modifications required for deeper excavations along the western portion of Building 101. Excavation activities, final grading, and restoration of the remediated areas will be completed soon.

In the coming months, USACE will begin remedial activities construction at Destrehan Street East between Plants 6 and 7 at SLDS. Preconstruction activities have already begun.

The planned Destrehan Street remedial activities will proceed from east to west in four linear sections and will result in the removal and disposal of approximately 16,000 cubic yards of contaminated soil. USACE projects completion of RA for Destrehan Street East, including the required utility and street restorations, in about a year.

North County Vicinity Properties

USACE completed remedial activities at St. Cin Park in the City of Hazelwood in February 2016. Cleanup required removing approximately 3,400 cubic yards of contaminated material. Restoration activities at the park are ongoing. USACE recently completed the construction of a basketball court at the site.

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Restoration at St. Cin Park (including turf establishment, as shown) is in progress this summer.

Remedial activities at Duchesne Park in the City of Florissant started in March 2016. To date, USACE has removed over 1,500 cubic yards of contaminated material. USACE tentatively expects to complete Duchesne Park in August 2016.

Sampling at CWC from Frost Avenue to St. Denis Bridge is almost completed. USACE is currently preparing documents to release the sampling data from this stretch of the creek. When the document is complete, it will be posted on the FUSRAP website. (<http://bit.ly/FUSRAPstl>)

MARSSIM-based Sampling

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.



To date, USACE removed over 1,500 cubic yard of contaminated material from Duchesne Park.

Educational Information

Q: What is a Picocurie?

A: The *curie* is a standard measure for the intensity of radioactivity contained in a sample of radioactive material. The basis for the *curie* is the radioactivity of one gram of radium. A *picocurie* is one trillionth of a curie.

To put the relative size of one trillionth into perspective, consider that if the Earth were reduced to one trillionth of its diameter, the “picoEarth” would be smaller in diameter than a speck of dust. In fact, it would be six times smaller than the thickness of a human hair.

Obtaining the most accurate information is critical to the mission of FUSRAP. Therefore, laboratory data are reported in either picocuries per gram (pCi/g) or picocuries per liter (pCi/L) for soil and water, respectively. This allows for even comparison with FUSRAP remediation goals.

Millicurie	=	1/1,000 (one thousandth) of a curie
Microcurie	=	1/1,000,000 (one millionth) of a curie
Nanocurie	=	1/1,000,000,000 (one billionth) of a curie
Picocurie	=	1/1,000,000,000,000 (one trillionth) of a curie.

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St. Louis Formerly Utilized Sites Remedial Action Program Activities

Coldwater Creek Floodplain Investigations

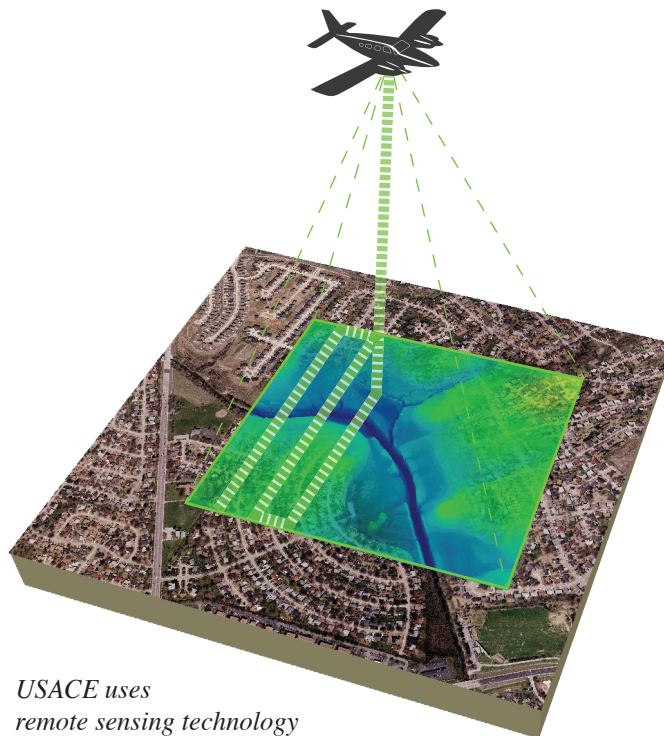
The U.S. Army Corps of Engineers (USACE) uses floodplain knowledge and geospatial mapping techniques to help guide Coldwater Creek (CWC) investigations. Investigations begin with map making and proceed with soil and sediment sampling and analysis.

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

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

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

LIDAR uses a laser beamed to a surface area that is reflected back to the LIDAR sensor. This technology



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

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

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

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

Upcoming Events

Information Releases: Summer Newsletter - 2016

This newsletter is issued twice a year.

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



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North St. Louis County Sites

Contamination Control to Protect the Public and Workers

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

Work Area Isolation

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

Prevention of Airborne Spread

The potential for radioactive materials to become airborne from the project site does exist, but this possibility is strictly controlled. USACE conducts air monitoring



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

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

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

Prevention of Transfer Spread

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

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

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

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

Selection of Sampling Locations along Coldwater Creek

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

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

- Areas of known physical movement (hauling and historic grading)

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

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

Meeting Remediation Goals

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



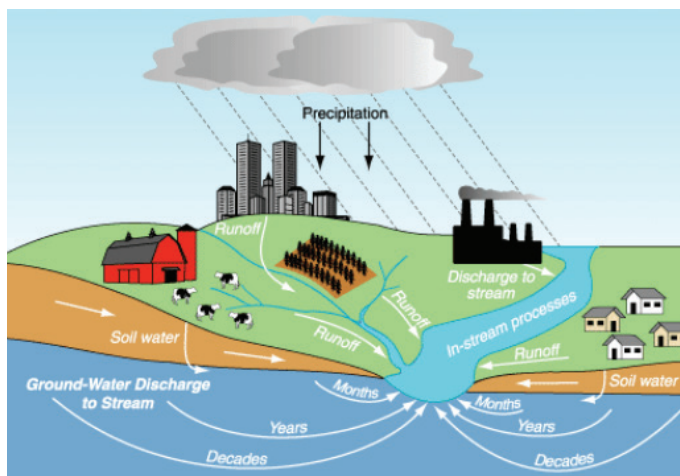
Workers collect sediment samples at Coldwater Creek.

Educational Information

Q: What is a conceptual site model?

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

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



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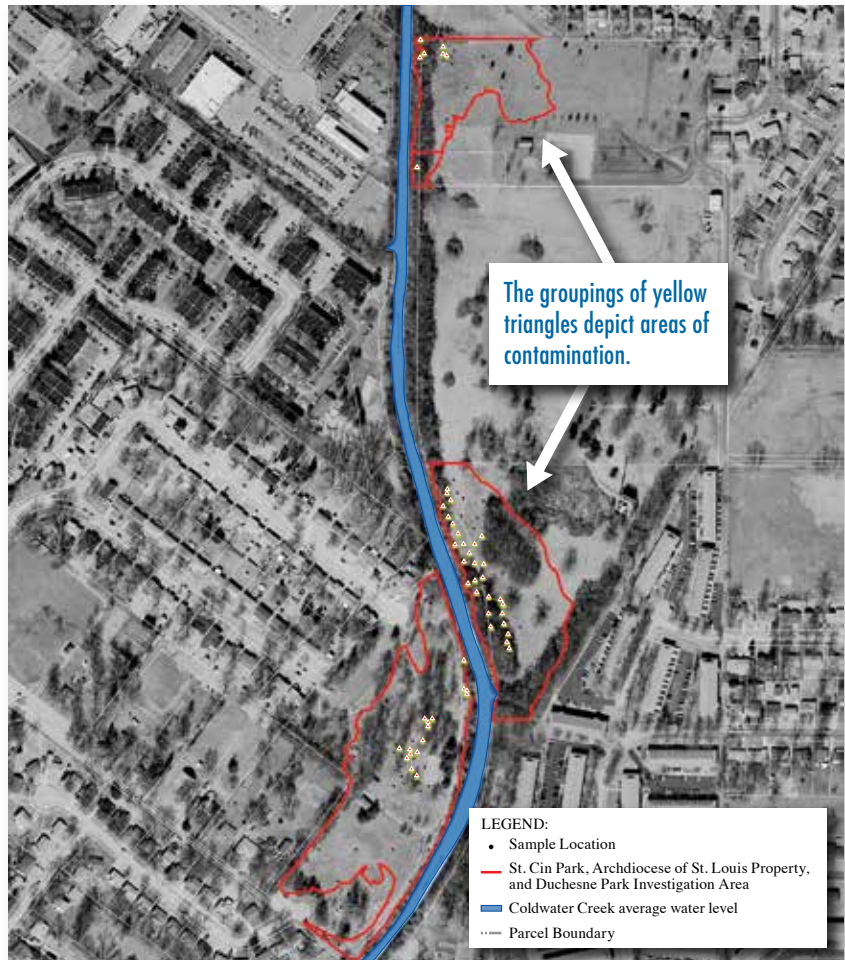
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St. Cin Park Activities

Sampling along Coldwater Creek has identified three areas with residual contamination: an area within St. Cin Park, an area within Duchesne Park, and an area within the Archdiocese of St. Louis property. These areas contain low levels of contamination and pose no immediate risk to the public. The U.S. Army Corps of Engineers (USACE) is currently working with the cities of Hazelwood and Florissant and the St. Louis Archdiocese to remediate these areas. The first area that will be remediated is St. Cin Park. Once activities are completed in St. Cin Park, USACE will remediate Duchesne Park and then the Archdiocesan property.

After July 4th, activities began at St. Cin Park to remove soil as part of the ongoing FUSRAP project in North St. Louis County. The soil being removed is not a risk to human health in its current configuration, but residual levels of some FUSRAP-related contaminants have been found at levels above the North St. Louis County Sites Remediation Goals.

Unfortunately, during the removal and restoration activities, portions of the park will be closed to the public. The restrictions are necessary, not because of the residual contamination, but due to the inherent dangers associated with heavy equipment at a construction site. The restricted areas will be clearly marked with construction fencing at a safe distance from the working areas. Unauthorized entry will be prohibited beyond this fencing.



Aerial photo on St. Cin Park (bottom left); mid right is Archdiocese Property; top right Duchesne Park

Upcoming Events

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

Upcoming Meetings: *St. Louis Oversight Committee Meeting, Thursday, August 20, 2015, 6:00 - 8:00 p.m. at the Hazelwood Civic Center.*

In addition to the areas requiring soil removals, a haul route for entering and exiting the work areas will be established. The haul route will be selected to minimize the amount of disturbance to the park, but will likely be from the Alma Drive parking lot to the work areas.

The work is expected to take between two and four months to complete. Typical work hours will be from 7:00 am to 4:30 pm Monday through Thursday. Any questions or concerns can be directed to the St. Louis District Public Affairs Office: 314-331-8000 or TeamSTL-PAO@usace.army.mil.



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A portion of the former Building 101 footprint – St. Louis Downtown Site, including large amounts of rebar and metal that were separated, scanned and recycled.

St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Sites

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

Remedial action (RA) construction activities at the St. Louis Downtown Sites (SLDS) are continuing in Plant 6 WH of the Mallinckrodt property with excavation activities beneath the footprint of the former Building 101. An approximate volume of 41,100 cubic yards of contaminated soil has been removed from the Building 101 footprint area. The RA required the removal of several abandoned concrete foundations and utilities from historical Manhattan Engineer District/Atomic Energy Commission buildings that significantly impacted excavation progress.

Challenges were encountered in removing the underground concrete foundations and utilities. The effort required separating the rebar and miscellaneous metal items for scanning and disposal at nearby metal recycling centers. The metal pieces are cut into manageable sizes and scanned to verify that they are not contaminated and can be disposed of at the recycling facility. The removed concrete is sized, sampled, and stockpiled for use as deep backfill in excavation areas below 6-feet deep. Backfill authorization for much of the eastern and northern portions of the Building 101 footprint area has been issued, and the backfill of these areas is underway. Excavation activities continue in the western and southern portions of the Building 101 footprint.

Radon Basics

Radon is a natural, radioactive gas that filters up from soil, rock, and water around the world. Radon has no color, odor, or taste. Depending on your location, the ground under you releases differing amounts of radon gas all the time. Radon typically enters the air where it never reaches hazardous levels. It diffuses through the atmosphere. But, radon is a heavy gas so when it enters buildings it will stay in basements and lower levels unless vented. Only the soil about 1-foot under or around a building affects its radon levels. Radon can be found in homes, offices, and schools.

Radon comes from the natural decay of radium from uranium and thorium. These elements are radioactive and found in all soils everywhere. Radioactive elements are unstable and decay into other more stable elements.

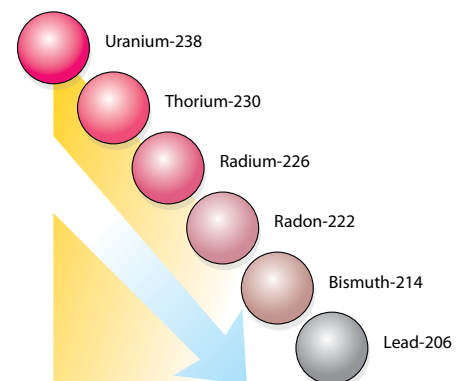
Uranium slowly decays to lead, a stable element. It happens in a chain of events called a decay chain that we measure in half-lives. The half-life of uranium-238 is 4.5 billion years. The half-life of radium-226 is 1,620 years. You can imagine, then, how very slowly radon gas production is occurring.

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 2,635 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 reports are available on the USACE website: <http://bit.ly/FUSRAPstl>.



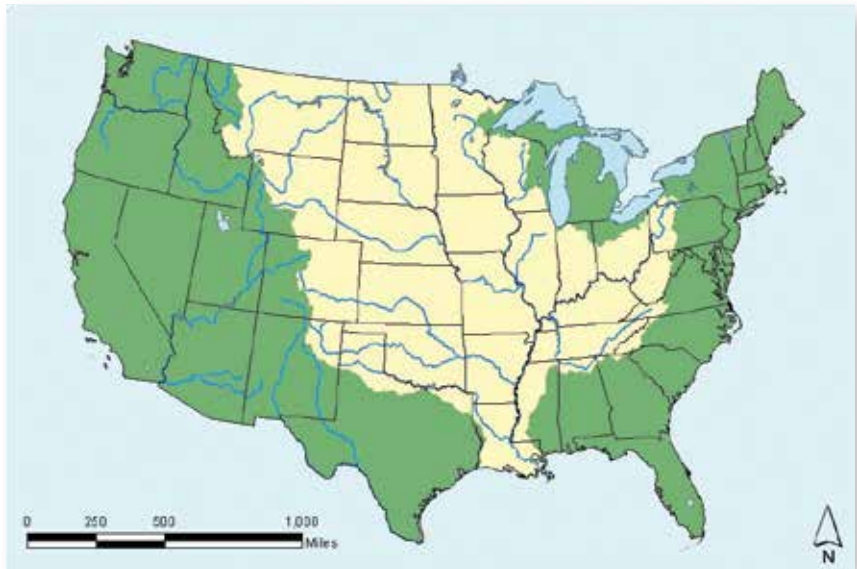
Radon is formed in the natural uranium decay chain.

Are a watershed and a floodplain the same thing?

Simply put, the answer is “no.” Let’s take a look at the definitions of each, simple real world examples of each, and look at how these terms fit into the FUSRAP program.

A watershed is defined as the area of land in which all surface water drains to a common waterway or point. In St. Louis, the Mississippi River contains water from many watersheds, including those drained by the upper Mississippi, the Missouri River, the Illinois River, the Salt River, and other smaller drainages. A canoe launched in northern Montana eventually would float past the Arch in Downtown St. Louis. When thinking about this simple example, one can understand that a waterway is affected by what happens upstream in its watershed, which may be hundreds of miles and several states away. This diagram shows the entire extent of the Mississippi River Watershed.

A floodplain is an area of land adjacent to a stream or river that stretches from the banks of its channel to the base of the enclosing high ground or valley walls. Envision a floodplain by thinking of a stream and what ground is covered when that stream floods. Of course, the extent of flooding varies with more extreme flooding being less common.



The entire Mississippi River Watershed shown in yellow

Levels of floods are typically referred to as “events” associated with a number of years, such as a “100-year flood event.” A 100-year flood has a one percent chance of occurring in any given year, while a 10-year flood has a one-in-ten chance in any year. The higher the number of years, the more extensive the flooding. Going back to our canoe scenario, a canoe in a given stream that could not float beyond its banks under normal conditions will be able to float out of its banks and over the floodplain during a flood. As a flood recedes, the canoe will either float back to the stream, or perhaps get stuck on the floodplain and left behind.

The St. Louis FUSRAP program uses knowledge of the local watershed as well as local floodplains, and how they relate to known radioactive contamination sources in order to drive investigations and sampling campaigns. By tracing drainage patterns downstream from sources, USACE can rule out locations that would be upstream in the watershed and put the focus on downstream depositional areas. A focus is also put into the floodplain downstream from the sources where contaminants were most likely to come to rest as flood waters began to recede in past events.

Understanding the differences in a watershed and a floodplain and thinking of contaminants as the canoe we used earlier will help form a basic understanding of what areas are of concern to the FUSRAP program in the St. Louis area.

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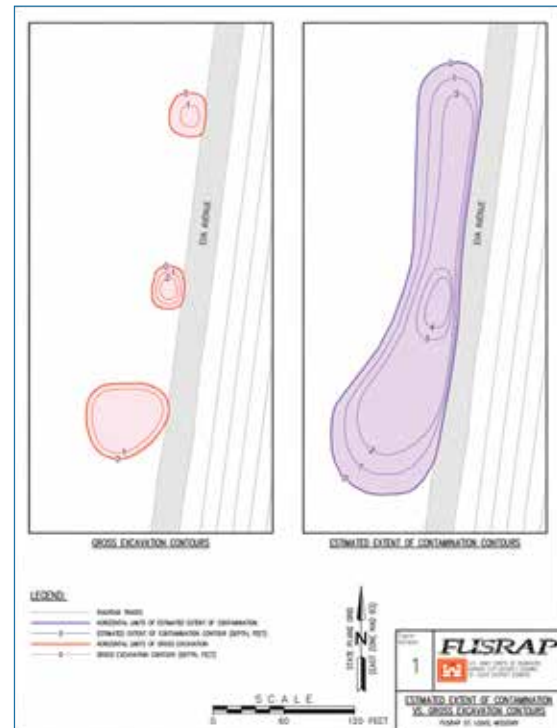
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Educational Information

Q: What is the difference in the FUSRAP gross cut contours and estimated extent of contamination contours found in design documents?

A: Simply put, the gross cut contours represent the contamination that is known to be present that must be removed by a remedial action (RA). Due to the nature of radioactive contamination, time, and budget limits, and other factors, it is difficult to pin point the exact bounds of the contamination that needs RA. During each RA, areas adjacent to the excavation are carefully checked to determine how much additional area (if any) will need to be remediated. The Estimated Extent of Contamination contours represent an educated guess as to the final excavation size based on factors such as elevated samples, geological features, soil types, and historic knowledge. The Estimated Extent serves as a planning tool for the worst case scenario.



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St. Louis Formerly Utilized Sites Remedial Action Program Activities

Recent Remedial Construction Activities at the St. Louis Downtown Sites

Remedial action (RA) construction activities at the St. Louis Downtown Sites (SLDS) are continuing at the Mallinckrodt property beneath the former Building 101 footprint in Plant 6 West Half. Restoration was recently completed for two properties – the DT-2 City of St. Louis Vicinity Property (VP) east of the Mississippi River Flood Protection Levee near the foot of Destrehan Street, the Kiesel property located at the northeast corner of Hall and Branch Streets, and adjacent City of St. Louis and Gunther Salt parcels. The remediation of the DT-2 City Property, east of the Levee, required approximately 38,200 cubic yards of excavation from January 2011 to August 2014 in six excavation areas, and the remediation of the Kiesel Hall Street and adjacent properties required approximately 10,500 cubic yards of excavation from May 2013 to August 2014 in ten excavation areas.

Excavation beneath Mallinckrodt's former Bulk Shipping Center (Building 101) footprint continues and approximately 25,000 cubic yards of contaminated soil have been removed with an additional volume of approximately 5,700 cubic yards of soil removed in excavation layback areas. This excavation required the removal of several abandoned concrete foundations and utilities from historical Manhattan Engineer District/Atomic Energy Commission (MED/AEC) buildings that have significantly impacted excavation progress. Backfill authorization for much of the eastern area has now been issued, and the backfilling of these approved portions is underway.



Building 101 looking west from the northeast corner - SLDS

Sheet pile shoring previously installed around most of the perimeter of the building footprint is being modified for some of the deeper excavation areas. After RA of the eastern portion of the building footprint is completed, the western portion excavation will begin prior to the scheduled completion of the total building footprint area in the fourth quarter of 2015.

The restored surfaces of the Kiesel Hall Street and adjacent properties included approximately 94,000 square feet of gravel and approximately 6,700 square feet of asphalt pavement. The restored surfaces of the DT-2 City Property east of the Levee included the replacement of approximately 430 lineal feet of asphalt pavement for the St. Louis Riverfront Trail, re-vegetation of approximately 57,000 square feet of River bank area, and restoration of approximately 24,000 square feet of rip rap slope protection.



Restored area looking south at DT-2 - SLDS

Upcoming Events

Information Releases: Summer Newsletter – July 2015

This newsletter is issued twice a year.

Upcoming Meetings: St. Louis Oversight Committee meeting:

January 29, 2015, 7:00 - 9:00 pm, Hazelwood Civic Center, 8969 Dunn Road, Hazelwood, MO 64042

Check <http://bit.ly/FUSRAPstl> for updates.



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North St. Louis County Sites

The USACE is supporting construction by the St. Louis Metropolitan Sewer District (MSD) for a wet-weather storage tank facility on the eastern portion of VPs 57

The St. Louis Sites

and 58, and Pershall Road: South Ditch, south of Pershall Road, and west of Coldwater Creek (CWC), in the City of Hazelwood, Missouri. To provide the MSD with the necessary utility support for construction, the USACE is sampling and remediating approximately seven acres along the Pershall Road South Ditch, and eastern portions of VPs 57 and 58. This work is being performed on a very fast-track basis. In order to assist the MSD with their construction efforts, the USACE has already excavated over 9,000 cubic yards of materials in the area and the work continues. The USACE will start remedial activities in the west bank of CWC adjacent to VPs 57 and 58. This area is also needed by MSD to complete the construction of the storage tank facility.

In 2014, 10 properties in North County were returned for beneficial use. In the past few months, the USACE initiated sampling at Latty Avenue and Pershall Road. CWC sampling continues from Frost Avenue to the St. Denis Bridge including the creek, creek banks, and ten-year flood plain. The USACE anticipates completion of this part of CWC in mid 2015. The USACE anticipates initiating



Pershall Road sampling - SLAPS VP

remedial activities in CWC at the McDonnell Bridge after completing remedial activities at VPs 57 and 58, as well as the CWC west bank.

Monitoring the Sites

Since beginning the process of remediation, the USACE has also been monitoring the St. Louis Downtown and North County sites to determine the environmental impact of remediation. USACE monitors four main areas – air, excavation water, CWC, and ground water – and develops an annual Environmental Monitoring Implementation Plan (EMICY) for each site. The results of this monitoring are collected in an Environmental Monitoring Data and Analysis Report (EMDAR).

Air Monitoring

There are three types of radiological air monitoring that occur at the St. Louis FUSRAP sites: gamma radiation, airborne radioactive particulates, and airborne radon.

Gamma radiation is emitted from natural, cosmic, and manmade sources. USACE uses thermoluminescent dosimeters to measure the overall gamma radiation at the sites.

Airborne radioactive particulates are a result of radionuclides in soils that become suspended in the air. These radionuclides include naturally occurring as well as radioactive particles resulting from manmade activities. Airborne radioactive particulates are measured by drawing air through a filter membrane with an air sampling pump placed approximately three feet above the ground, and then analyzing the material contained on the filter. The results of the analysis are compared to the amount of air drawn through the filter and reported as radioactive contaminant concentrations.

Airborne radon or Rn-222, is a naturally occurring radioactive gas found in the Uranium-238 (U-238) decay series. A fraction of the radon produced from U-238 diffuses from soil and rock into the atmosphere, accounting for natural background airborne radon concentrations. Additional radon is produced from the above background concentrations of radioactive materials present on the St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP) sites. Radon alpha track detectors (ATDs) are used to measure alpha particles emitted from radon and its associated decay products. Besides the outdoor ATDs, ATDs are also placed in locations within applicable structures to monitor for indoor radon exposure.

Air monitoring occurs in several locations at both sites. However, as gamma radiation, airborne radioactive particulates, and airborne radon occur naturally, USACE also performs air monitoring at another location in order to determine background concentrations.

Excavation Water

Excavation water is storm water and groundwater that accumulates in excavations that are present at the St. Louis FUSRAP sites as a result of remedial actions. The purpose of excavation water discharge sampling at each of the sites is to maintain compliance with the specific discharge requirements for each site. Monitoring results obtained from these activities are presented and compared with the various authorization letters or permit-equivalent limits as provided by the MSD Special Discharge Approval letters and National Pollutant Discharge Elimination System permits. Excavation water that does not meet these requirements is filtered prior to being discharged. Waste water produced by the USACE owned and operated laboratory located within the Latty Site

in North County is also considered to fall within excavation water and has its own permits and regulations.

Coldwater Creek

CWC surface water and sediment is sampled twice yearly in six locations along the creek. Starting in October of 2014, USACE began sampling an additional two locations downstream of the North County sites. The purpose of this sampling is to monitor and document the effect on the creek by the remedial actions in North County and provide additional data to assess whether CWC is being measurably affected by contamination migration from the shallow groundwater aquifer. Water quality parameters measured include pH, temperature, dissolved oxygen, specific conductivity, oxidation reduction potential, and turbidity. In addition, a sample of sediment and a sample of surface water are tested for radioactivity and other contaminations of concern as established by the North County Record of Decision (ROD). All samples taken from the CWC semi-annual monitoring have been below regulatory goals.

Ground Water

Several monitoring wells are strategically placed in both the St. Louis Downtown and North County sites. While the majority of these wells are screened in the shallow ground water aquifer, a few wells are screened in the deeper aquifers. As the shallow-most aquifer is not considered to be a viable source of drinking water, the purpose of ground



Coldwater Creek - SLAPS VP

water monitoring is to maintain the protectiveness of CWC and of the lower aquifers.

Static water levels of the monitoring wells are measured quarterly. Field parameters and water samples are taken according to an analysis of previously recorded data. Field parameters include pH, temperature, dissolved oxygen, specific conductivity, oxidation reduction potential, and

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turbidity. Water samples are tested for either radioactive or inorganic contaminations of concern as established by the appropriate ROD. Monitoring wells are sampled a minimum of once every three years.

Review of Historical Documents

A thorough review of historical documents is included throughout the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, from the initial identification of a site until final site closure. The most comprehensive review takes place during the preliminary assessment. The purpose of the assessment is to determine whether a site is releasing, or has the potential to release, hazardous substances, pollutants, or contaminants into the environment. This includes compiling and evaluating available information on the potential sources of hazardous substances, pollutants, or contaminants. For the FUSRAP sites, this included research into the uranium refining process that was conducted at the SLDS to evaluate what types of waste materials may have been transported and stored at the SLAPS, and later at the Hazelwood Interim Storage Site. This review also included the inventory records, transportation information, regulatory documents and submittals, and other pertinent correspondence that may contain details regarding the origin of waste materials. All of the information gathered during the review is used to plan and execute the remedial investigation, propose alternatives for remediation of the wastes, and select the remedy for the site. The documentation reviewed throughout the CERCLA process is contained in the Administrative Record for the Site. The Administrative Record for the North St. Louis County Sites may be viewed at the USACE Project Office, 8945 Latty Avenue, in Berkeley, Missouri or at the St. Louis Public Library, Government Information Room, 1302 Olive Street, St. Louis, Missouri 63103.

Educational Information

Q: What is the Uranium-containing sand from Japan that is referred to in the Federal Facilities Agreement (FFA) between DOE and EPA? Are the radiological contaminants of concern different than those from other sources/materials stored at SLAPS?

A: The material referred to in the FFA has had various descriptions, depending upon the source document. Descriptions include "Japanese precipitates" (ROD, p.2-3), "Japanese uranium precipitates" (FS, Table 2-1), "Japanese uranium-containing sand" (Historical Summary, p.3), and "captured Japanese uranium."

Regardless of the description, the references describe approximately 60 tons of material that was captured and transported and stored at SLAPS in 1954. Of the total 60 gross tons, approximately 0.2 tons was inventoried as uranium. The radionuclides contained in the precipitates, or sands, are the same that are in other FUSRAP wastes, namely uranium, thorium and radium. Therefore, the methods and techniques used throughout the FUSRAP investigation, remediation, and verification processes will detect the radionuclides if present. The Remedy selected for the North St. Louis County Sites was chosen based on these radionuclides, and is protective of human health and the environment.

Q: Was SLAPS used to store plutonium (or other transuranic isotopes)?

A: The work performed by Mallinckrodt for the AEC was related to the refining of uranium ore to produce uranium metal and uranium oxide. This material was then shipped to other locations for uranium enrichment (primarily Oak Ridge, TN) and plutonium production (Hanford, WA). Transuranic compounds, such as plutonium, are chemical elements with atomic numbers greater than that of uranium (92) and are unstable elements that do not occur naturally. Rather, they are artificially generated via nuclear reaction or particle accelerators. Therefore, transuranic compounds would not be contained in the waste residues from the refinement of uranium ore that occurred at the SLDS.

Transuranic compounds were not stored at the SLAPS. The sampling data collected during the investigation phase confirms that transuranic elements were not at the SLAPS.

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The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Summer 2014

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St. Louis Formerly Utilized Sites Remedial Action Program Activities

St. Louis Downtown Sites

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

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

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



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

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

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

Upcoming Events

Information Releases: Winter Newsletter - January 2015

This newsletter is issued twice a year.

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

North County

Coldwater Creek Sampling

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

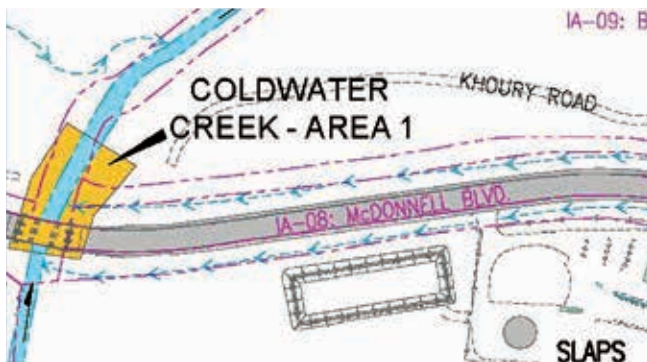


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Entry (ROE) to allow sampling to progress. Winter and spring weather conditions have at times made sampling soil and sediment too dangerous beneath the creek water line or on the steep creek banks; therefore, the majority of sampling progress has been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

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



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

North County Sampling Activities

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



Latty Avenue Sampling

How does FUSRAP determine if remediation is necessary?

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

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

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

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

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

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

standards for Ra-226 of 5 pCi/g and 15 pCi/g, respectively, be met as an average [over 100 square meters (m²)]. Since Ra-226 is in the radioactive decay chain of both Th-230 and U-238, this requirement is applied by USACE for all three principle radionuclides. If the result of a sample is over the RG, then additional samples are collected at 100 m² surrounding that sample to determine the extent of contamination in that area. This is why the environmental data is evaluated (i.e., averaged) over 100 m² instead of at individual locations.

Also, since more than one cleanup criteria must be evaluated at the same time, a sum-of-ratios (SOR) approach is used with the individual cleanup criteria for each of the principle radionuclides to determine if cleanup is required. The SOR must also be applied over 100 m².

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

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

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

1. All the sample results are evaluated against the cleanup criteria as described above at each individual sample location.
2. If the SOR for each sample collected on the property is ≤ 1.0 , then the cleanup criteria has been met over the entire land area and cleanup is not required.
3. In cases where an individual sample result has an $SOR > 1.0$, then the average SOR must be calculated over 100 m² to determine if the RG has been met at that location. In these cases, additional samples are typically collected within each of these 100 m² areas so that sufficient information is available to determine if cleanup is necessary.
4. If the average SOR at this 100 m² location is ≤ 1.0 , then the RG has been met and cleanup is not required.
5. If the average SOR is > 1.0 at this 100 m² location, then the RG has not been met and cleanup is required.

Assessment Example

Environmental soil samples were collected on a property, analyzed at an analytical laboratory, and all individual sample results had SOR values < 1.0 except at one location. As a result, additional samples were collected within the 100 m² area surrounding that sample and the following

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assessment was conducted to determine if remedial action would be necessary at this 100 m² area.

Example of a Sample Situation:

Samples collected within the 100 m² area requiring additional evaluation: SVP68932, SVP109640, SVP109641, SVP114485, and SVP109643.

Table 1. 100 m² Area Sample Data Summary

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

Table 2. Area-Weighted Average SOR_N

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

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

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

Educational Information

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

A: The U.S. Environmental Protection Agency (EPA) Superfund program has developed a new Counts per Minute (CPM) calculator to correlate real-time survey results. These are often expressed as CPMs to contaminant concentrations that are more typically provided in risk assessments or for cleanup levels that are usually expressed in pCi/g or pCi/m². Currently, there is no EPA guidance for Superfund sites on correlating CPM field survey readings back to risk, dose, or other ARARs-based concentrations. This calculator is a web-based model that estimates a gamma detector response for a given level of contamination. The intent of the calculator is to facilitate more real-time measurements within a Superfund response framework. The CPM calculator has two major sub-calculators based on the field survey scenario: (1) ground-based scanning of surface contamination and (2) ground-based scanning of volumetric contamination. Work on a third major sub-calculator, areal-based scanning of contamination, has not begun yet. When using the Volume calculator, there are six different options for source material – soil, concrete, plate glass, wood, steel, and drywall. The model for these sources is based on a uniformly contaminated cylindrical slab source of varying thickness. In addition to facilitating greater use of real-time measurement at Superfund sites, the CPM calculator may also standardize the process of converting laboratory data to real time measurements. It will thus lessen the amount of laboratory sampling that is needed for site characterization and confirmation surveys. However, it will not remove the need for sampling. The CPM calculator was developed as a stand-alone device, but, in the future, it will be incorporated into all of EPA's Superfund models for risk and dose assessment. (Stuart Walker OSRTI)

<http://online.unitconverterpro.com/unit-conversion/radiation.html>

<http://hps.org/publicinformation/ate/q10433.html>

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The St. Louis Sites

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St. Louis Formerly Utilized Sites Remedial Action Program Activities

In Fiscal Year 2013 (FY13), 28,500 cubic yards (cys) of contaminated material were shipped from the St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP) sites to an out-of-state, licensed and permitted disposal facility.

St. Louis Downtown Sites

At the St. Louis Downtown Sites (SLDS), remediation continues underneath the footprint of former Building 101. Four properties were released at the SLDS in FY13.

Inaccessible Soil Operable Unit Proposed Plan

The U.S. Army Corps of Engineers (USACE) is currently developing a Proposed Plan (PP) recommending no further action for selected properties associated with the Inaccessible Soil Operable Unit at the SLDS. The properties included in this PP are those that require no further action for the protection of human health and the environment. The public will have an opportunity to review and comment on the PP this winter. The PP and other supporting documents will be available on the St. Louis District FUSRAP website and in the Administrative Record File locations during the public review period. A public meeting will occur this winter to present the proposed remedy, as well as to accept public comments regarding the PP.

Latty Avenue Sites

During FY13, the USACE completed remedial activities at the Latty Avenue sites with the clean-up of the Futura and Vicinity Property (VP)-01(L) Buildings. Documentation to release VP-02(L) and the Hazelwood Interim Storage Site were issued. In FY14, the USACE will issue



Building 101 Remediation – St. Louis Downtown Site

documentation to release the VP-01(L) Buildings and the Futura property. Institutional controls for the soils under the Futura Buildings will be implemented.

St. Louis Airport Site Vicinity Properties

During FY13, the USACE completed remedial activities at the Ballfields Phase 2. Remedial activities were also completed at two other VPs. Sampling in Coldwater Creek (CWC) was completed from the McDonnell Boulevard Bridge to Frost Avenue. Sampling in CWC from Frost Avenue to the St. Denis Bridge was initiated and is anticipated to be completed by late next Fall (2014). Eleven North County properties were released in FY13.

Five Year Review

The USACE will conduct the third Five Year Review (FYR) in 2014. Under the Comprehensive Environmental Response, Compensation, and Liability Act, an evaluation of response actions at hazardous waste sites where contaminants remain on site above the remediation goals is required at least every five years following the start of cleanup activities at the site. The FYR determines whether the cleanup response continues to be protective of human health and the environment. These reviews begin five years after the initiation of the first response and continue in five year cycles to perpetuity or at least until the contamination is removed from the site.

Upcoming Events

Information Releases: Summer Newsletter - August 2013
This newsletter is issued twice a year.

Upcoming Meeting: St. Louis Oversight Committee Meeting -
6:00 pm, January 14, 2014 at the Hazelwood Civic Center East.
Check www.mvs.usace.army.mil/eng-con/expertise/fusrap.html
for updates, or call Jo Anne Wade at 314.260.3913.



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Radiation Basics

At its simplest, radiation is energy moving through something. Heat traveling through your coffee mug to warm your hand and light from the sun traveling through space are just a couple of examples of radiation.

A more scientific definition of radiation is a type of energy given off by atoms with unstable nuclei that travels in waves or particles and may be able to penetrate various materials. The *Electromagnetic Spectrum* (or EM Spectrum) arranges the forms of radiation from lowest energy to highest energy.

Light, radio waves and microwaves are examples of radiation that appear on the low end of the EM Spectrum. These low energy types of radiation are called *non-ionizing radiation* because they do not have enough energy to acquire a negative or positive charge by gaining or losing electrons.

Higher energy radiation is called *ionizing radiation* because atoms with unstable nuclei carry enough energy to emit energy or mass in order to reach stability. The types of ionizing radiation a person typically encounters are alpha, beta or gamma/x-ray.

Alpha particles are an emission of two protons and two neutrons. These particles travel very short distances (1-3 inches) in the air and can be blocked by a sheet of paper. Alpha particles are too large to penetrate your skin.

Beta particles are an emission of stray electrons. They can travel 6-10 feet but can be blocked by plastic, aluminum, your clothing etc.

Gamma rays are produced by the decay of atomic nuclei from high energy states but are also created by other processes. They can travel the farthest but can be stopped with higher density materials such as lead or concrete.

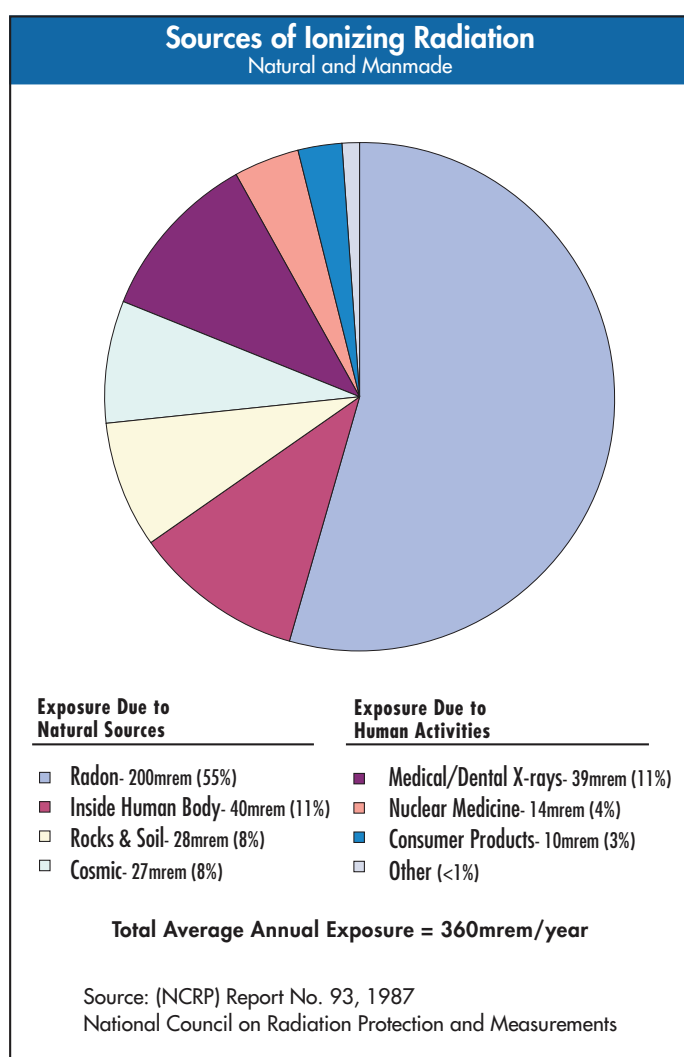
Radiation is measured by the dose – defined as the quantity of absorbed energy. The *rem* is the unit used for equating radiation absorption within human tissue. The *mrem* (millirem, or one thousandth of a rem) is often used for the dosages commonly encountered.

Background radiation can be found everywhere in our environment in trace amounts. We encounter radiation in naturally occurring radioactive isotopes from terrestrial sources such as rock, vegetation, water, soil and people and also from cosmic sources such as the sun.

Each year an individual receives an average radiation dose of approximately 300 mrem from background radiation. The average American receives an additional 60 mrem per year from human activities such as x-rays and other medical devices.

How does FUSRAP compare to of Chernobyl?

Often when people think of radioactive contamination they think of the Chernobyl nuclear reactor explosion that occurred in 1986. While both FUSRAP and Chernobyl involve unintentional release of radioactive contamination into the environment, there is a vast difference. A comparison appears in the following table.



FUSRAP	Chernobyl
FUSRAP is a program that identifies and remediates radioactive residues as a result of uranium processing during the nation's early atomic program in the 1940's and 50's.	Chernobyl was a nuclear reactor that suffered a full meltdown in the 1980's sending radioactive particles and gases into the atmosphere.
North County and the SLDS FUSRAP wastes contain low-level radioactive residues from the uranium conversion process.	High-level radioactive fission products from the nuclear reactor were released into the atmosphere because of the Chernobyl explosion.
FUSRAP wastes contain naturally occurring radium, thorium and uranium that primarily emit alpha particles.	Fission products from the nuclear reactor explosion primarily emit beta and gamma radiation (iodine-131, cesium-137 and strontium-90).
FUSRAP waste is mostly found within shallow land areas (soils), migration areas and sediment.	Chernobyl radioactive products are found on the surface of vegetation, soils, buildings, and surface water.

Coldwater Creek

In 2012, the USACE initiated sampling in Coldwater Creek (CWC) from the McDonnell Boulevard Bridge to Frost Avenue. Over one thousand samples have been collected to characterize this segment of the creek. The results of this effort indicate contamination exceeds FUSRAP remedial goals at McDonnell Bridge and two other isolated locations of deposition along the creek bank. Sampling was initiated at the second segment of CWC from Frost Avenue to the St. Denis Bridge in October 2013. The USACE anticipates that this sampling effort will be completed by late 2014.

Why does it take so long to sample a segment of the creek?

There are several steps involved to initiate and complete sampling in the creek. Before sampling can begin, a sampling plan is prepared to summarize the existing data, define additional data needs, describe the rationale and methods for conducting the sampling and identify the proposed sample locations. This multi-prong approach ensures that all potentially contaminated areas in the creek and banks are investigated.

In order to physically access the creek, the rights-of-entry (ROEs) must be obtained from property owners adjacent to the creek. Once the sampling crews are allowed access, a path must be cleared through the heavy vegetation on the creek banks. The sampling crews may encounter obstacles such as tree roots, debris, and rocks that prevent sampling

in the appointed areas. When this occurs, the sampling locations are changed to locations that are as close as possible to the original location. The steepness of the creek banks and water in the creek also pose obstacles that make sampling difficult. In addition, the weather, such as heavy rain or flash floods prevents the sampling crews from safely entering the creek channel, thus causing delays. Finally, USACE collects a large number of samples from within the creek corridor which takes time. Collecting numerous samples assures that adequate sample coverage of the area has been achieved.

Once the samples have been collected, they are sent to the laboratory for analysis. To obtain accurate measurements of the samples, the sample must be dried. In some cases, based on the moisture content of the sample, it takes several days to prepare and dry the creek samples for analysis. In addition to the creek samples, the laboratory analyzes samples collected from other St. Louis FUSRAP sites. As a result, sample schedules occasionally require adjustment based on the overall project priority. Sample results are quality checked and validated to ensure the data are accurate and precise.

If the analytical results of the sample indicate that contamination is present above the remediation goals, then another round of sampling may be required in the vicinity of the elevated sample to further investigate the area. These additional samples are used to bound or delineate the area of contamination around the original sample. This information assists in determining the size of the area impacted and the depth of the contamination. The process of preparation, analysis and validation of data must be performed again for any additional samples collected. Once all the data is analyzed and validated, a data table is prepared that contains all the results, depths, and identification of each sample. At the conclusion of sampling and analysis, a report is written to discuss the results of the sampling and to describe any deviations, such as sample location or schedule delays, from the original sampling plan and the rationale for that deviation.

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

Educational Information

Q: How Does the USACE Determine if Contamination Exceeds Remedial Goals?

A: When more than one radiological contaminant is present on a site, the combined effects of the contaminants are evaluated through the use of the sum of the ratios (SOR) calculation. The SOR, also known as the "unity rule", is the sum of each individual contaminant concentration, corrected for background, and divided by its applicable remedial goal (RG). The total sum of the ratios of concentrations to their RG is limited to one (i.e., unity) when averaged over a 100 square meter (m²) area. Remedial goals for the FUSRAP contaminants are presented in the Records of Decision (ROD).

To concurrently address each of the radionuclides of interest, a SOR calculation is applied as follows for Ra-226, Th-230 and U-238 using the North County remedial goals as an example:

$$\text{Ra-226} - \text{SOR}_{\text{surface}} = \frac{{}^{226}\text{Ra}_N}{5 \text{ pCi/g}} + \frac{{}^{230}\text{Th}_N}{14 \text{ pCi/g}} + \frac{{}^{238}\text{U}_N}{50 \text{ pCi/g}} \leq 1$$

$$\text{Th-230} - \text{SOR}_{\text{subsurface}} = \frac{{}^{226}\text{Ra}_N}{15 \text{ pCi/g}} + \frac{{}^{230}\text{Th}_N}{15 \text{ pCi/g}} + \frac{{}^{238}\text{U}_N}{50 \text{ pCi/g}} \leq 1$$

$$\text{U-238} - \text{SOR}_{\text{sediment}} = \frac{{}^{226}\text{Ra}_N}{15 \text{ pCi/g}} + \frac{{}^{230}\text{Th}_N}{43 \text{ pCi/g}} + \frac{{}^{238}\text{U}_N}{150 \text{ pCi/g}} \leq 1$$

When the soil/sediment sampling average SOR is less than 1.0 over a 100 m² area, remediation is not required. If the soil/sediment average SOR is greater than 1.0 over a 100 m² area, then ROD RGs are exceeded and remediation is required.

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St. Louis Downtown Site

Recent RA Construction Activities at SLDS

Remedial action (RA) construction activities at the St. Louis Downtown Site (SLDS) currently include excavation beneath the footprint of the Mallinckrodt Plant 6 Building 101, on City Property east of the Mississippi River area flood protection levee, and on the Kiesel Hall Street Property.

The U.S. Army Corps of Engineers (USACE) completed demolition of the superstructure of Plant 6 Building 101 (Mallinckrodt's former Bulk Shipping Center) in October 2012. Excavation of the concrete slab foundation and contaminated soil beneath the building continues. The excavation includes removal of abandoned concrete foundations from historic Manhattan Engineer District and Atomic Energy Commission (MED/AEC) era buildings at the Destrehan Street plant. USACE has removed approximately 25 percent of the contaminated soil. This effort is scheduled for completion in the third quarter of 2015.

Recent high Mississippi River levels flooded the area and temporarily delayed excavation at the City Property. In August 2012, the USACE completed the removal of abandoned 15-inch and 30-inch sewer outfall structures from the river. Excavation will resume when river conditions allow for access. The USACE has removed about 50 percent of the contaminated soil. Excavation of this area is scheduled for completion in the third quarter of 2016.

The USACE began RA of the Kiesel Hall Street Property in May 2013. This remediation will require removing a total of about 3,000 cubic yards in seven excavation areas. This RA is scheduled for completion in August 2013.

SLDS - Inaccessible Soils Operable Unit Proposed Plan

The USACE is currently developing a Proposed Plan (PP) recommending no further action for selected properties associated with the Inaccessible Soil Operable Unit at the SLDS. The properties included in this PP are those that do not pose an unacceptable risk to the public and require no further action for the protection of human health and the environment. The PP and other supporting documents will be available on the St. Louis District Formerly Utilized Sites Remedial Action Program (FUSRAP) website and in the Administrative Record File locations during the public review period. A public meeting will likely occur this summer to present the proposed remedy as well as to accept public comments regarding the PP.

North County

Ballfields

The "Ballfields" area consists of approximately 60 acres north of Lambert-St. Louis International Airport. The area is bounded to the south by McDonnell Boulevard, to the north by Coldwater Creek and Frost Avenue, and to the east by Eva Avenue. Historically, the area was agricultural land, a baseball field, and a part of the former Brown Road. Contamination of the area occurred when residues migrated from SLAPS via runoff onto adjacent properties through CWC or was windblown, released, or otherwise deposited when material was transported along haul routes.

To assist with water management, the USACE decided to remediate the Ballfields in three phases, generally moving from up gradient to down gradient areas. Phase 1 is complete. Remediation in Phase 2 (17 acres) is ongoing. The remedial design for Phase 2B is currently being prepared.

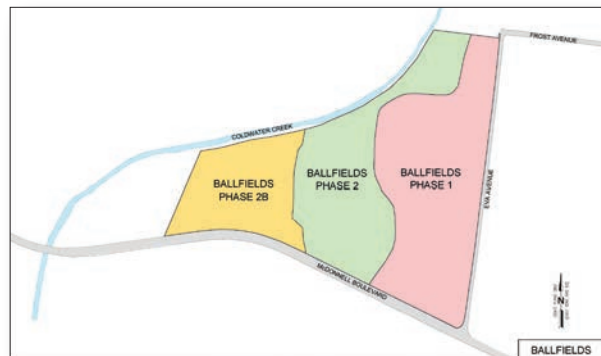
Upcoming Events

Information Releases: Winter Newsletter - January 2014

This newsletter is issued twice a year.

Upcoming Meeting: St. Louis Oversight Committee Meeting

The next meeting time and date will be posted on the USACE website when scheduled: www.mvs.usace.army.mil. Click on FUSRAP for updates, or call Jo Anne Wade at 314.260.3913.



Ballfields Phases 1, 2, and 2B



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VP-16/Eva Loadout

The USACE has completed remediation at VP-16/Eva Loadout. This property is located at Eva Road and McDonnell Boulevard. Efforts required coordination with the railroad.

IA-10

IA-10 is the area north of the Ballfields and adjacent to CWC. The USACE is completing the characterization of IA-10. Additional samples were needed to identify and bound areas that may need remediation. In 2011, the USACE remediated the part of IA-10 adjacent to McDonnell Boulevard and CWC.

Coldwater Creek

The U.S. Department of Energy and the USACE have supported several sampling events in CWC. USACE continues to develop plans for reaches of the creek – working upstream to downstream – to fill data gaps. The purpose of the sampling is to confirm that the creek meets North County Record of Decision (ROD) cleanup requirements or to identify and quantify any material requiring removal in order to meet ROD requirements. If remediation is required, USACE will remove the sediment and soil and ship it to an offsite, permitted disposal facility in accordance with the ROD.

In 2012 to 2013, the USACE initiated sampling of CWC from McDonnell Boulevard to Frost Avenue. Sampling was completed in March 2013, but additional sampling is needed to identify and bound areas that may need remediation.

The USACE is currently developing a sampling plan for the CWC reach from Frost Avenue to the St. Denis Bridge and the area within the 10-year floodplain of the creek. Sampling is scheduled to begin in late summer or fall 2013. After



IA-10 Delineation Sampling

this reach of CWC is completed, the USACE will continue characterizing the creek from St. Denis Bridge toward the Missouri River.

Other VPs

This summer/fall sampling will also be conducted on two additional groups of vicinity properties – one along McDonnell Boulevard (between Lindbergh Boulevard and Airport Road) and one along Byassee Road. Sampling plans are being prepared for these areas. Real estate access will also be pursued.

Conceptual Site Model and Coldwater Creek

Before the ROD was prepared for the North County sites (including 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



Coldwater Creek

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 re-examined 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.

In the case of CWC, the original CSM (as presented in the Feasibility Report/Baseline Risk Assessment) was re-examined. 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;



Coldwater Creek - Sampling Depositional Areas

- 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.

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Educational Information

Q: Which government agencies control FUSRAP? How is a site included in FUSRAP?

A: FUSRAP was established to address contamination resulting from the Nation's early atomic weapons program. The U.S. Department of Energy (DOE) acted as the lead agency for the entire program until October 1997 when Congress transferred the lead agency role and responsibility for the execution of the cleanup aspect to the USACE. DOE continues to be responsible for site designation ("pre-cleanup") and long term management of remediated sites ("post cleanup"). Typically for site designation, DOE initiates an evaluation of the site. The basic criteria for inclusion in FUSRAP are: (1) the site/area was involved in MED/AEC activities, (2) residual radioactive contamination likely remains at the site from these activities at levels that may pose a risk to human health or the environment or exceed applicable standards, and (3) the site is not subject to cleanup under any other remedial action program or a Nuclear Regulatory Commission or state license. A site can also be added to FUSRAP by legislation directed by Congress.

After inclusion in FUSRAP, the site competes for a share of the USACE's annual FUSRAP budget. When funded, USACE follows the CERCLA process for planning, investigating, and executing remedial activities. The U.S. Environmental Protection Agency and the state assist USACE by reviewing documents, providing field oversight, and providing input into project decisions.

FUSRAP

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St. Louis Downtown Site

Current remedial action (RA) construction activities at the St. Louis Downtown Site include removal of contaminated soil from beneath the footprint of Building 101 in Mallinckrodt's Plant 6 and additional excavation on City Property east of the Mississippi River Flood Protection Levee. Workers will remove abandoned 15-inch and 30-inch Metropolitan Sewer District sewers and river outfall structures.

The U.S. Army Corps of Engineers (USACE) recently demolished the superstructure of Building 101, Mallinckrodt's former Bulk Shipping Center. Also underway is the demolition of the concrete foundation from the 57,400 square foot building, including removing abandoned foundations beneath the building footprint. Remediation of this area will require the removal of approximately 46,000 bank cubic yards (cys) of contaminated material. RA of this area is scheduled for completion in 2015.

The dry weather and low flow conditions of the Mississippi River this past year have aided the safe removal of abandoned 15-inch and 30-inch sewer outfall structures located in the river. Excavation of these contaminated concrete structures below normal water level and about 60 feet of the connecting sewers back to the toe of the rock-fill berm, which protects the excavation slope, is almost complete. The USACE has authorized the backfill for a portion of this area, and backfilling is now underway.

Excavation of the remaining portion of this area and the next phase of this RA will continue as resources and favorable river level conditions allow. Remediation of this area will require the removal of approximately 7,500 cys of contaminated material around the sewers and river outfall structures. RA of this area is scheduled for completion in 2016.



Building 101 Demolition – St. Louis Downtown Site

SLDS Inaccessible Soils Operable Unit Feasibility Study and Proposed Plan

The USACE is currently preparing the Feasibility Study (FS) and Proposed Plan (PP) for the SLDS Inaccessible Soils Operable Unit (ISOU). The FS uses information gathered and analyzed during the Remedial Investigation (RI) phase to develop and evaluate potential remedial alternatives. The goal of the RI and FS is to gather information sufficient to support an informed risk management decision regarding which remedy appears to be most appropriate for the site.

The PP identifies the preferred alternative, provides a rationale for this preference, and includes summaries of other clean up alternatives evaluated. A public meeting will take place to present the FS/PP to the stakeholders in 2013. The stakeholders may review the FS/PP and provide comments. The USACE will issue a public announcement stating the date, time, and place for the SLDS ISOU public meeting.

North County

Latty Avenue Sites

Hazelwood Interim Storage Site/Futura

The USACE completed remedial activities on the Hazelwood Interim Storage Site (HISS) property in October 2011. In 2000 and 2001, the USACE removed more than 39,000 cys of contaminated material from the storage piles at the Latty Avenue properties. Since 2007, the USACE has removed over 105,000 cys of contaminated material from below the soil surface and shipped it to an out-of-state licensed disposal facility. In 2011, the USACE removed and

Upcoming Events

Information Releases: Summer Newsletter - August 2013
This newsletter is issued twice a year.

Upcoming Meeting: St. Louis Oversight Committee Meeting - 7:00 pm, April 25, 2013 at the Florissant Civic Center. Check www.mvs.usace.army.mil/eng-con/expertise/fusrap.html for updates, or call Brenton Barkley at 314.260.3922.



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remediated under the HISS railspur to complete the remedial activities at the HISS. A Post Remedial Action Report (PRAR)/Final Status Survey Evaluation (FSSE) for HISS is to be completed in 2013.

The USACE is currently remediating the interior of Building 2/3 located on the Futura property. Building 4 was completed during the summer of 2012. All remedial activities at the Futura site are expected to be complete by February 2013. A PRAR/FSSE for Futura is to be completed in 2013.

The USACE will place institutional controls on any contamination left in place at the Futura property in accordance with the North County Record of Decision (ROD), signed September 2, 2005. An institutional controls plan is currently under development and expected to be published in late 2013. In order to protect Coldwater Creek, adjacent to the Futura property, the USACE established a long-term environmental monitoring program that evaluates the groundwater for radiological parameters that may affect Coldwater Creek.

Latty Avenue Vicinity Properties

The Latty Avenue Vicinity Properties (VPs) include 01L, 02L, 03L, 04L, 05L, 06L, 10K530087, and VP-40A (Latty). A PRAR/FSSE for Latty VPs 03L, 04L, 05L, and 06L was published in September 2012. The VP-02L PRAR/FSSE was published in December 2012. The PRAR/FSSE for portions of VP-40a is scheduled for completion in 2013.

RA is required in the interior of buildings located at VP-01L. A design is currently underway at VP-01L, and remediation is expected to begin in early 2013. An addendum to the VP-01L/10K530087 PRAR/FSSE will be published upon completion of remediation within the buildings.



Ballfields Phase 2 Excavation



VP16 Eva Loadout Remediation

St. Louis Airport Site Vicinity Properties

Ballfields Area

The USACE continued remedial activities at the Ballfields area, which comprises approximately 60 acres in Berkeley and Hazelwood, Mo. The property is located north of Lambert-St. Louis International Airport and south of Frost Avenue. The Ballfields area is bordered to the south by McDonnell Boulevard and to the west by Coldwater Creek.

Contamination of the Ballfields occurred when residues migrated from the St. Louis Airport Site (SLAPS) via runoff onto adjacent properties from Coldwater Creek or when material being transported along haul routes was windblown, released, or otherwise deposited.

Remediation of the Ballfields will be completed in multiple phases. Phase 1, consisting of 25 acres, was completed on July 18, 2012. The design for Phase 2, encompassing 17 acres, was completed in mid-May 2012 and remediation began in early July 2012. An addendum to the Phase 2 design is currently underway, including an additional 11 acres directly adjacent to the west side of the initial Phase 2 design, and work is expected to begin in February 2013. All remedial excavations are controlled with dust suppression and waste water management to prevent migration.

Other St. Louis Airport Site Vicinity Properties

Currently, sampling designs are underway for VPs-1, 2, 7, 13, 14, 15, and IA-11 along McDonnell Boulevard, and at VPs-09C and 10C on Byassee Road. The RA for VP-16/Eva Loadout Facility is nearly complete. Eva Avenue has been reopened due to completion of the RA along the railroad adjacent to it. PRAR/FSSEs for both VPs 10, 11, and 12 and VPs 60, 61, and 62 are currently being developed.



Coldwater Creek Sampling

Coldwater Creek

Potential radiological contamination in Coldwater Creek can be attributed to runoff or windblown migration of the prior storage of uranium processing residues and wastes at SLAPS and at HISS. The USACE removed the SLAPS and HISS wastes, which resulted from the ore-processing activities at SLDS.

The USACE routinely conducts sampling in Coldwater Creek as part of the Formerly Utilized Sites Remedial Action Program (FUSRAP) Environmental Monitoring Program. Sediment and water are sampled biannually at six different locations. The resulting data is reported and evaluated in annual environmental monitoring reports, which can be viewed on the FUSRAP homepage.

Although many sediment and water samples have been taken along Coldwater Creek, some data gaps still exist. As part of the plan to work from upstream to downstream, the USACE sampled Coldwater Creek from McDonnell Boulevard to Frost Avenue in October and November 2012. Currently, the USACE is sampling and analyzing the data along the banks adjacent to Coldwater Creek from McDonnell Boulevard to Frost Avenue. The Pre-Design

Investigation Report Phase 1 will be completed in 2013 upon completion of the data analysis. In addition, the USACE is developing a sampling plan for the portion of the creek from Frost Avenue to St. Denis Bridge.

Once the sampling plan has been issued, the USACE will begin sampling this stretch of the creek. The results of this stretch will determine the density of sampling required throughout the remainder of the creek to the mouth of the Missouri River. The purpose of this final round of sampling will be to confirm that the creek meets ROD cleanup requirements or to identify and quantify any material requiring removal in order to meet these requirements.

5-Year Review

The USACE initiated the Third 5-Year Review for the St. Louis FUSRAP sites in 2012. CERCLA requires a 5-year Review on RAs when “hazardous substances, pollutants, or contaminants will remain on site above levels that allow for unlimited use and unrestricted exposures.” Manhattan Engineer District/Atomic Energy Commission contamination still exists at the SLDS and North County sites. The USACE is currently in the process of remediating these areas.

5-Year Review activities consist of a document review to ensure requirements of the selected remedy have been implemented; data review and analysis; site inspections; and interviews from the state, representatives of the community, local officials, potential responsible parties, property owners, and the public. The final component of the review is an overall evaluation to determine whether the selected remedy upon completion will be protective of human health and the environment. The results of the community interviews will assist in judging whether the strategies and activities of the selected remedy remain responsive to the needs of the FUSRAP stakeholders. These steps will culminate in a 5-Year Report which will be available for public review in 2014.

The St. Louis Oversight Committee

The most recent St. Louis Oversight Committee meeting was held on November 8, 2012, at the Florissant Civic Center. The USACE gave a presentation on FUSRAP, summarizing the remediation work that is taking place at all of the St. Louis Sites. Jonathan Garoutte of the Missouri Department of Health and Senior Services gave a presentation on the biological effects of radiation. Jaynie Doerr gave a presentation on the regulatory process, including Section 404 of the Clean Water Act and Section 10 of the River and Harbors Act. The next Oversight Committee meeting is set for 7:00 pm, April 25, 2013, at the Florissant Civic Center.

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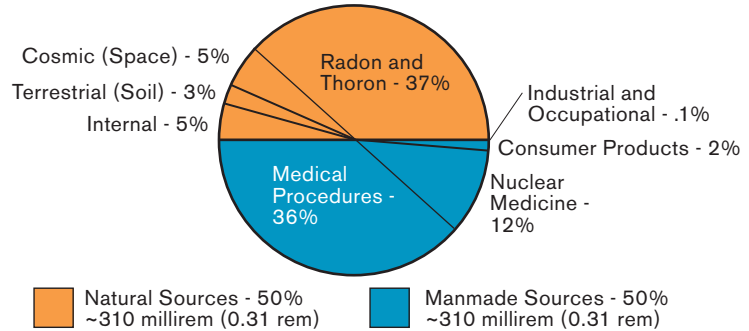
If you have any suggestions, questions, or comments, please contact us.

Educational Information

Q: What sources of radiation are we exposed to?

A: Since the beginning of time, all living creatures have been, and continue to be exposed to radiation. Many people are not aware of all the natural and manmade sources of radiation in our environment. The chart displayed here shows the sources of the 620 millirem of ionizing radiation that people generally receive every year. Of this total, natural sources of radiation account for about 50 percent, while manmade sources account for the remaining 50 percent.

Sources of Radium Exposure in the United States



Source: NCRP Report No. 160
 Full report is available on the NCRP website at www.NCRPpublications.org

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St. Louis Downtown Site

Remedial action construction activities in progress or recently completed at the St. Louis Downtown Site (SLDS) include the Mallinckrodt – Plant 7 West (7W) 700 Pad, Plant 6 West Half (6WH), City Property Phase 1- west of the Mississippi River Levee and Phase 2- east of the levee.

Between April 2011 and February 2012, remediation and restoration of two additional survey units at the Plant 7W 700 Pad were performed, resulting in the removal and disposal of approximately 3,500 bank cubic yards (cys) of contaminated soil. Remediation of the third survey unit, completed in May 2012, included the removal of approximately 2,550 bank cys of contaminated soil along the historical rail spur. Restoration of the third survey unit and excavation of the fourth survey unit is underway and scheduled for completion in late summer 2012.

In May 2012, the demolition began on the above ground structure known as Building 101, which is located at Mallinckrodt's abandoned shipping center in Plant 6WH. The demolition of the 57,600 square foot building is necessary for the removal of contaminated soils beneath the structure and includes several abandoned foundations of the historical Manhattan Engineering District/Atomic Energy Commission Destrehan Street Plants. Demolition of the building and debris management is scheduled for completion in September 2012. The remediation and restoration of this area is expected to be completed by December 2015.

Between November and December 2011 remediation and restoration were performed on City Property Phase 1, west of the levee, along the Destrehan Street sewer. Its completion included the removal and disposal of



City Property Phase 2 (Area 7) Looking East

approximately 300 bank cys of contaminated soil and the removal and restoration of approximately 35 linear feet of 30-inch sewer. This area is located adjacent to a previously remediated area completed in October 2009 and is beneath an overhead trestle. Slide rail trench shoring was used to meet the vertical clearances available at this location.

In November 2011, remediation and restoration were completed on Area 3 of City Property Phase 2, east of the levee. This area's remediation began in February 2011 and included the removal, disposal, and restoration of approximately 7,900 bank cys of contaminated soil. Excavation in this area followed the U.S. Army Corps of Engineers (USACE) River Stage/Excavation Guidelines, and restoration included the replacement of the clay cap layer with a vegetation cover and rip rap protection for the river bank.

In October 2011 remediation began at the final two excavation areas, Area 7 and Area 8, on City Property Phase 2, east of the levee, along the abandoned portion of the Destrehan Street sewer. This excavation will extend from the east toe of the levee into the edge of the river and will remove abandoned sewer outfall structures. Excavation at this location is approximately 10 percent complete; it is currently on hold until required river levels are reached (potentially in late summer 2012 at current river stage discharges). Required river levels are such that sewer outfall structures are exposed for periods long enough to allow remediation. The remediation and restoration of these final two excavation areas are expected to be completed in early 2016.

Upcoming Events

Information Releases: *Winter Newsletter - January 2013*
This newsletter is issued twice a year.

Upcoming Meeting: *St. Louis Oversight Committee Meeting - November 8, 2012 at the Florissant Civic Center. Check www.mvs.usace.army.mil/eng-con/expertise/fusrap.html for updates, or call JoAnne Wade at 314.260.3912.*



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North County

Latty Avenue Sites

Hazelwood Interim Storage Site Futura

Remedial activities on the Hazelwood Interim Storage Site (HISS) property were completed in October 2011. In 2000 and 2001, the USACE removed over 39,000 cys of contaminated material from the storage piles located at the Latty Avenue properties. Since 2007, the USACE has removed over 105,000 cys of contaminated material from below the soil surface and shipped it to an out-of-state licensed disposal facility. In 2011, the USACE removed and remediated under the HISS railspur to complete the remedial activities at the HISS. A Post Remedial Action Report (PRAR)/Final Status Survey Evaluation (FSSE) is underway for the HISS property, and USACE anticipates the document's release in 2013.

The USACE is currently completing designs and beginning remediation of contaminated material on buildings 2/3, and 4 located on the Futura property. The USACE's goal is to complete all the remedial activities at the Futura site during 2012. Following the decontamination of the buildings, the USACE will prepare a PRAR/FSSE for the Futura property and anticipates its release in 2013.

The North County Record of Decision (ROD) determined that contamination located under buildings is inaccessible. The USACE will place institutional controls on any contamination left in place at the Futura property. In order to protect Coldwater Creek, adjacent to the Futura property, the USACE established a long-term environmental monitoring program that will evaluate the groundwater for radiological parameters that may affect Coldwater Creek.



Futura Building 4 Raceway Decon



Futura Building 2/3 Decon Prep Work

Latty Avenue Vicinity Properties

In October 2011, the USACE completed remedial activities of the soils at the Latty Avenue Vicinity Properties (VPs). The Latty VPs include 01L, 02L, 03L, 04L, 05L, 06L, 10K530087, and VP-40A (Latty). All Latty Avenue VPs are currently in final status survey to ensure the properties are releasable for unrestricted use and unlimited exposure.

At VP-02L, the USACE removed over 17,500 cys of contaminated material and shipped it to a licensed out-of-state facility. At VP-40A (Latty), over 29,000 cys of contaminated material were removed and shipped to a licensed out-of-state facility. A minimal amount of contaminated material was removed during utility support work at the VP-03L through 06L sites. VP-01L is currently undergoing building inspection to determine if additional remediation is required within the building. The USACE anticipates the PRARs/FSSEs for the Latty Avenue properties, with the exception of HISS/Futura and VP-40a (Latty), to be completed by the end of 2012.

St. Louis Airport Site Vicinity Properties

Ballfields Area

The USACE also continued the remedial activities at the Ballfields, which comprises approximately 60 acres in Berkeley and Hazelwood, Mo. The property is located north of Lambert-St. Louis International Airport and south of Frost Avenue. It is bordered to the south by McDonnell Boulevard and to the west by Coldwater Creek. The property is vegetated with grasses, trees, and brush and is currently unused except for the small northeast portion, which is used as a shooting range for the City of Berkeley. Historically, the property was used for agricultural land



Ballfields Phase I Restoration

and as a baseball field complex. Contamination of the Ballfields occurred when residues migrated from the St. Louis Airport Site (SLAPS) via runoff onto adjacent properties through Coldwater Creek or when material being transported along haul routes was windblown, released, or otherwise deposited. The alignment of McDonnell Boulevard (which was once Brown Road in that area) has changed over time.

The remediation of the Ballfields will be completed in three phases. Phase 1 includes the east portions of Eva Avenue, IA-08 North Ditch, IA-09 North Ditch, the area north of IA-09, and Eva Avenue. This area is situated on the east of the area drainage divide and comprises approximately 25 acres. Phase I remediation was completed on July 18, 2012. The design for Phase 2 was completed in mid May, and remediation began in early July. All remedial excavations are controlled with dust suppression and waste water management to prevent migration.

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

Other St. Louis Airport Site Vicinity Properties

In December 2011, the USACE released the PRAR/FSSE for the SLAPS VPs 54 and 55 located on Pershall Road. Currently, sampling designs are underway for VPs 1, 2, 7, 13, 14, and 15 along McDonnell Boulevard, VPs 09C and 10C on Byassee Road, as well as the Ballfields West IA-10 property, north and west of Coldwater Creek. The remedial design for VP-16/Eva Loadout Facility is nearly complete, and remedial activity is expected prior to the reopening of Eva Avenue.

Coldwater Creek

Potential radiological contamination in Coldwater Creek can be attributed to the prior storage of uranium processing residues and wastes at SLAPS and subsequently at HISS. These wastes resulted from the ore-processing activities at SLDS and have been removed by USACE. The potential movement of wastes into the creek would have occurred by wind or water.

Sampling is routinely conducted in Coldwater Creek by USACE as part of the Formerly Utilized Sites Remedial Action Program Environmental Monitoring Program (FUSRAP). Sediment and water are sampled biannually at six different locations. The resulting data is reported and evaluated in annual environmental monitoring reports, which can be viewed on the USACE homepage.

Although many sediment and water samples have been taken along Coldwater Creek, some data gaps still exist. As part of the plan to work from upstream to downstream, USACE currently is developing a sampling plan for the part of the creek from McDonnell Boulevard to the railroad bridge crossing just northeast of VP-9C. The purpose of this final round of sampling will be to confirm that the Creek meets ROD cleanup requirements or to identify/quantify any material requiring removal in order to meet these requirements. If remediation is required, the sediment/soil will be removed and shipped to an offsite permitted disposal facility in accordance with the North County ROD.

The St. Louis Oversight Committee

The most recent St. Louis Oversight Committee meeting was held on April 26, 2012, at the Florissant Civic Center. The USACE gave a presentation on FUSRAP, summarizing the remediation work that is taking place at all of the St. Louis Sites. Mr. Jonathan Garoutte of the Missouri Department of Health and Senior Services gave a presentation on the biological effects of radiation, and Dr. Bruce Stinchcomb gave a presentation on the geology of Coldwater Creek.

The next Oversight Committee meeting is set for November 8, 2012, at the Florissant Civic Center.

Educational Information

Q: If something contains radiation, is it contaminated?

A: The short answer is “not necessarily.”

Radiation, which is energy in the form of particles or electromagnetic rays released from radioactive atoms, comes from many sources – some natural and some man-made. The four major sources of naturally occurring radiation exposures are: cosmic radiation (i.e. from the sun and outer space), terrestrial (sources in the earth’s crust such as soils and rocks), sources in the human body and radon (which comes from the decay of naturally occurring radium in the soil.) The major sources of man-made radiation are: medical radiation (such as x-rays or scans), consumer products (such as some TVs and older smoke detectors), and others (such as residual fallout from atmospheric nuclear weapons testing in the 1950s and early 1960’s). Because radiation can occur in places where it is beneficial or unavoidable, radiation is only considered as contamination when one has a radioactive material in an unwanted place.

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The St. Louis Sites

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St. Louis Downtown Site

Remedial Action (RA) construction activities completed since the last newsletter or currently in progress at the St. Louis Downtown Site include additional excavations in the Covidien (formerly Mallinckrodt) Plant 7 North (7N) at their former Hazardous Waste Storage Area, in Plant 7 West (7W) at the historic Manhattan Engineer District/Atomic Energy Commission (MED/AEC) 700 Pad, along the BNSF Railroad tracks on the eastern edge of the Covidien Plant and on the City of St. Louis property along Destrehan Street between the Covidien Plant and the Mississippi River.

Remediation and restoration of seven areas located along the BNSF Railroad right-of-way between Angelica Street and Dock Street were performed between May 2010 and September 2011. Approximately 2,300 bank cubic yards (cys) of contaminated soil were removed and transported to the Soil Storage and Loadout Facility for loading into railroad gondola cars for off-site disposal. The excavation depths in six of the areas varied from about 2 to 6 feet, but around the Destrehan Street 30-inch sewer main, the maximum excavation depth extended to about 14 feet.

Restoration of the remediated Plant 7N former hazardous waste storage area is nearing completion. Covidien has now completed the required closure procedures for this previously permitted hazardous waste storage facility. The remediation of this area included excavation depths up to 12 feet and the removal of approximately 2,750 cys of contaminated soil.

Remediation of the Plant 7W Building 700 Pad was started in April 2011 and is continuing. Demolition and removal of the former building foundations were completed recently. Remediation of this area may require the removal of approximately 4,890 bank cys of contaminated soil per the



Remediation and restoration at city property east of the levee

Plant 7W design documents. Completion of the RA activities in this area is currently scheduled for March 2012.

Remediation and restoration of three excavation areas (Nos. 4, 5, and 9) on city property on the east side of the levee were performed between January and April 2011. Their completion included the removal of approximately 800 bank cys of contaminated soil. Work in these areas required daily monitoring of Mississippi River levels to follow U.S. Army Corps of Engineers (USACE) River Stage/Excavation Guidelines. Restoration of the surface area at these locations also required the replacement of the clay cap layer with a vegetation cover and rip rap protection for the river bank to minimize seepage and erosion adjacent to the river.

Remediation and restoration of the fourth excavation area (No. 3) on city property on the east side of the levee is nearing completion. The remediation of this area began in February 2011 and included excavation depths extending to approximately 22 feet for the removal of approximately 7,900 bank cys of contaminated soil. Excavation in this area also followed USACE River Stage/Excavation Guidelines. Restoration of this area also includes the replacement of the clay cap layer with a vegetation cover and rip rap protection for the river bank to minimize seepage and erosion adjacent to the river.

Upcoming Events

Information Releases: [Summer Newsletter - July 2012](#)
This newsletter is issued twice a year.

Upcoming Meeting: [St. Louis Oversight Committee Meeting - TBD](#). Check www.mvs.usace.army.mil/eng-con/expertise/fusrap.html for meeting date and time.



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Remediation of the last two areas (Nos. 7 and 8) on city property on the east side of the levee was started in October 2011. Over 200 linear feet of sheet pile shoring were previously installed along the east side of the levee toe to facilitate remediation of the area, and a cable marker sign was moved to a location outside the planned excavation area. The planned excavation of this area will extend into the edge of the river to remove abandoned sewer outfall structures and will be staged for work in that area to be performed during low river levels. The projected schedule for the remediation and restoration of these areas extends until early 2013.

An additional excavation area on city property on the west side of the levee is now underway to remediate the section of the Destrehan Street 30-inch sewer main beneath an overhead trestle between the previous remediation area and the adjacent BNSF Railroad property line. This excavation requires the use of slide rail shoring to facilitate the deep excavation in order to remove contaminated soil around the 30-inch sewer. Approximately 30 linear feet of the sewer main will be removed and replaced as well as the removal of approximately 250 bank cys of contaminated soil. The completion of this RA is currently scheduled for January 2012.

North County

Hazelwood Interim Storage Site (HISS)/Futura

In 2000 and 2001, the USACE removed over 54,000 cys of contaminated material from the storage piles located at the Latty Avenue properties. Since 2007, the USACE removed over 102,000 cys of contaminated material



Sampling Futura property for radioactive contamination



Removal of contaminated soil at the Ballfields area

from below the surface and shipped it to an out-of-state licensed storage facility. In 2011, the USACE removed and remediated beneath the Hazelwood Interim Storage Site (HISS) rail spur to complete the remedial activities at the HISS, which completed remediation of the HISS property.

The USACE is currently characterizing the buildings on the Futura property for radioactive contamination. Once the characterization of the buildings is complete, the USACE will remediate/decontaminate the buildings on the Futura site. The USACE's goal is to complete all the remedial activities at the HISS/Futura site in 2012. Following completion of remedial activities, a Post-Remedial Action Report (PRAR)/Final Status Survey Evaluation (FSSE) will be prepared to release these properties. The USACE anticipates the release of the PRAR/FSSE for HISS/Futura properties in 2013.

The North County Record of Decision states contamination under buildings is inaccessible. The USACE will place institutional controls on the contamination left in place at the Futura property. In order to protect Coldwater Creek (adjacent to the Futura property), a Long-Term Environmental monitoring program has already established. This program evaluates and identifies the groundwater for radiological parameters that may affect Coldwater Creek. There is currently no migration of contamination.



Contaminated material removed from SLAPS

Latty Avenue Vicinity Properties (VPs)

In 2011, the USACE completed remedial activities at the Latty Avenue Vicinity Properties (VPs). The Latty Avenue VPs include VPs 02L, 03L, 04L, 05L, 06L, and 40a. At VP-02L, the USACE removed over 17,000 cys of contaminated material and shipped it to a licensed out-of-state facility. At VP-40a, over 29,000 cys of contaminated material were removed and shipped to a licensed out-of-state facility. From VP-03L to -06L, a minimal amount of contaminated material was removed during utility support work at the sites. The USACE anticipates the PRARs/FSSEs for the Latty Avenue properties to be completed by the end of 2012. The USACE released the PRAR/FSSE for VP-01L/10K530087 in 2010.

SLAPS Vicinity Properties

In 2011, the USACE completed remedial activities at several of the St. Louis Airport Site (SLAPS) VP. At VP-12 (located on the north side of McDonnell Boulevard and to the north of Coldwater Creek), over 5,000 cys of contaminated material were removed and shipped to an out-of-state licensed facility. Remedial activities were completed on the southeast section of McDonnell Boulevard (known as East Section B), removing 166 cys of contaminated material. Approximately 734 cys of contaminated material were removed from VP-31A located at Frost and Hazelwood Avenues in 2011.

In 2011 the USACE completed the characterization of soils under McDonnell Boulevard and Eva Avenue, VP-16/Eva

Loadout area, and VP-40a (SLAPS VP). The USACE also released the PRARs/FSSEs for VPs 5, 6, 8, 9, 53, 54, 55, and 63 and the Pre-Design Investigation Report (PDIR)/FSSE for VPs 3 and 4.

The USACE also initiated remedial activities at the Ballfields (IA-09). The Ballfields area consists of approximately 60 acres in Hazelwood, MO. The property is located north of Lambert-St. Louis International Airport and bounded to the north by McDonnell Boulevard, to the east by Eva Avenue, to the north by Frost Avenue and to the west by Coldwater Creek. Historically, the property was used for agricultural land and a baseball field complex and was also a part of the former Brown Road. Contamination of the Ballfields occurred when residues migrated from SLAPS via runoff onto adjacent properties through Coldwater Creek or was windblown, released, or otherwise deposited when material was transported along haul routes. The northern portion of the Ballfields is currently used by the City of Berkeley as a shooting range; the remainder of the property is not in use.

The remediation of the Ballfields will be completed in three phases. Phase 1 includes the east portion of the Ballfields area along Eva Avenue; IA-08 North Ditch (east portion); IA-09 North Ditch (east portion) and Eva Road. This area is situated on the east side of the area drainage divide and comprises approximately 25 acres. The USACE anticipates the removal of approximately 3,580 bank cys of contaminated material. Remedial activities have started at the Ballfields along Eva Avenue and along McDonnell Boulevard. Estimation of the completion of Phase 1 Ballfields will be approximately 8 to 12 months. The USACE is currently performing additional sampling of the Phase 2 area in the Ballfields to determine the extent of remediation.

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Educational Information

Q: What is the difference between the Resource Conservation Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)?

A: RCRA regulates how wastes should be managed to avoid potential threats to human health and the environment. CERCLA, on the other hand, comes into play when mismanagement occurs or has occurred (i.e., when there has been a release or a substantial threat of a release in the environment of a hazardous substance or of a pollutant or contaminant that presents an imminent and substantial threat to human health).

Information quoted from RCRA Orientation Manual: CERCLA - The Hazardous Waste Cleanup Program. For additional information, the full manual can be viewed at:
<http://www.epa.gov/osw/inforesources/pubs/orientat/rom62.pdf>

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St. Louis Downtown Site

In Fiscal Year (FY) 2011, Remedial Action (RA) construction activities were in progress or recently completed at the Covidien (formerly Mallinckrodt) Plant. These areas include Plant 6 West Half (6WH) Phase 2, Plant 7 North (7N) Hazardous Waste Storage Area (HWSA), Plant 7 West (7W) 700 Pad; Burlington Northern Santa Fe (BNSF) Railroad Vicinity Property (VP) DT-12; and City Property Phase 2, East of the Mississippi River (River) Levee (Levee).

In November 2010, remediation of Plant 6WH was completed in Excavation Areas (EAs) 4 through 6; the surface was restored with asphalt pavement in November 2010. The remediation of EAs 4 through 6 required the removal and disposal of approximately 12,100 bank cubic yards (cys) of contaminated soil. EA 3 continues to be used for railcar loading activities.

The demolition of the above ground structure at the Plant 7N HWSA was completed in FY10 and remediation began in November 2010. Remediation of this area required the removal and disposal of approximately 2,750 bank cys of contaminated soil as well as buried concrete foundations that were left in place following the decommissioning of historical Manhattan Engineer District/Atomic Energy Commission (MED/AEC) operation support facilities. Restoration of this area will begin after Covidien completes the required closure procedures for this previously permitted hazardous waste storage facility.

Remediation of the adjacent Plant 7W 700 Pad began in June 2011 with the demolition of the concrete foundation. An estimated volume of 4,890 bank cys yards of contaminated soil is anticipated to be removed.



Demolition of SLDS 700 Pad

Remediation of this area is expected to be completed in October 2011.

Remediation of BNSF property DT-12 included the removal of approximately 2,200 bank cys of contaminated soil from six excavation areas along the railroad right-of-way between Angelica Street and Dock Street. One of the excavation areas was expanded into Covidien Plant 7 South (7S) and included the removal of approximately 150 bank cys of contaminated soil. This extension of Covidien Plant 7S remediation was also completed in November 2010.

In Spring 2011 remediation began on City Property Phase 2, East of the Levee. City Property Phase 2 consists of 6 EAs, containing approximately 21,200 bank cys of contaminated soil to be removed. Remediation of EAs 4, 5, and 9 was completed in April 2011 and included the removal and disposal of approximately 810 bank cys of contaminated soil. Over 200 linear feet of sheet pile shoring was installed along the east side of the levee in March 2011 to protect the levee during remediation of EA 7, but RA at this location has been delayed because of continuing high river levels. Completion of the remediation of EA 3, which began in April 2011, has also been delayed because of continuing high river levels.

Upcoming Events

Information Releases: [Winter Newsletter - January 2012](#)
This newsletter is issued twice a year.

Upcoming Meeting: [St. Louis Oversight Committee Meeting-TBD](#). Check www.mvs.usace.army.mil/eng-con/expertise/fusrap.html for meeting date and time.



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North County

Latty Avenue Sites

Hazelwood Interim Storage Site/Futura

The U.S. Army Corps of Engineers (USACE) continues remedial activities at the Latty Avenue site. In February 2011, the USACE completed remedial activities at the Futura site removing a total of 37,447 cys of contaminated material and shipping it to an out-of-state licensed facility. The Futura site is currently undergoing restoration activities.

Remedial activities are almost completed on the Hazelwood Interim Storage Site (HISS) property. The USACE removed the HISS rail spur and completed the cleanup of soil underneath and adjacent to the railspur. Since the HISS railspur has been removed, contaminated soils and material are being transported to the St. Louis Airport Site (SLAPS) and shipped off-site to a designated disposal facility. Work is currently being completed at the north end of the HISS property close to Latty Avenue. Additional remedial activities at the HISS include the removal and cleanup of the sanitary sewers at the site. Plans for the removal and replacement of sanitary sewers at the HISS are in progress to allow for excavation of remaining contaminated soils. The USACE anticipates remedial activities at the HISS site will be completed by the end of the year. Since the beginning of FY11, over 27,000 cys of contaminated soil/material has been shipped to an out-of-state licensed facility.



Removal of HISS Railspur



Decontamination of the building at VP 02(L)

Latty Avenue Vicinity Properties

In FY10, the USACE completed remedial activities on Vicinity Property (VP)-02L. Over 16,000 cys of contaminated soil/material was removed from the property and shipped to an out-of-state licensed facility. The USACE is completing the remediation of the building at VP-02L. Contaminated dust was found in the dock/loadout area and on the rafters of the structure, as well as in two exhaust fans and in the floor drain located in the dock/loadout area. No contamination was found in the storm water drainage system or the floor drains inside of the building. The remediation/decontamination of the building has been expedited by the USACE since the building is empty. The USACE anticipates the completion of remedial activities in the building by the end of this summer.

The USACE has completed the characterization of VPs 3L–5L. In FY12, the USACE plans to release these properties under a Pre-Design Investigation Report/Final Status Survey Evaluation (PDIR/FSSE) because no remedial activities were required on these properties.

SLAPS Vicinity Properties

During FY11, the USACE also completed remedial activities and restoration at VP-12 located on McDonnell Boulevard across from the SLAPS with the removal of 2,821 cys of contaminated soil. In addition, 2,939 cys of contaminated soil was removed from the Coldwater Creek (CWC) area adjacent to VP-12 on McDonnell Boulevard,

166 cys was removed from VP-31A located on Hazelwood Avenue, and 734 cys was removed from McDonnell Boulevard (East Section).

During this FY, the USACE characterized the soils under McDonnell Boulevard and Eva Road and is currently characterizing soils in the VP-40a (Norfolk Southern Railroad property located within the Formerly Utilized Sites Remedial Action Program [FUSRAP] boundaries) and VP-16/Eva Loadout areas located on Eva Road in anticipation of remedial activities in the FY12. The USACE also expects to start remediating the eastern portion of the Ballfields adjacent to Eva Avenue.

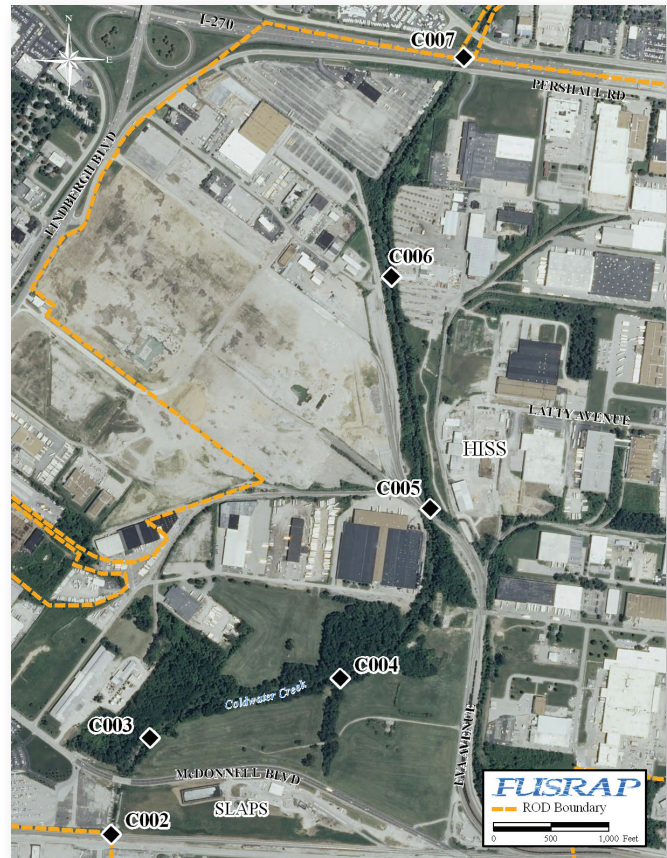
As of July 2011, the USACE has released the Post Remedial Action Reports (PRARs) for VPs 5, 6, 8, and 9 and PDIR/FSSE VPs 3 and 4. The USACE anticipates the release of the PRARs for VPs 53 and 63 during late summer/early fall timeframe. VPs 5, 6, 53, and 63 were cleaned up using American Recovery and Reinvestment Act funds.

Coldwater Creek

CWC is the major drainage mechanism for the SLAPS, SLAPS VPs, and the Latty Avenue Properties. It has been designated as a Metropolitan No-Discharge Stream. CWC flows adjacent to the SLAPS and SLAPS VPs, then meanders near the HISS, Futura and other Latty VPs and continues to flow through northern St. Louis County until it discharges into the Missouri River. In the industrial area located between the airport and Pershall Road, the water quality in CWC is generally poor. The present and reasonably anticipated future uses of the lower reach of CWC are recreation and live stock/wildlife watering.

Since 1998, as part of the St. Louis FUSRAP Environmental Monitoring Program (EMP), the USACE has monitored surface water and sediment for radiological and chemical parameters at six different monitoring stations along CWC adjacent to and downstream from the North County Sites. These sampling events are conducted semi-annually and have the following objectives: to document compliance with appropriate standards; to provide the public with information; to provide a historical record for year-to-year comparisons; and to identify environmental impacts. The EMP for CWC evaluates the water quality and radiological and chemical parameters present in the surface water and sediment.

Surface water and sediment data collected from CWC are evaluated relative to historical sample results obtained at each station. In addition, the Record of Decision established sediment remediation goals for radium-226, thorium-230,



Location of the 6 monitoring stations on Coldwater Creek

and uranium 238 and these criteria are also being used in evaluating CWC sediment. Although CWC is not a source of drinking water, the drinking water standard for total-uranium is used as a monitoring guide for surface water.

A trend analysis of the data from each station is also performed to determine the effects of the remedial actions on surface water and sediment in CWC. This trend analysis is reported annually in the Environmental Monitoring Data and Analysis Report (EMDAR). This assessment evaluates if surface water and sediment could adversely affect human health. Assessments completed since 1998 indicate that radiological dose levels in CWC are 100 times less than the regulatory limit.

It should be noted that FUSRAP was created to address environmental waste resulting from MED/AEC operations. Non-FUSRAP discharges are relatively common along the sampled reaches of CWC, and consequently sample parameters could be influenced by existing industrial sources rather than former MED/AEC operations.

Educational Information

Q: What does the Environmental Monitoring Program at FUSRAP involve?

A: The intent of the EMP is to: 1) document compliance with appropriate standards; 2) provide the public with information; 3) provide a historical record for year-to-year comparisons; and 4) identify environmental impacts. The USACE issues the Annual EMDAR for each calendar year. The EMDAR provides an evaluation of the data collected as part of the EMP. The USACE monitors various media at the FUSRAP sites including groundwater, surface water, air, and sediment for contaminants-of-concern. The public will be able to review the EMDAR for 2010 along with other key FUSRAP documents on our website at <http://www.mvs.usace.army.mil/eng-con/expertise/fusrap.html>.

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Five Year Review

The Second Five Year Review (FYR) has been completed for the St. Louis FUSRAP sites. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), an evaluation of response is required at least every five years following the start of the cleanup at hazardous waste sites where contaminants are present above levels that allow for unlimited use/unrestricted exposure. The Second Five Year Review covers the 09/01/2003 to 12/31/2008 time period. This review evaluates the protectiveness of the St. Louis Sites (SLS) remedies.

The Second FYR for the SLS was conducted by a team led by the U.S. Army Corps of Engineers (USACE), with representatives from the U.S. Environmental Protection Agency and the Missouri Department of Natural Resources. The FYR consisted of four components: document review, site inspection, site interviews, and assessment of response action protectiveness.

The remedial actions of the St. Louis Downtown Site (SLDS) operable unit (OU) and the North St. Louis County OU are under construction. These actions for the SLS OUs are designed to be protective of human health and the environment upon completion. In the interim, exposure pathways that could result in unacceptable risks are being controlled.

The results of the FYR are available to the public in the *Five Year Review Report for the St. Louis FUSRAP Sites*. This report documents the methods, findings, and conclusions of the review. Any problems



USACE has nearly remediated the sixth area in Plant 6WH, Phase 2 at the St. Louis Downtown Site.

found and recommendations to address them are documented in the report.

The public can read copies of this report in the Administrative Record located at the FUSRAP Project Office at 8945 Latty Avenue in Berkeley, MO. Because the main branch of the St. Louis Public Library is closed for remodeling, a copy of this FYR can be also found at the St. Louis Public Library – Prairie Commons Branch at 915 Utz Lane in St. Louis. The FYR can also be viewed on the FUSRAP website: www.mvs.usace.army.mil/eng-con/expertise/fusrap.html

St. Louis Downtown Site

During the period from October 1, 2009 until September 30, 2010, Remedial Action (RA) construction activities were in progress or completed at the City Property west of the Mississippi River levee (Vicinity Property [VP] DT-2), BNSF Railroad (VP DT-12), Covidien - Plant 7N Hazardous Waste Storage Area (HWSA), and Covidien - Plant 6WH, Phase 2.

Remediation of the DT-2 area surrounding the 30-inch sewer in the Destrehan Street right-of-way, west of the levee, was completed with authorization to backfill in October 2009. The active sewers rerouted during RA activities were restored, and the area was backfilled

Upcoming Events

Information Releases: Summer Newsletter - July 2011
This newsletter is issued twice a year.

Upcoming Meeting: St. Louis Oversight Committee Meeting -
Friday, February 25, 2011, 1:00 pm at the FUSRAP Project
Office at 8945 Latty Avenue in Berkeley, MO 63134.



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and restored during FY10. Most sheet pile shoring, which was installed to safely reduce the excavation size and for protection of the Mississippi River Flood Protection Levee, was left in place but cut-off about 2 ft. below finished grade. However, some sheet pile was removed for use at other locations. A total of approximately 9,200 cubic yards of soil was removed for the DT-2 RA, including roughly 3,900 cubic yards of contaminated material and about 5,300 cubic yards of clean overburden soil.

Remediation of six areas in DT-12 along the Burlington Northern Santa Fe Railroad right-of-way between Angelica Street and Dock Street was started in May 2010 and five of the six areas were completed in FY10. Remediation of the sixth area on this property was nearing completion at the end of FY10. Approximately 1,200 cubic yards of soil were removed from the five areas in FY10, and the completed areas were backfilled and the surface restored with gravel.

Remediation of the Plant 7N HWSA area began in February 2010 with the installation of sheet pile shoring along portions of the south and west sides of the excavation to protect building structures on the adjacent property. During FY10, the storage area canopy structure and historical building foundations were removed to prepare the area to complete the planned RA in FY11.

Remediation of the Plant 6WH, Phase 2 area continued in FY10 with two of the six planned excavation areas being completed during that period. At the end of FY10, five of the six planned areas had been completed



USACE completed remedial activities at VP-02L in FY10.

including the three areas completed prior to FY10. The RA in the two areas included the removal of about 8,100 cubic yards of contaminated soil. These areas were backfilled, and the surface was restored with asphalt pavement for the continued use as the Soil Storage and Load-Out Facility for the SLDS operations adjacent to the rail spur. Remediation of the sixth area in Plant 6WH, Phase 2 was nearing completion at the end of FY10.

North County

Latty Avenue Sites

In FY10, the USACE continued remedial activities at the Hazelwood Interim Storage Site (HISS)/Futura site. The USACE removed another set of underground tanks buried behind the buildings at Futura and continued remediating around the Futura buildings and on the HISS side of the property. Remedial activities also continued at VP-40A (Norfolk Southern Railroad property) adjacent to the HISS. The USACE removed over 19,100 cubic yards of contaminated material from these areas. Remedial activities were completed at VP-2L in FY10 removing over 16,000 cubic yards of contaminated material. The USACE also issued Post Remedial Action Reports (PRARs) for two Latty Avenue properties (VP-1L and 10K530087) during FY10.



Excavation of the Plant 7 Hazardous Waste Storage Area continued during FY10.



Remediation proceeds along the McDonnell Boulevard Right-of-Way.

During FY11, the USACE anticipates completing the remediation on the Futura property and remediating the soils under the HISS railspur with the removal of the tracks. The USACE will begin sampling and characterizing the building on VP-2L and Latty Avenue properties, VP-3L and -5L. VP-6L and other parts of VP-40A property will be remediated concurrent with the HISS railspur remediation.

St. Louis Airport Vicinity Properties

In FY10, the USACE received American Recovery and Reinvestment Act (ARRA) funds to remediate properties at the SLAPS VPs. Five properties (VPs-5, -6, -53, -54, -55, and -63) were remediated. Over 3,000 cubic yards of contaminated material was removed from the ARRA properties and shipped to a licensed, out-of-state facility.

Remediation was also initiated at three other SLAPS VPs: VP-12; area north of McDonnell Boulevard, adjacent to Coldwater Creek (CWC); and, the south eastern section of the McDonnell Boulevard Right-of-Ways (ROWS). To date, the USACE has removed over 1,900 cubic yards from VP-12; over 1,800 cubic yards from the area north of McDonnell Boulevard adjacent to CWC; and, over 450 cubic yards from the McDonnell Boulevard ROWs. Remediation continues at these properties and will be completed in FY11.

During FY10, the USACE issued the PRARs for eight SLAPS VPs along Hazelwood Avenue (VPs-32, -35, -35A, -36, -39, -40, -42, and -47) and a Pre-Design Investigation Report/Final Status Survey Evaluation (PDIR/FSSE) for three Hazelwood Avenue properties (VPs-33, -34, and -37).

In FY11, the USACE anticipates the release of the ARRA properties (VPs-5, -6, -53, -54, -55, and -63) when the PRARs for these properties are issued and the PDIR/FSSE for VPs-3 and -4 is finalized.

Fiscal Year 2011 Funding

As of January 2011, Congress has not passed an appropriations bill for FUSRAP. In December, 2010 Congress passed and the President signed an extension of the Continuing Resolution through March 4, 2011. Essentially, a Continuing Resolution provides interim authority to continue funding federal programs until an appropriations bill is enacted.

Personnel

At the end of December, Mr. Roy Parks, the SLDS Project Manager (PM), retired after serving USACE for 28 years. He worked on FUSRAP's St. Louis sites for the past ten years, three of which he served as the SLDS PM. We wish him well.

St. Louis FUSRAP welcomes our new PM, Steve Hamm. Steve comes to us with experience from U.S. Steel - Granite City Works and Environmental Resources Management.

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

Educational Information**Q: What is radon?**

A: Radon is a tasteless, odorless, and colorless gas naturally found in rocks, soil, and water. Radon is a radioactive and carcinogenic element known to cause lung cancer. As a result, it is considered to be a contaminant that affects indoor air quality and is typically the largest source of background radiation dose for humans.

Radon is formed from the radioactive decay of uranium and thorium from rock and soil. The radon gas rises from soil and tends to accumulate in low lying areas in buildings due to its heavy density. The concentration of radon in a building depends on several factors, including ventilation, local geology, weather, and building design. The EPA estimates that one in 15 homes have concentrations of radon that are at or above the EPA's national voluntary action level of 4 picocuries per liter. Many test kits are available to test your home or office for radon levels.

For more information, refer to the EPA's citizen's guide to radon.

<http://www.epa.gov/radon/pubs/citguide.html>

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North St. Louis County

Latty Avenue Properties

Currently, Remedial Actions (RA) are focused on two adjacent properties – the Vicinity Property (VP)-02(L) and the Futura part of the Hazelwood Interim Storage Site (HISS)/Futura property located on the west end of Latty Avenue.

An RA was initiated in December 2009 at the VP-02(L) property. To date, approximately 15,294 cubic yards (cys) of contaminated soil have been removed from the site and shipped to an out-of-state licensed disposal facility. This portion of the RA is scheduled for completion by August 2010. In addition, the U.S. Army Corps of Engineers (USACE) and the property owner are working together to assess the inside and the outside of the on-site building for possible radiological contamination.

At the Futura property, over 27,700 cys of Manhattan Engineer District/Atomic Energy Commission (MED/AEC) contaminated soil have been removed from the Futura portion of the site and shipped to an out-of-state licensed disposal facility. An estimated 6,200 bank cubic yards (bcys) remain to be removed. (See “Educational Information” on page 4 for an explanation of “bank” versus “shipped” volumes.) The property owner is currently working with the Missouri Department of Natural Resources to remove several underground storage tanks. Once this is accomplished, the USACE will remediate all MED/AEC contamination under the tanks. This remaining remediation work should be complete by the fall of 2010. Contamination under the Futura buildings is considered inaccessible, and institutional controls will be established to minimize any health risks.



Restoration of VP-54 along Pershall Road

At the HISS property, over 33,600 cys of contaminated soil have been removed and shipped to an out-of-state licensed disposal facility. An additional 21,000 bcys remain to be removed. Most of the remaining contamination is located under the HISS railspur and will be removed at a future date.

St. Louis Airport Site Vicinity Properties

In February 2010, an RA was started using funds furnished by the American Recovery and Reinvestment Act (ARRA). Five properties are targeted for remediation under this RA. Most of the work is on road rights-of-way adjacent to Pershall Road and McDonnell Boulevard. To date, work has been completed at VP-63 (the old Ford Automobile Plant) off Lindbergh Boulevard, and remediation has been completed at three properties along Pershall Road (VPs-53, 54, and 55) and at VPs 3, 4, 5, and 6 off of McDonnell Boulevard. The last ARRA property to be remediated is VP-12, a property located on the northwest side of McDonnell Boulevard across from the St. Louis Airport Site (SLAPS). An estimated 706 bcys will be removed from VP-12. To date, approximately 864 cys of contaminated soil have been removed from the ARRA properties and shipped to an out-of-state licensed facility. Final restoration of the ARRA properties is expected to be completed by the end of the summer.

Upcoming Events

Information Releases: *Winter Newsletter - January 2011*
This newsletter is issued twice a year (January and July).

Upcoming Meeting: The next St. Louis Oversight Meeting is scheduled for July 21, 2010 at noon at the Sunset Park Lodge in Florissant. There will be an optional tour of the Lodge at the end of the FUSRAP meeting for interested participants.



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Work on McDonnell Boulevard

Stay alert this summer and fall when travelling McDonnell Boulevard.

Starting in July, the USACE will be remediating the rights-of-way along McDonnell Boulevard between Banshee Road and Genaire Drive. An estimated 310 bcys of contaminated soil and gravel will be removed from the rights-of-way on both sides of this stretch of road.

The USACE will also be sampling under the surface of McDonnell Boulevard. The results of the sampling activities will identify and evaluate areas of possible radiological contamination under the road. Sampling will be conducted on McDonnell Boulevard from North Lindbergh Boulevard to just north of the intersection with Genaire Drive. To minimize traffic disruption, the majority of this work will be done on weekends. However, drivers need to be alert and anticipate lane closures and traffic delays whenever work is in progress.

The USACE is working with the St. Louis County Department of Highways and Traffic to safely execute these activities.

When driving McDonnell Boulevard, please stay alert and slow down to protect yourself and the workers conducting these activities.

Coldwater Creek

The section of Coldwater Creek (CWC) that pertains to the Formerly Utilized Sites Remedial Action Program (FUSRAP) begins south of McDonnell Boulevard adjacent to the SLAPS and continues in a northeasterly direction through Hazelwood, Florissant, unincorporated St. Louis County, and the northern edge of Blackjack before discharging into the Missouri River. CWC, which forms the western boundary of the SLAPS, was contaminated when radioactive residues migrated from the SLAPS during significant rainfall events, primarily as storm water runoff. Prior to the installation of the gabion wall that stabilized the bank, bank erosion on the western end of the SLAPS also contributed to the contamination of the creek. Since the 1980s, the U.S. Department of Energy and then the USACE have conducted several sampling investigations of the creek.

To date, the USACE has cleaned up two areas of the creek. In 1998, the USACE assisted the City of Florissant during their construction efforts to replace the St. Denis Bridge, which is located approximately 3 miles downstream of the SLAPS. During the project,



Coldwater Creek south of Pershall Road

approximately 450 cys of MED/AEC contaminated soils and sediments were removed from the creek and its banks. In 2004, the section of CWC adjacent to the SLAPS, between the Norfolk Southern railroad on the south, and the McDonnell Boulevard Bridge on the north, was also remediated as part of the SLAPS remedial activities. Approximately 11,230 cys of contaminated soils and sediments were removed from CWC and its banks. The remediation of CWC in this area culminated in the reconstruction of the channel and the armoring of the banks and creek bed with riprap.

Sampling is routinely conducted in CWC as part of the FUSRAP Environmental Monitoring Program. The data is evaluated and reported in annual environmental monitoring reports. The USACE has also started characterization sampling in CWC to determine the areas of the creek that need to be remediated. CWC will be remediated in accordance with the North County Record of Decision (ROD).

St. Louis Downtown Sites

Mallinckrodt Plant 6-West Half

Excavation continues in Mallinckrodt Plant 6-West Half. The FUSRAP team previously remediated the southern portion of this plant area, and Mallinckrodt removed their source material from this area under a separate contract. Currently, remedial activities are being conducted adjacent to FUSRAP's Soil Storage and Load-out Facility in the northern area of Plant 6-West Half. Prior to initiating excavation, sheet pile shoring was installed along the eastern side of Building 101 and between some of the excavation areas to protect

the building foundation and to facilitate the staging of the various excavation areas. FUSRAP coordinated closely with Mallinckrodt, who removed additional source material from this area under a separate contract. All Mallinckrodt work has been completed in this area and it is anticipated that the FUSRAP remediation of Plant 6-West Half will be completed by this September. To date, FUSRAP has shipped about 35,000 cys of contaminated material from Plant 6-West Half to an out-of-state licensed disposal facility.

Burlington Northern Santa Fe Railroad Vicinity Property

In May 2010, the USACE released the final remedial design and initiated the remediation for the Burlington Northern Santa Fe (BNSF) Railroad property (DT-12). Remedial activity here includes the removal of about 2,620 bcys of contaminated soils in six areas along the railroad right-of-way between Angelica and Dock Streets. The current schedule calls for excavation and backfill completion at this property in September 2010.

7N Hazardous Waste Storage Area

The Plant 7N Hazardous Waste Storage Area, which consisted of a metal canopy and concrete foundation, has been demolished to allow for the removal of approximately 2,900 bcys of MED/AEC contaminated soil at that location. Sheet pile shoring was installed south and east of the planned excavation area to ensure stability of adjacent building foundations and pavement while remediation was underway. Excavation and restoration of this area will begin after the nearby BNSF VP (DT-12) is remediated.

City Property Vicinity Property

Another remedial action area nearing completion is the City Property VP (DT-2), Phase 1 West of the



Plant 6-West Half Excavation

Mississippi River Flood Protection Levee. Sheet pile shoring was installed along the toe of the levee and along sides of the Destrehan Street right-of-way in order to protect the integrity of the levee and to facilitate the removal of the approximately 15-foot-deep sewers and the contaminated soil surrounding the sewers. About 9,200 bcys of soil were excavated, including about 3,900 yards of contaminated soil and about 5,300 yards of clean overburden, which was stockpiled and reused for backfilling some of the area. Both active and abandoned sewer lines were removed or grouted, and the active portions restored to connect to the newer diversion sewer. Final restoration of the area at City Property-West of the levee has been completed.

St. Louis Downtown Sites Inaccessible Soils Operable Unit

The original ROD for the St. Louis Downtown Sites (SLDS) specified a remediation remedy for 'accessible' soils. Accessible soils are those that are not beneath buildings or other permanent structures. FUSRAP is currently investigating and characterizing the remaining areas potentially impacted by MED/AEC contamination. Sewer lines, building surfaces, and inaccessible soils comprise what is designated as the SLDS Inaccessible Soils Operable Unit (OU).

FUSRAP has recently completed most of the sampling required to issue a Remedial Investigation Report for this OU. An internal draft of this document is under preparation and a final document is expected in 2011. A Proposed Plan and ROD will be issued in 2012. Public input and comment, a valuable component of these documents, will be sought and incorporated during the development process.

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Educational Information**Q: What are the differences among various soil volume descriptions?**

A: Readers of the *FUSRAP Update* or of other FUSRAP documents and briefings may be confused by different designations used to describe soil volumes. For example, in some contexts, we refer to “bank” or “*in situ*” volumes of soil and in other situations discuss “loose,” “disposed,” “*ex situ*,” or “shipped” volumes.

Bank and *in situ* volumes are synonymous and generally are used in design or other pre-remediation discussions of contaminated soils prior to excavation. The terms refer to undisturbed soil volumes. After excavation, the synonymous terms loose, disposed, *ex situ*, and shipped volumes of soil may be used to reflect the expanded volume of the soil after it is excavated. Soil is broken apart during the excavation process and is no longer subject to compaction by overburden or surrounding soil. The soil expands to about 1.3 times its *in situ* volume when excavated.

Perhaps a good way to visualize the distinction is to picture a gardener digging a hole to plant an azalea or rose bush in the spring. The volume of the hole itself would represent a bank soil volume, while the pile of soil on the ground would be a disposed or loose volume.

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Fiscal Year 2009 in Review

Fiscal year 2009 (FY09) was a productive year for the St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP). During FY09 several properties were remediated and/or released and preparations are underway to begin work on properties targeted for cleanup during FY10.

In FY09 a total of 58,847 cubic yards (cy) of contaminated material was shipped from St. Louis FUSRAP sites to out-of-state, licensed and permitted disposal facilities – 39,423 cy from Latty Avenue, 4,915 cy from the St. Louis Airport Site (SLAPS) Vicinity Properties (VPs), and 14,509 cy from the St. Louis Downtown Site (SLDS).

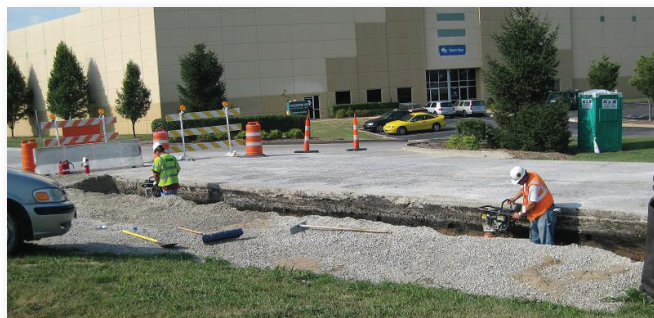
St. Louis FUSRAP Sites FY 2010 Budget

On October 28, 2009 President Obama signed the Energy and Water Development Appropriations Act which provides funding for the St. Louis FUSRAP (among other programs) for FY 2010. \$43.2 million was appropriated for St. Louis FUSRAP. An additional \$2 million in American Recovery and Reinvestment Act (ARRA) funds was provided. These funds will be used to continue remediation at the St. Louis District's FUSRAP sites.

North St. Louis County

Vicinity Properties

A total of 17 North St. Louis County VPs were released under a Pre-Design Investigation Report/Final Status Survey Evaluation (PDIR/FSSE) report. This means that these properties were investigated and found to meet the North County Record of Decision (ROD) objectives with



Due to the possible exposure of contaminated soils under the roadway during the City of Hazelwood's road improvement activities, the USACE decided to clean up the inaccessible soils under the road.

no remediation. All 17 of these properties are located on Frost and Hazelwood Avenues.

Remedial activities continue at VP-40a East with a total of 11,434 cy of contaminated material removed in FY09. The USACE anticipates completion of remediation of this property in FY10. The VP-40a East pump-around area on the Coldwater Creek tributary adjacent to the Hazelwood Interim Storage Site (HISS) was completed and restored in late October 2009. Remedial activities continue at the HISS/FUTURA properties with the removal of 27,987 cy of contaminated material in FY09. The USACE anticipates the completion of remedial activities at the Futura part of this property in FY10. Contaminated materials removed from the above-referenced properties have been sent to out-of-state, licensed and permitted disposal facilities.

Plans are also under way to begin work at VP-02L, a property immediately adjacent to the HISS. The USACE currently intends to remove approximately 5,800 cy of contaminated material from this VP.

Hazelwood Avenue Remediation Complete

The USACE completed remediation of the rights-of-way and under the road for Hazelwood Avenue in August 2009. Hazelwood Avenue became contaminated when it was used as a haul route for transporting uranium-bearing residuals from the SLAPS on McDonnell Boulevard, to the HISS on Latty Avenue. The USACE expedited the remediation of Hazelwood Avenue because the City of Hazelwood is planning to improve and widen the road beginning in the Spring 2010. A total of 1,364 cy of contaminated materials was removed from Hazelwood Avenue and sent to an out-of-state licensed and permitted disposal facility.

Upcoming Events

Information Releases: [Winter Newsletter - December 2009](#)
This newsletter is issued twice a year in July and December.

Upcoming Meeting (Please come if you are available!):
[St. Louis Oversight Committee Meeting - Date TBD, 11:30 a.m.](#)
at the FUSRAP office on Latty Avenue.

2nd 5-year Review: [See update on page 2.](#)



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During the remediation of Hazelwood Avenue, the USACE sent out traffic updates to business and property owners and posted signs on adjacent roads to enable workers and residents to exit and enter Hazelwood Avenue without running into sections of the road that were closed.

American Recovery and Reinvestment Act of 2009 Funding

In early FY10, the USACE St. Louis FUSRAP received funds from the ARRA. These funds will be used to remediate at least five FUSRAP properties located in North St. Louis County. Work was started in the spring of 2009 to complete the Pre-design Investigation and Remedial Design documents to remediate these properties. In keeping with President Obama's request to create jobs, a new contract was awarded to Cabrera Services to perform the remedial activities. The USACE estimates that approximately 2,000 cy of contaminated material will be removed from the ARRA properties.

Five-Year Review Progresses

The USACE plans to release the second St. Louis FUSRAP Sites Five-Year Review early in 2010. The purpose of this review is to evaluate whether the response actions implemented on the FUSRAP St. Louis Sites continue to be protective of human health and the environment. The St. Louis Sites consist of the North St. Louis County Site and the SLDS.

FUSRAP activities at the St. Louis Sites follow the guidelines established by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) more commonly known as Superfund. Under CERCLA, a review of the response actions must be conducted at least every five years following the start of the cleanup. As part of the five-year review process, the USACE, Environmental Protection Agency (EPA), and Missouri Department of Natural Resources (MDNR) work together to inspect each site and document conditions observed. Members of the community are also interviewed and asked to provide their views about the cleanup to help the team better understand the impacts of the work on the local community.

The results of the review will be published in the "Five-Year Review Report for the St. Louis FUSRAP Sites." The report will also document any problems found and include recommendations to address them. The draft report is currently under regulator review. After regulator comments are addressed copies of the report will be placed with the Administrative Record located at the St. Louis Public Library, 1301 Olive Street, and at the FUSRAP Project Office at 8945 Latty Avenue in Berkeley.



In FY09, the USACE initiated excavation west of the flood protection levee at City Property (DT-2).

St. Louis Downtown Site

The USACE proceeded with remediation efforts in three different areas of SLDS in FY09. Remediation was initiated at Plant 6 West Half, Phase 2. The effort was closely coordinated with Covidien, who accomplished Columbium-Tantalum (C-T) pit removal simultaneously. The USACE also initiated excavation west of the flood protection levee at City Property (DT-2) and completed remedial activity at the Terminal Railroad Association VP (DT-9). 3,023 cy of contaminated material from DT-9 was shipped to an out-of-state, licensed and permitted disposal facility.

In addition, the USACE prepared the plan for sampling inaccessible soils, sewers, and buildings and submitted it for regulatory review and comment. This plan is a precursor to a ROD regarding the disposition of inaccessible soils and other media not addressed in the 1998 SLDS ROD.

Finally, a PDIR/FSSE for DT-35 and DT-36, releasing the accessible soils on these properties as having met the SLDS ROD remedial goals without any requirement for soil removal, was published.

What's Next?

Preliminary investigation and/or design work is currently underway for the Burlington Northern Santa Fe VP (DT-12) and the City Property (DT-2). These two properties are scheduled for remediation in FY10. In addition, the Plant 6W Phase 2 remediation is scheduled for completion in 2010, including Covidien's removal of two remaining C-T pits. Finally, inaccessible soils sampling will be completed in preparation for the resulting Remedial Investigation Report and Feasibility Study.

Missouri Department of Natural Resources Role in the St. Louis FUSRAP Process

The MDNR's Federal Facilities Section provides state regulatory oversight to the St. Louis FUSRAP. Section staff coordinate with the EPA, USACE, and other sections within the MDNR to ensure that the selected remedy is implemented in a manner that is protective of public health and the environment. One way MDNR staff carry out this task is by providing independent technical review on major decision documents, work plans, PDIRs, remedial designs, and Proposed Remedial Action Reports. Section staff also regularly collect independent environmental samples (e.g. soil and water). The purpose of independent sample collection includes confirmation of both remedial action results and storm water management practices and investigation of locations of potential concern.

MDNR personnel are available for questions, requests for information, or as a means of submitting comments and concerns. The MDNR encourages community involvement in order to ensure that the concerns of Missouri citizens are addressed. For more information or to submit comments or concerns please contact the following MDNR staff members located at the Florissant Field Office: Daniel Carey, North County project coordinator (314-877-3047 or daniel.carey@dnr.mo.gov) and Tiffany Burgess, SLDS project coordinator (314-877-3251 or tiffany.burgess@dnr.mo.gov).

St. Louis Oversight Committee

On October 7, 2009, an Oversight Committee meeting was held at the Jana Elementary School in Florissant. Meeting participants included the USACE, MDNR, a Council member from Florissant Ward 4, representatives from

the offices of Congressmen Lacey Clay and Todd Aiken, current members of the Oversight Committee (Sally Price and Jack Fraenhoffer), representatives from the Missouri Coalition on the Environment, and various members of the community. The meeting consisted of a presentation from the USACE on the project's current issues and questions from the community about FUSRAP and how it affects the North County community. Also, interested citizens/stakeholders were encouraged to join the Oversight Committee to replace several of the original members who have recently resigned.

The next meeting is yet to be scheduled, but will take place at the FUSRAP office trailers located at 8945 Latty Avenue, Berkeley, MO 63134. Future newsletters will provide the date and further information on Oversight Committee meetings. Information and dates for the Oversight Committee meetings will also be posted on the FUSRAP Website.

Comings and Goings

New St. Louis FUSRAP Engineer

We extend a warm welcome to Vick James, our new St. Louis FUSRAP team Senior Project Engineer. Vick brings 25 years of construction experience working with the USACE to his new role of overseeing activities at both the SLDS and North County Sites.

St. Louis FUSRAP Team Members Serve on Operation Enduring Freedom

Sonny Roberts, the USACE construction manager for North St. Louis County, recently volunteered to serve his second tour of duty on Operation Enduring Freedom. Sonny will soon be heading for Wardak Province, Afghanistan where he will be working as Lead Construction Representative on numerous construction contracts for the Army. Sonny has been a member of the St. Louis FUSRAP team since January 1999. We will miss him and wish him well.

The St. Louis FUSRAP team also wishes a fond farewell to Gerald Allen, Project Engineer for the SLDS site. Gerald is now serving his second tour of duty with Operation Enduring Freedom. His first assignment was as a Resident Engineer near the city of Baqubah, Iraq. Gerald is now serving as a Resident Engineer of the Bagram Area Office in Afghanistan.

Congratulations are due to Susan Adams, who has been with the St. Louis FUSRAP team for 10 years. Susan has assumed Gerald's responsibilities and is the new SLDS site Project Engineer.

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If you have any suggestions, questions, or comments, contact our office.

Educational Information

Q: What is the difference between alpha, beta, and gamma radiation?

A: There are three types of nuclear radiation emitted from radioactive atoms: alpha, beta, and gamma.

Alpha particles are the slowest moving and least penetrating of the three forms of radiation. Alpha particles can be stopped by a sheet of paper or the dead layer of a person's skin. Alpha particles are only harmful if ingested or inhaled.

Beta particles travel faster than alpha particles and are more penetrating. These particles can pass through a sheet of paper, but cannot penetrate a sheet of aluminum foil. Beta particles are also harmful if ingested or inhaled.

Gamma rays are not particles but electromagnetic energy. They have a much greater penetration power than alpha or beta particles and require shielding with materials such as concrete, lead, steel, or water. Gamma rays are the most hazardous type of radiation because they can travel up to a mile in open air and penetrate all types of materials, including the human body.

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St. Louis Downtown Site

The FUSRAP team has been busy at the St. Louis Downtown Site (SLDS). The FUSRAP team

- completed remedial activities at the Terminal Railroad Association Vicinity Property in early June 2009. This large area in the northeast corner of SLDS included a total of 2,860 cubic yards of contaminated soil. The soil was removed and shipped to a licensed, out-of-state facility.
- continued excavation and shipping of contaminated material from Plant 6 West Half in the winter and spring of 2009. Since the fall of 2008, a total of 5,000 cubic yards of contaminated material was removed and shipped to a licensed, out-of-state facility. The U.S. Army Corps of Engineers (USACE) returned a small portion of this area to Mallinckrodt. The remaining contaminated soil, including additional licensed material excavated by Mallinckrodt, will be removed in 2010.
- is currently preparing a design change at Plant 7 North to accommodate the removal of contaminated soil beneath Mallinckrodt's Hazardous Materials Storage Area. Mallinckrodt is replacing this facility with a new one, making the contaminated soil under the old facility available for remediation beginning in the Fall 2009.

Upcoming Events

Information Releases: [Winter Newsletter - December 2009](#)
This newsletter is issued twice a year in July and December.

Upcoming Meeting (Please come if you are available!):
[St. Louis Oversight Committee Meeting - Date TBD, 11:30 a.m.](#)
at the FUSRAP office on Latty Avenue.

2nd 5-year Review: ongoing in 2009



Heavy pile-driving equipment is used to initiate the sheet pile protection for the City Property Vicinity Property at SLDS.

City Property Sheet Pile Installation

At the "City Property," sheet pile was installed in preparation for excavation of contaminated soil in the adjacent area. "City Property" is a large Vicinity Property of the SLDS. This portion of the property is located along Destrehan Street, east of the Burlington Northern rail line and west of the U.S. Army Corps of Engineers (USACE) Mississippi River Flood Protection Levee (Levee).

Sheet piling consists of long sheets of interlocking half-inch-thick steel. The purpose of the sheet pile is to form a wall around the excavation to keep surrounding soil from falling into the excavation. As seen in the photos, sheet pile is driven into the ground before excavation begins. The installation of sheet pile will facilitate remediation activities in this area which include the removal of approximately 5,200 cubic yards of contaminated soil, an abandoned MSD 30-inch-diameter sewer line, and nearby sewer support structures.

The installation involved driving 168 pairs of sheet pile, approximately 506 linear feet, into the ground. The pairs of sheet pile varied in height from 29 to 44 feet, depending on the specific installation location and the planned depth of excavation in that area. The excavation itself may be as deep as 30 feet in certain places.



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The USACE must ensure the stability of the levee, and therefore the team installed monitoring equipment to detect soil movement in the levee during sheet pile installation and during actual soil excavation. The FUSRAP team initiated excavation activities in mid-May following completion of the sheet pile installation and after a brief delay caused by high levels of the Mississippi River.

Throughout the excavation activities, river level and levee stability will be continuously monitored to ensure that remediation is completed safely and that the St. Louis flood protection levee is not compromised. Remediation is expected to continue well into 2010.

North St. Louis County Site

HISS/Futura/Norfolk Southern Properties

Remediation of the Hazelwood Interim Storage Site (HISS) and Futura Coatings Company and adjoining Norfolk Southern Railroad properties continues in 2009. During the 1960s uranium-bearing residues from St. Louis Airport Site (SLAPS) were stored and processed at the Futura and HISS properties.

Since early 2008, the FUSRAP team has remediated approximately 4 acres of the combined 11-acre Futura/HISS properties. They have excavated over 28,000 cubic yards of contaminated material and shipped it to an approved waste disposal facility. Part of the remediation process has included the partial restoration of completed areas. During remediation activities, close coordination occurs to ensure site stockpiling and rail car loading cause minimal impact to the business operations of the current tenant.

Remediation also continued on the adjoining Norfolk Southern Railroad property, which included excavation around a tributary of Coldwater Creek. After excavation of over 12,000 cubic yards of material from the area near the tributary, work was temporarily suspended due to saturated soil conditions. Remediation will resume this summer or fall during a period of drier weather.

The remediation of the Norfolk Southern area was particularly interesting from a technical standpoint. The FUSRAP team installed a temporary pump-around system in the tributary area to divert an estimated 1,500 gallons per minute of dry-weather flow around



Sheet pile protection system for the City Property excavation is shown nearing completion.

the construction area. The system included portable diesel-powered pumps, temporary piping, check dams, and scour protection.

In addition to providing easier access to the tributary area, the system eliminated any possibility of Coldwater Creek contamination by diverting flow away from the area of remediation.

SuperValu Property

A second phase of the St. Louis Airport Site Vicinity Property 38 (SLAPS VP-38) cleanup activities was completed this spring. VP-38 is an area immediately adjacent to the USACE FUSRAP office compound on SuperValu, Inc., property.

The team performed an earlier remediation phase at the location of the compound in 2000. During the current remediation, the FUSRAP team excavated and transported approximately 1,600 cubic yards of contaminated soil to an off-site disposal facility.

As part of the recent excavation, 1,000 cubic yards of clean overburden soil were removed, stockpiled, and re-used as backfill for the excavation. The remediation team screened this material during handling to verify that the soil met applicable remediation criteria.

Re-use of overburden results in significant cost savings since more expensive clean soil does not have to be purchased and imported to the site. The term 'overburden' is explained in this newsletter's Educational Information on page 4.

Hazelwood Avenue Right-of-Way

You may have noticed the signs posted on Pershall Road, Hanley Road and Hazelwood Avenue recently warning of road closures along Hazelwood Avenue. The road signs are up because the USACE started remediation along the Hazelwood Avenue Right-of-Ways (ROWs) this spring. The USACE decided to start remediation activities along the ROWs before the City of Hazelwood begins their road improvement project along Hazelwood Avenue later this year.

The City of Hazelwood received a grant from the East-West Gateway Council Transportation Improvement Program to make road improvements and widen Hazelwood Avenue from Frost Avenue to Pershall Road. The USACE has been coordinating with the City of Hazelwood to ensure the time frame of our remediation does not interfere with the road improvement project for Hazelwood Avenue.

In order to lessen the problems with the road closures, the USACE passed out announcement letters to all the businesses that use Hazelwood Avenue. For those business owners and employees that wanted to be updated on the road closures, the USACE set up an email notification list. When the road barriers are moved, all on the list are notified of the changes by email. The USACE has been working with the Hazelwood Police Department to verify that our signs are properly situated along the roads. The Hazelwood Police have increased their patrols along Hazelwood Avenue since remediation activities started.

In the 1960s, Hazelwood Avenue was used as a haul route transporting uranium-bearing residuals from the St. Louis Airport Site on McDonnell Boulevard



Two large pumps divert Coldwater Creek flow around an excavation at the Norfolk Southern Vicinity Property in North County.

to the Hazelwood Interim Storage Site on Latty Avenue. Contamination along Hazelwood Avenue occurred as a result of soil spillage from transport vehicles. As a result of characterization sampling and investigations along Hazelwood Avenue, twelve areas require remediation to estimated depths ranging from 1 to 3 feet below ground surface. Remedial action is currently underway with an estimated 635 cubic yards of contaminated soil to be removed.

Ballfields Site

The remedial design effort has begun for the area north of SLAPS and McDonnell Boulevard that is commonly referred to as the Ballfields Site. Historically, the site was used as agricultural land and then as a baseball field complex. Today, the only remnants of the former baseball fields are a small building and a concrete pad, located in the center of the four fields on the eastern half of the site.

The Ballfields Site is estimated to be the largest contaminated FUSRAP North County site remaining in terms of volume. It is comprised of four contiguous properties totaling approximately 60 acres, of which about 14.4 acres contain contaminated soil. The majority of contaminated soil is located in the southwest portion of the site (near the intersection of Coldwater Creek and McDonnell Boulevard) and is covered by an average of 4.5 feet of clean overburden soil (totaling approximately 43,000 cubic yards). This overburden soil will be moved aside and stockpiled prior to the removal of the underlying contaminated soil.

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If you have any suggestions, questions, or comments, contact our office.

Educational Information**Q: What is Overburden?**

A: The term 'overburden' has a unique context in FUSRAP work. Overburden refers to a layer of material, generally soil, which exists atop deeper, contaminated soil. This material may be backfill from a previous, shallower remediation, or it could have been brought to the site as part of land development by the property owner. The FUSRAP team must first excavate this top layer of material prior to removing and shipping the contaminated material off site. Because bringing clean backfill material is costly, moving the overburden aside and saving it for later reuse as backfill can result in significant cost savings. Before reusing it as backfill, FUSRAP tests the stockpiled overburden to ensure it is free from contamination.

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North St. Louis County Sites

The U.S. Army Corps of Engineers (USACE) completed cleanup of the St. Louis Airport Site (SLAPS) in May of 2007 and immediately moved on to work at other North County locations. At the top of the list are the Hazelwood Interim Storage Site (HISS) and Futura Coatings Company (Futura) on Latty Avenue. In the past year and a half, USACE removed over 80,000 cubic yards of contaminated material from these sites and sent it to an out-of-state licensed, permitted disposal facility.

Short History of HISS/Futura

The original owners used SLAPS as a storage site for uranium ore residues and uranium- and radium-bearing process wastes. The waste and byproducts were generated at the Mallinckrodt plant from 1942 through the late 1950s. In 1966, the Continental Mining and Milling Company (CMMC) purchased and stored the waste at the present HISS/Futura site on Latty Avenue. Before shipping them for reclamation, CMMC processed the waste. As a result of this processing, the HISS/Futura site and several adjacent properties were contaminated and, consequently, required cleanup.

The U.S. Environmental Protection Agency placed the HISS/Futura site on the National Priorities List in 1989. A Record of Decision for this site and all other North St. Louis County Sites was completed in 2005.



Over 80,000 cubic yards of contaminated material have been removed from HISS and Futura since 2007 and shipped out-of-state for disposal at a permitted, licensed facility.

Current HISS/Futura Remediation Activities

The St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP) team is progressing toward cleanup goals at HISS and several adjacent locations. The FUSRAP team removed 5,000 cubic yards of contaminated material from the Futura site in the summer of 2008. It was shipped out-of-state for disposal at a permitted, licensed facility. USACE also removed and decontaminated eight previously identified 4,000-gallon underground storage tanks. The tanks were returned to the property owner. Missouri Department of Natural Resources is currently working with the property owner to safely dispose of the tanks.

Current excavation work continues at HISS, moving from the northern portion of the work site toward the southern portion. Restoration work has included adding 3,200 tons of clean backfill soil to HISS. Cleanup crews excavated the southern portion of the Futura property and backfilled it with 5,000 tons of clean material.

Upcoming Events

Information Releases: [Spring Newsletter - April 2009](#)

Upcoming Meeting (Please come if you are available!):

[St. Louis Oversight Committee Meeting - Date TBD, 11:30 a.m.](#)
at the FUSRAP office on Latty Avenue.

Community Involvement Plan update: [Early 2009](#)

2nd 5-year Review: [ongoing to 2009](#)



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North County Vicinity Properties

Since the Spring 2008 newsletter, USACE has completed the remediation and restoration of several more North County Vicinity Properties:

- Since June 2008, USACE and the owner of the property, the Lambert-St. Louis International Airport have worked together on an area called IA-13. The site became an important location for all existing utility lines. Various utilities worked in cooperation in order to correctly locate and identify utility lines existing on the site. Excavating around utilities requires special care and conditions safe for utility digging. Particularly challenging was the discovery of an unexpected utility line and manhole. After much study, the owner was identified and contacted, and work was able to move forward. After re-locating a portion of the Lambert-St. Louis International Airport fence in order maintain the high security level required for the runway area, excavation work began. The excavation and removal process has thus far been successful, and Phase I is now complete.
- In other areas, Vicinity Properties (VPs) 8 and 9 are located on McDonnell Boulevard, northwest of SLAPS. VPs 8 and 9 are owned by Florissant Valley Sheltered Workshop and Ameren/UE, respectively. The cleanup crew removed about 252 cubic yards of radiologically contaminated soil to ship to an out-of-state licensed, permitted disposal facility.
- USACE completed a Pre-Design Investigation/ Final Status Survey Evaluation on VPs 21, 22, 23, 24, 26, 28, 29, 30, and 31, located on Frost Ave. The final round of sampling and data evaluation determined that no excavation would be necessary at these properties. They were released for unlimited use and unrestricted exposure.

Hurricane Ike Causes Flooding in North County

Heavy rainfall resulting from Hurricane Ike caused significant flooding on September 14, 2008 at the North St. Louis County FUSRAP sites. Ike's aftermath dumped over 4.5 inches of rainfall over a very short time span in the St. Louis area, causing Coldwater Creek to overflow its banks. At the St. Louis Airport Site, flood waters covered the western portion of the site from Entrance 2 to the Creek depositing debris but causing only minimal damage to vegetation.



Flooding from Hurricane Ike caused extensive damage to storage buildings, their contents, and vehicles parked outside the buildings at the east end of HISS.

Because areas upstream from Coldwater Creek are not contaminated, no radiological contamination was deposited at the Airport Site.

At HISS, the flood waters covered the majority of the site and entered the storage buildings on the east end. FUSRAP uses these buildings as temporary office space and for storage. The flooding caused extensive damage to the equipment and files stored inside the buildings. The water receded quickly, but left over one million gallons of water in a large, open excavation at the northern end of HISS. Because contaminated soil had already been removed from the area, no contamination was transferred from the excavation surface to the floodwaters.

St. Louis Downtown Site

USACE has completed several remedial actions at the St. Louis Downtown Site since the Spring 2008 newsletter.

- One area, the Terminal Railroad Soil Spoils Area on the southernmost extent of SLDS, was completed in August 2008. The cleanup crew removed a total of 166 cubic yards of contaminated soil to ship out-of-state for licensed disposal.
- Norfolk Southern Railroad Vicinity property, similarly, had 125 cubic yards of contaminated soil excavated and shipped.
- The cleanup crew completed excavation of 18,570 total cubic yards of soil at PSC Metals, a large scrap metal processor, early in 2008. The property was used throughout 2008 by FUSRAP for temporary

stockpiling material excavated from other SLDS properties. The construction crew completely removed the stockpile and restored the property in October 2008. It has now been returned to the property owner.

Plant 6 West Half, Phase 2

The Corps can now see the 'light at the end of the tunnel' in its program to remove contamination left by our country's early efforts to develop atomic weapons. In the fall of 2007, the FUSRAP team initiated the final phase of cleanup on the western half of Mallinckrodt's Plant 6. The cleanup of Plant 6 West Half represents one of the last remediation efforts to be undertaken by the Corps of Engineers on Mallinckrodt property.

Before remediation could begin, USACE and Mallinckrodt worked together to develop a delineation agreement for the site. This agreement established the respective cleanup responsibilities for both parties. Negotiations were necessary because contamination at the site came from both Manhattan Project activities and unrelated Mallinckrodt commercial activities. This agreement was signed in the summer of 2007.

USACE and Mallinckrodt identified and agreed on separate but closely phased cleanup efforts in order to find the most efficient overall procedure. First, the plant required numerous utility and structural modifications. The major effort involved Mallinckrodt removing a 500,000 gallon, above-ground fuel oil tank. They also relocated utility lines from two buildings on the site and moved a guard shack and its utilities.



The final phase of cleanup on Mallinckrodt's Plant 6 West Half is well underway. Sheet piling forms walls around the excavation.

The team submitted the remedial design and after approval, construction began in November 2007. The first step was to install sheet piling surrounding the excavation areas. Sheet piling allowed the required deep excavation while simultaneously maintaining the integrity of surrounding structures (see photo above). These structures include Destrehan Street, Building 101, and the soil loadout facility.

Soil excavation began in February 2008 at the southwest corner and progressed eastward along Destrehan Street. Before a short break in the excavation in late March, USACE removed and shipped 3,000 cubic yards of contaminated material to a licensed, out-of-state facility. For a short time, a licensed contractor for Mallinckrodt occupied the site and removed a portion of contaminated material under the oversight of the Nuclear Regulatory Commission. USACE then continued its FUSRAP excavation.

The FUSRAP remediation continues at the site today. Currently, USACE is working in the area immediately south of the loadout facility. FUSRAP remediation is expected to continue in this area until late 2009. In 2010, Mallinckrodt will excavate the remainder of its licensed material at the site. USACE will then finish the deep excavation and backfill the site. The final restoration of Plant 6 West Half is expected to take place later in 2010.

To date, USACE has removed 19,000 cubic yards of contaminated soil from Plant 6 West Half and shipped it to an out-of-state, licensed disposal facility.

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Educational Piece

Q: What is a PDI/FSSE?

A: Several FUSRAP properties have had Pre-Design Investigations (PDI) and Final Status Survey Evaluations (FSSE). The USACE conducts a PDI to see if a property contains contamination above cleanup goals. The investigation looks for areas of known or suspected radiological contamination. When it is proved that no more cleanup is necessary at a property, USACE writes a FSSE in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual. The FSSE declares that residual radioactivity does not exceed the limits specified by the Record of Decision. The property is then released to the property owner for use without restriction. If the PDI indicates that contamination is found on a property, no FSSE is written at that time. Instead, a remedial design is prepared to address removal of the contamination.

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St. Louis Airport Site

Closing Ceremony

A formal closing ceremony took place on May 30, 2007 to commemorate the completion of the cleanup at the St. Louis Airport Site (SLAPS). Over 600,000 cubic yards (cy) of radiologically contaminated material was removed from the site over a 9-year period.

Representatives from the U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (MDNR), the St. Louis Oversight Committee, and other concerned citizens attended the ceremony. The main address was given by Brigadier General Robert Crear, Commander, Mississippi Valley Division, USACE. Colonel Lewis Setliff, Commander, St. Louis District, USACE opened the ceremony. Other speakers included Sharon Cotner, the Formerly Utilized Sites Remedial Action Program (FUSRAP) Program Manager, Richard Cavanagh, Chairman of the St. Louis Oversight Committee, and Dan Schuette, Director of the Division of Environmental Quality, MDNR. All agreed that the commitment of the citizens of Missouri, federal, state, and local agencies together achieved this milestone.

The SLAPS is a 21-acre site just north of the St. Louis Airport that was used during the nation's early atomic weapons program for storage of radioactive process residues/by-products and other material from the downtown site. On October 4, 1989, SLAPS was added to the EPA's National Priorities List. The USACE remediated SLAPS between 1998 and 2007.

In October 1997, under the Energy and Water Development Appropriations Act, Congress transferred management of FUSRAP from the U.S. Department of Energy to the USACE.

North St. Louis County Sites

Since spring 2007, the USACE has completed remediation of three different

North County sites. 15,075 cy of contaminated material was removed from the Federal Mogul property (VP-01L) and the 10K530087 parcel. Restoration was completed and the property was released to the property owner. In addition, three cy of contaminated material was removed from the Graham Manufacturing Property (VP-04L) and a total of 5,735 cy of contaminated material was removed from VP 8C. Both properties were restored and released to the property owners. Contaminated materials removed from these sites were shipped to an out-of-state licensed, permitted disposal facility.

Remediation activities continue at the VP-40A East Parcel. So far the USACE has removed and shipped over 14,400 cy of contaminated material to an out-of-state licensed, permitted disposal facility. Though restoration of the IA-12 property continues, excavation of the property was completed with the removal of 8,450 cy of contaminated material.

USACE remediation activities scheduled to begin in 2008 include the IA-13 and VP-2L properties. Work on IA-13 will begin in June. The area to be remediated and restored starts on the south side of Banshee Road and extends to the St. Louis Airport property. VP-2L is a Latty Avenue property adjacent to the Hazelwood Interim Storage Site. Remediation on VP-2L will begin in the fall.



Colonel Lewis Setliff, Commander, St. Louis District, USACE opened the SLAPS Closure Ceremony.

Upcoming Events

Information Releases: [Fall Newsletter - October 2008](#)

Upcoming Meetings (Please come if you are available!):

[St. Louis Oversight Committee Meeting - June 20, 11:30 a.m.](#)
at the FUSRAP office on Latty Avenue.

Community Involvement Plan update: [Early 2009](#)

2nd 5-year Review: [ongoing to 2009](#)



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In December 2007, river levels were low enough for USACE to collect samples from the dry riverbed.

St. Louis Downtown Site

River Sampling

The USACE St. Louis District has developed a plan to investigate a portion of the Mississippi River to determine if elevated levels of radiological activity exist from nearby historical Manhattan Engineer District/Atomic Energy Commission (MED/AEC) operations. From the 1940's through the 1950's, the MED/AEC conducted uranium processing operations at the nearby Mallinckrodt Chemical Works. During the years that MED/AEC operations were being conducted at Mallinckrodt, and prior to sewage treatment upgrades, plant sewer effluent containing some residual radioactivity was discharged directly to the River.

Some elevated activity was detected in riverbed sediment samples collected in an area slightly downstream of the sewer outfall during an investigation in the 1990's, but these results could not be duplicated in a subsequent investigation of the riverbed. To address this issue, the Record of Decision (ROD) for the St. Louis Downtown Site (SLDS) stipulated that the area of the riverbed where radiological contamination was detected would be revisited and characterized. The recent USACE plan describes the sampling to fulfill the ROD requirement.

In December 2007, river levels were low enough for samples to be collected from the dry riverbed using hand equipment. Based on the findings of the riverbed samples, the USACE will determine if any further actions are needed.

Inaccessible Soils

In the spring of 2007, the USACE began investigative activities ultimately leading to an Inaccessible Areas (IA) ROD for SLDS. The 1998 ROD addresses MED/AEC contamination in accessible soils at the SLDS. The future IA ROD will address inaccessible MED/AEC contaminated soils under buildings, structures, roads, and active rail

lines. While the IA ROD is in development, the USACE will continue remediation of MED/AEC contaminated soils in accessible areas at the SLDS in agreement with the present ROD.

A Remedial Investigation (RI) and Feasibility Study (FS) will be conducted to characterize the MED/AEC contaminated inaccessible soils at the SLDS. The RI/FS will assess the risk for the public and the environment and develop and evaluate the remedial alternatives and costs.

After completion of the RI/FS, a proposed plan (PP) will be prepared. The PP will inform the public of all the alternatives considered to remediate the site including the preferred remedy. The PP will be made available for public inspection in the administrative record file. A 30-day public comment period will be held.

After the public comment period ends, a remedy will be selected and documented in the Record of Decision. The selected remedy will be based on the PP, comments received from the public, the regulators, and the lead agency.

Mallinckrodt and Vicinity Properties Cleanup Moves Forward

Work at the SLDS Mallinckrodt Plant and VPs continues to progress smoothly, with only a few areas remaining to be remediated. Recently completed Mallinckrodt areas include Plant 7 North and South where USACE removed 23,000 cy of contaminated material, Plant 9 Security Gate area where 22 cy of contaminated material were removed, and the Soil Storage and Load-Out facility in Plant 6 West Half (6WH) where 8,000 cy of contaminated material were removed. The Plant 6WH load-out area was completed and operational in January 2007. Recently completed VPs include Thomas and Proetz where 1,995 cy of contaminated material were removed, Christiana Court where 47 cy of contaminated material were removed, Norfolk Southern Railway property



Excavation activities at Gunther Salt North and South resulted in the removal of 2,826 cy of contaminated material to an out-of-state licensed/permitted disposal facility.

where 243 cy of contaminated material were removed, and Gunter Salt North and South where 2,826 cy of contaminated material were removed. Contaminated materials removed from these remediated properties were shipped to an out-of-state licensed, permitted disposal facility.

5-Year Review

The second 5-year Review for the St. Louis FUSRAP sites will be completed in 2009. CERCLA requires a 5-year Review on remedial actions when “hazardous substances, pollutants, or contaminants will remain on site above levels that allow for unlimited use and unrestricted exposures.” MED/AEC contamination still exists at the SLDS and North County sites. The USACE is currently in the process of remediating these areas.

The 5-year Review activities consist of: a document review to ensure all requirements of the selected remedy have been implemented; data review and analysis; site inspections; and interviews from the state, appropriate representatives of the community, local officials, potential responsible parties, property owners, and the public. The final component of the Review is an overall evaluation to determine whether the selected remedy continues to protect the health and safety of the public and the environment. The results of the community interviews will assist in judging whether the strategies and activities of the selected remedy remain responsive to the needs of the FUSRAP stakeholders. These steps will culminate in a 5-year Report that will be available to the regulators and the stakeholders for review and comment before the 5-year Review is finalized.

St. Louis FUSRAP Sites FY2008 Budget

The USACE received funding for the St. Louis FUSRAP sites in February 2008. \$39,500,000 was allotted for the St. Louis FUSRAP sites FY 2008 budget. This money will be used to continue the cleanup at the St. Louis FUSRAP sites.

The USACE is the lead agency that will be conducting the 5-year Review with support from the EPA, the state, and the community. Activities for the 5-Year Review will begin in spring, 2008 with the community interviews. If you are interested in participating in the Review via an interview, please contact Roy Parks at the USACE, 314-260-3923.

Community Involvement Plan

The Community Relations Plan (CRP) has a new name. It is now the “Community Involvement Plan for the St. Louis FUSRAP Sites (CIP).” Along with the new name, the CIP is in the process of being revised and updated. There have been many changes at the St. Louis FUSRAP sites since the last CRP update in 2003.

The first 5-Year Review was completed in 2004, the North County ROD was completed and signed in 2005, SLAPS and other properties were remediated and released back to the property owner at the North County sites and SLDS, and work has started on the second 5-Year Review. All of these changes will be reflected in the revised CIP. Community interviews will be conducted by the USACE in June 2008. After the community interviews, the interview results and comments and revisions from EPA and the regulators will be incorporated into the CIP. CIPs will be sent to EPA, the regulators, and the administrative record file for public review. Copies will be kept at the USACE FUSRAP trailers.

New St. Louis FUSRAP Sites Project Managers

Two new project managers (PM) for the St. Louis FUSRAP sites have been added to the FUSRAP team. Roy Parks is the new PM for the SLDS site. Roy brings seven years of St. Louis FUSRAP experience to the project, having previously been technical manager for contracts providing characterization and verification support. He also worked in the environmental area for 13 years at USACE's Europe District. Roy may be reached at (314) 260-3923 or by e-mail at roy.e.parks@usace.army.mil.

Jo Anne Wade is the new PM for the North St. Louis County sites. Jo Anne has eight years of experience overseeing the St. Louis FUSRAP Sites working for the State of Missouri and over 15 years experience as an Environmental Chemist. Jo Anne can be reached at (314) 260-3932 or by e-mail at josephine.a.wade@usace.army.mil.

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What is Thorium?

Q: What is Thorium?

A: Thorium is a soft, silvery white metal that is a naturally occurring radioactive metal found at very low levels in soil, rock, and water. It has several different isotopes, both natural and man-made, all of which are radioactive. Thorium was discovered in 1828 by the Swedish chemist Jons Jakob Berzelius who named it after the Norse god of thunder and weather, Thor.

Thorium is useful in lantern mantles because when heated, thorium oxide glows bright white. However, alternatives are replacing the use of thorium in lantern mantles. Thorium also has coloring properties that has made it useful in ceramic glazes. It is also used in welding rods and is an alloying agent in certain metals used in the aerospace industry. Scientists today are researching thorium as the next fuel material for nuclear reactors.

Small quantities of thorium are in virtually all rock, soil, water, plants, and animals. People will always be exposed to tiny amounts of thorium through air, food, and water because it is found nearly everywhere on earth. Thorium is excreted from the body within a few days of exposure.

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St. Louis Airport Site

Closing the Chapter

Excavation at the St. Louis Airport Site (SLAPS) was completed in mid-December 2006. Following confirmation sampling during the early part of January 2007, the U.S. Army Corps of Engineers (USACE) released the final portion of the site for unrestricted use. This milestone marks a 9-year effort in which over 600,000 cubic yards of radiologically contaminated material were removed.

This important milestone closes one chapter of the continuing work in the St. Louis area under the Formerly Utilized Sites Remedial Action Program (FUSRAP) to excavate contamination generated during the nation's early atomic weapons program. To commemorate the completion of one of the nation's Superfund Sites, USACE will hold a site closeout ceremony at SLAPS building complex on May 30, 2007 at 10:00 A.M.

SLAPS Loadout Pad Remains

The SLAPS railcar loading facility, or "Loadout Pad," will remain to support the transportation of soils from other contaminated properties in North County.



Loadout sign warns of danger during rail load operations.



Final yards of contaminated soil at SLAPS are excavated.

Currently, USACE project managers have the option of loading railcars from the rail facility at SLAPS or the Hazelwood Interim Storage Site (HISS) on Latty Avenue. The decision on which facility is used is based on minimizing the distance contaminated soils must travel on public roads as well as other safety and economic considerations.

The SLAPS loadout pad sits on previously remediated soil and is paved with 8 in. of sloped and curbed asphalt designed to collect any runoff generated from the contaminated soil while it awaits loadout into a rail car. There is an automatic pump and piping able to move water into storage basins capable of accommodating up to 1.5 million gallons of water, if necessary.

The SLAPS loadout facility will be removed when it is no longer needed to support North County remedial activities. Once removed, the area underneath will undergo verification to confirm that the area still meets remediation goals.

Upcoming Events

Upcoming Meetings (Please come if you are available!):

St. Louis Oversight Committee Meeting - April 13, 11:30 a.m.
at the FUSRAP office on Latty Avenue.

SLAPS Closeout Ceremony - May 30, 10:00 a.m. at SLAPS

Latty Avenue Start-up

FUSRAP Breaks New Ground

Upon completion of remedial activity at SLAPS, crews and equipment transitioned to the next remediation area: the 9100 block of Latty Avenue, in Berkeley, MO.



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Laborers cut and remove fencing to allow equipment access to contaminated soil.

The first location to undergo remediation is the VP-02(L) property located on the north side of Latty Avenue. To initiate work on this property, the USACE removed the railroad tracks and fencing that blocked the remediation, located and marked buried utilities, and coordinated with the property owner to ensure uninterrupted operations.

On January 23, 2007, all initial preparations were complete and excavation of contaminated soil began along the southern side of VP-02(L). Trucks continue to transport the contaminated material the short distance from the work site to the railcar loading facility at HISS. To date, remedial activities have been occurring as planned at several locations throughout the property.

Due to the shallow nature of the contamination on the Latty Avenue property, work is expected to continue for just three to four months. Once complete, the USACE plans to continue to remediate westward towards Coldwater Creek.

Remediation Of Mallinckrodt Plants 7 North & 7 South

Mallinckrodt Plants 7N and 7S encompass an area of about 4 acres located north of downtown St. Louis, south of Destrehan Street between Hall and Wharf

Streets. The current location of Plants 7N/7S was once occupied by several buildings that were used for green salt production, thorium extraction processes, and support for the Manhattan Engineer District /Atomic Energy Commission (MED/AEC) uranium metal production activities until 1958. Several areas of residual subsurface radiological contamination from these MED/AEC processing operations were further identified and evaluated by pre-design investigations at this location.

In February 2005, remediation of the Plant 7N/7S area was initiated. This remediation included the excavation and disposal of about 23,000 cubic yards of contaminated soil. These contaminated soils were safely transported by rail to an approved out-of-state disposal facility. The Plant 7N/7S area was subdivided into smaller excavation areas, and construction was staged to minimize impacts on traffic patterns in the operating chemical plant. During the various excavations, several abandoned and active underground utilities were encountered, most notably the removal and replacement of about 400 ft of a 30 in. diameter combined sanitary/storm water sewer serving this portion of Mallinckrodt's plant. A temporary sewer bypass pumping and piping system was required to accommodate flows while this portion of the sewer was out of service. The sewer work also required that sheet pile shoring be installed along the south curb line of Destrehan Street to facilitate the 15 ft deep excavation without impacting the adjacent street.



Sheet pile retaining wall preserves Destrehan Street stability during Plant 7N/7S remediation.



Applying sealant to the Plant 6 rail spur.

The remediation work included backfilling and restoration of surfaces to pre-construction conditions. Much of the area was restored with a gravel surface, but a significant amount of concrete pavement was required between a trailer staging area in Plant 7S and the driveway to Destrehan Street. A concrete fire training pad, removed for the excavation was also replaced. Most of the remediated area was backfilled by late 2006. The Plant 7N/7S remediation also included decontamination of two abandoned foundation pads. Mallinckrodt will use these foundation pads for the relocation of their current Hazardous Materials Waste Handling Building to allow FUSRAP remediation in an adjacent plant area.

A New Loadout Facility For SLDS

The Plant 6 storage and loadout facility became operational in January 2007, upon completion of paving the rail spur area and construction of a water runoff management system. Completion of this facility will increase the USACE's loadout capability and provide greater efficiency throughout the remainder of the project. The Plant 6 loadout facility is located in Mallinckrodt's Plant 6 near the intersection of Hall and Destrehan Streets and will replace the current loadout facility.

Prior to construction of the new facility, the original rail spur was removed and the soil underneath remediated as part of the Plant 6 task. USACE then built a new rail spur on the newly remediated area. This new facility consists of an asphalt pad for soil storage and rail car loading, two water collection sumps, and a water storage basin for water management and containment. The collected water will be filtered to remove suspended solids and then sampled to ensure water meets discharge criteria for release to the Metropolitan Sewer District sewer system.

The current Plant 6 loadout facility is co-located on Mallinckrodt's Plant 6 and the PSC Metals property (DT-8). Moving the soil storage and loadout operation to a new location will allow contaminated

soil underlying the loadout facility to be excavated for disposal. USACE estimates that approximately 8,000 cubic yards of contaminated material lie under the current rail loadout facility and along the property line between PSC Metals and Mallinckrodt.

The new rail spur is approximately 250 ft long and will allow four railcars at a time to be staged and loaded with contaminated material. The spur is also located just off a main track line which will allow daily railcar service to the new facility, if needed. This will give work crews the capability of shipping up to four railcars per day or approximately 12 to 16 railcars per week.

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Cross-Contamination

Q: What is “cross-contamination”?

A: In the context of FUSRAP, cross-contamination occurs when contaminated material gets disturbed and relocated to a previously uncontaminated area. Instances where this could happen are during sampling, excavation, or transport. Throughout these processes, USACE utilizes administrative controls and engineered work practices to avoid cross-contamination and minimize risks to the community, the workers, and the environment.

*All contaminated material
is secured and covered
during transport to avoid
cross-contamination.*



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North County

Long-Term Stewardship (LTS) Meeting

While much remains to be done at the St. Louis FUSRAP sites, citizens can look forward to a day when cleanup work is completed and the land is released for unrestricted use, with the exception of inaccessible areas.

The selected remedy for the North St. Louis County FUSRAP sites calls for removing contaminated soils to meet unlimited use and unrestricted exposure standards with a limited number of specific exceptions. These exceptions include areas where the soils are not easily accessed and do not present an immediate health risk under their current land use. More specifically, contaminated soils may remain if they are located under permanent structures such as roads, active rail lines, and buildings.

U.S. Army Corps of Engineers (USACE) is developing a Long Term Stewardship (LTS) plan to ensure land use does not change and site conditions remain protective over the long term using Institutional Controls (ICs) such as zoning restrictions and deed notices. The USACE is responsible for implementing this plan for two years after site completion. At that time, these responsibilities will transfer to the Department of Energy (DOE) under an agreement between the USACE and DOE.



A Long-Term Stewardship plan will ensure the long-term protectiveness of the remedy for soils located under permanent structures such as roads.

The St. Louis FUSRAP Oversight Committee met with representatives from the DOE's Office of Legacy Management at a special meeting on May 11th.

The Committee discussed several long-term stewardship issues including:

- DOE's role in long term stewardship
- Site transition from USACE to DOE management
- DOE process for funding long-term stewardship activities
- Public involvement opportunities in the long-term stewardship process

Oversight Committee Co-Chairman, Ric Cavanagh, stated, "This meeting was a unique opportunity for us to learn firsthand about DOE's operations in long-term stewardship. It also gave us a chance to voice concerns

Upcoming Events

Information Releases:

- Summer Newsletter – August 2006

Upcoming Meetings (Please come if you are available!):

St. Louis Oversight Committee Meetings at the FUSRAP Project Office located at 8945 Latty Avenue in Berkeley, Missouri. Meetings will begin at 11:30 a.m. on July 14th and September 8th.



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about how DOE will perform these tasks in St. Louis once the clean up of radioactive waste at the sites is completed.”

Meeting attendees included representatives of the USACE, Missouri Department of Natural Resources (MDNR), St. Louis County Government, and the Cities of Berkeley and Hazelwood.

The details of the LTS plan will be closely coordinated with other federal, state, and local government agencies as well as land owners. USACE is scheduled to submit a draft IC design and implementation plan to the U.S. Environmental Protection Agency (EPA) and MDNR for review in January 2007 under the Record of Decision for the St. Louis North County Sites.

Much hard work has been accomplished. As the FUSRAP mission approaches the finish line, USACE remains committed to a careful balance between contamination removal and minimizing project impacts on peoples’ lives (and livelihoods). In all matters pertaining to this balance, the final decision has always been in favor of public safety and security. We fully expect that this will continue to be the choice throughout cleanup and long-term stewardship of these sites.

St. Louis Airport Site

Signal Replacement Supported

As excavation of large open areas of the St. Louis Airport Site (SLAPS) continues, USACE is also working to address small, difficult-to-access areas of contaminated soil. One such area is located at the corner of McDonnell Boulevard and Norfolk Southern Rail Line near the eastern tip of SLAPS.

Norfolk Southern informed USACE that it planned to replace the current railroad crossing signal. The railroad’s plan to replace this signal made soils in an otherwise inaccessible area of SLAPS accessible for cleanup. While most of the contaminated soil in this area had already been removed, contamination remained beneath the existing signal. USACE left this soil behind to minimize potential traffic and safety problems on heavily-traveled McDonnell Boulevard.



USACE closely coordinated its field activities with local agencies and utilities to support Norfolk Southern Rail Line’s crossing signal replacement project.

In order to address the signal area and support the railroad, USACE closely coordinated field activities with local agencies and utilities. St. Louis County Highway and Traffic Division supported excavation activities immediately adjacent to McDonnell Boulevard. Missouri American Water Company supported the location of an existing water line. In addition, crews worked closely with Norfolk Southern to ensure the existing crossing signal was not damaged and to locate communication lines critical to operation of the crossing signal when a train was in the area.

Approximately 390 cubic yards of contaminated soils were removed. Cleanup activities included saw-cutting and removing 80 linear feet of McDonnell Boulevard’s shoulder, placing traffic barriers along the affected area of McDonnell Boulevard, removing contaminated soils, and backfilling with clean soil. With cleanup and backfill complete, Norfolk Southern has scheduled the new signal for installation in June 2006.

Cleanup Approaches Completion

Cleanup of contaminated areas at SLAPS continues at a steady pace. However, funding constraints have forced USACE to make difficult choices. USACE had to choose between shutting down the site mid-season

or continuing excavation activities and limiting the shipment of contaminated soil to out-of-state facilities.

Continuing business as usual (excavating and shipping contaminated soils to out-of-state facilities for disposal) would mean shutting down the site in the middle of the construction season this summer. Under this scenario, the contractor would “demobilize” from the site. Highly trained and experienced field crews would be laid off until USACE received funding for the next government fiscal year in October. Construction equipment would either be cleaned and sent off-site or remain idle. Although no equipment would be working, USACE would take measures to prevent contaminated sediments from moving off-site.

Conversely, continuing excavation activities and limiting off-site shipments would allow the USACE to keep the contractor working onsite. Field crews could work straight through to project completion. The shipment of excavated soils would be temporarily delayed until the next government fiscal year when funding is received. These soils would instead be temporarily stockpiled onsite.

Not willing to lose the expertise of its contractor or incur additional expenses to re-mobilize equipment the following fiscal year, the USACE chose to focus on completing excavation of contaminated areas and position the site for completion in 2007.

The contractor will stockpile the soil beside the railcar loading area. At its maximum volume, the stockpile will be approximately 12 feet tall and will cover approximately 1 acre. Storm water run-off from the contaminated stockpile will be collected, treated, and tested before release.

To control potential public and environmental exposure to fugitive dust and to minimize erosion of the stockpile, a soil stabilizer will be applied to the surface of stockpiled soil. The soil stabilizer is a polymer-based solution that becomes completely transparent after drying. The stabilizer creates a temporary surface “crust” that is impermeable by water. It will have no adverse impact on the environment.

This approach allows for the maximum amount of contaminated soil to be removed, given current



To position the site for completion in 2007, SLAPS contaminated soils will be stockpiled onsite beside the railcar loading area.

funding levels. Groundwater, surface water, and atmospheric contact with contaminated soil is minimized, soil is positioned for immediate shipment as funds become available, and the expense associated with the demobilization and/or idling of construction equipment is eliminated. All things considered, stockpiling at SLAPS is beneficial to USACE, the contractor, and the taxpayer.

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Institutional Controls (IC)

A Critical Component of Long-Term Stewardship (LTS)

Q: Question: When all is said and done and the excavation equipment is gone, is that the end of FUSRAP in North County?

A: Answer: In short, no. Contaminated soils under permanent structures at the North County FUSRAP sites such as active roads, rail lines, and the Futura Coatings buildings have been deemed inaccessible. Due to the high cost associated with replacing these structures and potential worker safety issues, these soils will be left undisturbed. A Long-Term Stewardship (LTS) plan will be developed to ensure the long-term protectiveness of the remedy.

Critical to all LTS plans are Institutional Controls (ICs). ICs are administrative and legal controls that are used when residual contamination remains onsite at a level that does not allow for unrestricted land use. Some common examples of ICs are:

- easements
- zoning restrictions
- well-drilling prohibitions
- deed restrictions
- state or local ordinances

Implementing ICs should prevent inaccessible contaminated areas from being developed and used for residential housing, elementary and secondary schools, child care facilities, and playgrounds. While ICs may sound imposing, they only affect areas that are already inaccessible to the general public. USACE is cleaning areas accessible to the general public to a degree that will allow unrestricted use.

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North St. Louis County Sites

Record of Decision Signed

The St. Louis District U.S. Army Corps of Engineers (USACE) is pleased to announce the signature and release of the final Record of Decision (ROD) for the North St. Louis County Sites. Subsequently, all are invited to an open house on November 10th to view this document and ask questions. (See "Upcoming Events")

The North St. Louis County 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 which include Coldwater Creek.

The ROD outlines the final remedy selected to address contamination at the North St. Louis County sites. In response to the potential risk of exposure to site contaminants, the USACE will implement Alternative 5, Excavation with Institutional Controls for Soils under Roads, Rail lines, and Other Permanent Structures, to protect human health and the environment.

One part of the remedy includes the removal of contamination in accessible soils, sediment, and on various structures to concentrations that will allow for unrestricted land use. Inaccessible contaminated soil under buildings, roadways, or active rail lines will remain. The second part of the remedy, which includes long-term stewardship, institutional controls, and monitoring, will address the inaccessible soils left in place.

The USACE worked with the U.S. Environmental Protection Agency and Missouri Department of Natural Resources to develop the ROD. The final remedy was selected based on comments received from the public and regulatory agencies on the North County Feasibility Study and Proposed Plan (FS/PP). Responses to comments submitted on the FS/PP are included in the Responsiveness Summary. The Responsiveness Summary is an appendix to the ROD.

Contamination at the sites is the result of Manhattan Engineer District/Atomic Energy Commission activities that supported our nation's early atomic program. The



The remedy for the North St. Louis County Sites calls for excavation with institutional controls for soils under roads, rail lines, and other permanent structures to protect human health and the environment.

North St. Louis County sites were contaminated through the storage, handling, and transportation of radiological residues and uranium production by-products from 1946 through 1973. Residual contamination left behind, and corresponding risk to the long-term occupants, resulted in SLAPS, HISS and the Futura Property being added to the National Priority List in 1989.

Individuals interested in viewing a copy of the complete ROD may view the document on-line at www.mvs.usace.army.mil or visit the FUSRAP Project Office to view the document in the Administrative Record for the North St. Louis County Sites.

Upcoming Events

Information Releases:

• Winter Newsletter – January 2006

Upcoming Meetings (Please come if you are available!):

St. Louis Oversight Committee Meetings at the FUSRAP Project Office located at 8945 Latty Avenue Berkeley, Missouri at 11:30 a.m. on December 9th, and January 13th, and February 10th

Open House regarding the North St. Louis County Sites ROD at the FUSRAP Project Office located at 8945 Latty Avenue in Berkeley, Missouri from 3:00 - 6:30 p.m. on November 10th.



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St. Louis Airport Site

Cleanup Approaches Completion

The final phase of cleanup at the St. Louis Airport Site (SLAPS) is underway. This phase of work, called Phase 6, requires the removal of contaminated soils beneath the rail load out facility. USACE uses the facility to carefully load contaminated soils into lined rail cars for off-site disposal.

This summer, crews installed a 2,200 foot sheet-pile wall to support the cleanup of the southern border of the site. The wall forms a boundary between the SLAPS and Norfolk Southern Corporation rail line. The wall will minimize disruption to Norfolk operations by maintaining the stability of the main line as the adjacent contamination is removed.

As work progressed from west to east, crews relocated the SLAPS rail load out facility to facilitate completion of the final phase of cleanup at the site. The load out facility has been moved to the northeastern portion of the site where cleanup has already occurred. This new facility includes a 1-acre paved load out pad to prevent recontamination of the site and a detention basin for collecting storm water runoff. USACE anticipates using the new load out facility to complete the cleanup of SLAPS and nearby SLAPS vicinity properties.

Completion of the Phase 6 area is expected to require the removal of 85,000 cubic yards of material in fiscal year 2006. USACE anticipates completing the cleanup of the site in August 2006.



An estimated 950 cubic yards of contaminated material was removed from the Ballfields in September.



Crews relocated the SLAPS rail load out facility to facilitate completion of the final phase of cleanup at the site.

SLAPS Vicinity Properties

Ballfields “Hotspot” Removed

Additional work to stabilize the SLAPS area and minimize the migration of contaminated soils to Coldwater Creek was completed in September. Crews removed a small area of contamination, known as the Ballfields “Hotspot.” The (former) Ballfields are located north of SLAPS and are bordered by Coldwater Creek. The “Hotspot,” which was found along the bank of the creek, covered approximately 1/3 acre.

Approximately 950 cubic yards of contaminated materials were shipped off-site for disposal. Prior to excavation, crews removed trees and underbrush to prepare the area for the excavation of the contaminated soil. Open excavations were covered with plastic sheeting and surrounded by an earthen berm to prevent the spread of contaminated soils off-site from runoff during storms.

USACE removed the soils in accordance with the 1998 SLAPS Engineering Evaluation/Cost Analysis (EE/CA) document. Although the Ballfields are considered a SLAPS Vicinity Property, the cleanup of the “Hotspot” was included in the scope of the EE/CA as part of the USACE’s effort to protect the creek from further off-site migration of contaminants.

Hazelwood Interim Storage Site

GIFREHC Improvement Supported

During the summer, support was provided to a Latty Avenue property owner, GIFREHC. USACE support of the owner’s property drainage plans resulted in the removal of an estimated 800 cy for offsite for disposal.

St. Louis Downtown Site

Remediation Progresses

Crews made strong progress at the St. Louis Downtown Site (SLDS) during fiscal year 2005. USACE successfully completed plans for remediation of the Mallinckrodt Plant 7 South, Thomas & Proetz Lumber Company, and Midtown Garage. USACE also initiated plans to cleanup Plant 7 North and relocate the rail load out facility in Plant 6 West. These cleanup efforts resulted in the off-site disposal of 11,134 cubic yards from the site.

USACE also made significant progress toward clearing numerous other properties for release without restriction. Soil samples were collected from twelve properties west of Broadway, located between Bremen Street on the north and Dock Street on the south. None of these samples exceeded remedial goals identified in the SLDS ROD. Since no contamination was found, letters will be issued to the property owners documenting the investigation and subsequent release of the property for future development without restriction.

Similarly, USACE completed the analysis of data on properties where excavation was required. Reports for the release of Mallinckrodt Plant 10, the City of Venice, Heintz Steel, Midwest Waste, and Midtown Garage were recently issued. These properties have been released without radiological restrictions.

New Colonel Takes Command

A new leader assumed control of the USACE, St. Louis District on June 30, 2005 during the time-honored Change of Command Ceremony. Col. Lewis F. Setliff III became



Colonel Lewis "Skip" F. Setliff III

the 48th District Engineer of the USACE St. Louis District. He replaced Col. C. Kevin Williams, who retired after a 26-year career with the U.S. Army.

Col. Setliff comes to his new assignment from previous duty as the deputy to the Deputy Chief of Staff - Engineer for the Multinational



Cleanup activities at SLDS this fiscal year resulted in the removal and off-site disposal of 11,134 cubic yards of contaminated material from the site.

Forces-Iraq in Baghdad. He has held a variety of command and staff positions to include Brigade Operations Officer and Executive Officer in the 1st Engineer Brigade at Fort Leonard Wood, Missouri, and Battalion Commander of the 14th Combat Engineer Battalion at Fort Lewis, Washington. Col. Setliff is a 1982 graduate of the U.S. Military Academy at West Point.

Currently, Col. Setliff is heading a special team of USACE personnel from the St. Louis and New Orleans Districts for the Hurricane Katrina recovery effort. He is scheduled to return to St. Louis in November.

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You're Invited!**Open House Scheduled**

You're invited to attend an Open House regarding the North St. Louis County Sites ROD on Thursday, November 10, 2005 from 3:00 - 6:30 p.m. at the FUSRAP Project Office, 8945 Latty Avenue in Berkeley, Missouri.

Copies of the North St. Louis County Sites ROD and handouts summarizing key components of the remedy will be available for interested parties.

Interested citizens may examine copies of the recently signed ROD and discuss specific details of the remedy with team members. USACE representatives will be available to answer questions regarding the ROD and/or the design to implement the remedy.

The FUSRAP Project Office is located in the Berkeley Industrial Park, just west of I-170. Contact Ms. Jacqueline Mattingly, FUSRAP Project Manager, at (314) 260-3924 for more information or for specific directions to the Open House.

ROD Issued

The Record of Decision for the North County Sites has been issued. To view this or other St. Louis FUSRAP documents, feel free to visit either of our Administrative Record locations.

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What Safety Precautions does USACE Follow Before Shipping Waste Off-site?

The local media recently aired coverage of nuclear waste shipments by rail line through the St. Louis area from eastern power plants. The levels of radioactivity in soils shipped from the St. Louis FUSRAP Sites are not nearly as toxic as these shipments. But what safety precautions does U.S. Army Corps of Engineers (USACE) follow in its shipping process?

Cleanup of the St. Louis FUSRAP sites requires disposal of contaminated materials at an approved, out-of-state, disposal facility. In accomplishing this mission, USACE abides by the regulations of the U.S. Department of Transportation (DOT) that govern the packaging, communication, and transportation of excavated materials.

Appropriate packaging of the material is vital to safe transportation. Railcars are lined with heavy plastic liners that are then folded and tied in such a fashion as to form a tight, secure package impervious to weather. Once the liner is properly closed, the material cannot escape. Crews survey every liner and railcar prior to transport off-site to assure surfaces are free of contamination. The exterior surface of the liner is waterproof. No water can get into or out of the liner. This ensures that any precipitation encountered during transportation can safely drain away through holes in the railcar floor.



Placards, or signs, posted on the railcar help communicate the contents held by the railcar.

All of the required labels and/or placards for these hazards are applied to each railcar along with a destination sticker. A manifest and bill of lading for each railcar is also completed and given to the railroad company along with emergency response information. Prior to release, each



USACE follows U.S. Department of Transportation regulations to package and transport contaminated materials from the FUSRAP sites.

Each railcar is inspected by quality control personnel to ensure the proper closure and integrity of the liner, and that the proper information has been placed on the railcar.

USACE is committed to the safe shipment and disposal of FUSRAP material. USACE maintains open communication with the surrounding community, including local emergency responders. No railcars are allowed to leave the site until USACE certifies that all of the paperwork has been completed and the material is ready to ship.

Each railcar's progress from the site to the disposal facility is tracked. To ensure that all the material shipped arrives safely at its destination, the disposal facility provides receipt notification to the USACE. Since 1998, USACE has safely shipped over 7,000 railcars to disposal facilities.

Upcoming Events

Information Releases:

• Spring Newsletter – June 2005

Upcoming Meetings (Please come if you are available!):

St. Louis Oversight Committee Meetings at the FUSRAP Project Office located at 8945 Latty Avenue Berkeley, Missouri at 11:30 a.m. on April 8th, May 13th, and June 10th.



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Cleanup: A Property Owner's Perspective

In 1896, Mr. Thomas' ancestors founded the Thomas & Proetz Lumber Company on a tract of land in northern St. Louis City. The location proved to be a business incubator for the fledgling lumber company.

Riverfront lumber companies supported the explosive development of the city, providing lumber to meet the growing demand for materials to build homes, businesses and even some of St. Louis' majestic mansions. Piles of wood, 10- to 15-feet high, were stacked as far as the eye could see. From the Mississippi riverfront, workers pulled logs brought downriver from vast northern forests directly to St. Louis sawmills. The raw timber was quickly converted into finished lumber and sold.

But as shrewd as they were in selecting this location and setting up business, how could Thomas & Proetz have known that decades later -- half way through the 20th century -- the U.S. would be involved in a global war culminating in a headlong rush to become the first nuclear power under the Manhattan Project? And how could they have foreseen the resulting radioactive contamination of their property?

Although the lumber company was not on the property where the actual work took place, radioactive contamination spread from Mallinckrodt Chemical Works to the adjacent property, through no fault of the lumber company.

So what was the lumber company's reaction? Frankly, when USACE first sat down with them, they were less



USACE worked closely with the lumber company to minimize disruptions to daily business operations.



The Thomas & Proetz office building was constructed in 1903. This photo from Angelrodt Street was taken in 1910.

than enthusiastic about granting access to the government to cleanup his property. Neither Mr. Thomas nor his employees had presented any illnesses to make him concerned. Most died of old age. From what he, his family and his workers had experienced, he didn't understand what all the fuss was about. He couldn't think of one suspicious illness related to the radiological contamination.

And human health wasn't their only concern. What about the health of the business? The lumber yard was a "just in time" business, producing what the customer requested as they requested it. Taking a "few days" off for a government cleanup could risk the business and employees' job security. Even if USACE could cleanup the property in two weeks, they couldn't afford the risk. The lumberyard might not have any customers left when the government finished and the employees could be out of their jobs.

As with most FUSRAP areas, the levels of radioactivity on his property did not pose an immediate health risk. No one lived on this property and it certainly was not used for recreational purposes. The potential risks were long-term, related to future property inhabitants more likely to live or play on the property.

But even if Mr. Thomas was willing to accept the contamination on his property, future buyers might not and he could encounter difficulty getting full market value his property. In today's business world, few banks would support purchase of a contaminated property and few businesses would accept such risks themselves. Impacting the value of the property also impacted the value of the business.



USACE started cleanup of the Thomas & Proetz property in November 2004 working in one small area at a time.

Finally, Mr. Thomas asked, “Would the government give his property a ‘clean bill of health’?” That could be a problem. If the contamination were inaccessible (i.e. - under permanent structures, such as his buildings), USACE could not remove it. Two potential areas of inaccessible contamination existed. One was under the rail spur where he received and shipped product. The other was under the planer building, where he transformed raw lumber into finished materials. Any disruption to the operation of either of these structures could literally put him out of business.

USACE had a plan ready for just this type of problem. We’d learned many lessons in the course of our work and had time to refine work plans. USACE proposed a plan to investigate both areas with Mr. Thomas’ permission. Then, we could regroup and find a win-win solution for both Mr. Thomas and USACE.

We arrived at an agreement last year. Together, we were able to identify the risks for each party and develop an approach agreeable to both parties for the cleanup of the property. USACE started the cleanup in November 2004, removing and restoring one section at a time, careful to minimize disruption to ongoing business operations. In February 2005, USACE “returned” the property free of contamination.

The success of this cleanup is a story of “adaptive management,” or stepping back and examining progress periodically and adapting future work to take into consideration new or changing facts as presented by each project stakeholder. The USACE adapted plans to

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accommodate the lumberyard’s requirements to permit property access for the proposed cleanup. Mr. Thomas also adapted. He adapted to a future that neither he nor his ancestors who founded the lumber company could have possibly foreseen.

In so doing, two great organizations have moved ahead. The USACE is taking another step toward completing its mission and Mr. Thomas, his family, and employees continue to enjoy a bright future in their chosen lives. It’s called a “win-win” solution... and now you know the rest of the story.



By working with the lumber company, USACE was able to successfully complete the cleanup of the property in February 2005.

St. Louis Airport Site Enters Final Phase

Unusually heavy rainfall earlier this year delayed work at the St. Louis Airport Site (SLAPS) where crews are preparing for the final phase of cleanup.

Crews are installing sheet pile along the Norfolk Southern Corporation rail line, which in part forms the southern border of SLAPS. Sheet piling is being installed to maintain the stability of the rail line during the excavation of the final phase of SLAPS – Phase 6.

USACE has been working closely with the railroad. The sheet piles are being driven from a rail-mounted crane that operates from their track siding. This, in turn, minimizes disruption to main line operations.

The sheet piling installation will continue throughout the upcoming summer. Excavation of contaminated material will follow this installation in a “stair-step” manner. Removal will generally proceed from the west end of the site by Coldwater Creek to the east. Phase 6 is estimated to result the removal of some 90,000 cubic yards of material.



Crews are installing sheet piling along the Norfolk Southern Corporation rail line from a rail-mounted crane. Sheet piling is being installed to maintain the stability of the rail line during upcoming cleanup activities.

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NORTH COUNTY

Record of Decision Nears Completion

The North St. Louis County Sites Record of Decision (ROD) identifies the final selected remedy for the North St. Louis County sites. The ROD is the key legal document needed to authorize the final cleanup for these sites.

The North St. Louis County sites consist of the St. Louis Airport Site (SLAPS), the Latty Avenue Properties and the St. Louis Airport Site Vicinity Properties including Coldwater Creek. The sites include commercial/ industrial, residential and recreational properties.

On June 22 and 23, 2004, the St. Louis District, U.S. Army Corps of Engineers (USACE) met with personnel from the United States Environmental Protection Agency (USEPA) and the Missouri Department of Natural Resources (MDNR) to resolve comments on the draft ROD. Discussions focused on long-term stewardship concerns, the remedy for inaccessible soils, Applicable or Relevant and Appropriate Requirements (ARARs) and the approach to address contaminated soil on structures. In general, the meeting went well and was very productive.

The draft ROD was revised based on these discussions. The document was then re-issued for further agency review as a draft final document on September 10, 2004.



Removal activities in the Phase 4 and 5 work areas at the St. Louis Airport Site (SLAPS) are nearing completion.

What's Next?

The North St. Louis County ROD will be finalized once issues on the draft final version of the document are resolved. The USACE, USEPA, and MDNR are committed to making every effort to resolve remaining issues with the ROD in a timely manner. USACE expects to submit the document for final approval by the end of December 2004.

Upcoming Events

Recent Informational Releases:

- Five-Year Review Report: Initial Five-Year Review - October 2004
- Derivation of Site-Specific Derived Concentration Guidelines Levels (DCGLs) for North County Structures - October 2004.

Information Releases:

- Winter Newsletter – February 2005

Upcoming Meetings (Please come if you are available!!):

St. Louis Oversight Committee Meetings at the FUSRAP Project Office located at 8945 Latty Avenue Berkeley, Missouri at 11:30 a.m. on December 10th and January 14th, and February 11th.

ST. LOUIS AIRPORT SITE

Strong Progress in 2004

Crews continue to make strong progress at the St. Louis Airport Site (SLAPS). USACE successfully cleaned up another 5.5 acres of the site in 2004. These cleanup efforts resulted in the removal and out-of-state disposal of more than 106,000 cubic yards of contaminated soil from the site.

To achieve this success, USACE focused its efforts on the western 1/3 of the site, which consists of five separate work areas identified as Phases 2 - 6.

Although significant progress has been accomplished in these areas, more work remains. Storm water control basins will remain in Phases 2 and 3, near the west central portion of the site until no longer needed. Removal work in Phases 4 and 5, at the west end of the site will be completed early this winter. Work on Phase 6 along the southern edge of the SLAPS will continue through 2005.



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Coldwater Creek Removal Action is Complete

Crews safely removed radiologically contaminated soils from Coldwater Creek without incident this summer. This small segment of the creek, between Banshee Road and McDonnell Boulevard, was addressed as part of the Phases 4 & 5 cleanup at the west end of the SLAPS.



Removal activities in Coldwater Creek on the western border of SLAPS began on August 6, 2004 and were completed on September 9, 2004.

Removal activities were delayed earlier this year by the presence of high voltage power lines at the west end of the site. The USACE worked closely with AmerenUE to relocate the lines, which service a number of large manufacturing businesses in the area. Once the relocation was complete, crews were ready to begin removing contaminated soil from the creek.

Excavation activities began on August 6, 2004. Two crews, each working daily 10-hour shifts, completed the cleanup. The first shift removed contaminated material from the creek and confirmed that cleanup criteria were met. Without missing a beat, the second shift backfilled and placed riprap over the same creek section excavated by the first shift.

Despite the occasional rains that caused some delays, removal and backfilling activities were completed on September 9, 2004. Approximately 12,700 cubic yards of material were removed from Coldwater Creek as part of the removal action for SLAPS Phases 4 and 5.

What's Next?

Removal activities in the SLAPS Phases 4 and 5 will be completed this winter. Efforts to complete the cleanup of SLAPS will continue with Phase 6.

ST. LOUIS DOWNTOWN SITE

Plant 6WH Phase I Nearly Complete

The Plant 6 West Half (6WH) - Phase I area is a 20,400 square foot area on the south side of Building 101, between the building's south wall and Destrehan Street. The area includes a nine-bay loading dock that serves as one of the main shipping and receiving areas for Mallinckrodt Inc.'s St. Louis operations.

To maintain access to this important building during remediation of the Phase I area, it was necessary to divide the planned remediation and restoration into three work areas. Each work area was estimated to take approximately two months to excavate, confirm the area meets cleanup goals, backfill and restore. An estimated total of 2,340 cubic yards of contaminated material was to be removed from the three Phase I work areas based on Pre-Design Investigation sampling results.

Excavation activities in Plant 6WH Phase I were initiated on June 21, 2004. The presence of ground water and numerous utilities (both overhead and underground) presented some challenges to the cleanup. As work progressed, the cleanup was complicated somewhat by contamination found around the buried remnants of former building foundations. Discovery of this "capped" contamination required the removal of the old foundations and the underlying contamination. As a result, the volume of contaminated soil



Repair of a sewer line in Plant 6WH Phase I.



At the St. Louis Downtown Site (SLDS) crews had to deal with old concrete foundations, overhead and underground utilities and water infiltration during remediation of Plant 6W Half Phase I.

removed from areas 1 and 2 exceeded the estimated volume by approximately 800 cubic yards.

Overall, however, the work progressed better than anticipated. As of October 15, 2004, all areas had been excavated and verified clean. Areas 1 and 2 have been backfilled and fully restored. Area 3 has been partially backfilled. A total of approximately 3,600 cubic yards of contaminated material were removed from Plant 6W Half - Phase I and shipped to a permitted out-of-state disposal facility.

What's Next?

Crews will complete Area 3 of Plant 6W Half Phase I by restoring the manhole and sewer lines, completing backfill



Remediation work continues at the southern boundary in Plant 6W Half Phase I Area 3.

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restoration and re-paving. Once Area 3 of Plant 6W Half Phase I is completed, crews will prepare to begin remedial activities in Plant 7N/7S, the next Mallinckrodt plant scheduled for cleanup.

Thomas & Proetz VP Cleanup Progress

Pre-Design Investigation and remediation design work has been completed for Thomas and Proetz Lumber Company (DT-10). Remediation of the Thomas and Proetz Lumber Company property will be initiated in November 2004.

Excavation activities will be phased to minimize disruption to the property owner's ongoing daily business operations. Rather than opening all four contaminated areas of the property at once, crews will excavate and restore one area at a time. An estimated 300 cubic yards of contaminated soils will be excavated and removed from the property over a six-week period.



DT-10 remediation activities began in November 2004.

Cleanup Guidelines for Structures

The final “Derivation of Site-Specific DCGLs for North County Structures” or DCGLs document has been finalized. In October 2004, the USACE released the document for public review and comment. Based on public input, the DCGLs document was revised and finalized.

In May 2003, the U.S. Army Corps of Engineers, St. Louis District released a feasibility study for removing radioactive contamination from the North St. Louis County Sites. This study identified alternatives to address site contamination resulting from activities associated with the nation’s early atomic energy program.

Although the “Feasibility Study for the St. Louis North County Site” presented some information related to the removal of contaminated soils from the surface of structures, the St. Louis District, U.S. Army Corps of Engineers developed guidelines, which are known technically as “derived concentration guideline levels” (DCGLs), to identify cleanup levels specifically for structures. These measures were documented in the “Derivation of Site-Specific DCGLs for North County Structures”, which was made available for public review and comment July through August, 2004. An electronic copy of the final document, incorporating responses to comments received, is available online at <http://www.mvs.usace.army.mil/engr/fusrap/home2.htm>.

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North St. Louis County Sites

Record of Decision (ROD) Processing

The U. S. Army Corps of Engineers (USACE), St. Louis District is preparing the Record of Decision (ROD) for the North St. Louis County Sites. These sites include the Latty Avenue/Hazelwood Interim Storage Site (HISS), the St. Louis Airport Site (SLAPS), the SLAPS Vicinity Properties (VPs) and Coldwater Creek.

On May 1, 2003, the USACE issued the North St. Louis County Sites Feasibility Study and Proposed Plan (FS/PP) for public comment. The documents present a range of potential alternatives to address contamination at the sites related to the Manhattan Engineer District / Atomic Energy Commission's (MED/AEC) activities. The USACE also prepared a plan for addressing North County structures that have been impacted by MED/AEC operations. When finalized, the plan will provide derived concentration guideline level (DCGL) values to be used during the evaluation, clean-up and release of structures. The DCGL values will ensure compliance with all applicable or relevant and appropriate requirements (ARARs) as established in the FS/PP. In response to public request, the comment period was extended through July 14, 2003.

Private citizens, property owners, public interest groups, and local, state, and federal officials attended the public meeting at the Hazelwood Civic Center – East on May 29, 2003. A transcript of the meeting, which includes oral comments submitted, may be obtained from the St. Louis FUSRAP website.

Oral and written comments submitted on the alternatives during the comment period and at the public meeting are being used to assist with the selection of the final



Excavation activities have begun in Phase 4 and 5 on the western border of SLAPS.

remedy for the sites, which will be identified in the final ROD. Responses to comments submitted on the FS/PP will be published in the Responsiveness Summary. The Responsiveness Summary is an appendix to the ROD.

Due to the complexity of the comments received, development of the final approved ROD will require more time than originally anticipated. The ROD is expected to be finalized in the summer of 2004.

The USACE completed its first internal review of the ROD in February 2004. The United States Environmental Protection Agency (USEPA) and Missouri Department of Natural Resources (MDNR) have begun reviewing the document.

What's Next?

The USACE will work with the USEPA and MDNR to resolve comments regarding the draft ROD. Upon successful resolution of the comments, the document will be finalized and signed by the USACE and USEPA.

St. Louis Airport Site (SLAPS)

Removal Action Continues

Excavation activities at the St. Louis Airport Site (SLAPS) Phases 2 & 3, near the west central portion of the site, have geared down for a while. Two temporary water storage basins have been constructed in this area and will remain there for two more construction seasons. Approximately 83,500 cubic yards of contaminated materials from this area

Upcoming Events

Information Releases:

Summer Newsletter - August 2004

Draft Five-Year Review Report - June 2004

Upcoming Meetings (Please come if you are available!):

St. Louis Oversight Committee Meetings at the FUSRAP Project Office at 11:30 a.m. on June 11, July 9 and August 13.



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have been removed and shipped for disposal at an out-of-state permitted and licensed disposal facility.

Work is now focused mainly in SLAPS Phases 4 & 5 (the western border of the site) adjacent to Coldwater Creek between Banshee Road and McDonnell Boulevard. A 220 foot long sheet-pile wall has been installed along the shoulder of McDonnell Boulevard in order to protect the road surface during excavation. The removal along the sheet-pile wall is complete and confirmation is underway. Other areas along McDonnell Boulevard are currently being backfilled to original grade. Also, high-voltage electrical lines along the Coldwater Creek border are in the process of being relocated by AmerenUE to allow the safe excavation of the area.

The USACE negotiated agreements with AmerenUE and Norfolk Southern Railroad to facilitate continuing removal activities. Similar discussions were also held with adjoining property owners (GKN Aerospace Sciences, Inc. and the Metropolitan Sewer District) to minimize disruptions to on-going business activities at neighboring properties.

In December 2003, work was initiated to remove contamination from Phase 6 in the southwest corner of SLAPS where one of the utility poles to remain on the site would be placed. During sampling efforts to verify the area met cleanup goals, a record rainfall event on January 4th caused Coldwater Creek to overflow the protective berm separating the excavation from the creek.

After creek levels returned to normal, some water remained in the excavation trapped behind the berm. Although potentially contaminated portions of the area were covered with weighted tarps, water remaining in the excavation was held onsite and tested. The results of the test showed that there was no hazard to human health or the environment. After the last of the water was pumped from the excavation, the verification sampling was completed and the area was backfilled.

Coldwater Creek Removal Scheduled

Excavation and drainage improvements in Coldwater Creek are currently scheduled to begin in August 2004 as part of the SLAPS Phase 4 & 5 construction activities. August is the start of the next historically low flow period for Coldwater Creek. The Coldwater Creek work is to last approximately twenty days.

Crews will operate seven days a week in two shifts. Work plans include precautions to decrease the potential for contamination to migrate from the excavations. The creek will be diverted between Banshee Road and McDonnell

Boulevard using large pumps to minimize water levels in the excavation.

The work will be performed in segments. The area of the creek that is excavated during the first shift will be backfilled on the second shift of the same day. Should there be rain in the forecast, no excavation will occur in the creek. Creek excavation would resume once the creek has receded to normal levels.

What's Next?

Removal activities in Phases 4 & 5 will continue. Coldwater Creek restoration and removal action is scheduled to begin in August 2004.

St. Louis Downtown Site (SLDS)

Mallinckrodt Remediation Progresses

Two more plants have been returned to Mallinckrodt as a result of successful cleanup efforts at the St. Louis Downtown Site (SLDS). Remediation and site restoration work at Mallinckrodt Plants 6 East/East Half and 7 East are complete. The USACE excavated approximately 24,230 cubic yards of contaminated material from Plant 6E/EH. Another 2,028 cubic yards of material were excavated from Plant 7E.

Remediation and disposal activities were accomplished in accordance with the 1998 Record of Decision (ROD for SLDS). Now that the cleanup of these two areas has been completed, work has begun on preparing a Post Remedial Action Report (PRAR) for each plant. The PRAR will document the current (post remedial) radiological conditions of the plant. The PRAR will also document how those



Collecting PDI samples from test pits allows sampling crews to better investigate any geological features of interest.

conditions meet the cleanup criteria established in the ROD for the St. Louis Downtown Site.

The USACE will combine the PRAR for Plants 6 East/ East Half and Plant 6 West (6W) and issue the combined document after remediation of Plant 6W is completed. Similarly, the PRAR for Plant 7 East will be combined with the Plant 7 North/South document and issued after remediation of Plant 7 North/South is completed.

Vicinity Property Cleanups Progress

In October 2003, USACE successfully completed remedial activities at Heintz Steel (also identified as DT-6). In accordance with the 1998 Record of Decision (ROD) for SLDS, 1,790 cubic yards of material were excavated and shipped to an out-of-state licensed/permitted disposal facility. Site restoration activities were completed in November 2003.

For efficiency reasons, the Post Remedial Action Report (PRAR) for this property will be combined with the PRAR for the adjacent property to the east, Midwest Waste Vicinity Property (DT-7), which was remediated in 2002. A draft copy will be provided for regulator review in June 2004.

McKinley Bridge Status

The USACE supported plans to replace the McKinley Bridge. In 2002, the USACE was notified of pending plans to replace the structure. To minimize impacts of contamination on the proposed construction project, the property was investigated and a design developed for the removal of the contaminated soils.

Remediation of the McKinley Bridge / City of Venice property (also identified as DT-11) began in November 2003. Approximately 2,590 cubic yards of contaminated soil and debris were excavated and shipped to an out-of-



Drill crew collecting soil samples on the City of Venice, Illinois Vicinity Property DT-11 south of the McKinley Bridge to delineate the extent of contamination.

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state licensed/permitted disposal facility. Site restoration activities were substantially completed in January 2004.

What's Next?

The USACE will complete the post remedial action reports for Heintz Steel, Midwest Waste, McKinley Bridge / City of Venice and Mallinckrodt Plants 6/6E, and 7E. Investigation and design for Thomas and Proetz (DT-10), Gunther Salt (DT-4) and Mallinckrodt Plants 6W and 7N/S properties will continue.

Five-Year Review Report

In 2003, the USACE initiated a review of cleanup actions underway at the St. Louis FUSRAP sites to ensure that the selected response actions being implemented continue to be protective of human health and the environment. A team, consisting of representatives of the USACE, U.S. Environmental Protection Agency (USEPA) and Missouri Department of Natural Resources (MDNR), inspected each site. The team also interviewed members of the local community to better understand the impacts of the work on the surrounding area.

The results of the five-year review have been compiled. Any problems found at the sites and recommendations to address them are documented in the report. The report will be made available to the public in the Five-Year Review Report for the St. Louis FUSRAP Sites.

What's Next?

The USACE anticipates releasing the report in June 2004. Interested parties may view this document on-line at: <http://www.mvs.usace.army.mil/engr/fusrap/home2.htm>.

What does it take to design the cleanup of a property?

A property cleanup typically consists of removing contaminated soil, placing it in a railcar and shipping it for disposal at an out-of-state and licensed/permitted facility, verifying that cleanup criteria have been met and restoring the property to its original condition using clean off-site borrow material. This process appears relatively simple but before the removal begins, a design must be completed. So, what does it take to design the cleanup of a property? The following is a listing of some of the steps of our design process:

- **Collect property development historical information** – this provides insight to the various activities that have shaped the character of the site. It discloses material facts about the site, which impact construction methods, equipment, costs, and schedule.
- **Review archival documents** – provides a preliminary assessment of property features to be considered, e.g. ownerships, utilities, and historical land uses.
- **Interview property owners** – gives a verbal recounting of events that affect a site and often reveals latent defects, anomalies, and special considerations peculiar to the property as well as current activities, uses, and coordination efforts required.
- **Perform radiological walkover surveys** – gives a cursory overview and provides decision makers an opportunity to develop a basis for further, more in-depth investigation of a site and the ability to generally assess the magnitude of potentially hazardous conditions.
- **Collect & analyze soil samples** – provides an analysis of the nature and concentration of the specific contaminants of concern.
- **Coordination of design features with current property use** – allows the construction sequence and progress to proceed with minimal disruption to on-going business activities and in a cooperative spirit for the mutual benefit of all stakeholders involved in the process.

Produce design document (including regulatory/property owner reviews) – maintains a living record for posterity of actions taken and rationale used in site development.

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North County

On May 29th the U.S. Army Corps of Engineers, St. Louis District (USACE) held a public meeting on the North County Feasibility Study and Proposed Plan (FS/PP). Seventy-four members of the public were in attendance. Twelve individuals gave comments. Comments centered around the cleanup of areas under roads, bridges, railroads and buildings as well as Coldwater Creek.

The comment period for the North County FS/PP closed on July 14th. USACE is currently in the process of addressing the public comments received on the documents and using those responses to assist in the preparation of the Record of Decision (ROD) for the North County Site. The responses to the public and stakeholder questions submitted on the North County Site FS/PP will be published in the Responsiveness Summary. The Responsiveness Summary will be an appendix to the ROD and is currently scheduled to be completed (signed by the United States Environmental Protection Agency and USACE) in early 2004. ■

St. Louis Airport Site (SLAPS)

Since the beginning of Fiscal Year 03 more than 85,843 cubic yards of contaminated soil have been removed



More than 80,000 cubic feet of soil was excavated to complete Phase 1.

and shipped from the St. Louis Airport Site to an out-of-state permitted and licensed disposal facility. The shipments have been made in 1,153 lined gondola rail cars. Most of this material came from phase I, located in the center of the site, which is now complete. Phases 2 and 3, which are located west of Phase 1, began in December 2002. USACE expects to remove more than 60,000 cubic yards and ship it out-of-state during this stage of the remediation. Phases 2 and 3 are expected to be about 75% complete by the end of the fiscal year.

After completion of Phases 2 and 3, the next step in the remediation of SLAPS is the remaining western portion of the site, Phases 4 and 5, which are adjacent to Coldwater Creek. This work is currently scheduled to begin in mid 2004.

Most notable to the public is the roadway progress. More than 50% of the contamination along the south shoulder of McDonnell Boulevard has been removed and the roadway surface replaced.

Upcoming Events

Information Releases:

Fall Newsletter - October 2003

Draft Five-Year Review Report - Sept. 2003

Upcoming Meetings (Please come if you are available!):

St. Louis Oversight Committee Meetings at the FUSRAP Project Office at 11:30 a.m. on Sept. 12, Oct. 10, Nov. 14, and Dec. 12.



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Water Treatment

You may have noticed the large corrugated steel tanks on the south side of McDonnell Blvd. These tanks help facilitate the de-nitrification process, which allows USACE to more efficiently remove selenium from the water. With the tremendous amount of rain experienced this past June, there was significant water at SLAPS. Any water that comes into contact with our remediation efforts must be treated prior to release to the Metropolitan Sewer District (MSD). So far this year we have treated and released more than 1.8 million gallons to MSD. ■

Five-Year Review Progresses

USACE plans to release the Five-Year Review in November 2003, evaluating whether the response actions implemented on the FUSRAP St. Louis Sites continue to be protective of human health and the environment. The St. Louis Sites consist of the North County Site and the St. Louis Downtown Site (SLDS).

FUSRAP activities at the St. Louis Sites follow the guidelines established by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) more commonly known as Superfund. Under CERCLA, a review of the response actions must be conducted at least every five years following the start of cleanup.

This five-year review was triggered by the commencement of field operations at SLDS on September 8, 1998. The five-year review began in spring 2003 and will take nine to 12 months to complete.

As part of the five-year review process, the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency and the Missouri Department of Natural Resources inspected each site and documented the conditions observed. Members of the community also gave their views about the cleanup to help the team better understand the impacts of the work on the local community.

The results of the review will be published in the "Five-Year Review Report for the St. Louis FUSRAP Sites." The report will also document any problems found and include recommendations to address them. Copies of this report will be available, after comments from the regulators are addressed, on-line at: <http://www.mvs.usace.army.mil/engr/fusrap/Home2.htm>.

Hard copies will be placed with the Administrative Record located at the St. Louis Public Library, 1301 Olive St., and at the FUSRAP Project Office at 8945 Latty Avenue in Berkeley. ■

St. Louis Downtown Site (SLDS)

Heintz Cleanup Underway

USACE is working on the cleanup of the second SLDS vicinity property this year. The property is identified as DT-6 and is currently owned by Heintz Steel and Manufacturing.

Phase one of the remediation resulted in excavation and disposal of 65 cubic yards of material.

Applying the lessons learned from the cleanup of the adjacent Midwest Waste property USACE chose to further investigate the remainder of the property. The investigation better defined the area of contamination and helped to minimize the impact of the cleanup to on-going business operations.



Excavation begins at Heintz Steel and Manufacturing.

Crews are now working on phase two of the cleanup, which required more extensive excavation on the property.

Contaminated materials will be shipped via rail to a certified out-of-state disposal facility.

USACE estimates that contractors will remove 1,800 cubic yards of material to complete the remediation under this phase of the plan. Remedial activities for this property are scheduled to be complete in September. Restoration of the property will be complete in October.

USACE works on the SLDS vicinity properties in accordance with the 1998 Record Of Decision for the St. Louis Downtown Sites.

Plant 6 East Half (6EH) Complete

In accordance with the 1998 St. Louis Downtown Site Record of Decision, the USACE completed the remediation of Mallinckrodt's Plant 6 East Half in July 2003. A total of 23,937 cubic yards of material were excavated from the site and shipped to an out-of-state disposal facility. The Atomic Energy Commission (AEC) contracted with Mallinckrodt to use Plant 6 for uranium processing from 1946 through 1957. By 1962, the AEC had cleaned the area to criteria then in effect and returned the area to Mallinckrodt. However, since that time buildings have been demolished to facilitate ongoing business operations at Mallinckrodt.



Crews are removing material from Plant 7 East.

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Prior to backfill and restoration the site was verified with a final site survey, which confirmed that the area was free of radiological contamination. Following the completion of restoration activities Plant 6EH was returned to Mallinckrodt for beneficial use.

Plant 7 East Under Construction

Concurrently with Vicinity Property DT-6 cleanup, Mallinckrodt Plant 7E is also being addressed. Plant 7E is located in the eastern portion of SLDS, south of Destrehan Street and east of the Burlington Northern Railroad tracks. Historically Plant 7E was used as a parking lot and coal storage area. Remedial activities began in July. Because there are no buildings or underground utilities USACE expects this area to progress relatively quickly.

With approximately 1500 cubic yards of material slated for removal, the projected end date is in September.

What's Next?

In the coming months USACE will complete the cleanup of DT-6 (Heintz Steel) and Plant 7E. USACE will also address contamination around the McKinley Bridge as the Illinois Department of Transportation prepares to work on bridge restoration. 

Where does all of that material go?

There are an awful lot of cubic yards of material being removed from the FUSRAP locations here in the St Louis area, but where does it all end up?

Because Missouri does not have any facilities available to accept radiological waste, all of the material generated in the remediation must be shipped to properly licensed facilities out-of-state. At this point, USACE has contracts with hazardous waste facilities in Utah and Idaho. The facilities were selected based upon an evaluation of their safety record, ability to accept FUSRAP materials, and cost effectiveness. The shipments are generally completed by rail. ■



Crews prepare material for shipment from SLAPS.

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ST. LOUIS SITES

5-Year Review Initiated

A 5-year review of radiological cleanup actions is underway for local sites that are being addressed by the Formerly Utilized Sites Remedial Action Program (FUSRAP).

FUSRAP activities follow the guidelines established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), more commonly known as Superfund.

Superfund establishes the process to identify, investigate, and clean up hazardous waste sites. It requires a review at least every five years following the selection of a final site remedy. The purpose of the review is to determine whether the cleanup continues to be protective of human health and the environment.

The five-year review will assess cleanups underway at the St. Louis Downtown Site in northern St. Louis City, and the North County Site in St. Louis County. The North County Site includes: the St. Louis Airport Site (SLAPS), the SLAPS Vicinity Properties, the Hazelwood Interim Storage Site/Latty Avenue Vicinity Properties, and the Futura Coatings Property.

The cleanups at these sites consist of excavating radioactively contaminated soils. The soils are then



A five-year review will assess cleanup underway at the St. Louis Sites. Workers here take soil samples to monitor conditions as cleanup progresses.

loaded into rail cars, covered and shipped to an out-of-state licensed facility for disposal.

A team will inspect each site. The team will be led by the U.S. Army Corps of Engineers (USACE) and will include representatives from the U.S. Environmental Protection Agency and the Missouri Department of Natural Resources. The team will document the conditions of the sites and the surrounding area.

As part of the review process, members of the community will be contacted for their views about the cleanup. Their responses will help the team to better understand the impacts of the work on the local community.

The results of the five-year review will be made available to the public in the *Five-Year Review Report for the St. Louis FUSRAP Sites*. Any problems found at the sites and recommendations to address them will also be documented in the report.

For more information or to participate in the review, please visit our web site at www.mvs.usace.army.mil/engr/fusrap/home2.htm or call (314) 260-3905.

What's Next?

Site inspections and interviews will continue until the end of May. In August, the community will be notified of the availability of the Five-Year Review Report and comments on the review will be accepted for 30 days following the release of the document.

Upcoming Events

Information Releases:

Summer Newsletter - July 2003

Draft Five Year Review Report - August 2003

Upcoming Meetings (Please come if you are available!):

**St. Louis North County Site Feasibility Study/
Proposed Plan Public Meeting at the Hazelwood
Civic Center - East at 6:00 p.m. on May 29, 2003.**

**St. Louis Oversight Committee Meetings at the
FUSRAP Project Office at 11:30 a.m. on May 9,
June 13, and July 11.**



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ST. LOUIS DOWNTOWN SITE

VP Cleanup Complete

The cleanup and restoration of the first privately-owned vicinity property owned by Midwest Waste and identified as DT-7, was completed in February 2003. Cleanup efforts began under the 1998 St. Louis Downtown Site Record of Decision in Fall 2001. Work progressed slowly as small crews diligently identified and removed numerous small pockets of contamination scattered throughout the property.

In 1942, when work under the Manhattan Project began, the elevation of the property was much lower than its present day level. Efforts to raise the property above the floodplain altered the elevation of the property 4 to 5 feet above its 1942 surface elevation. Subsequent rainfall pooled surface contamination in low-lying areas on the property creating the small pockets of contamination that were subsequently covered during the intervening years.

Sampling has verified that above-criteria radiological contamination was successfully removed from the property. Approximately 4,800 cubic yards of contaminated soils were excavated from the property, which is located at the foot of Angelrodt Street.

Plant 6EH Approaches Completion

The remediation of Plant 6 East and East Half is almost complete. Nearly 23,000 cubic yards of contaminated soil and debris have been removed from the 4.5-acre area since December 2000.

Cleanup of the area was complicated by the discovery of unmapped sewer lines, the difficulty in accessing contamination located near active utility lines, and "capped" contamination covered by the former building foundations. During the Manhattan Project, Plant 6 East Half was the home of former Buildings 102, 112, 115, 116, and 117. Over the years, these buildings were demolished to accommodate ongoing business operations at Mallinckrodt, but their foundations remained.

Crews removed the foundations. The cleanup of impacted soils from beneath these foundations will signal the completed remediation of accessible soils in the Plant 6 East and East Half area. Once remediation is complete, restoration activities can begin.



Nearly 23,000 cubic yards of contaminated soil and debris have been removed from the 4.5-acre Plant 6 East Half since December 2000.

What's Next?

Crews will restore Plant 6 East and East Half to its original condition and prepare to begin remedial activities in Plant 7 East, the next area requiring cleanup. ■

NORTH COUNTY

FS and PP Available for Public Review

The St. Louis North County Feasibility Study (FS) and the Proposed Plan (PP) are available for public review from May 1, 2003 through May 30, 2003. The FS and PP address the remediation of contamination related to the storage of wastes at the North County Site. The site includes the St. Louis Airport Site (SLAPS), the Latty Avenue Properties including the Hazelwood Interim Storage Site (HISS), the Futura Coatings Property, the SLAPS Vicinity Properties, and Coldwater Creek.

The FS describes six remediation alternatives under consideration to reduce the impact of contaminants resulting from previous uranium manufacturing and processing activities. The PP summarizes the alternatives and provides the rationale for the USACE's preferred alternative.

The alternatives, which identify a range of potential final site remedies from no action to complete excavation, are all under consideration. However, the USACE has identified Alternative 5, Excavation with Institutional Controls Under Roads, Bridges, Railroads and Other Permanent Structures, as the preferred alternative based on the information available at this time. Under this alternative, USACE would excavate all accessible soils

from all locations and place institutional controls, such as land use and zoning restrictions, to control soils beneath roads, bridges, railroads, and other permanent structures.

The public is encouraged to review and comment on all alternatives described in the FS and PP. The preferred alternative can change in response to public comment or to new information. Comments on the proposed remedial action at the North County Site will be accepted for 30 days following the release of the documents. Unless a request to extend the comment period is received, all comments must be received before June 1st. Interested participants should call the main office or check the website.

On May 29, 2003, a public meeting will be held at the Hazelwood Civic Center East, beginning at 6 p.m. with a poster session and technical staff available to answer questions. At 7 p.m., the USACE will briefly identify the alternatives then request verbal comments from the public. Speaker's comments about the alternatives will be recorded, and written comments may be submitted at that time or mailed to the address given in the "Keeping in Touch" box on this page. ■

ST. LOUIS AIRPORT SITE (SLAPS)

Removal Actions Still Going

Crews have also been very busy cleaning up the St. Louis Airport Site (SLAPS) over the past several months. Under the 1998 Engineering Evaluation/Cost Analysis (EE/CA), two more areas have been completed, one more is approaching completion, and yet another has begun.

The final section of the Radium Pits, identified as Survey Unit 21, was cleaned up in November 2002. Survey Unit 21 served as a temporary sump during the removal of contamination from adjacent areas. The removal of approximately 10,000 cubic yards resulted in the cleanup completion of the Radium Pits.

The USACE was also able to complete the cleanup of contaminated material from the remainder of the East End Extension in April 2003. Successful coordination with St. Louis County's Department of Highways and Traffic allowed the USACE to remove contaminated soil from the southern shoulder of McDonnell Boulevard and drainage ditch. Approximately 11,731 cubic yards of contaminated materials were excavated from the shoulder and shipped to an out-of-state disposal facility.

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Homepage - To reach our site, set your browser to www.mvs.usace.army.mil and select District Projects.

If you have any suggestions, questions, or comments, contact our office anytime.

Crews are nearly finished with the cleanup of the central portion of SLAPS, referred to as the Phase 1 region. Completion of the area was delayed to allow crews to complete the cleanup of the McDonnell Boulevard shoulder and drainage ditch adjacent to the Radium Pits before spring rains seriously impacted the work. Removal efforts are back underway with an anticipated completion date of May 2003. Approximately 97,000 cubic yards of contaminated soils have been removed since December 2001.

The USACE began the remediation of Phases 2 and 3, located in the northwest and north central portion of the site in early December 2002. Over 10,000 cubic yards of material of an expected 75,000 cubic yards, has been remediated to date.

What's Next?

USACE will continue the cleanup of Phases 2 and 3. ■



Workers finished the McDonnell Boulevard drainage ditch before spring rains impacted work.

North County Public Review Period

The North County Feasibility Study (FS) and Proposed Plan (PP) are available for public review and comment now through May 30th! Public comments on cleanup alternatives presented in these documents will aid in the selection of the final remedy for the North County Site. Copies of the FS and PP have been placed with the site Administrative Record File and may be reviewed during normal business hours at the following locations:

St. Louis District, Corps of Engineers


FUSRAP Project Office
8945 Latty Avenue, Berkeley, MO

St. Louis Public Library

Government Information Section
1302 Olive Street, St. Louis, MO

Additional copies of the FS and PP only are also available for review at select St. Louis City and County Libraries during normal business hours. These libraries include:

- Julia Davis Branch at 4415 Natural Bridge Road in St. Louis, MO
- Prairie Commons Branch at 915 Utz Lane in Hazelwood, MO
- St. Louis County Library Headquarters at 1640 S. Lindbergh Boulevard in St. Louis, MO
- Washington University - Earth & Planetary Sciences Library at One Brookings Drive in St. Louis, MO

Electronic copies of these documents are also available at: www.mvs.usace.army.mil/engr/fusrap/home2.htm. All comments are due to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Project Office at 8945 Latty Avenue in Berkeley, Missouri by June 1st. 

U.S. Army Corps of Engineers - St. Louis District
FUSRAP Project Office
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The St. Louis Sites

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A Year In Review

The federal government began a new fiscal year on October 1st, 2002. At this time each year the U.S. Army Corps of Engineers (USACE) team pauses to reflect on what was accomplished and what remains. The highlights of our observations follow.

Last October, the team set a goal to remove 70,700 cubic yards of contaminated soils from the St. Louis FUSRAP Sites. Instead, we excavated and disposed of 92,958 cubic yards of contaminated materials —more than any previous year!

We prepared for future cleanup actions by working to define the extent of radiological contamination on 36 properties (7 at the Downtown Site and 29 in North County). This information led to the development of designs and reports that will direct future cleanup activities. In addition to these planned activities, the team also responded to 20 requests from private interests for radiological support during subsurface work on impacted properties.

Our achievements were not limited to fieldwork. We transferred long-term stewardship responsibilities (consisting of records management) for the Madison Site in Madison, Illinois to the Department of Energy. We held a public workshop on a series of environmental



Soil removal is just one of the team's many achievements pushing the project to its ultimate goal, complete cleanup of the FUSRAP St. Louis Sites.

and legal topics affecting site work to facilitate the review of the North County Feasibility Study and Proposed Plan. Moreover, the team made technological advances to better treat selenium found in contaminated water encountered during the excavation at the St. Louis Airport Site (SLAPS).

So where will we go from here?

Our ultimate purpose in working on these sites is to complete the cleanup of radioactive contamination left behind by the Manhattan Project. To do that, we've set two goals for fiscal year 2003: 1) to remove 88,000 cubic yards from the St. Louis Sites; and 2) to issue the North County Feasibility Study and Proposed Plan.

At the St. Louis Downtown Site (SLDS), the team plans to remove 13,000 cubic yards of contaminated material. This will include the completion of remedial activities at the Mallinckrodt Plant 6 East Half and two vicinity properties, as well as initiate the cleanup of Plant 7E at Mallinckrodt.

Upcoming Events

Information Releases:

Winter Newsletter - February 2003

Upcoming Meetings:


St. Louis Oversight Committee Meetings at the FUSRAP Project Office at 11:30 a.m. on December 13th, January 10th, and February 14th. Please come if you are available!



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In North County, we expect to remove 75,000 cubic yards of material under the 1998 SLAPS Engineering Evaluation/Cost Analysis document. Work will consist of completing cleanup of the central portion of SLAPS identified as Phase 1 and the ditch to the north, and begin work in the northwestern portion of the site (identified as Phase 2).

The Vicinity Properties and the Hazelwood Interim Storage Site have not been left out. Efforts to characterize the extent of contamination at these sites will continue. Removal of contamination on these properties will occur after a final cleanup remedy is selected. 

St. Louis Downtown Site (SLDS)

Mallinckrodt Cleanup Progresses

Cleanup activities are progressing in the Mallinckrodt portion of the St. Louis Downtown Site (SLDS). Under the approved 1998 SLDS Record of Decision (ROD) for accessible soils, remedial activities at the Mallinckrodt facility have addressed 33,800 cubic yards of contaminated material.

The USACE is investigating newly accessible areas within Plant 1 in support of Mallinckrodt's recent plans to demolish several structures in Plant 1. Since the foundations of these buildings are not believed to cover contamination, the USACE has arranged to assess the underlying soils once the buildings are demolished and the debris is removed. This confirmation effort is scheduled for completion in December 2002.

Within the Plant 6 East Half work area, cleanup activities are continuing. Approximately 20,000 cubic yards of contaminated material has been shipped to out-of-state disposal facilities from the work area. The USACE anticipates removing a total 27,000 cubic yards of contaminated material from Plant 6 East Half before completing cleanup of this work area in early 2003.

Vicinity Property Cleanup Underway

Although the work may not be as visible as within the Mallinckrodt facility, remedial efforts are also continuing on the surrounding properties. Under the 1998 SLDS ROD, the vicinity properties are being studied to assure that any FUSRAP-related contamination is addressed.

Soil borings, which assist in defining the extent of contamination on a property, are being collected. Borings have been collected from most of the known impacted properties south of the Mallinckrodt facility.




Accurately placed soil borings assist with ensuring the cleanup criteria specified in the approved environmental documents are met.

More recently, crews have begun collecting borings from properties north of the facility.

Meanwhile, excavation activities are winding down at DT-7, the first privately owned vicinity property to be remediated under the SLDS Record of Decision. An estimated 4,500 cubic yards of contaminated soils have been removed from the property, located south of Mallinckrodt along Angelrodt Street. The remediation of this property is expected to be complete in December 2002.

What's Next?

The remediation of DT-7 is expected to be complete in December 2002 while remedial activities in the Plant 6 East Half will continue through 2003. 

St. Louis Airport Site (SLAPS)

Phase 1 Removal Continues

Cleanup activities at the St. Louis Airport Site (SLAPS) Phase 1 work area are continuing. The Phase 1 work area consists of a 2.3-acre block of contaminated soils in the central portion of SLAPS.

The USACE subdivided the work area into five smaller units, each of which encompasses roughly one-half acre. Breaking the work area into smaller pieces makes water management during excavation easier. It also helps prevent storm-water runoff from transporting contaminated sediments to clean areas. As of November, crews have finished three of the five units and are working on the remaining two as they work their way to the west across the site.

Under the approved 1998 SLAPS Engineering Evaluation/Cost Analysis, 63,000 cubic yards of contaminated soil have been shipped to an out-of-state disposal facility from the Phase 1 work area. The USACE anticipates finishing the 75,000 cubic yard Phase 1 excavation in December 2002.

Water Treatment Advances

Efforts by the FUSRAP team to improve its onsite water treatment facility have paid off. Since runoff from open construction sites can have a significant impact on water quality, crews carefully check excavation water before releasing it from the site to ensure it will meet discharge criteria and not adversely affect local water bodies.

During construction activities, water periodically collects on the excavation floor. This water is pumped to onsite holding tanks and tested for a number of pollutants. These pollutants include radionuclides (such as uranium) and inorganics (such as selenium).



Crews carefully check excavation water before releasing it from the site to ensure it will not adversely affect local water bodies.

Selenium, which is a type of metal pollutant, was present in excavation water above allowable discharge limits.

For the past year, the team has been working to improve the treatment facility to enable it to address the selenium-contaminated water held

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If you have any suggestions, questions, or comments, contact our office anytime.

onsite. They developed a bioremediation process that uses bacteria to successfully reduce selenium, reduce interfering nitrates, and separate uranium from the water. As of mid-November, the USACE has been able to safely dispose of 132,000 gallons of accumulated excavation water using the new treatment process.

SLAPS Ditches Planned

Last winter, crews removed contaminated soils from the eastern portion of the drainage ditch between McDonnell Boulevard and SLAPS. The work was performed as part of the effort to cleanup the East End Extension under the approved 1998 SLAPS Engineering Evaluation/ Cost Analysis document.

Approximately 1,000 cubic yards of contaminated soil have been shipped to out-of-state disposal facilities from the drainage ditch. The USACE chose to delay work on the remainder of the ditch last spring to minimize potential sediment migration issues during the wet season, which runs from late-March to early-June.

An estimated 9,000 cubic yards of contaminated soil await removal from the western half of the drainage ditch, which extends from the former Radium Pits to Coldwater Creek. Excavation work will begin upon completion of Phase 1.

What's Next?


Crews will work to finish the cleanup of the Phase 1 work area so that work may begin on the drainage ditch between McDonnell Boulevard and SLAPS in early 2003. ■

Reaching Out

Environmental Training Sessions Offered

FUSRAP... ionizing versus non-ionizing radiation... rem and Curie... ARAR... such is the mysterious vocabulary of the people cleaning up radioactive contamination from the Manhattan Project. These and other words, phrases and concepts were the focus of the training sessions offered by the team August 13th and 20th in North County.

The USACE offered the public a two-day training session to familiarize people with technical processes and terms used to accomplish FUSRAP work. Graphics and handouts presented the fundamentals of various topics including radiation, risk assessments, risk range, cleanup, and long-term stewardship. Hands-on demonstrations reinforced the concepts of soil sampling, and surveys, while handling radiological detection equipment and instruments illustrated how fieldwork is achieved. Participants received copies of the presentations, fact sheets, and contact information for future reference.

About 50 people from widely varied backgrounds attended the two sessions. The training was limited to general information and did not identify or discuss final cleanup alternatives, which are still under development. 



The USACE offered a two-day training session to familiarize people with technical processes and terms used to accomplish FUSRAP work.

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Before



Gravel now covers the ground where the 58,000 cubic yard HISS piles once stood, over twenty years after the first stockpile was created on the site.



After

Hazelwood Interim Storage Site (HISS)

Pile Removals Successfully Completed

The USACE has successfully completed the removal of the stockpiles from the Hazelwood Interim Storage Site (HISS). Gravel now covers ground where the interim storage piles once stood, over twenty years after the first stockpile was created on the site.

Removal of the stockpiles began in March 2000, when crews began loading spoil piles generated by the construction of the HISS railspur into railcars for disposal. Cleanup activities continued over the next eighteen months as crews removed two stockpiles from an adjacent vicinity property and two stockpiles from HISS.


Environmental control measures were instituted to protect the public from the potential off-site migration of

contamination during the removal of these piles. Crews sprayed work areas with water regularly to prevent soils from drying and becoming airborne during the removal. Permanent air sampling stations monitored the perimeter of the site to assure that contaminants did not become airborne and leave the site.

Nearly 58,000 cubic yards of material were removed from the site using a woman-owned, small business contractor. Crews loaded the stockpiles of soil and debris onto railcars and sent them to an out-of-state disposal facility. The removal of the stockpiles achieved one of the objectives of the approved 1998 HISS Engineering Evaluation/Cost Analysis.

Now that the stockpiles have been removed, the next step for USACE is to characterize subsurface soil contamination on the portion of the site that was previously concealed by the large stockpiles. Completing the characterization of contamination at HISS will enable the USACE to design its cleanup once the final remedy is selected for the site.

What's Next?

Crews will begin pulling soil samples to characterize contamination in the newly accessible areas of HISS this spring. 

Upcoming Events

Information Releases:

Spring Newsletter - May 2002

Upcoming Meetings:

St. Louis Oversight Committee Meetings at the FUSRAP Project Office at 11:30 a.m. on March 8th, April 12th, and May 10th. Please come if you are available!



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St. Louis Airport Site (SLAPS)

East End Extension Winding Up

Cleanup activities in the main body of the East End Extension are complete. Of the five-acre wedge that comprises the East End Extension work area at the St. Louis Airport Site (SLAPS), only a portion of the drainage ditch next to McDonnell Boulevard remains to be addressed.

Removal of contaminated soils from the drainage ditch was delayed to avoid potential water and traffic management problems on McDonnell Boulevard during the wetter winter months. Under the approved SLAPS Engineering Evaluation/Cost Analysis (EE/CA), approximately 60,000 cubic yards of material have been removed from the main body of the East End Extension. The USACE anticipates removing an additional 2,000 cubic yards from the shoulder and ditch next to McDonnell Boulevard along the northern border of SLAPS.

Crews will begin removing material from the shoulder of McDonnell Boulevard in February. Efforts to remove this material have been coordinated with the St. Louis County Highway Department to ensure the safety of McDonnell Boulevard travelers and construction crews.

Phase 1 Removal Begins

Now that the removal of contamination from the main body of the East End Extension is finished, crews are focusing on the central portion of the St. Louis Airport Site (SLAPS), referred to as Phase 1.

The 2.3-acre SLAPS Phase 1 work area has been divided into five smaller work areas to ease the management of drainage water during the excavation. Removal activities will progress westward across the site from areas of higher to lower elevations in order to stabilize the site and berms will be constructed to prevent storm-water runoff from transporting contaminated sediments into clean areas. Although the majority of contaminated soils are within twelve feet of the surface, some areas will require excavation to depths of 20 feet.

Since December 2001, over 14,000 cubic yards have been removed and shipped to an out-of-state disposal facility from the Phase 1 work area. The USACE anticipates completing the 42,000 cubic yard excavation of the SLAPS Phase 1 work area by the end of this summer.

What's Next?

Removal activities will continue in the SLAPS Phase 1 work area through the end of this summer. In the meantime, the USACE is completing the Phase 4 and 5 designs for future work at SLAPS. ■



Crews lay sod as part of the site backfill and restoration process upon completing the cleanup of the East End Extension.

North County

Environmental Documentation Update

An extensive internal review of the draft North County Feasibility Study and Proposed Plan (FS/PP) is nearing completion. The FS/PP will address the presence of contamination related to the activities of the Manhattan Engineer District / Atomic Energy Commission in North St. Louis County which includes the Latty Avenue/Hazelwood Interim Storage Site (HISS), the St. Louis Airport Site (SLAPS), the SLAPS Vicinity Properties (VPs), and Coldwater Creek.

Comments on draft versions of the North County FS/PP were received from the U. S. Environmental Protection Agency (EPA) and Missouri Department of Natural Resources (MDNR). As the USACE began incorporating modifications into the documents based on the agencies' comments, the basis for the cost of each alternative changed. A comprehensive review of each alternative's cost was performed to ensure the information, when presented to the public, is accurate.

The revised draft FS/PP, which incorporates the first group of regulatory comments and the new cost data, is under internal USACE review to ensure comments are adequately addressed. Once the internal review is complete, the USACE will submit the revised draft document to the EPA and MDNR for review over a 30-day period.

What's Next?

The North County FS/PP will be presented to the public for a 30-day review and comment period after comments from the regulatory review cycle are addressed. ■

St. Louis Downtown Site (SLDS)

Mallinckrodt Remediation Progressing

Under the approved 1998 St. Louis Downtown Site (SLDS) Record of Decision for accessible soils, cleanup work is progressing steadily. Over 35,900 cubic yards of contaminated soil and debris have been excavated from the site to date. Remedial activities at the Mallinckrodt facility alone produced nearly 27,700 cubic yards of this material.

The USACE completed the remediation of 10,800 cubic yards of contaminated soil from Plant 2 in April 2000. Plant 1 will be added to the list of completed work areas within the facility by the end February.

An estimated 3,700 cubic yards of contaminated soils were removed from Plant 1. Although activities within the main body of the Plant 1 work area were completed by June 2001, work in small isolated areas continued through 2002. Progress in these areas slowed as the USACE worked with the property owner to accommodate their need for access to the same isolated areas. Since these areas were only large enough to accommodate one construction crew at a time, cleanup activities in Plant 1 had to be carefully coordinated.

Remedial activities are continuing within the Plant 6 East/East Half work areas. The USACE has excavated approximately 13,200 cubic yards of contaminated soil and debris from the Plant 6 East/East Half to date. While most of the contamination in this work area has required the excavation of soils within eight feet of the surface, one area of remediation reached a depth of 20 feet.



Remedial activities are well underway at the DT-7 vicinity property (located south of Mallinckrodt along Angelrodt Street).

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If you have any suggestions, questions, or comments, contact our office anytime.

Approximately 27,000 cubic yards of soil, concrete and debris are anticipated for disposal from the Plant 6 East/East Half work area.

Vicinity Property Cleanup Underway

The USACE is also working to cleanup properties around the Mallinckrodt facility that were contaminated by Manhattan Engineer District/Atomic Energy Commission (MED/AEC) activities. Under the 1998 SLDS Record of Decision, the vicinity properties are being studied to assure that any MED/AEC contamination present is addressed.

Crews are collecting soil samples to characterize the full extent of contamination at the vicinity properties. Data from these samples will confirm the absence of contamination or will be used to design the remediation of the property.

Remedial activities are well underway at DT-7 (located south of Mallinckrodt along Angelrodt Street). DT-7 is the first privately owned vicinity property to be remediated under the SLDS Record of Decision. Approximately 3,700 cubic yards of contaminated soils and debris have been removed to date. The completion of the 4,000 cubic yard excavation and restoration is expected this summer.

What's Next?

Efforts to remediate Plant 6 East/East Half will continue through the remainder of this fiscal year. DT-7 is scheduled to be complete this summer. ■


What is Radiation?

Q: If you were to try to explain radiation to someone, what would you say? **Radioactivity is not detectable with the five senses. You cannot see, hear, smell, taste, or feel it. How would you describe it?**

A: The simplest explanation is that radiation is a type of energy. Nuclear radiation is a specific type of energy produced when an unstable atom tries to become more stable by “decaying” or releasing particles. These particles, called photons, are pure energy. Radiation may take one of two forms: ionizing or nonionizing. Ionizing radiation consists of high-energy particles capable of creating electrical charges (ion pairs) in substances they pass through. Nonionizing radiation cannot create ion pairs as it passes through material.

Nonionizing radiation consists of radiowaves and may be found in common household products such as light, microwaves, or televisions. Ionizing radiation can be found in everything in nature in trace amounts – including people. It can be found in carbon and potassium, as well as elements such as uranium and thorium. If radiation is natural, why are we spending so much to clean it up? Just like sunlight (another radiation source), radiation poses little harm until you’ve been exposed to too much of it. The Corps is working on the FUSRAP sites to limit the amount of radiation to which we are exposed.

Naturally occurring ionizing radiation may be one of three types (alpha, beta, or gamma). Alpha particles can only travel approximately one to two inches in air and can be blocked by a sheet of paper. Beta particles can travel 6-10 feet in air and can be blocked with Plexiglas® or glass. Gamma particles can travel the farthest but may be stopped with lead.

Some people believe radioactive materials can be treated by finding the right chemical mixture to neutralize it or “make it go away”. Unfortunately, since radioactivity is a type of energy released by elements, which are already in their simplest form, it cannot be neutralized. We can only control the locations of radioactive material and wait until nature takes its course. 

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Crews have removed over 10,100 cubic yards of soil and debris as work progresses across the 4.5-acre Plant 6 East Half site.

St. Louis Downtown Site (SLDS)

Plant 6 East Half Continues

The U.S. Army Corps of Engineers (USACE) is continuing to remove radiological contamination from the east half of Plant 6. Under the approved St. Louis Downtown Site (SLDS) Record of Decision, the USACE expects to remove 15,000 cubic yards of material from the Plant 6 East Half.

Remedial activities in the Plant 6 East Half began in January 2001 with the removal of the concrete pad, which covered the foundations of the former Mallinckrodt Buildings 116 and 117. Since the removal of this concrete pad, crews have been systematically removing soils from the 4.5-acre site. Additional soil borings were collected from the floor of the excavation and from beneath a concrete ring-wall encompassing the work area to ensure the cleanup requirements outlined in the 1998 SLDS Record of Decision are met.

Approximately 10,100 cubic yards of soil, concrete and debris have been removed from Plant 6 East Half to

date. Cleanup activities are expected to continue in the plant through February 2002.

Vicinity Property Cleanup Begins

Efforts to remove residual radioactively contaminated soils at the SLDS Vicinity Properties are underway. Remediation activities have begun on the first vicinity property scheduled for cleanup, DT-7 (located south of Mallinckrodt along Angelrodt Street).

Preparatory work for the DT-7 remediation began last May with the installation of temporary fencing to prevent inadvertent entry into the work area. Although no buildings or other facilities are currently located on the property, the USACE put environmental controls in place to prevent the offsite migration of sediments. Air and water resources are being monitored during the removal. Over 1,700 cubic yards of material have been excavated to date. A total of 2,000 cubic yards is anticipated for removal.

The USACE is working to identify the full depth and extent of contamination on other surrounding properties resulting from the activities of the resulting from the activities of the Manhattan Engineer District/Atomic Energy Commission (MED/AEC). Samples are being collected from properties surrounding the Mallinckrodt facility. Data from these samples allow the USACE to identify areas of concern or to certify the property free of MED/AEC contamination.

What's Next?

Upon completing the cleanup of DT-7, the USACE will begin remediating DT-8 located north of the Mallinckrodt facility. Efforts to cleanup Plant 6 East Half are expected to continue through the winter. ■

Upcoming Events

Information Releases:

Winter Newsletter – December 2001

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on October 12th, November 9th, and December 14th. Please come if you are available!



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North County

Feasibility Study/Proposed Plan Update

The North County Feasibility Study/Proposed Plan (FS/PP) is getting closer to release for public review. The North County FS/PP will present six remedial alternatives to address contamination resulting from the activities of the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the development of the atomic bomb in the 1940s and 50s.

The USACE provided draft copies of the North County FS/PP to the U. S. Environmental Protection Agency and the Missouri Department of Natural Resources for review last fall. As the USACE began incorporating changes based on formal comments from these agencies, the basis for the cost of each alternative was altered. To ensure the accuracy of information presented to the public, the USACE elected to perform a comprehensive review of the reported cost for each alternative.

An extensive internal USACE review of the draft documents incorporating the first round of regulatory comments and the new cost data was recently completed. Copies of the revised draft FS/PP are currently under internal USACE review. Once comments are addressed, the USACE will present the North County FS/PP to the regulators for a 30-day review and comment period. Following a USACE response to the regulators' comments, the North County FS/PP will be presented to the public for a 30-day review and comment period.

The final remedy selected to address contamination at the North County sites will be selected based on written comments received during the public comment period. The final cleanup remedy may be different from the




The long, thin finger of the East End Extension in the drainage ditch along McDonnell Boulevard will be removed next summer to avoid potential water management problems during wet winter months.



Removal activities are nearly finished in seven of the ten areas that make up the SLAPS East End Extension.

alternative USACE identifies in the Proposed Plan as the one preferred.

What's Next?

After State and Federal agency comments on the documents are addressed, the North County FS/PP will be released to the public for review and comment. 

St. Louis Airport Site (SLAPS)

East End Extension Progresses

Since November 2000, the USACE has made significant progress in removing contaminated soils from the five-acre wedge of the St. Louis Airport Site (SLAPS), known as the East End Extension.


The work area was divided into ten half-acre units to minimize potential contaminant migration issues during the cleanup. Under the approved 1998 SLAPS Engineering Evaluation/Cost Analysis (EE/CA), the USACE has removed almost 60,000 cubic yards of contaminated soil from seven units located in the main body of the East End Extension. Most of the contaminated soils were contained within the first five to nine feet of the surface, although some areas required excavation to depths of 21 feet.

Contamination in a portion of the East End Extension, comprised of the drainage ditch along McDonnell Boulevard, will be removed next summer. Work in this area is being delayed to avoid potential water management problems during the wet winter months. In the meantime, the USACE is working with the County Highway Department to ensure that the integrity of McDonnell Boulevard is maintained during the removal of a few small areas of contamination extending under its shoulder.

Currently, a temporary 21,000 cubic yard stockpile of soil from the East End Extension is being shipped to an out-of-state disposal facility. These soils were temporarily stockpiled at the SLAPS rail load out facility due to funding constraints in the 2001 fiscal year, which ended in September.

Excavation activities will resume after the stockpile has been loaded into railcars for transport. The USACE anticipates that the remaining 3,000 cubic yards of soil will be removed from the main body of the East End Extension by early November.

What's Next?

Once cleanup work in the main body of the East End Extension is finished, crews will begin removing contaminated material from the central portion of SLAPS, referred to as Phase 1. 

Hazelwood Interim Storage Site (HISS)

Pile Removal Nears Completion

The appearance of the Hazelwood Interim Storage Site (HISS) has undergone a dramatic change over the past year. The large stockpiles of material covered with green tarps and rock will soon be completely gone. Under the 1998 Engineering Evaluation/Cost Analysis (EE/CA) for Latty Avenue/HISS, the removal of the final stockpile (the Main Pile) is nearly complete.

USACE began removing the HISS Main Pile last fall. Using a small business contractor, over 20,000 cubic yards of contaminated soils and debris from the Main



The USACE anticipates loading the final material from the HISS stockpiles into a railcar for transportation and disposal by the end of October.

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Pile have been loaded onto railcars for transport to an out-of-state disposal facility. Removal of the remaining 9,500 cubic yards of material began in September. The USACE anticipates pile removal activities will be completed in October, with the loading and shipping of the final railcar of material.

Until a final cleanup remedy for the North County site is selected, the USACE will cover soils in the footprint of the piles to stabilize the site and ensure sediments cannot readily move offsite. Nearly 50,000 cubic yards of material have been removed from HISS to date.

What's next?


Crews will characterize the HISS Site to determine the extent of contamination remaining. 

Want to really keep up with what's happening at FUSRAP?

Visit the St. Louis Oversight Committee web page! Each month, members of the St. Louis District, Corps of Engineers team meet with the Oversight Committee to present the current status of work around the project. A copy of the Corps's presentation and the Committee Chairman's notes from the previous month are posted on the site for others to view. Visit www.mvs.usace.army.mil/enr/fusrap/SLOC.htm, to keep up with the latest information available about progress at the St. Louis Sites!

What kinds of people does it take to cleanup FUSRAP?

Q: Have you ever wondered what all those people on a FUSRAP site do?

A: *The FUSRAP team is comprised of people from a variety of occupational backgrounds. We use the technical expertise of environmental and design engineers, geologists, physicists, chemists, and biologists to design effective environmental cleanup strategies. The practical skills of field engineers, technicians, laborers, inspectors, health and safety personnel, and transportation and disposal officials ensure cleanup work is carried out safely and effectively. Blending and supporting the expertise of these two groups to ensure the project work is well-coordinated and operating smoothly is the function of project management, real estate, the office of counsel, community outreach, accounting, contracting and information management personnel. Effective cleanup of a FUSRAP site takes the experience, knowledge and skills of all these professionals.* 



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St. Louis Downtown Site (SLDS)

Plant 6 East Half Progressing

Remedial activities are progressing in the east half of Plant 6 at the St. Louis Downtown Site (SLDS). Under the 1998 SLDS Record of Decision, preparatory work within the designed excavation outline began last fall. Crews installed fencing around the cleanup area and temporarily relocated utility lines to minimize safety risks. By January, the U. S. Army Corps of Engineers (USACE) began removing contaminated soil from the area.

The bulk of the contaminated material was contained beneath the concrete pad, which once covered the footprint of the demolished Buildings 116 and 117. As the removal of this material progressed, additional soil contamination was discovered beneath a layer of clean clay during a routine walkover survey, which is performed to ensure the area meets the 1998 SLDS Record of Decision cleanup criteria.

During the 1800s, landowners in St. Louis typically filled in swampy areas with a mix of readily available waste (cinder and ash) material. A layer of clay was then dumped on top of the waste material. This allowed landowners to temporarily fill the low area and reclaim the land for productive use. As these layers settled, a bowl-like impression formed and more material was added to the area.

Such activities might have occurred at Plant 6, which is located within 1,000 feet of the Mississippi River. Clay does not readily absorb water, which can transport soluble radionuclides. However, the porous, mixed-cinder material may allow water to transport radionuclides to the cinder layer. While the cinder layer beneath may have been contaminated, the layer of clay above appeared to be clean in soil sample data.

Routine walkover surveys (shown here) assist excavation crews with ensuring the cleanup criteria specified in the approved environmental documents are met.



Additional soil borings for the remainder of the plant have been collected for further analysis to ensure the cleanup meets the requirements

outlined in the SLDS ROD. Although most of the work has reached no deeper than eight feet below the surface, a remedial activity in one area has reached depths of twenty-two feet. Approximately 7,700 of the estimated 15,500 cubic yards have been removed to date from the 4.5-acre area of Plant 6 East Half.

Plant 1 Nearly Finished

In June, the USACE successfully completed the remediation of all except 10 cubic yards of contaminated material in Plant 1 at SLDS. Over 2,500 cubic yards of material were removed from the Plant 1 area, which was the center of Manhattan Engineer District/Atomic Energy Commission activities during the 1940s and 50s.

Progress in the isolated areas slowed through the winter months when the USACE accommodated the property owner's need to meet regulatory requirements for current operations. The owner is installing temporary overhead piping to carry wastewater from on-going business operations. Since the isolated areas are only large enough to accommodate one construction crew, cleanup activities have to be carefully coordinated.

The remaining isolated area, which contains 10 cubic yards of contaminated material, is the final area in Plant 1 impacted by the property owner's project. Cleanup of this final isolated area of contamination, which is located

Upcoming Events

Information Releases:

Fall Newsletter - September 2001

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on July 13th, August 10th, and September 14th. (Please come if you are available!)



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within one of two entrances to a building essential to current business operations, will be delayed until construction activities in the other entrance are complete.

What's Next?

Once the remaining accessible contamination in Plant 1 is successfully remediated, the USACE will return the plant to Mallinckrodt. In the meantime, crews will continue cleanup activities in Plant 6 East Half and begin work at the SLDS Vicinity Properties. ■

St. Louis Airport Site (SLAPS)

Removal Action Continues

Under the approved 1998 Engineering Evaluation/Cost Analysis for the site, removal activities in the East End Extension are well underway at the St. Louis Airport Site (SLAPS). Over 33,000 cubic yards of contaminated soil have been removed during this phase and another 18,000 cubic yards are anticipated.

The East End Extension consists of a five-acre wedge of contaminated soils nestled between the Radium Pits and East End (see photo below), which the USACE has already cleaned up. It also includes a large portion of the drainage ditch that borders the northern boundary of the site.

Although the majority of the contamination in this work area is within five to nine feet of the surface, some areas require excavation to depths of 15 feet. The USACE anticipates encountering ground-water five feet below the original surface.

Crews completed removal of the upper four feet of contaminated soil from the East End Extension this spring. The remainder of the cleanup in the East End



Removing contaminated material from the SLAPS East End Extension will help ensure contamination does not migrate to recently cleaned areas such as the East End or the Radium Pits.

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If you have any suggestions, questions, or comments, contact our office anytime.

Extension has been divided into smaller sections to enable the USACE to better manage drainage water during the excavation. Black tarps weighted with sandbags cover sections awaiting cleanup and prevent contaminated soils and water from migrating offsite. The tarps also aid in segregating clean rain water from other contaminated water in an effort to minimize water management costs.

By removing contaminated soils from the East End Extension, the USACE can continue to minimize the potential migration of contamination from the site. Excavation activities in this area are expected to continue through the end of this summer.

Modular Building Installed

Personnel at the St. Louis Airport Site (SLAPS) have new offices. The USACE recently completed the installation of a 9,600 square foot modular office building, which was transferred to the USACE when the building was listed as excess government property.

The availability of the building is a result of cleanup work at the Weldon Spring Site Remedial Action Project in St. Charles County nearing completion. The Department of Energy used the building as an office to accommodate its workforce at its site. Authorities verified the structure was free of contamination and it became available for use by another federal agency.

The USACE immediately began negotiations to provide a government-owned building for site personnel rather than leasing office space. By February, pieces of the structure began arriving on site.

Positioned in the recently cleaned Radium Pits area of SLAPS, the building is now occupied by the USACE contractor and onsite USACE oversight personnel. The

USACE will remove many, but not all, of the previously occupied on-site support trailers. By removing these trailers, other portions of the site will be more readily available for investigation, design and remediation activities.

What's Next?

The USACE will analyze soil samples from the McDonnell Boulevard right-of-way borings and calculate the extent of contamination beneath the road. ■

Hazelwood Interim Storage Site (HISS)

Pile Removals Near Completion

Under the authority of the 1998 Engineering Evaluation/ Cost Analysis (EE/CA) for the Latty Avenue/Hazelwood Interim Storage Site (HISS), removal of the final stockpile of soil is nearly complete.

The final stockpile is known as the HISS Main Pile due to its size. It once contained an estimated 25,000 cubic yards of soil and debris from property development and improvement projects along Latty Avenue twenty years ago.

Last fall, the USACE successfully removed 4,400 cubic yards of material from the northeastern corner of the pile using a small business contractor. As removal activities continued clockwise around the pile this spring, another 15,800 cubic yards were shipped to an out-of-state licensed disposal facility.

Approximately 4,800 cubic yards of the Main Pile's material remain to be loaded into gondola rail cars and shipped for disposal. Until funding becomes available to finish the process, activities at HISS will be postponed. Currently, the USACE anticipates the removal activities will resume next fiscal year, which begins in October.

What's Next?

The completion of the Main Pile removal action will be completed when funding becomes available. ■

North County

FS/PP Costs Re-Evaluated

The public will soon be able to review and submit comments on six alternatives designed to address the presence of Manhattan Engineer District/Atomic Energy Commission-related contamination in northern St. Louis County.

The Feasibility Study and Proposed Plan (FS/PP) for the North County Sites will present remedial alternatives to



Removal of the final stockpile at HISS is nearly complete. Of the estimated 25,000 cubic yards comprising the Main Pile, roughly 20,200 cubic yards have been removed.

address contamination present at the following sites: Latty Avenue/Hazelwood Interim Storage Site (HISS); St. Louis Airport Site (SLAPS); the SLAPS Vicinity Properties (VPs); and, Coldwater Creek.

While the Feasibility Study describes each alternative in detail, the Proposed Plan will identify the alternative recommended by the USACE. The final remedy for the North County sites will be selected based on the written comments received during the 30-day public comment period. The final remedy may not be the alternative identified by the USACE as the preferred alternative in the Proposed Plan.

The USACE began incorporating the changes into the FS/PP based on the formal comments received from the U.S. Environmental Protection Agency and the Missouri Department of Natural Resources on draft copies of the documents last fall. Some of these changes altered the basis for the cost of each alternative. To ensure the accuracy of information presented to the public, the USACE elected to perform a comprehensive review of the reported cost for each alternative.

Once the cost information is reviewed internally, draft copies of the documents will be provided to the U. S. Environmental Protection Agency and the State of Missouri for final review and comment. Once these comments are addressed, the USACE will present the North County FS/PP to the public for review and comment over a 30-day period.

What's Next?

The North County FS/PP will be released to the public for review and comment. Copies of these documents will be available for public review at the FUSRAP Project Office and at select local libraries. ■

Won't radiological contamination be left behind?

Q: *The St. Louis area landscape has changed dramatically since the early days of the Manhattan Project. Developments now cover what was once empty countryside. Will contamination remain after the rest of FUSRAP is finished because of these improvements? What will protect the public then?*

A: The St. Louis area has changed. Since the time when St. Louis played a major role in the nation's early nuclear weapons program, structures such as buildings, roadways, bridges and railroads cover what was once only farmland. This statement remains true at the FUSRAP sites.

When structures such as these are present on a FUSRAP site, the USACE evaluates its usage and the potential for contamination beneath the structure. If the structure's current construction is protective of the public's health and safety, residual contamination may remain undisturbed until a capital improvement project (such as a road repair or building demolition) provides the government access to the contamination. Then the contaminated material will be removed.

To develop a process to manage this type of residual contamination, the USACE is working with landowners; railroads; utility companies; and representatives from federal, state and local government agencies to develop a long-term stewardship plan. The goal of this plan is to establish controls needed to ensure the protection of the public and the environment after the cleanup of the FUSRAP contamination is considered complete. These controls will be designed to ensure assistance with obtaining information and/or managing the potential risks attributable to the contamination is readily available. By involving these potentially affected groups early in the development process, the USACE can design a collaborative plan that satisfies their needs. ■

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Foreword

It's no secret that bad weather heavily impacts the progress of outdoor work. Remedial activities at the FUSRAP project are no exception. Excavation activities at the St. Louis FUSRAP Sites slowed considerably after the sites were hit with not only the second coldest December on record but also with heavy snowfall-nearly 14 inches in two weeks. Soils at the sites were effectively frozen in place by the sudden cold snap.

With this temporary delay, we thought this was a good time to consider how far work has come on the project. The U. S. Army Corps of Engineers (USACE), St. Louis District assumed responsibility for completing the cleanup of FUSRAP sites in the St. Louis area nearly three and one-half years ago. In addition to the current activity update normally presented in this newsletter, we have added a brief description of achievements since the Corps assumed responsibility for FUSRAP. We hope you find this review as encouraging as we did. ■

North County

Project Review

When USACE took over in 1997, the DOE had just begun removing contamination from the West End of the St. Louis Airport Site (SLAPS) under a 1997 Engineering Evaluation/Cost Analysis (EE/CA). Since then, the USACE-St. Louis District has successfully accelerated work and made substantial progress toward the final cleanup of SLAPS and the Hazelwood Interim Storage Site (HISS) in North County.

Upcoming Events

Information Releases:

Spring Newsletter – May 2001

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on

April 13th, May 11th, and June 11th. (Please feel free to attend if you are available!)

St. Louis Earth Day Celebration - April 22nd in Forest Park (Please stop by and see us!)



Since October 1997, the USACE has removed 112,600 cubic yards of contaminated material from SLAPS.

Under separate EE/CAs, the FUSRAP team obtained public approval to conduct specific actions at the SLAPS and HISS sites. The USACE constructed railspurs at HISS and SLAPS to safely increase shipping and disposal capacity.

Upon completing the West End removal action at SLAPS, site stabilization efforts began. A sedimentation basin was constructed to limit the migration of contamination offsite via stormwater runoff. The Radium Pits, believed to contain the most contaminated soils at the site, were safely removed. Approximately 112,600 cubic yards of material have been removed by USACE from the SLAPS East End, Radium Pits and adjacent ditches to date.

Perhaps the most dramatic change since 1997 has been the removal of the piles that stood at HISS for nearly twenty years. Roughly 28,400 cubic yards of soils from the railspur construction piles, two Eastern Piles, the HISS Supplemental (or Front) Storage Pile, and part of the HISS Main Pile have been removed. Today, only a portion of the Main Pile remains at HISS.

FS/PP Release Scheduled

The North County Feasibility Study and Proposed Plan (FS/PP) will be issued this summer for public review and comment over a 30-day period. These documents will address the presence of contamination related to the activities of the Manhattan Engineer District / Atomic Energy Commission in North St. Louis County.

Six alternatives have been developed to address contamination at the North County Site, which includes the Latty Avenue/Hazelwood Interim Storage Site (HISS), the St. Louis Airport Site (SLAPS), and the SLAPS Vicinity Properties (VPs), and Coldwater Creek.



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While the Feasibility Study (FS) describes each alternative in detail, the Proposed Plan identifies the alternative recommended by the USACE. Once these documents are ready, the public will be given 30 days to review the documents and provide comments to the USACE on the alternatives. In addition, the USACE will host a public meeting to explain the alternatives presented in the documents and accept comments from interested citizens.

The USACE will review all of the comments received and select a final remedy for the North County Sites. The final selected remedy will be based on the comments received during the 30-day comment period and may not necessarily be the alternative identified as the preferred alternative by the USACE in the Proposed Plan.

What's Next?

The North County FS/PP will be released to the public for review and comment once the USACE, EPA and State agencies put the finishing touches on it. Copies of FS/PP will be available for public review at the Project Office and at the local information repositories. ■

SLAPS Vicinity Properties (VPs)

Letters to Property Owners

SLAPS Vicinity Property owners will soon be receiving letters from the USACE regarding FUSRAP contamination on their property. Although owners are aware of the presence of the contamination on their property, the USACE is concerned that not everyone may understand how to request assistance with managing contamination on their properties.



Twenty years after its initial creation, the removal of the Main Pile from HISS has begun. The pile contains approximately 25,000 cubic yards of soil.

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If you have any suggestions, questions, or comments, contact our office anytime.

Owners may wish to make property improvements before a final remedy is selected for the North County Site. They are encouraged to contact the FUSRAP Project Office to allow the USACE to verify the presence of radiological contamination in the impacted area and advise owners of the potential impacts it may have on their work. By working with the property owners, the USACE can minimize the adverse effects of contamination.

What's Next?

Once the final cleanup alternative is selected, the USACE will begin developing plans for the design and cleanup of the site. Progress will be based on the level of funding received from Congress. ■

Hazelwood Interim Storage Site (HISS)

Main Pile Removal Underway

Twenty years after its initial creation, the removal of the Main Pile from the Hazelwood Interim Storage Site (HISS) has begun. This final pile will be removed under the approved 1998 Engineering Evaluation / Cost Analysis (EE/CA) for the Latty Avenue/Hazelwood Interim Storage Site (HISS).

The Main Pile contains an estimated 25,000 cubic yards of soil and debris from two property development / improvement projects on Latty Avenue. The USACE completed removal of a portion of the northeastern corner of the Main Pile in November using a small business contractor. Crews will continue removing the Main Pile this spring by working in a clockwise pattern. Approximately, 4,400 cubic yards have been removed to date.

What's Next?

Using a small business contractor, the USACE anticipates completing the removal of half of the Main Pile this summer if funding is available. Removal activities will continue through the end of October. ■

St. Louis Airport Site (SLAPS)

East End Extension Removal

In November, the USACE began excavating contaminated soils from areas adjacent to the recently decontaminated East End of the St. Louis Airport Site (SLAPS). The removal action, referred to as the East End Extension, is progressing in two general areas: work in the drainage ditch along McDonnell Boulevard, and work between the Radium Pits and East End.

The USACE designed the work to progress from east to west across the site to create a continuous decontaminated area and further stabilize the site. Under the approved 1998 SLAPS Engineering Evaluation/Cost Analysis, approximately 46,000 cubic yards of soil will be removed during the East End Extension removal action. The USACE anticipates completing this effort sometime late this year. Nearly 4,000 cubic yards of soil have been removed to date.

What's Next?

The USACE will continue removing contamination from the East End Extension through the end of this summer. In the meantime, the USACE is completing the design for the next phase of work at SLAPS. ■

St. Louis Downtown Site (SLDS)

Project Review

In 1997, the Department of Energy (DOE) was in the process of completing its building demolition activities in the Mallinckrodt facility at the St. Louis Downtown Site (SLDS). Contaminated soils along the Mississippi River had been removed to support the construction of the Riverfront Trail.

In October 1997, Congress transferred responsibility for FUSRAP from the DOE to the USACE. Within six months, the USACE presented cleanup alternatives for the final cleanup of SLDS to the public. By October 1998, the final SLDS Record of Decision (ROD) identifying the selected site cleanup alternative for accessible soils was issued.

Nearly 18,000 cubic yards of contaminated material have been removed under this ROD. This material has been



Once the small, isolated areas of contamination are removed, permanent supports (called pylons) and piping are being constructed by the owner to support business operation.

removed from the remainder of the property bordering the Mississippi River, the Mallinckrodt Plant 2 area, and portions of Plant 1 and Plant 6 East Half.

Plant 1 Remediation Progressing

Remedial activities in Plant 1 began late last summer when the concrete pad covering the former Building K foundation was demolished. Work continues as the USACE focuses its efforts in two separate areas of the plant - the main excavation area located beneath the Building K pad, and the small, isolated areas of radiological contamination scattered about the remainder of the plant.

Work in the isolated areas is progressing slower than originally anticipated as the USACE attempts to accommodate the owner's need to meet regulatory requirements for current operations. The owner is installing temporary overhead piping to carry wastewater from on-going business operations. After the USACE completes removal of the small, isolated areas of contamination, the owner's construction crews erect permanent supports (pylons) and piping. Since these areas are only large enough for one crew, backfill activities must be delayed as the pylon bridge is constructed.

The remediation area in Plant 1 contains 2,400 cubic yards of accessible contamination within a 6.5-acre area. Approximately 2,100 cubic yards of contaminated material have been removed from Plant 1 to date.

What's Next?


Although the remediation of the Main Area of the Plant 1 cleanup will be complete this spring, work in the isolated areas will continue through the end of this summer. As work winds down in Plant 1, the USACE will intensify efforts to cleanup Plant 6 East Half. ■

Do I Count?

Q: You often mention a “30-day public review period”. What does the public review of a document have to do with cleaning up waste? Even if I review your documents and turn in comments, will my opinions really make a difference?

A: Congress believed that most citizens want to be aware of and participate in decision-making processes that affect their communities. When it created CERCLA (Comprehensive Environmental Response and Compensation Liability Act) in 1980, Congress required agencies to encourage community involvement in the cleanup of hazardous waste sites, especially during the selection of the final remedy. Upon completion of the Feasibility Study (FS), 30 days are set aside for interested citizens to review alternatives presented in the document and provide comments to the issuing agency. However, recognizing that lengthy technical documents can be intimidating, agencies also host a public meeting during the 30-day comment period to provide an understandable explanation of the proposed alternatives and accept comments on the alternatives.

Based on the comments received during the 30-day period, a specific long-term remedy is selected and identified in the Record of Decision (ROD). As the primary decision document, the ROD will substantiate the need for a remedial action, describe the proposed action and justify the action selected. Public comments, responses to those comments and any new information provided during the public review period are detailed in the Responsiveness Summary, a section of the ROD.

If you review the FS and provide written comments to the agency, you could influence the final remedy selected for a site. Although the issuing agency will identify its preferred alternative in the Proposed Plan, the final remedy for a site may be different from the alternative preferred by the agency. So yes, your comments really do make a difference. 

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Clean soil and rock are being used to backfill the 2-acre hole left behind by the cleanup of the Radium Pits. Restoration of this area will be completed by the end of this year.

North County

FS/PP Release Scheduled

The U.S. Army Corps of Engineers (USACE) continues work with its Headquarters, Environmental Protection Agency and State agencies to finish the North County Feasibility Study/Proposed Plan (FS/PP). These documents will present remedial alternatives to address contamination present at the Latty Avenue/Hazelwood Interim Storage Site (HISS), the St. Louis Airport Site (SLAPS), the SLAPS Vicinity Properties (VPs) and Coldwater Creek. The purpose of these alternatives is to address the presence of Manhattan Engineer District/Atomic Energy Commission-related contamination at the sites.

Alternatives for remediating the North County sites will be described in detail in the Feasibility Study and presented to the public for review and comment. The Proposed Plan will identify the alternative recommended by the USACE to address contamination at the sites.


In August, draft copies of the North County FS/PP were provided to the U. S. Environmental Protection Agency and the State of Missouri for review and comment. The USACE is currently working to address the comments received from these agencies in late-October. Once these comments are addressed, the USACE will present the North County FS/PP to the public for review and comment over a 30-day period.



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The final remedy for the North County sites will be selected based on the written comments received during the 30-day public comment period. The final remedy may not necessarily be the alternative identified as the preferred alternative by the USACE in the Proposed Plan.

What's Next?

The North County FS/PP is currently scheduled to be released to the public for review and comment in January 2001, after responses to the EPA and State comments have been addressed. Copies will be made available for public review at the Project Office and at the Local Information Repository .

St. Louis Airport Site (SLAPS)

Radium Pits Excavation Complete

In November, the USACE successfully and safely completed the removal of the most contaminated material encountered to date in the St. Louis FUSRAP project. Approximately 49,800 cubic yards of radiologically contaminated soils were removed from the St. Louis Airport Site (SLAPS) Radium Pits area.

The USACE took every precaution to prevent any release of the material from the site. Air monitors operated continuously in and around the excavation area. Crews regularly sprayed the work area with water to prevent the soils from drying and becoming airborne. New fencing and barriers were installed around the perimeter of the site to prevent inadvertent access. Berms and sumps were located around and within the Radium Pits to ensure the water that fell on contaminated soils was collected, sampled and, if necessary, treated prior to release.

Upcoming Events

Information Releases:

Winter Newsletter – February 2001

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on December 8th, January 12th, and February 9th. (The public is welcome to attend.)



The excavator (shown above) is moving material from the HISS Supplemental Pile into a front end loader, which takes the material directly to the railcars.

Rock and clean soil are being used to backfill the 2-acre hole left from this removal action. The restoration of the area will be completed in December with the exception of a small section at the southwestern corner of the Radium Pits, which will serve as a sump during the next phase of cleanup at SLAPS.

East End Extension Removal Underway

With the completion of excavation activities in the Radium Pits, the USACE is shifting its focus to the removal of the SLAPS East End Extension. The East End Extension contains approximately 46,000 cubic yards of contaminated soils. It includes the region of contaminated soil between the Radium Pits and the East End, and in the drainage ditch immediately south of McDonnell Boulevard.

Removal activities have been designed to limit the total area open at any given time and to prevent cross-contamination. The East End Extension removal action is proceeding in three general phases: work in the drainage ditch from the eastern tip of SLAPS to the edge of the East End; work in the main body of the East End Extension; and work in the drainage ditch from the western edge of the Radium Pits eastward.

In November, the USACE began the first phase of the East End Extension removal action by beginning work in the drainage ditch south of McDonnell Boulevard. Removing contamination from the East End Extension and the drainage ditch will create a continuous area of clean soils in the northeast portion of SLAPS.

What's next?

Once the first phase of the East End Extension removal action is complete, work within the main body will begin. ■

Hazelwood Interim Storage Site (HISS)

Pile Removals Continue

In October, the USACE removed approximately 7,100 cubic yards of material from the Hazelwood Interim Storage Site (HISS) using a small business contractor. The removal of the Supplemental Storage Pile under the 1998 HISS Engineering Evaluation/Cost Analysis (EE/CA) was completed in four weeks.

The Supplemental Pile, which was the result of a drainage and utility improvement project performed by the Cities of Berkeley and Hazelwood in 1986, could be seen behind the project trailers from Latty Avenue. Only the footprint where that pile once stood remains.

The USACE has begun the removal of the Main Pile, the final pile left at HISS. Approximately 12,500 cubic yards of material contained in the Main Pile will be removed under the next contract. The USACE began removing approximately 5,000 cubic yards of soil from the North Half of the Main Pile in November, under an existing contract.

What's Next?

The USACE will continue removing the Main Pile through the end of the year using a small business contractor. ■

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Characterization data obtained from the soil samples will be used to develop remedial designs for the cleanup of the vicinity properties at SLDS.

St. Louis Downtown Site (SLDS)

Plant 1 Remediation Continues

The remediation of Plant 1 at the Mallinckrodt facility is continuing forward on schedule. Cleanup activities in Plant 1 are continuing as two simultaneous remediation efforts - the main excavation area and the eleven isolated areas.

Under the St. Louis Downtown Site (SLDS) Record of Decision (ROD), remediation activities in the main excavation area will result in the removal of approximately 1,500 cubic yards of contaminated soil next to building foundations and roadways. To protect these structures during excavation activities, a steel slide-rail shoring system is being used. This system allows shoring and excavation to be accomplished simultaneously, whereas the installation of traditional sheet piling would have delayed excavation activities 30 days. Removal activities are being accomplished in a series of strips using the slide-rail system.

The eleven isolated areas of elevated radiological activity require remediation to depths of three feet or less. Remedial activities in these areas are expected to produce an additional 400 cubic yards of material for disposal.

Roughly 1,600 cubic yards of material have been removed from Plant 1 to date (including material from four of the isolated areas). The USACE anticipates completing the 1,900 cubic yard excavation and backfill by the end of this year. Restoration of the remediated areas in Plant 1, however, will not be completed until early 2001.

Plant 6 East Half Begins

Preparatory work for the Plant 6 East Half remediation began in November. Since Mallinckrodt uses Plant 6 East Half for current shipping and receiving operations, the USACE plans to phase remedial work to minimize the impact of the cleanup on current business operations.

Workers prepared the site by surveying and staking the excavation area for the first phase of work. Fencing was then installed around the perimeter of the work area to prevent inadvertent access. Electric, water and sewer lines are currently being routed away from the area to minimize safety risks to personnel.

Pre-design characterization data indicates that the Plant 6 East Half contains approximately 3,800 cubic yards of material. Remedial work in this area will begin early in 2001 with the removal of the concrete pad that covers the footprint of the demolished Buildings 116 and 117.

SLDS Vicinity Properties Sampled

The USACE has been busy over the last several months systematically collecting soil samples to characterize contamination on properties surrounding the Mallinckrodt facility. These properties are known as the SLDS Vicinity Properties. They are primarily operating industrial facilities.

Areas of potential contamination were identified in a limited soil sampling event over ten years ago. The current sampling event is necessary to better define the depth and extent of contamination on these properties and to verify that Manhattan Engineer District/Atomic Energy Commission (MED/AEC) contamination is not present in other areas. Several rounds of sampling are typically necessary to fully determine the extent of contamination.

Information obtained from these sampling events will be used to develop work plans and designs for remedial activities at the vicinity properties. The USACE plans to begin remediating the SLDS Vicinity Properties in 2001.

What's Next?

The USACE will begin excavation activities in Plant 6 East Half once the remediation of Plant 1 is finished. In the meantime, data from the sampling of the SLDS vicinity properties will be compiled and analyzed to develop work plans and designs. ■

Why Don't You Just Start Digging?

C If you know where the contamination is, why don't you just start digging it up and hauling it away? Once all of the contamination is removed, the problem is resolved and everyone can go home. Why do you keep writing documents?

A Although an environmental cleanup project seems very simple, numerous documents must be written before the contamination can be removed. No one wants to go into a contaminated area without being certain they know what pollutants are present. Unless you know what contaminants are present, it is difficult to protect yourself or others against its health risks or to protect the environment from additional harm.

In 1980, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA dictates several activities must be conducted before a final remedy can be selected for a site. (FUSRAP is conducted according to CERCLA.)

The first activity in the CERCLA process is to conduct a **Preliminary Assessment (PA)**. During the PA, historical background information is collected to determine the likely locations of hazardous materials and to determine the initial extent of site contamination. Next, a **Site Inspection (SI)** is performed to verify this information by collecting limited soil and water samples. If substantial amounts of contamination are confirmed to be present on the site, further study and analysis are needed.

The **Remedial Investigation (RI)** further identifies the types of contaminants present at or near the site, the degree and extent of contamination, and potential risks to public health and the environment. Information gathered during this phase will assist in developing cleanup alternatives to address the contamination, which will be identified in the **Feasibility Study (FS)**. Once the remedial alternatives are identified, the **Proposed Plan (PP)** is written. The PP summarizes the alternatives presented in the FS and identifies a recommended cleanup remedy for a site.

Upon completion of these documents, the FS/PP is presented to the public for review and comment over a 30-day period. While the public can submit comments at any time during this review period, a public meeting is also held to provide an opportunity to discuss the alternatives. After the 30-day comment period has ended, a specific long-term remedial action or cleanup technology can be selected. The selected cleanup alternative is identified in the **Record of Decision (ROD)**, which is the final document in the CERCLA process. The ROD will substantiate the need for a remedial action, describe the proposed action and justify the removal action selected. Public comments, the Corps's replies to public comments, and any new information are addressed in the Responsiveness Summary of the ROD.

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Uranium-contaminated dust at the Madison Site was vacuumed and scraped from overhead structures.

MADISON SITE

Madison ROD Signed

In May 2000, the St. Louis District, U. S. Army Corps of Engineers (USACE) released the signed Final Record of Decision (ROD) for the Madison Site in Madison, Illinois. In response to the potential risk of exposure to radioactive dust, the USACE selected a final remedy for the site entailing a cleanup that is protective of human health and the environment.

During the late 1950s and early 1960s, the site was used to perform extrusions of uranium metal and straightening of extruded uranium rods for the U. S. Atomic Energy Commission (AEC). In 1999, the USACE identified uranium contamination in two buildings operated by a manufacturer in Madison, Illinois. The contamination was limited to dust on overhead surfaces.

In February 2000, four remedial alternatives were identified to address the contamination at the Madison Site. These alternatives were presented to the public for review and comment in a Remedial Investigation/ Feasibility Study (RI/FS) and Proposed Plan. Based on comments received from the general public and regulatory agencies, the USACE selected Alternative 4, decontamination of accessible surfaces.

Alternative 4 is identified as the final remedy for the Madison Site in the Record of Decision (ROD). The ROD incorporates public comments received on the Feasibility

Study and outlines the final cleanup method selected to address the contamination. The Madison ROD was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Madison Site Administrative Record, on which the final decision was based, was completed and released in May with the signing of the ROD.

Madison Decontamination Complete

Under the Final Record of Decision (ROD), decontamination activities at the Madison Site began in June. The USACE designed the cleanup activities so that the site would meet the specific cleanup levels established to protect human health and identified in the Madison Site ROD.

The small business contractor mobilized its decontamination teams to the site with protective clothing, scaffolding and equipment. Uranium-contaminated dust was vacuumed from overhead structures over a 12-day period. By mid-July, independent surveys confirmed that the USACE had successfully decontaminated Buildings 6 and 4 ahead of schedule and under budget. Forty cubic yards of contaminated dust and materials were sent to a licensed, out-of-state facility for disposal.

The current condition of the site will be documented in a Post Remedial Action Report for the Madison Site. This report will document how the current condition of the decontaminated areas meet the criteria established in the Madison Site Record of Decision.

What's Next?

After the Post Remedial Action Report is complete, the site will be removed from the list of active FUSRAP sites. ■

Upcoming Events

Information Releases:

Fall Newsletter – November 2000

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on September 8, October 13, and November 10. (The public is welcome to attend.)



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A slide-rail shoring system (shown above) prevents the walls of the excavation from caving in during the Plant 1 remediation.

ST. LOUIS DOWNTOWN SITE (SLDS)

Plant 2 Remediation Complete

Asphalt now covers Plant 2, which is the first area within the Mallinckrodt facility successfully remediated under the St. Louis Downtown Site (SLDS) Record of Decision.

Remediation of the SLDS Plant 2 area began last year with the excavation and removal of contaminated material covering the area. By May, construction crews encountered 19th century utility lines predating available maps. Utility lines had to be temporarily relocated and/or shutoff before the excavation could proceed.

Remedial activities were temporarily delayed again in August 1999 when Civil War ordnance was discovered in the excavation. The USACE paused to develop a plan for the remediation of the remainder of the Plant 2 area in accordance with the SLDS Record of Decision while minimizing safety risks for plant personnel and remediation workers.

Over the next seven months, contaminated soils were removed in 10- to 15-inch thick layers after being scanned for the presence of metal objects. Law enforcement authorities received thirty pieces of ordnance for disposal recovered from the Plant 2 excavation.

The USACE removed approximately 10,600 cubic yards of contaminated material from Plant 2. A Post Remedial Action Report, which documents the condition of the site after remedial activities have taken place, is being prepared. This document will confirm how the current

condition of the site meets the criteria established in the SLDS Record of Decision and will be released in October.

Plant 1 Excavation Begins

Now that the remediation of Plant 2 is complete, the USACE has shifted its focus to Plant 1 where Mallinckrodt's Building K once stood.

Plant 1 site preparatory work began this spring within the anticipated excavation footprint. Crews installed fencing around the excavation area to prevent inadvertent entry. Electric, water and sewer lines continue to be routed around the area to minimize the safety risk to personnel. A temporary ramp was also built to provide access to the remediation area for transporting material to the loading facility.

For Plant 1, a steel, slide-rail shoring system will be used to provide additional support to the walls during remedial activities. The Plant 1 excavation will be completed in three separate strips reaching 12 feet in depth. The main area (or the area where Building K once stood) will be remediated using open excavation techniques expected to reach depths of up to 16 feet.

The USACE anticipates completing the 1,500 cubic yard excavation and backfill of Plant 1 by the end of this year. However, site restoration, which consists of restoring utility connections, grading and paving the area, will continue into next year.

What's Next?

Plant 1 will be backfilled and restored once survey data confirms that the remediation criteria established in the SLDS Record of Decision have been met. ■

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NORTH COUNTY

FS/PP Nears Release

The selection of the final remedy for the North County sites is on the horizon. The USACE has been busy developing the North County Feasibility Study and Proposed Plan (FS/PP) for presentation to the public. These documents will address the presence of Manhattan Engineer District/Atomic Energy Commission-related contamination at the Hazelwood Interim Storage Site (HISS), the St. Louis Airport Site (SLAPS), the SLAPS Vicinity Properties (SLAPS VPs) and Coldwater Creek.

Alternatives for remediating the North County Sites will be described in detail in the Feasibility Study, while the Proposed Plan will identify the USACE recommended alternative to address contamination at the sites.

Over the past several months, the USACE has been carefully reviewing draft documents to ensure they adequately address contamination in the North County area. Currently, the U. S. Environmental Protection Agency and the State of Missouri are reviewing draft copies of these documents to ensure they fully consider all applicable, relevant and appropriate requirements. Once the regulator's comments have been addressed and incorporated into the documents, the public will be given the opportunity review and comment on the North County FS/PP.

What's Next?

This winter the USACE will present the FS/PP to the public for review and comment to determine the final remedy for the site. A public meeting will be held approximately two weeks after the release of the documents to the public to gather comments. ■

ST. LOUIS AIRPORT SITE (SLAPS)

Radium Pits Excavation Continues

Excavation activities at the St. Louis Airport Site (SLAPS) have left a large, 2-acre hole where a contaminated area known as the Radium Pits was once located.

The gross excavation of contaminated soils in the Radium Pits, which began in May 2000, is complete. While the bulk of the excavation is complete, surveys are being performed to identify the locations of residual radiological contamination for removal. To date, over 525 railcars containing 37,800 cubic yards of material have been shipped from the site to a licensed, out-of-state disposal facility. Backfill of the Radium Pits with clean soils is expected to begin in October.

What's Next?

Once confirmation is received that removal criteria have been met for the Radium Pits activity, the area will be backfilled and grass seed will be placed to prevent erosion. ■

HAZELWOOD INTERIM STORAGE SITE (HISS)

Supplemental Pile Removal

Fourteen years after its creation, the HISS Supplemental Pile, which can be seen from Latty Avenue, is being removed. This material is being removed under the 1998 Engineering Evaluation/Cost Analysis (EE/CA) for the Latty Avenue/Hazelwood Interim Storage Site. The Supplemental Pile contains 5,500 cubic yards of material that resulted from drainage and improvement project performed by the Cities of Berkeley and Hazelwood in 1986.

The USACE completed negotiations with a woman-owned, small business contractor for the removal of the HISS Supplemental Pile in August. Since then, the contractor has submitted the project plans to the USACE for approval. The project plans describe how the contractor will carry out the pile removal. Once the plans are approved, the contractor will mobilize its crew to the site and begin removing the pile.

Beginning in September 2000, the Supplemental Pile soils will be loaded into railcars at the HISS railspur, which was built in 1999. The soils will then be shipped to a licensed, out-of-state facility for disposal. The USACE has implemented additional protective measures to protect human health and the environment. Crews will spray the area with water regularly to prevent soils from drying and becoming airborne. Permanent air sampling stations have been installed around the perimeter of the site that will operate continuously to help assure soil or dust particles do not migrate from the site.

What's Next?

During the removal of the Supplemental Pile, the USACE will design the removal of the first half of the HISS Main Pile. ■



While the bulk of the Radium Pits excavation is complete, walkover surveys help identify the locations of residual radiological contamination for removal

We've Moved!

If you came by the Project Office lately, you would notice some pretty big changes have taken place. Throughout the month of July, we have been busy moving the trailers from 9170 Latty Avenue to 8945 Latty Avenue (just up the street). By moving the trailers off the site, heavy construction equipment will have more room in which to operate and begin removing the piles at the Hazelwood Interim Storage Site (HISS).

Feel free to visit us at our new location - 8945 Latty Avenue! Or call us at our new number, (314) 260-3905, if you have any questions about the program!



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The selected remedy addressing uranium-contaminated dust, found on overhead eaves in Buildings 4 and 6, will be identified in the Record of Decision for the Madison Site.

Madison Site

Record of Decision (ROD) Coming Soon


Comments received from the public on the Remedial Investigation/Feasibility Study (RI/FS) are assisting the U. S. Army Corps of Engineers (USACE) in developing a final plan to address the Madison Site.

Four remedial alternatives were developed to address the presence of uranium-contaminated dust on overhead steel beams at the Madison Site. These were presented to the public for review and comment in the Feasibility Study.

The USACE developed remedial alternatives to address uranium-contaminated dust based on detailed site-specific characterization data presented in the Remedial Investigation. The alternatives presented at the public meeting included No Action (for baseline comparison), Institutional Controls, Containment, and Decontamination of Accessible Surfaces. The USACE identified its recommended alternative, Decontamination of Accessible Surfaces, in the Proposed Plan.

The Madison Site RI/FS and Proposed Plan were presented to the public at the Madison City Hall in February. Comments received during the public comment period on these documents are being carefully weighed and considered as the USACE develops the final Record of Decision (ROD), which identifies the approved selected alternative for addressing site contamination.

What's Next?

The USACE will respond to comments received during the public review of the Madison Site RI/FS and Proposed Plan. The approved Madison Site Record of Decision (ROD) is expected in May 2000. 

North County


Feasibility Study Nears Release

The USACE has been busy developing a North County Feasibility Study and Proposed Plan (FS/PP) for presentation to the public. These documents will address the presence of low-level, radioactive contamination at the Hazelwood Interim Storage Site (HISS), the St. Louis Airport Site (SLAPS), the SLAPS Vicinity Properties (SLAPS VPs) and Coldwater Creek.

Alternatives for remediating the North County Sites will be described in detail in the Feasibility Study, while the Proposed Plan will identify the recommended alternative to address contamination at the sites.

Over the past several months, the USACE has been carefully reviewing draft documents to ensure they adequately address contamination in the North County area prior to releasing the document to the public for review.

What's Next?

The FS/PP will be presented to the public for review and comment this summer. After the public review, the USACE will consider comments on the FS/PP and select the final remedial alternative, which will be identified in a North County Record of Decision. 

Upcoming Events

Information Releases:

Summer Newsletter – July 2000

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on May 12, June 9, and July 14. (The public is welcome to attend.)



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The first significant removal action at HISS began with the disposal of 5,900 cubic yards of excess soils generated by the construction of the railspur.

Hazelwood Interim Storage Site (HISS)

Pile Removal Underway

The first significant removal action at the Hazelwood Interim Storage Site (HISS) is underway. The contractor, a woman-owned small business, mobilized its crew to the site in February.

Removal work began in March with the construction of a haul road alongside the HISS railspur. In the first 20 days, 5,900 cubic yards of excess soil generated last year during the railspur construction was removed from the site. After the excess soils stored between the main and supplementary storage piles were removed, the contractor began to focus on the removal of the Eastern Piles.

The Eastern Piles contain approximately 8,000 cubic yards of material. The Corps is removing these piles under the 1998 Engineering Evaluation/Cost Analysis (EE/CA) for the Latty Avenue/Hazelwood Interim Storage Site.

What's Next?

The USACE is reviewing characterization data and developing designs for the removal of the Supplemental (or Front) Pile immediately behind the Project Offices. ■

St. Louis Airport Site (SLAPS)

Radium Pits Removal Underway

The removal of low-level, radioactive contamination from an area of the St. Louis Airport Site (SLAPS) commonly referred to as the Radium Pits is underway. In September 1999, the Corps sampled the area to better define geological, chemical and safety issues specific to the Radium Pits.

While historical records indicated that the USACE could reasonably anticipate encountering elevated levels of radium and thorium in the Radium Pits area, data collected from this sampling effort found significantly lower radium levels than expected. The decreased concentrations somewhat eased concerns over exposure to radon, which is a daughter product of the decay of radium. In contrast, sample results found higher levels of thorium than anticipated.

To maintain site safety during this removal action, air monitors are operating continuously in and around the excavated area. Crews regularly spray the area with water to prevent soils from drying and becoming airborne. New fencing and barriers were installed around the perimeter of SLAPS to prevent inadvertent access. Berms and sumps are located around and within the Radium Pits to ensure the water that falls on contaminated soil is collected, sampled and, if necessary, treated prior to release.

Approximately 29,000 cubic yards of contaminated material are scheduled for removal from the Radium Pits to a permitted, out-of-state disposal facility by July 3, 2000.

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What's Next?

The USACE hopes to complete the Radium Pits removal action in July 2000. Once the bulk of the excavation is complete, crews can begin surveying the area to verify that it meets the cleanup criteria set forth in the 1998 SLAPS Engineering Evaluation/Cost Analysis (EE/CA).

East End Removal Complete

Site stabilization work on the SLAPS East End resulted in the removal of approximately 27,000 cubic yards of contaminated soil. Removal work, which began on the East End to create a continuous path of excavation from east to west across the site, concluded in February.

Once radiological surveys confirmed the removal of the contamination, the area was partially backfilled with clean soil. Final backfilling and grading activities will occur after the USACE develops its final site grading plan.

What's Next?

Removal work will continue to move westward across the site from areas of higher to lower elevations in order to stabilize the site and prevent storm-water runoff from transporting contaminated sediments into clean areas. ■

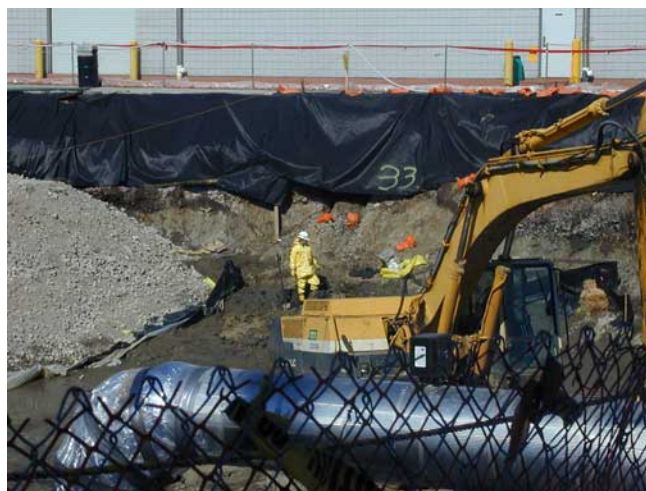
St. Louis Downtown Site (SLDS)

Plant 2 Excavation Complete

The excavation of the Mallinckrodt Plant 2 footprint was concluded in April 2000 with the removal of approximately 10,200 cubic yards of material. Remedial work was delayed temporarily in late August when unexploded Civil War ordnance was discovered during excavation activities.

Ordnance experts developed a plan to address the possibility of encountering more ordnance in Plant 2. The plan enabled the USACE to continue remediation of the site in accordance with the approved St. Louis Downtown Site (SLDS) Record of Decision while minimizing safety risks for plant personnel and remedial workers.

Magnetometers, which can detect buried metal objects four feet below the surface of the soil, were used to verify the work area was clear of all metal objects. Once a work area was cleared, excavators removed the top 10- to 15-inches of soil for disposal. Roughly 5,000 cubic yards of contaminated soils were removed this way and resulted in the discovery of additional Civil War ordnance in December and March.



Excavation of Plant 2 concluded in April with the removal of approximately 10,200 cubic yards of material.

What's Next?

The USACE anticipates completing backfill activities in the Plant 2 area in May.

Plant 1 Work Underway

SLDS Plant 1 site preparatory work began in March with the staking of the excavation footprint. Electric, water and sewer lines will be routed away from the area to minimize safety risks to personnel.

Since the Plant 1 remediation area is adjacent to currently operated buildings without the cushioning barrier of a street or walkway, a great deal of care and coordination will be required to protect plant workers. The USACE is working closely with Mallinckrodt personnel to coordinate remedial activities and minimize the impact on daily business operations as much as possible.

Pre-design characterization data indicates that Plant 1 contains approximately 1,500 cubic yards of contaminated material in the main area of excavation. Another 500 cubic yards, divided between an additional eleven nearby areas of elevated radiological activity, will also be remediated.

What's Next?

Sheet piling, which are steel sheets used to reinforce and protect the foundations of nearby buildings during remediation of the Plant 1 area, will be driven into the ground. Once this is complete, the excavation of radiological contamination in Plant 1 will begin. ■

Am I Protected?

Q. As I pass by your sites, I see workers dressed in moon suits and white garments? Am I protected from the radiation at your site?

A. Radiation presents a hazard if taken into the body. Radioactive particles can be taken into the body through inhalation or ingestion (eating or drinking). Three factors can be used to protect the body from external radiation—distance, time and shielding. Individuals are better protected the farther from the source of radiation, the shorter the time of exposure, or the thicker the shielding.

As you pass by one of the St. Louis Sites, you are protected from its radioactive materials by a variety of protective measures taken by the Corps. First, a fence around contaminated areas reduces the potential for inadvertent entry and distances you from the radiation. Second, water sprayed on the site prevents dust from becoming airborne (or inhaled) as crews excavate contaminated soils. Third, continuously operating air monitors positioned around the excavated area, assess the effectiveness of these protective measures by monitoring the levels of airborne particles present.

Because they may work directly with materials for long periods of time, workers are exposed to the greatest risks posed by FUSRAP contamination. Depending on the levels of radiation and their proximity to the material, workers are dressed in varying degrees of protective clothing. As you pass by one of the FUSRAP sites, you will see workers dressed in varying levels of protective gear.

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Workers, dressed in the appropriate level of personal protective clothing and respiratory equipment, collected samples from the Radium Pits to verify contaminant information.

North County

Feasibility Study Being Developed

The USACE is currently developing the North County Feasibility Study/Proposed Plan (FS/PP), which will describe remedial alternatives to address contamination on the sites. The North County FS/PP will address contamination at the Latty Avenue/Hazelwood Interim Storage Site (HISS), the St. Louis Airport Site (SLAPS), the SLAPS Vicinity Properties (VPs) and Coldwater Creek.

By working with the Missouri Department of Natural Resources and the U. S. Environmental Protection Agency, the USACE hopes to resolve outstanding issues prior to releasing the document to the public for review. The agencies are working together to determine which federal and state regulations apply to these sites and to resolve issues regarding potential contaminants of concern.

In the coming months, the FS/PP will be presented to the public for review and comment. After the review period is over, the final remedial alternative will be selected and identified in the Record of Decision.

One more way to keep in touch:

MDNR FUSRAP Field Oversight Office
917 N. Highway 67, Suite 104
Florissant, MO 63031
phone (314) 877-3250

St. Louis Airport Site (SLAPS)

Radium Pits Tested

In September, the USACE dug test pits in an area of the St. Louis Airport Site (SLAPS), commonly referred to as the Radium Pits, which are located in the curve of the site next to McDonnell Boulevard. The test pits were dug to better characterize the extent of contamination and to develop a geological profile for this portion of the site.

The Atomic Energy Commission/Manhattan Engineer District (AEC/MED) previously used the Radium Pits to store residues from manufacturing operations at the St. Louis Downtown Site (SLDS).

By investigating the Radium Pits, the USACE gathered valuable radiological and geotechnical data for developing plans, which accurately address the Radium Pit's conditions. While significantly less radium than expected was found, the results of this activity showed that higher levels of thorium exist in this location.

The USACE was concerned that radon, which is a byproduct produced by the decay of radium, would be a problem given the original data that calculations were based on. However, since the actual radium levels were low, radon levels were not an issue.

The USACE, in conjunction with state and federal agencies, is currently developing the Plans and Specifications for this removal action. It is anticipated work will begin this spring in the Radium Pits. An estimated 26,000-28,000 cubic yards of contaminated soils are scheduled for removal. ■

Upcoming Events

Information Releases:

Winter Newsletter – February 2000

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on December 10, January 14, and February 11.



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The workers shown here are in the process of surveying an area to determine if further excavation is required. Once surveys confirm the contamination has been removed, the Corps can direct its contractors to begin backfilling the excavated area with clean material.

East End Excavation Continues

Site stabilization work is continuing at the East End of SLAPS in the wedge between McDonnell Boulevard and Banshee Road. Confirmation surveys have verified that the contamination has been removed from the eastern most survey unit. Under the USACE's direction, contractors have begun backfilling the cleaned areas.

Removal work on SLAPS will progress in a continuous path of excavation from east to west across the site. This progression will stabilize the site and prevent storm-water run-off from re-contaminating cleaned areas as work moves from higher to lower elevations. To date, the contractor has excavated 16,500 cubic yards of contamination from the East End.

What's Next?

Once the confirmation surveys and the backfill of the remainder of the East End are completed, the SLAPS Construction Support Area will be moved to the East End and thus allow excavation activities to continue across the site. ■

Hazelwood Interim Storage Site (HISS)

Lab Relocation Nearly Completed

The USACE has procured a new site lab to replace the current facility. Production requirements and the HISS Railspur construction this spring brought attention to potential production problems with analyzing samples at the lab's original location.

The analysis of radiological samples requires a stable environment. Once heavy equipment begins removing the nearby piles, the lab's original location at the end of a railspur will no longer suffice.

The relocated facility will better support the number of samples that need to be analyzed. As the USACE removes more contaminated material from the St. Louis sites, the increased capability will enable the lab to process these samples without impacting the schedule of work on the rest of the project. The new lab should be fully operational by mid-December 1999.

Pile Removal Design Continues

In September, the USACE completed technical negotiations regarding the removal of the HISS Eastern Pile and the Spoil Piles from the railspur construction with a selected small, woman-owned business. Together these piles contain approximately 12,000 cubic yards of material. The Corps will remove these piles to minimize disruption to business operations and facilitate the current owner's use of the property.

The contractor has submitted the project plans to the USACE for approval. These plans describe how the contractor will implement the design plans during the actual pile removal. Once the plans are approved, the contractor will mobilize its personnel and equipment on-site, receive site-specific training to ensure personnel are familiar with the site, and begin removing the piles using the new railspur.

What's Next?

Once these preparatory activities have been completed, the piles will be removed under the approved 1998 HISS Engineering Evaluation /Cost Analysis (EE/CA). Until a Record of Decision (ROD) describing the final cleanup method is approved, no subsurface contamination at HISS can be removed. ■

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Excavation in Plant 2's main remediation area will continue once unexploded ordnance plans, which address the presence of the Civil War Ordnance, are approved.

St. Louis Downtown Site (SLDS)

Plant 2 Progress on Hold

Remediation work in Plant 2 stopped when unexploded Civil War ordnance was found during site excavation in late August.

Historians suspect the ordnance originated from a prior land owner (Buck's Stove & Range Company), which manufactured cast iron stoves. After the Civil War, many weapons were decommissioned and sold as scrap iron. Authorities speculate that Buck's Stove & Range Company, which was using the iron from the rounds for manufacturing stoves, discovered the live rounds and buried the rounds rather than disarming them.

Years later, in 1935, Mallinckrodt purchased and demolished the foundry. They discovered and disposed of hundreds of cannonballs left over from the Civil War, unaware of the buried rounds. By 1941 Mallinckrodt erected buildings on that same site to support Manhattan Engineer District / Atomic Energy Commission (MED/AEC) activities during World War II. Now more than sixty years after the demolition of the foundry, the buried rounds have been discovered.

While the USACE will not continue remediation in the main area of excavation until an Unexploded Ordnance (UXO) plan is approved, four small adjacent areas of elevated radiological activity are being remediated. These four areas total approximately 120 cubic yards.



This twelve pound cannon ball made of iron was one of the pieces of ordnance found during the Plant 2 remediation. Originally, the hole in the cannon ball would have been plugged. The ball was filled with black powder.

UXO Plan Under Review

Ordnance experts are working with physicists to finalize a plan that addresses the possibility of encountering more ordnance in the radiologically contaminated soils of the main excavation area in Plant 2. The plan will enable the USACE to backfill the open excavation.

Magnetometers, which can detect buried metal objects four feet below the surface of the soil, will be used to verify the work area is clear of all metal objects. If the magnetometer detects a metal object beneath the surface, a team of UXO specialists will dig up the object by hand. If it is identified as ordnance, it will be turned over to the St. Louis Bomb Squad for disposal. Once the work area is cleared using the magnetometer, an excavator will remove the top 10- to 15-inches of soil for disposal.

This process would be repeated for each layer of soil until the remaining 5,000 cubic yards of contamination in Plant 2 has been removed as described in the SLDS Record of Decision. The USACE hopes that the remedial work in Plant 2 can be completed by February assuming inclement weather does not further hamper remediation efforts.

Plant 1 Remediation Starting

Concurrent with the Plant 2 work, contractors are focusing their efforts on Plant 1. Remediation activities in Plant 1 will begin with the removal of the asphalt and concrete, which presently cover the contaminated soils around the footprint of the demolished Building K.

To prepare the site, crews will survey and stake the excavation area so that it may be fenced off to prevent inadvertent access. Electric, water and sewer lines will be routed away from the area. Due to an elevation difference between the Building K pad and the street, a temporary ramp will be constructed to assist the trucks in transporting material from Plant 1 to the loading facility.

Pre-design characterization data indicate Plant 1 contains approximately 1,500 cubic yards of contaminated material in the main excavation area. Another 500 cubic yards divided between an additional eight areas of elevated radiological activity in Plant 1 will also be remediated.

What's Next?

Once the UXO plan is finalized, remedial work in the main excavation area of Plant 2 will resume while regular construction crews remediate Plant 1. ■

Why Don't You Just Start Digging?

Q: If you know the contamination is there, why don't you just start digging it up and hauling it away? Once all of the contamination is removed, the problem is resolved and everyone goes home. Why do you keep writing documents?

A: Although an environmental cleanup project seems very simple, numerous activities must take place before contaminants can be removed. No one wants to go into a contaminated area without knowing what pollutants are there. Unless you know what contaminants are present, it is difficult to protect yourself against its health risks.

In 1980, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). FUSRAP is conducted according to the processes described in CERCLA.

The first step in the CERCLA process is to conduct a **Preliminary Assessment (PA)**. Historical background information is collected to determine the likely locations of hazardous materials and to determine the initial extent of site contamination. Next, a **Site Inspection (SI)** is performed to verify historical information through limited soil and water sampling. If substantial amounts of contamination are confirmed present on the site, further study and analysis are needed. The **Remedial Investigation (RI)** further identifies the types of contaminants present at or near the site, the degree and extent of contamination, and potential risks to the public health and environment. Information gathered during the RI will assist in developing cleanup alternatives, which will be identified in the **Feasibility Study (FS)**. Once the remedial alternatives are identified, the **Proposed Plan (PP)** is written. The PP compares the alternatives presented in the FS and identifies a recommended cleanup remedy for a site. When the draft FS/PP is completed, the documents are presented to the public for review and a 30-day public comment period begins. While the public can submit comments at any time during this review period, a public meeting is also held to provide an opportunity to discuss the alternatives. After the 30-day comment period has ended, a specific long-term remedial action or cleanup technology is selected.

The selected cleanup alternative is identified in the **Record of Decision (ROD)**, which is the final document in the CERCLA process. The ROD will substantiate the need for a remedial action, describe the proposed action and justify the removal action selected. Public comments, the Corps' replies, and any new information are detailed in a section of the ROD known as the Responsiveness Summary.

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The East End removal action continued through the contractor turnover with the excavation of 5,200 cubic yards.

St. Louis Airport Site (SLAPS)

East End Excavation Resumed

In October 1998, the U. S. Army Corps of Engineers (USACE) began a two-phase removal action on the East End of the St. Louis Airport Site (SLAPS). Work began in the wedge between McDonnell Boulevard and Banshee Road as part of the site stabilization effort to prevent surface water runoff from carrying radioactive contaminants from the site.

The East End removal action was originally designed as a single activity; however, above normal winter rainfall hampered the progress of removal efforts. As a result of the moisture delay, the removal activity was split into two sections –the Northern and Southern Sections.

Under the initial contract, 9,000 cubic yards of contaminated material were excavated from the Northern Section. The new contractor will remove an additional 10,000 to 15,000 cubic yards of soil from the Southern Section and backfill the area as confirmation activities verify the removal of contaminants to established criteria has been accomplished.

Radium Pits Design Continues

The USACE is finalizing the design to remove contamination from the Radium Pits, which are located in the hump of SLAPS next to McDonnell Boulevard. Work in this section of SLAPS is proceeding under the authority of

the Final SLAPS Engineering Evaluation/Cost Analysis (EE/CA) reviewed by the public in March 1998.

The Atomic Energy Commission/Manhattan Engineer District (AEC/MED) previously used the Radium Pits to store residues from manufacturing operations at the St. Louis Downtown Site (SLDS). Presently, it represents one of the most contaminated areas on the site.

Although work was originally scheduled to begin in June, the excavation has been delayed until October because of weather delays (rain and heat). An estimated 40,000 cubic yards of contamination will be removed from the Radium Pits as the USACE works its way from east to west across the site stabilizing it to limit further offsite migration of material.

Contractor Transition Complete

Work at SLAPS and its contiguous properties has been successfully transitioned to a Total Environmental Restoration Contractor (TERC). Picking up where the previous contractor left off, the TERC is drafting designs and conducting removal actions under the direction of the USACE. Using one contractor to design and excavate is expected to result in a more cost effective and efficient flow of work.

Efforts to stabilize the site and prevent the migration of radioactive contamination (such as the East End removal action work) continued through the transition. By the end of July, sixty-eight railroad gondola cars carrying approximately 5,200 cubic yards of material had been shipped to a licensed out-of-state disposal facility since the contractor transition in June.

What's Next?

Once confirmation is received that removal criteria have been met for the East End activity and the area has been backfilled, contractors will move westward toward the Radium Pits. ■

Upcoming Events

Information Releases:

Fall Newsletter – November 1999

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on September 10, October 8, and November 12, 1999.



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Hazelwood Interim Storage Site (HISS)

Spoil Piles Stabilized

The USACE recently stabilized the HISS Railspur spoil piles by spraying on ConCover®, which encapsulated them with a polymer-type coating.

In April, site inspections revealed that these temporary piles, which were stored in the available space between the main and supplementary storage piles, became geologically unstable creating a potential health and safety risk. In addition, high winds occasionally dislodged the heavy liner weighted with cinder blocks making it difficult for workers to maintain coverage.

To eliminate these concerns, a temporary polymer-type coating that would last six months was applied to stabilize the piles until their scheduled removal in two months. The coating has stabilized the piles, ensuring material won't continue to slide down the slope face or risk dispersal by the wind.

Lab Relocation Started

The USACE is negotiating a lease to relocate the HISS on-site lab. Railspur construction near the lab this spring brought attention to potential production problems with analyzing samples.

Analysis of radiological samples requires a stable environment. The current location at the end of the new rail spur would not be adequate once heavy equipment began removing the nearby piles this fall.

In addition, the current facilities do not support the number of samples that need to be analyzed. As the USACE removes more contaminated material from these sites, the lab will be required to process more samples. Moving the



The spoil piles were recently sprayed with a gray polymer-type coating, which has stabilized them until their scheduled removal this fall.

lab to a more stable location will permit work on the rest of the project to continue as scheduled.

What's Next?

Once the negotiations are finished, the woman-owned, small and disadvantaged business contractor will mobilize on-site to begin removing the spoil piles and Eastern Piles. ■

North County

Ecological Risk Under Review

In mid-July, the USACE released its Ecological Risk Assessment for the North County Sites to the Environmental Protection Agency and the Missouri Department of Natural Resources for review. These regulatory agencies are reviewing the screening evaluation presented by the USACE specifically for Coldwater Creek on FUSRAP's ecological risk (i.e. the impact of contamination on the environment).

In the document, comparisons were made to determine if additional data is necessary to more fully assess ecological risk. Based on the review of this evaluation, these agencies will determine if further sampling is required to establish ecological risk in late August.

What's Next?

While the agencies review and provide input to the assessment of ecological risk, the USACE will continue developing remedial alternatives for the final cleanup of North County Sites. These alternatives will be presented to the public in a Feasibility Study in upcoming months. ■

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St. Louis Downtown Site (SLDS)

Plant 2 Progress Slows

Final cleanup activities within the Mallinckrodt Plant 2 area are proceeding slowly as workers negotiate their way around utility lines. Remedial activities are being conducted using criteria in the approved St. Louis Downtown Site (SLDS) Record of Decision (ROD). Remediation of Plant 2 began in January with the removal of a concrete slab, which had covered the footprint of a demolished building.

Subterranean utilities from demolished buildings dating back to 1846 are still present in the Plant 2 area and slowing progress. While crews reviewed historical maps before excavating, they have discovered utility lines predating available maps.

Since construction crews continue to encounter utility lines during the remediation, they are proceeding cautiously. As these outdated lines are found, they are shutoff and/or moved before proceeding with the excavation.

To date, approximately 5,000 out of an anticipated 8,500 cubic yards have been excavated from Plant 2 for disposal in a licensed out-of-state facility. The USACE anticipates Plant 2 remediation will be completed in November pending confirmation that contractors have successfully removed contamination to the criteria established in the SLDS ROD.

Plant 1 and 6 Sampled

The USACE is systematically surveying Plants 1 and 6 to further define the excavation limits to ensure above criteria contaminants are removed as outlined in the SLDS ROD. The data from this sampling effort will establish excavation volumes for the final remedial design for Plants 1 and 6.



Workers cautiously excavate Plant 2 as they continue to encounter outdated utility lines.



Systematically sampling Plants 1 and 6 will establish the excavation area and remediation volumes. The laborer shown here is working with a recently drilled soil sample.

Crews will excavate Plant 1 before starting Plant 6 work. Although a relatively small volume of contamination is anticipated from Plant 1 remediation efforts, it will require very careful planning. Work will be performed in close proximity to ongoing Mallinckrodt operational facilities beginning in October 1999.

What's Next?

Using the final remedial design, crews will begin remediating Plant 1 once Plant 2 has been finished. Engineers will also finalize the Plant 6 Remedial Design plans. ■

Madison

RI/FS/PP Under Development

With the Final Characterization Report for the Madison Site finished, the USACE is now developing a Remedial Investigation/Feasibility Study/Proposed Plan (RI/FS/PP). The Characterization Report identified uranium contamination in two buildings owned by a manufacturer in Madison, Illinois. The Characterization Report confirmed the presence of contamination in dust on overhead surfaces, while the floors and equipment were below criteria.

Now that the extent of contamination has been determined, the USACE is developing a plan to address the site. This strategy will be presented to the public for review and comment in the RI/FS/PP scheduled for release late this year.

What's Next?

The USACE will present the RI/FS/PP to the public for review and comment this fall to determine the final disposition of the site. ■

What is Radioactivity?

Q: Admittedly this question seems pretty elementary until you stop and think about it. If you were trying to explain what radioactivity was to a ten-year-old child, what would you say? Radioactivity is not detectable with five senses. You cannot see, hear, smell, taste, or feel it. Seems a bit harder to answer the question now doesn't it?

A: In its simplest explanation, radioactivity is a type of energy. Furthermore, radioactivity refers to a specific type of energy produced when an unstable atom tries to stabilize itself by "decaying" or releasing particles. As these particles are released, energy is created.

Radiation may take one of two forms: ionizing or nonionizing. Ionizing radiation consists of high-energy particles capable of creating an electrical charge in substances they pass through. Nonionizing radiation cannot create a charge as it passes through material.

Nonionizing radiation may be found in common household products such as lights, microwaves or televisions. Ionizing radiation can be found in everything in nature in trace amounts – including people. It can be found in carbon and potassium, as well as elements such as uranium and thorium. But if radiation is so natural, why are we spending so much to clean it up? Just like sunlight (another radiation source), radiation poses little harm until you've been exposed to too much of it. The Corps is working on the FUSRAP Sites in order to limit the amount of radiation to which we are exposed.

Naturally occurring ionizing radiation may be one of three types (alpha, beta, or gamma). Alpha particles can only travel approximately one to two inches in air and can be blocked by a sheet of paper. Beta particles can travel 6 – 10 feet in air but can be blocked with Plexiglas® or glass. Gamma particles can travel the farthest but may be stopped with lead.

Many people believe radioactivity is a compound that can be treated by finding the right chemical mixture to neutralize it or "make it go away". Unfortunately, since radioactivity is energy produced by elements, which are already in their simplest form, it cannot be neutralized. We can only control the locations of radioactive material and wait until nature takes its course.

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The new HISS railspur has the capability of holding nine railroad gondola cars. Workers here are inspecting the new facility to ensure it meets specifications.

Hazelwood Interim Storage Site (HISS)

Railspur Construction Complete

After six months of work, the U.S. Army Corps of Engineers (USACE) has completed construction of the Hazelwood Interim Storage Site (HISS) railspur. Nine railroad gondola cars easily fit on the new structure. The increased capacity will safely accelerate the removal of radioactive material from HISS; thus eliminating the need to ship contaminated soils by truck over local roads and public highways.

Railspur construction at HISS began in October 1998 under the authority of an Engineering Evaluation/Cost Analysis (EE/CA). As a result of the construction, approximately 5,000 cubic yards of excess soil was generated and is being temporarily stockpiled between the main and supplementary storage piles. The temporary piles are covered with a heavy liner to ensure that soil and dust particles do not move from the site. Air and water resources near the construction area continue to be monitored for release of contamination from the site.

Pile Removal Being Designed

This summer, the USACE anticipates removing the two small piles, referred to as the HISS Eastern piles,

located adjacent to HISS. These piles contain approximately 8,000 cubic yards of material. The Corps will remove these piles to minimize disruption to business operations and facilitate the use of the property for the current property owner.

The USACE has completed designs for the removal of the Eastern Piles. Presently, the St. Louis District is preparing to negotiate in June with the selected small woman-owned business pursuant to Section 8(a) of the Small Business Administration Act.

What's Next?

Technical issues regarding the pile removals are being addressed through the contracting process. The small business contractor will mobilize on-site and begin removing the Eastern Piles this summer. ■

St. Louis Airport Site (SLAPS)

Sedimentation Basin Complete

The USACE recently completed construction of a Sedimentation Basin on the West End of the St. Louis Airport Site (SLAPS). Completion of the basin's construction marks a significant step forward in site stabilization efforts, part of the Corps's commitment to the community and stakeholders to protect human health and the environment.

The Sedimentation Basin was built to significantly reduce the migration of radioactive sediments into Coldwater Creek. It works by collecting the site's stormwater run-off. As the run-off collects in the basin, it is slowly released through pipes beneath the basin.

Upcoming Events

Information Releases:

Summer Newsletter – August 1999

Upcoming Meetings:

St. Louis Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on June 11, July 9, and August 13, 1999.



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The water's speed is significantly reduced as it travels toward the creek. As a result, most sediment suspended in the water will settle and accumulate in the basin rather than entering the creek.

To prevent sediment transport, the basin is lined with a geomembrane fabric and crushed stone. The fabric creates a barrier between the contaminated sediments that settle out of the stormwater run-off and the soils below the basin. The accumulated sediment, which will likely be contaminated, can be removed from the basin periodically and disposed of off-site.

For high infrequent flows such as in the case of a heavy 25-year storm, an emergency overflow channel prevents the west section of SLAPS from being damaged. If the sedimentation basin fills with water too quickly to be released through the pipe, water will be released into the creek via the emergency overflow channel. For any extreme rainfall event, a weir has been placed in the outfall to track flow volumes.

Regular sampling will be performed in the sedimentation basin to assess initial accumulated water contaminants. Following verification of the basin's decreased sediment load, discharges will be made to Coldwater Creek. Discharges are analyzed to ensure acceptable limits are met. Thereafter, monthly discharges will be analyzed at the outfall.

Contract Turnover Underway

In June 1999, a new contractor will both design and conduct removal actions in North County for the USACE. The new contractor will pick up where the current contractor leaves off. The completion of the North Ditch excavation, the East End removal action, the management of the railspurs in North County, and the management of the off-site borrow source will all be handled by the new contractor.

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Previously, the USACE used one contractor to design and another to perform the activity. The contractor transition is taking place as originally scheduled in the overall project management plan. Transitioning to a single contractor for site work is expected to result in a more cost effective and efficient flow of work.

Efforts to stabilize the site and prevent the migration of radioactive contamination will continue through the transition under the Final St. Louis Airport Site (SLAPS) Engineering Evaluation/Cost Analysis (EE/CA), March 1999.

What's Next?

Once contamination is removed from the East End of SLAPS, the USACE will begin cleanup work on the radium pits. ■



To prevent sediment transport, the basin is lined with a geomembrane fabric and crushed stone. Workers are shown installing the fabric. The fabric creates a barrier between the contaminated sediments, which settle out of the storm water run-off, and the soils below the basin.

North County

Ecological Risk Being Evaluated

The USACE is evaluating the ecological risk, which is the impact of FUSRAP contamination on the environment, for the North County Sites. The scientists are reevaluating and collecting additional data to more accurately assess the ecological impact of contamination on the North County sites (particularly Coldwater Creek).

Although the ecological risk was initially addressed in the 1992 Baseline Risk Assessment, substantial changes have been made to risk assessment guidelines. Ecological risk assessment guidelines now require such evaluations be completed in tiers. The initial tier compares contaminant concentrations in soils, sediments and surface water at and near the site to protective ecological benchmarks.

Since such screening levels tend to be very conservative, additional assessments are required if concentrations exceed an ecological screening level. Comparisons are now being made for North County sites in order to determine if additional data is necessary to fully assess ecological risk. At this tier, risks to certain types of species that might be present in the area would be quantified using contaminant concentration data and anticipated exposure conditions.

What's Next?

Once the ecological risks are updated and defined, the USACE will be able to develop remedial alternatives for the final cleanup of the North County sites that are fully protective of human health and the environment. ■

St. Louis Downtown Site (SLDS)

Plant 2 Remediation Continues

In January 1999, the USACE began final cleanup activities within the Mallinckrodt Plant 2 area. Remedial activities are being conducted using the criteria described in the approved St. Louis Downtown Site (SLDS) Record of Decision (ROD).

The remediation of Plant 2 began with the removal of the concrete slab, which had covered the footprint of a demolished building. Presently, construction crews are using backhoes and excavators to remove radioactively contaminated material and load it into railcars for offsite disposal in a licensed out-of-state



Excavators load material from the Plant 2 remediation work into trucks which transport the covered material to the SLDS railspur.

facility. To date, approximately 4,000 out of an anticipated 8,500 cubic yards of contaminated material have been excavated and transported to a licensed disposal facility.

Systematic radiological surveys are also being performed in the Plant 2 area outside of the defined excavation limits to ensure that all radioactive contamination is removed as required. This action will result in the timely release of the Plant 2 area back to Mallinckrodt for its beneficial use. The USACE anticipates Plant 2 remediation will be finished this summer.

Plant 1 Design Being Developed

USACE engineers are currently developing the remedial design for Plant 1. For this design, radiological surveys are performed to better characterize the extent of contamination in the Plant 1 area. Surveys will also be performed in the area outside of the anticipated excavation limits to ensure the removal of all radioactive contamination from the area.

Although the USACE expects to remove a relatively small volume of contamination (2,800 cubic yards), the Plant 1 remediation will require very careful planning. Excavation activities will be performed in close proximity to ongoing Mallinckrodt operational facilities. The Corps anticipates issuing the design this summer.

What's Next?

Once the Plant 2 remediation is completed, construction crews will begin remediating the Plant 1 area. ■

Is that safe?

Q: Have you ever wondered how the Corps ensures that ponded water released from its sites doesn't endanger human health or the environment?

A: Occasionally, water will collect in the bottom of the excavation. This ponded water is tested for contamination and treated, as necessary, to meet the substantive requirements of the applicable regulations for each site. Technicians collect water samples in batches, label and forward them to the lab for analysis. Scientists carefully review the data collected from the water samples to determine if the water meets release standards or requires treatment. If treatment is determined to be necessary for release, the water is pumped into the water treatment plant where it undergoes a process that removes the contamination.

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Aerial layout of the St. Louis Downtown Site (SLDS).

ST. LOUIS DOWNTOWN SITE (SLDS)

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 St. Louis Downtown Site (SLDS) Record of Decision (ROD).

Plant 2 is located in the middle of Mallinckrodt as indicated in the map above. 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 preparing to excavate the


subsurface of Plant 2. Once crews complete the excavation, the floor 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 contaminated material will be removed from this area.

City Properties Completed

The St. Louis City Properties remediation is nearing completion. These properties are located between the Mississippi River, the Mallinckrodt plant, and the McKinley Bridge. Sampling has verified that above-criteria radiological contamination was successfully removed from the property. Approximately 4,390 cubic yards of contaminated material were removed. The restoration of the site is scheduled for completion in late February, assuming no further weather delays are encountered. Once the restoration is completed, the properties will be released for use to the City of St. Louis.

What's Next?

While the Plant 2 remediation is underway, remedial design work will begin on Plant 1. The USACE anticipates issuing the Plant 1 design in June 1999. The USACE and Mallinckrodt will also begin developing the remedial strategy and design plans for Plants 6 and 7. 

Upcoming Events

Information Releases:

Spring Newsletter – May 1999

Upcoming Meetings:

St. Louis Downtown Site (SLDS) Open House, Henry Clay Elementary School Gymnasium, February 25, 1999 from 4:30 p.m. to 8:30 p.m.

Oversight Committee Meeting at the FUSRAP Project Office at 11:30 a.m. on March 12, April 9, and May 14, 1999.



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ST. LOUIS AIRPORT SITE (SLAPS)

SLAPS East End Removal Underway

In October 1998 under the authority of the St. Louis Airport Site (SLAPS) Engineering Evaluation/Cost Analysis (EE/CA), March 1998, the USACE began a two-phase removal action on the East End of SLAPS as part of the site stabilization effort.

The Phase 1-East End work is currently being performed in the wedge between McDonnell Boulevard and Banshee Road. Previously, the area sloped to the northeast sending surface runoff to the McDonnell Boulevard drainage ditches just outside the existing fenceline. The surface water runoff will be collected in the Sedimentation Trap for sampling and, if necessary, treated and released. As part of the site stabilization effort, this removal action will minimize further contamination release into nearby Coldwater Creek through the removal of the source material. Before completion in late-April, approximately 40,000 cubic yards of contaminated soils will be removed from SLAPS.

Phase 2 work will begin in mid-May. Approximately 20,000 cubic yards (including a portion of the Radium Pits) will be moved this year.

Radium Pits Removal Design Underway

Under the authority of the previously mentioned EE/CA, the USACE is finalizing a design and planning to remove contamination from an area of SLAPS

Each month, the USACE presents a monthly progress report on the St. Louis Sites to the Oversight Committee. These meetings are open to the public. Exact dates and times are published each quarter in this newsletter.



St. Louis Airport Site (SLAPS) east end during excavation and construction.

Keeping in Touch

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If you have any suggestions, questions, or comments, contact our office anytime.

showing elevated radiological activity. The targeted area, referred to as the "Radium Pits," was used by the

Atomic Energy Commission/ Manhattan Engineer District (AEC/MED) as a storage area for residues removed from the manufacturing operations at the St. Louis Downtown Site (SLDS). An estimated 40,000 cubic yards of

contaminated soils will be removed during this cleanup action, which is scheduled to begin in June. The final design document will be completed in April 1999.

What's Next?

While contamination is being removed from the radium pits, the USACE is finalizing its strategy to stabilize the remainder of the site. ■

HAZELWOOD INTERIM STORAGE SITE (HISS)

Railspur Construction Underway

In October 1998, the USACE began construction of a rail loading facility for the Hazelwood Interim Storage Site (HISS) under the authority of the HISS EE/CA. Recently, crews began clearing and grubbing activities near the existing rail line to prepare the area for the installation of the HISS railspur. During the railspur design process, engineers became aware of a sewer line near the proposed construction site. According to railroad requirements, underground utility lines within



Crews begin clearing activities for the HISS railspur construction and sewerline encasement.

twenty-five feet of a proposed rail line must be moved or encased to prevent damage and provide access for utility workers. The USACE has finished encasing the sewerline and is progressing with railspur construction.

As construction crews grade the soil for the rail spur, excess soil is temporarily being stockpiled between the main and supplementary storage piles. This temporary pile, which will contain approximately 2,000 cubic yards, is covered with a heavy liner to ensure that soil or dust particles do not move from the site. Air and water resources near the construction area are constantly monitored for the release of contamination from the site.

What's Next?

Upon completion of the railspur construction, a small, woman-owned business will begin removing the Eastern Pile (approximately 5,000 cubic yards) this summer. The removal will be completed in late 1999. ■

MADISON SITE

Characterization Report Released

In February 1999, the USACE presented the Draft Final Characterization Report for the Madison Site to the property owner and regulators. Last summer and fall, the USACE took samples to validate existing site data. The report defines the site contamination and updates the risk associated with it. Using this document, the USACE will develop a Feasibility Study/Proposed Plan (FS/PP) presenting a range of alternatives for the final action to be taken at the site.

You're Invited!

You are invited to attend the St. Louis Downtown Site (SLDS) Open House on Thursday, February 25, 1999 from 4:30 pm to 8:30 pm at the Henry Clay Elementary School Gymnasium. The USACE will provide information explaining the Remedial Design for the Mallinckrodt Plant 2 area. The Remedial Design is the actual plan that implements the approved cleanup method established in the SLDS Record of Decision.

What's Next?

The USACE will meet with regulators to determine the next step in developing a ROD for the site. ■

NORTH COUNTY

Document Development Underway for ROD

The St. Louis District recently briefed the regulators and Oversight Committee on the Potential Contaminants of Concern Assessment Memorandum (PAM), which updates the Baseline Risk Assessment. As defined by FUSRAP, the USACE is authorized to remove site contaminants associated with MED/AEC activities of the '40s and '50s. The PAM defines the contaminant levels and associated risks. This information will be used to assist in developing a ROD for the final cleanup of North County sites.

What's Next?

A list of the preliminary applicable, relevant and appropriate requirements (ARARs), which are laws and regulations to be enforced during the remedial action, will be coordinated with the regulators. The ARARs enforced during the final cleanup will be directly related to the site's primary contaminants of concern. ■



Construction crews grade soil for rail spur at the HISS site. Excess soil is temporarily stockpiled between the main and supplementary storage piles.

Are you sure you're ready?

Q: Have you ever wondered how the USACE makes sure crews are ready to perform environmental cleanup work or how the Corps ensures the work is done correctly?

A: Before entering the site, crews are given site-specific and refresher training for working on a radioactively contaminated site. A key component of this review is how they will comply with the USACE-approved Site Safety and Health Plan. Surrounding the site, fencing and signs are in place to prevent inadvertent and unauthorized access. If necessary, additional barriers will be temporarily installed to further restrict site access. Prior to entering the site, equipment and workers are inspected to certify operability of equipment, verify appropriate wear of Personal Protective Equipment (PPE) by workers, and assure compliance with published safety standards and plans. While work is being performed, environmental monitoring devices monitor the surrounding area to ensure no contaminants are released from the site.

The USACE construction management team is physically located on-site to monitor contractor activities and ensure they are in compliance with the contractual requirements. Contractor activities are reported in both weekly and monthly progress meetings between the resident engineer and the construction crew. Additionally, daily inspections are conducted by the Corps to ensure the correctness of work being performed. Data gathered from the environmental monitoring devices is carefully reviewed to ensure the public remains unaffected by operations. Engineering representatives of USACE also perform regular site investigations to verify that individuals' health and safety are protected and to assure contractor compliance with the published Plans and Specifications.

U.S. Army Corps of Engineers - St. Louis District
FUSRAP Project Office
9170 Latty Avenue
Berkeley, Missouri 63134



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The St. Louis Sites

Formerly Utilized Sites Remedial Action Program • Fall 1998

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St. Louis Downtown Site ROD Issued

The St. Louis District, U.S. Army Corps of Engineers (USACE) is pleased to announce the release of the signed Final Record of Decision (ROD) for the St. Louis Downtown Site (SLDS) in St. Louis, Missouri. In response to the potential risk of radioactive exposure, the USACE and U.S. Environmental Protection Agency (EPA) have selected a final remedial action which is protective of human health and the environment. The selected remedy, Alternative 6, calls for the removal of certain contaminated soils, consisting of radium, thorium, uranium, arsenic, and cadmium, from the site if they are above the criteria.

Under Alternative 6, all accessible contaminated soil that is above the composite criteria outlined in the ROD will be excavated and shipped offsite for disposal. Cleanup activities have been designed so that the site will meet specific threshold levels established to protect human health.

SLDS is located in an industrial area on the eastern border of St. Louis, 300 feet west of the Mississippi River and 11 miles southeast of the Airport area. The site is composed of a large chemical-manufacturing complex owned and operated by Mallinckrodt, Inc. The site also includes adjacent commercial and city-owned properties. Site studies have determined that radiological contamination is present in surface and subsurface soils as well as in buildings. The primary contaminants of concern are radium, thorium, and uranium. The volume of accessible soils contaminated above the cleanup criteria, under Alternative 6, is estimated to be 8,000 cubic yards.

The ROD is a legal document which outlines the selection of the final cleanup method to clean up radiological contamination. It was developed in accordance with

several environmental laws and guidance documents, including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act (SARA), and the National Contingency Plan (NCP). The ROD was developed after incorporating comments received from the general public and regulatory agencies on the SLDS Feasibility Study and Proposed Plan (FS/PP). With the signing of the ROD, the SLDS Administrative Record was completed. As required by CERCLA, the complete SLDS Administrative Record was released for public review in late October 1998. ■

SLAPS Rail-Loading Facility Completed

In August, the St. Louis District of the U.S. Army Corps of Engineers (USACE) completed the construction and installation of a rail-loading facility at the St. Louis



As a result of the release of the SLDS ROD, remediation of the City Properties is nearing completion.

Inside the Sites

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HISS Railspur under Construction



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St. Louis District



Aerial photograph of SLAPS and the North Ditch Area.

Airport Site (SLAPS). Located along the East End of SLAPS, the load-out facility consists of a 1,200-foot rail spur in addition to a major staging area where excavated materials are placed before being loaded into railcars. The USACE shipped contaminated materials to a licensed out-of-state disposal facility.

The SLAPS load-out facility was built to support the removal actions outlined in the Final SLAPS Interim Action Engineering Evaluation/Cost Analysis (EE/CA), September 1997, which also allowed the remediation of the SLAPS West End. This new infrastructure will increase the District's load-out capacity by as much as 167 percent per day over what was possible previously. The SLAPS load-out facility can easily accommodate 10 gondola rail cars at one time and includes a staging area that holds up to 5,000 cubic yards of contaminated material for shipping. The increased load-out capacity has allowed the Corps to accelerate cleanup activities in the North St. Louis County area. Another benefit is that the Corps can take advantage of favorable construction weather without delays from coordinating major shipping campaigns.

Over 3,000 cubic yards of contaminated material were removed to build this larger, more efficient facility. When the facility was completed, the materials excavated from this construction effort were the first to be loaded into gondolas and shipped to a licensed disposal facility from SLAPS. As of November 24, 1998, 302 rail cars of excavated materials had been shipped. ■

Preliminary Site Characterization Activities Begin at the Madison Site

This summer, the St. Louis District, U.S. Army Corps of Engineers (USACE) pursued characterization activities at the Madison Site in Madison, Illinois. The site consists of two buildings owned by a component manufacturer at the corner of College and Weaver Streets in Madison, Illinois.

Like the St. Louis Downtown Site (SLDS), the Madison Site hosts an active business. It consists of a series of large, interconnected buildings of similar design and shape. The Madison Site is the smallest of five that comprise the St. Louis Sites, whose cleanup is managed by the Formerly Utilized Sites Remedial Action Program (FUSRAP).

Uranium was previously processed at the Madison Site for the Manhattan Engineer District/Atomic Energy Commission (MED/AEC). Based on a 1989 survey, the site was added to FUSRAP after radiological contamination was found. The survey report concluded that above-background levels of radiation were present only in the dust located on overhead surfaces of the main building (Buildings 4 & 6). The survey also determined that the residual radioactive contamination found did not pose health risk to workers, current occupants, or nearby neighbors and residents.

(continued on page 3)



The USACE constructed a sedimentation trap to manage runoff north of McDonnell Boulevard.

(continued from page 2)

Scientists are performing current site characterization activities in order to validate previous data. These activities serve to assure the continued safety of production and maintenance personnel throughout daily operations. Characterization information also allows a strategy to be developed for future remediation, if warranted. The Preliminary Site Characterization Report summarizing the results will be issued this winter after researchers complete their analysis of sampling data. ■

SLAPS Site Stabilization Efforts Focus on Coldwater Creek

McDonnell Boulevard motorists may have noticed significant remediation activities underway at the St. Louis Airport Site (SLAPS). This progress is a result of the Corps' commitment to the community and stakeholders to protect human health, wildlife, and the environment. Under the Final SLAPS Interim Action Engineering Evaluation/Cost Analysis (EE/CA), September 1997, and the SLAPS EE/CA, March 1998, the St. Louis District of the U. S. Army Corps of Engineers (USACE) began removal efforts in September to stabilize the migration of radioactive sedimentation into Coldwater Creek.

The USACE designed and constructed a sedimentation basin (sed basin) on SLAPS (just east of last year's excavated area), which will significantly reduce the migration of contaminated material into Coldwater Creek. The purpose of the sedimentation basin is to collect stormwater run-off. While the run-off is collecting it is simultaneously released, at a slow rate, through a pipe in the bottom of the basin. The release flow significantly slows as it travels toward the creek out fall. In this process, any sediments suspended in the water have a chance to settle out. Thus, the sed basin greatly reduces the amount of SLAPS material entering the creek. Monitoring by USACE personnel ensures that water released into the creek is below the published standards.

Community Relations Upcoming Events

Information Releases:

Final Community Relations Plan - December 1998
Winter Newsletter - February 1999

Upcoming Meetings:

**Oversight Committee Meeting, FUSRAP Project
Offices - December 11, 1998 at 11:30 a.m.**

**Oversight Committee Meeting, FUSRAP Project
Offices - January 08, 1999 at 11:30 a.m.**

**Oversight Committee Meeting, FUSRAP Project
Offices - February 22, 1999 at 11:30 a.m.**

An emergency overflow channel prevents the west section of SLAPS from being damaged by high, infrequent flows caused by a 25-year storm. If the sed basin fills with water too quickly to be released through the pipe, water will be released into the creek via the emergency overflow channel. In any such emergency, equipment is in place to measure the overflow. Regular sampling will be performed by USACE in the sedimentation basin and in any instances in which the water may be released via the regular outfall to the creek.

In contrast, a sedimentation trap has been constructed for the ditches north of McDonnell Boulevard while remediation efforts for this particular area are underway. The sedimentation trap is designed to function much like the sedimentation basin. Rather than releasing runoff through a pipe at the bottom of the trap, water collects until it can evaporate or infiltrate the trap's soils. If the sedimentation trap becomes too full, the system pumps water into Coldwater Creek after treatment to sedimentation standards that allow for release.

To prevent SLAPS storm water run-off from entering the ballfields, a plug has been placed in the culverts running between these two areas. Although hard to see, dikes are also around the North Ditch Area. These dikes are in place to prevent contamination from migrating

(continued on page 4)



The HISS rail-loading facility is scheduled for completion and full operation in 1999.

(continued from page 3)

westward and re-contaminating cleaned areas when workers remove contaminated material between the dike and the sedimentation trap. After the North Ditches are verified to be clean workers will excavate the sedimentation trap down to clean material and then fill in with clean backfill. These dikes will remain in place until the USACE is certain that cleaned areas no longer risk further contamination. ■

HISS Railspur under Construction

The Hazelwood community and other stakeholders will soon be able to witness implementation of the first phase of the Hazelwood Interim Storage Site (HISS) Engineering Evaluation/ Cost Analysis (EE/CA). In March 1998, a Draft HISS EE/CA, which evaluated three alternatives for site cleanup, was issued to the public for review and comment. The U.S. Army

Corps of Engineers (USACE) then selected the third alternative, which called for the on-site construction of a rail loading facility, the removal of the three storage piles, and the removal of accessible contaminated soils on two Latty Avenue properties.

This summer, the USACE signed an action memorandum describing the selected alternative for cleanup activities at the HISS and Latty Avenue Vicinity Properties. The memorandum is a legal document that outlines the Corps' path forward. It serves as the approval document for interim removal actions to be undertaken at the property while a separate ROD is developed to identify the final remedy.

Construction of the rail loading facility began in late October. It is expected to be fully operational in the second quarter of fiscal year 1999. As this first phase of the EE/CA is implemented, contractors working under the supervision of the USACE will construct the rail from the existing rail line to the HISS piles. Ultimately, this rail

(continued on page 5)



The Madison Site consists of two large, interconnected buildings of similar design and shape.

(continued from page 4)

spur will allow the USACE to ship directly from the site rather than truck material across heavily trafficked roads to the EVA spur.

SLAPS Vicinity Property 56 Cleaned

As a result of additional funding received from District Headquarters in August, the St. Louis District, U. S. Army Corps of Engineers (USACE) added another vicinity property in North County to its list of cleaned properties. Workers removed approximately 1,050 cubic yards of contaminated soils from Vicinity Property 56, which is located along Pershall Boulevard. These soils were loaded into trucks and sent to a licensed out-of-state disposal facility. Restoration activities for the site were completed in mid-November. ■

USACE Supports St. Denis Bridge Updates

Recently the St. Louis District USACE assisted the City of Florissant during their construction efforts to replace the St. Denis Bridge over Coldwater Creek. While contractors for the City of Florissant worked to demolish and then replace the existing structure, a separate contractor under USACE supervision



Erosion controls were used at VP 56 to prevent offsite flow of contaminated materials.

Keeping in Touch

Our office welcomes the opportunity to speak to the community and to hear from our neighbors. We try to provide different ways to keep you informed. Try any of our resources, as desired, including our homepage on the Web.

Mailing Lists - To receive newsletters and other printed communications, sign up for our mailing list anytime, 24 hours a day.

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Public Speaking - If your group, school, or association would like to hear from one of our experts, give us a call. We can speak on a variety of fields, including engineering, the environment, and geology.

Homepage - We've gone online with hundreds of pages of documents, digital photographs, maps, and other resources. Updates are posted regularly. An e-mail link is also available. To reach our site, set your browser to www.mvs.usace.army.mil and click on the FUSRAP icon.

If you have any suggestions, questions, or comments, contact our office anytime.

worked in support of the city to remove radioactive contamination along the banks of Coldwater Creek and ensure the safety of the workers.

Approximately 450 cubic yards of soil and concrete debris were removed from the creek. Restoration was completed in late November. ■

Community Safety Concerns

Protection of human health, wildlife, and the environment is the number one consideration when the USACE conducts its cleanup efforts. For example, orange safety fencing is placed around open excavation areas to restrict access by unauthorized

(continued on page 6)

The St. Louis Downtown Site ROD has been issued. To view this or any document, feel free to visit either of our Administrative Record locations.

St. Louis Public Library
Government Information Section
1301 Olive Street
St. Louis, Missouri 63103
(314) 241-2288

FUSRAP Project Office
9170 Latty Avenue
Berkeley, Missouri 63134
(314) 524-4083

individuals. The air and groundwater are continuously monitored at excavation sites and perimeters for possible remedial radiological contaminants. In areas being remediated, workers will dress in coveralls and other protective equipment for added safety, dependent on the level of contamination. The USACE also uses a variety of engineering controls and measures, such as spraying water to keep down dust generated by excavation activities. ■



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

The St. Louis Site

**U.S. Army Corps of Engineers • St. Louis District
Formerly Utilized Sites Remedial Action Program • June 1998**

[fusrap @ usa. net](mailto:fusrap@usa.net)

<http://144.3.144.51/engr/fusrap/index.htm>

This edition of the FUSRAP Update is part of our ongoing community outreach effort to keep the public informed of cleanup activities at the St. Louis Downtown Site. Please contact us if you have any questions or comments.

A Message from the St. Louis District Engineer

The St. Louis District of the Corps of Engineers is proud to bring to you this Special Edition of The St. Louis Site FUSRAP Update. This edition was developed to commemorate a milestone achievement at the St. Louis Downtown Site.

This past November, the Corps of Engineers completed the demolition of ten buildings at the St. Louis Downtown Site. This work originated with the Department of Energy. These buildings were located in an area of Mallinckrodt's downtown plant known as Plant 6 and 7. They were among the last of the buildings at the site that were used to process uranium during our nation's development of the first atomic bomb.

These buildings were identified through radiological characterization surveys as having fixed radioactive contamination along the walls, floors, and ceilings as well as contaminated soils beneath the buildings.

The federal government and the St. Louis community have worked together for a long time to clean up the radiological contamination that was a legacy of World War II and the Cold War. Demolition of the buildings closed one of many chapters in that effort. It moved us a step closer to developing a comprehensive cleanup strategy for the complete cleanup of the Downtown Site.

As we move forward in our mission to clean up the radioactive contaminated materials at the downtown site and other parts of the metropolitan area, your continuous involvement in the decision-making process is essential. We look forward to working with you in the community and we encourage you to become involved and participate fully in this important mission.



Aerial view of the Downtown Site, looking east.

Sincerely,

Thomas J. Hodgini
Colonel, U.S. Army
District Engineer

A New Chapter in the St. Louis Downtown Site's History

Demolition of nine of the original uranium process buildings in the past year began a new chapter in Mallinckrodt's history of association and cooperation with the U.S. government. This also successfully completed the first chapter of the Corps of Engineers' cleanup of low-level radioactive waste in the St. Louis region, which dated from the development of the atomic bomb in World War II.

What began at the St. Louis Downtown Site in 1942 as a small pilot-scale operation to produce extremely pure uranium compounds for the war effort soon developed into a sprawling industrial complex. The site produced the first significant quantities of reactor-grade uranium oxide.

All of the buildings, initially constructed to house different stages of the uranium purification process, were of similar design and arranged in clusters within the complex. Mallinckrodt's downtown facility became one of the primary suppliers of uranium products to the Atomic Energy Commission (AEC), predecessor of the Department of Energy (DOE).

After uranium operations were transferred to the Weldon Spring Plant in 1957, all buildings involved in such work were cleaned up using guidelines of the time. Ownership of the buildings was returned to Mallinckrodt without any radiological restrictions.

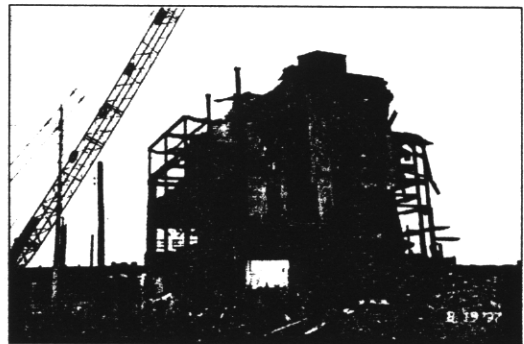
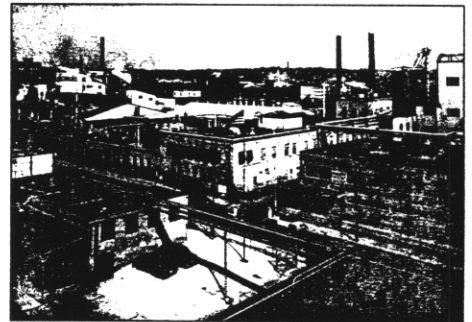
When radiation levels at the St. Louis plant were rechecked in the early 1970s, many of the buildings still contained contamination levels

higher than newer, more stringent, and more protective standards. The site was included under DOE's FUSRAP program.

In 1996 DOE and Mallinckrodt began discussing cleanup strategies for the site. Detailed radiological surveys found radioactive contamination throughout the buildings. It was decided that demolishing the buildings rather than decontaminating them

- was the most cost-effective strategy,
- would enable Mallinckrodt to move ahead with plans for future plant expansion and modernization, and
- would facilitate the next stage in the cleanup process by making contaminated soils under buildings more accessible for removal.

Remediation of the entire site is currently pending public approval.



Views of Destrehan Street Plant in the 1950s (top), demolition of Building 700 (above), and remediated area today (left).

A New Information Repository for the St. Louis Downtown Site

Working with members of the St. Louis Oversight Committee and the administration of Henry Clay Elementary School, the St. Louis District of the Army Corps of Engineers established a new information repository for the St. Louis Downtown Site in the Henry Clay Elementary School Library, 3820 North 14th Street, St. Louis, Missouri 63107. This repository is the first to be established since FUSRAP was transferred to the Corps of Engineers in October 1997.



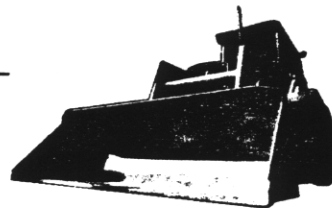
Reviewing documents in the new FUSRAP Information Repository are, (l. to r.) Community Coordinator Howard Hays; School Principal Frank Muehlheausler; Teacher Assistant Michele Anderson; Librarian Dorothy Jones, and FUSRAP Oversight Committee member Jack Fraunhoffer of Mallinckrodt.

Like the Administrative Record and Information Repository located in the Government Information Section of the St. Louis Public Library - Main Branch, this repository was created to provide residents in the St. Louis community an opportunity to participate in the decision-making process. It contains key site-related documents, fact sheets, and newsletters regarding the cleanup of the St. Louis Downtown Site, as well as other FUSRAP sites in the St. Louis area. It is updated quarterly and is available for review by the public during school hours.

For more information on the repository at Henry Clay Elementary School contact:

Christopher Haskell
Environmental Projects Information Specialist
USACE Environmental Projects
Public Information Office
9170 Latty Avenue
Berkeley, MO 63134
(314) 524-4083 or (314) 524-3334
chris.haskell@mvs01.usace.army.mil

Cleanup Activities at the Downtown Site Enter A New Phase



Cleanup activities at the St. Louis Downtown Site moved into a new phase this spring. In early April, the St. Louis District issued a draft feasibility study and proposed plan (FS/PP) identifying and evaluating six alternatives for cleanup of the site. These alternatives address removal and disposal of radioactive contaminated materials that originated at the site during the development of atomic weapons for World War II by the Manhattan Engineer District and later by the Atomic Energy Commission (MED/AEC).

The FS/PP are part of a series of four major documents required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The first document, a *remedial investigation report*, defined the nature and extent of contamination. Then, the *feasibility study* determined the practicality and cost of a range of alternatives to remediate the site. The *proposed plan* presents the Corps of Engineers' recommendation. Finally the *record of decision* (ROD) describes and analyzes the selected cleanup strategy.

The ROD for the St. Louis Downtown Site is being developed by the Corps of Engineers in cooperation with the community and in consultation with the Missouri Department of Natural Resources (MDNR) and the Environmental Protection Agency (EPA). The ROD is expected to be issued in July after receiving EPA approval.

Since our last newsletter, we've added a way to stay in touch — our homepage:

<http://144.3.144.51/engr/fusrap/index.htm>

Realizing that not everyone gets information from online sources, we will continue to use all reasonable alternative means to communicate with our neighbors.

Mailing Lists

Be sure you're on our mailing list and tell us of neighbors or other interested parties you think might want to be on it too. People can get on our mailing list 24 hours a day by:

Phone: (314) 524-3334 / 524-4083

Fax: (314) 524-6044

Mail: 9170 Latty Avenue, Berkeley, MO 63134

Email: FUSRAP@usa.net



Public Speaking

Let us know if your neighborhood association, business, community, youth, school, or other group would like to hear from one of our experts. They may not always be immediately available on short notice, but give us a call and see if we can't work out a speaking schedule. Experts are available in such fields as engineering, the environment, geology, journalism, and media relations.

Homepage

If you do join us online, you'll find hundreds of pages of documents (the full texts of all Engineering Evaluations/Analyses/Feasibility Studies, etc.), color digital photographs, maps, directions, names, addresses, resources. Many items are available online now and our webpages are being continually updated.

Be aware that if searching for "FUSRAP" on search engines (Infoseek, Alta-Vista, etc.) you'll find many pages that are NOT ours. Many of these pages were posted by others in the past. The only official FUSRAP homepage for the St. Louis District of the U.S. Army Corps of Engineers is:

<http://144.3.144.51/engr/fusrap/index.htm>

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

The St. Louis Site

**U.S. Army Corps of Engineers • St. Louis District
Formerly Utilized Sites Remedial Action Program • February 1998**

■ Letter from the USACE District Commander

The U.S. Army Corps of Engineers is dedicated to removing radioactive contamination at sites formerly managed by the Department of the Energy. We will perform this work in concert with our partners in the community in an efficient, timely, safe, and cost-effective manner.

In October, Congress transferred the responsibility for the Formerly Utilized Sites Remedial Action Program (FUSRAP) from the Department of Energy to the Corps of Engineers (see additional article on page 3). St. Louis District of the Corps is now managing that cleanup process at sites within the St. Louis area. These sites include:

- St. Louis Airport Site (SLAPS), where byproducts of the uranium processing were stored;
- St. Louis Downtown Site (SLDS) and vicinity properties, where uranium was processed for the Manhattan Engineer District and other programs between 1942 and 1957;
- Vicinity Properties at the St. Louis Airport site;
- Latty Avenue Properties: Hazelwood Interim Storage Site (HISS), where ore residues were moved, and vicinity properties; and
- Madison, Illinois, site, where research and development took place in the 1950s and 1960s.

In this early phase of the Corps of Engineers' work at these sites, the St. Louis District is committed to a seamless transition from the Department of Energy to the Corps of Engineers. Through this transition, we want to continue the removal process and improve it where possible. We view this project as a commitment to the taxpayers and will complete this project in a quality manner. Let me emphasize the word "complete." That means we see an end date to this removal action, a time when we return remediated land back to the community.

The St. Louis District brings a great deal of expertise to this project. The Corps of Engineers has long been applauded for its work on environmental sites. These include active military installations, formerly used defense sites and work for the Environmental Protection Agency. This District does not stand alone; we are drawing on the expertise of our sister Districts throughout the Corps. We call this "One Door to the Corps."


Further, St. Louis District people live and work in the community; we CARE about and are committed to this community. The decision makers are here, both onsite and downtown.

The Corps of Engineers is committed to perform this work to a very high standard. We look forward to working with you in the community and with property owners, elected officials, the media and other stakeholders in this very important mission.



Col. Thomas Hodgini

Sincerely,


Colonel Thomas Hodgini
USACE District Commander, St. Louis District

■ Transfer of FUSRAP to U.S. Army Corps of Engineers Complete With Signing of FY 1998 Appropriations Bill

The FY 1998 Energy and Water Appropriations Bill, which transfers 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. FUSRAP had been managed by the U.S. Department of Energy for the past 17 years.

In addition to transferring FUSRAP to USACE, the legislation provides \$140 million to fund the nationwide project in FY 1998, approximately twice the amount appropriated in FY 1997.

Following enactment of the bill, the contracts for FUSRAP's project management contractor, Bechtel National, Inc., and its environmental studies contractor, Science Applications International Corporation, were assigned to USACE.

■ Cleanup of Ten Vicinity Properties Continues

The road frontages of ten commercial properties along Hazelwood and Latty Avenues in North County now meet current cleanup guidelines. This cleanup, which began in June under the direction of the Department of Energy (DOE), is a continuation of remediation activities previously conducted along "haul routes" that became contaminated in the 1960s.

Approximately 5,900 cubic yards of low-level contaminated soils were excavated and shipped out-of-state to a licensed disposal facility. Post radiological sampling results, conducted by an independent verification contractor, indicate that the properties have been remediated to current cleanup guidelines.

All ten properties have been fully restored and are ready for use without radiological restrictions.



Hazelwood Avenue vicinity property during recent cleanup.

■ For more information...

If you have questions or comments about our work, please call us. You can reach us by calling our local site office in Berkeley at (314) 524-4083 or by contacting the St. Louis District office at (314) 331-8002. Leave a message with your name, phone number, and area of interest, and someone will return your call promptly. You can also visit our Internet home page; the address (or URL) for FUSRAP is:

<http://www.mrd.usace.army.mil>



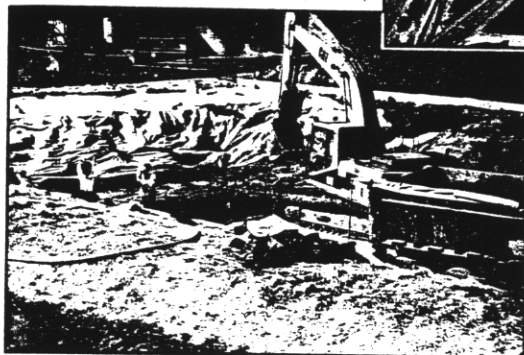
Calendar of Upcoming Activities

- | | |
|----------|--|
| March 5 | Issue SLAPS EE/CA for Public Comment |
| March 10 | Issue HISS EE/CA for Public Comment |
| March 17 | Public Meeting on SLAPS and HISS EE/CAs -- Hazelwood Civic Center - East, 7-9 pm |
| March 27 | Issue SLDS Feasibility Study (FS) and Proposed Plan (PP) |
| April 7 | Public Meeting on SLDS FS and PP -- Henry Clay Elementary School, 7-9 pm |

■ SLAPS West End Excavation Completed


The finishing touches on Phase IA cleanup activities at the St. Louis Airport Site (SLAPS) have been completed. SLAPS is a 21-acre site located north of the St. Louis airport, adjacent to McDonnell Boulevard.

The St. Louis Airport Site (SLAPS) aerial looking west (right) and the excavation work recently completed (below).



This cleanup, which began in late September under the direction of the U.S. Department of Energy, grew out of a series of discussions with area stakeholders on the acceleration of cleanup activities at the St. Louis site. Cleanup involved removing residual radioactive contaminated material from the west end of SLAPS, nearest to Coldwater Creek, and shipping this material to an out-of-state disposal facility.

According to project officials, the cleanup was no different from any other excavation. It consisted of the removal of approximately 6,000 cubic yards of low-level contaminated material and replacement with clean low-permeability clay backfill. A series of engineering controls prevented surface water run-off from entering Coldwater Creek. There was no impact to the gabion wall adjacent to the Creek and no disruption to normal traffic patterns and commercial activities along McDonnell Boulevard.

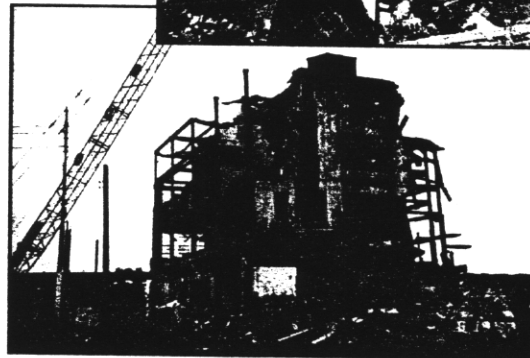
Radioactive contamination in the St. Louis area is the result of the processing of uranium and other materials associated with the early years of the nation's nuclear weapons program. The site was designated for cleanup in the late 1970s and is administered through the St. Louis District Office of the U.S. Army Corps of Engineers. 

■ Demolition Completed at the Downtown Site


In November, the St. Louis District of the Army Corps of Engineers completed the demolition of ten buildings at the St. Louis Downtown Site. These buildings are among the last of the buildings at the downtown site to be used to process uranium during the early years of the nation's nuclear weapons program. They were identified as containing residual radioactive contamination.

Work at the Downtown Site consisted of demolishing the buildings and trucking the masonry, brick, and other material to a staging area located on the east side of the site. The brick and masonry material, now clean to current guidelines, was crushed and left onsite to be used as backfill material in future excavation activities. Approximately 7,000 cubic yards of material was crushed and stockpiled at the site. The contaminated steel and other building debris was loaded onto gondola rail cars and shipped to an out-of-state licensed disposal facility.

Demolition in progress at Building 700. Contaminated structural steel and other building debris shown here was shipped offsite to an out-of-state licensed disposal facility.



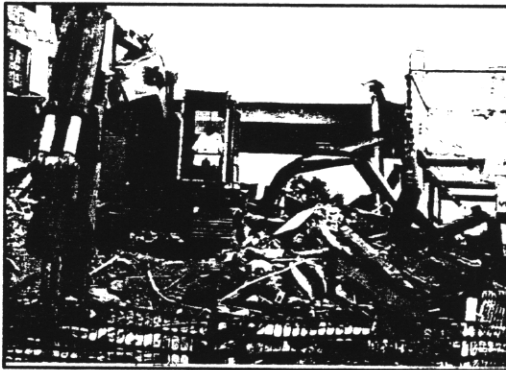
Other photos taken during this work are shown to the right on page 3.

All that remains from the structures are the slabs for each of the demolished buildings. A protective sealant was applied to each slab after demolition to prevent the movement of low-level contamination that remains on the slabs' surfaces until the slabs and soil beneath can be removed. 

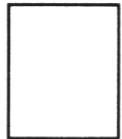
St. Louis Downtown Site Photo Album



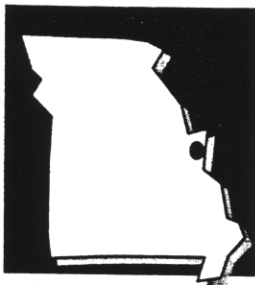
Clockwise from left: aerial view of building complex 704-707 in foreground; above: workmen remove structural steel; below: catwalk between Building 117 and 705 removed; below left: building debris being staged for removal.



U.S. Army Corps of Engineers - St. Louis District
Public Information Office
9170 Latty Avenue
Berkeley, Missouri 63134



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The St. Louis Site

U.S. Department of Energy • Formerly Utilized Sites Remedial Action Program • Summer 1997

Letter from the Site Manager

I have been here at the St. Louis Site for about two months now, and I must say that things around here have been anything but quiet. Since my arrival, I have been spending time getting to know both the issues and the people.

As an introduction, I have lived in St. Peters, Missouri, for more than ten years, and my job has been to manage the cleanup of the Weldon Spring Site, which was an old uranium ore processing plant that operated from the mid 1950s to the mid 1960s. The contaminants at that site are similar to the ones found at the St. Louis Site. There is still a lot of work to do before the project at Weldon Spring is complete, but things are going well, and the end is in sight.

In December of last year, Tom Grumbly, who at that time was Under Secretary for the Department of Energy, promised to establish a DOE site office in St. Louis for the management of the St. Louis cleanup effort. The DOE site office has now been officially established at 9170 Latty Avenue, and Ed Valdez, the Deputy Site Manager, and I are located there. It is still unclear how many DOE people will be required to fully staff the site office; this will be worked out over the next several months.

In reading this newsletter, I hope you will agree that a lot of work is under way and is contributing significantly to our cleanup mission. In meeting with the representatives from the State, local government officials, community leaders, and members of the public, it is clear that important project objectives should be to

- accelerate work at the St. Louis Site,
- improve communication and responsiveness to community concerns, and
- continue to improve the cost effectiveness of our work.

In future newsletters and through other communications, we will share with you our progress toward these objectives.

One of the things that will always be an impediment to progress is a lack of trust. I don't expect this to come easily (or quickly); however our commitment to you is to continually behave in a manner that is consistent with building trust. In closing, I would like to share with you some of the principles that will guide our behavior. As a site office (including DOE and our contractors), we will strive to

- value differences;
- engage people in problem solving, not just decision making;
- stand by our commitments;
- embrace the fact that technical solutions will not by themselves achieve understanding and acceptance; and
- never let indecision be an excuse for the lack of progress.

Your feedback and continuous involvement are important. If you feel that we have dropped the ball in any way, please call me at (314) 524-4083.



Sincerely,

Steve McCracken

DOE Site Manager, St. Louis Site Office

DOE Establishes Onsite Presence

DOE has established an onsite presence at the St. Louis site, as promised late last year by former DOE Under Secretary Tom Grumbly. Ed Valdez, of St. Charles, Missouri, was the first DOE official to be based full time at the site. He has now been joined by Steve McCracken, who will serve as Site Manager.

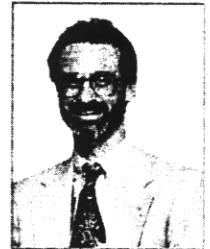
Valdez comes from DOE's Weldon Spring Site in St. Charles County, where he was a project engineer. He previously worked for McDonnell-Douglas in Hazelwood as a project and systems engineer. A retired Marine Corps officer and combat pilot, Valdez's many assignments included a tour of Vietnam.

McCracken also comes from the Weldon Spring Site, where he was the Project Manager. He has been with DOE since 1980, spending the past ten years at Weldon Spring.

Rounding out the team at the site are Wayne Johnson, Joe Wood, Suzanne Szojka, and Robert Edwards.

Johnson is the onsite Project Manager for the project management contractor. Before joining FUSRAP, he was a Project Manager for the Environmental Restoration Department at DOE's Savannah River Site. His primary responsibility in St. Louis will be to ensure that all work at the site is performed safely, cost effectively, and on schedule.

Wood is an Environmental Engineer, responsible for oversight of all environmental engineering activities at the site. He previously worked for EPA conducting remedial investigations and evaluating remedial alternatives for NPL Superfund sites.



Joe Wood

Szojka is a Professional Geologist with more than 8 years of experience as a hydrogeologist and technical manager in the United States, United Kingdom, and Canada.

Edwards comes to St. Louis from the Arnold Engineering Air Force Base in Tennessee. He has worked with both the Department of Defense and DOE environmental management programs. Early in his career, he worked in industry as an air pollution meteorologist.

These individuals and other site personnel are available to discuss any questions you have about ongoing work and site activities. They will also be participating in community outreach and educational activities.

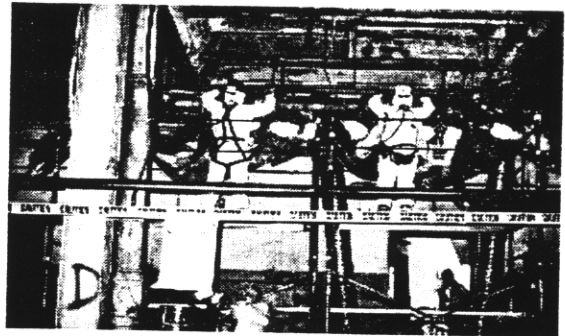


Personnel who have recently relocated to the DOE St. Louis office include Suzanne Szojka, Wayne Johnson, and Robert Edwards.

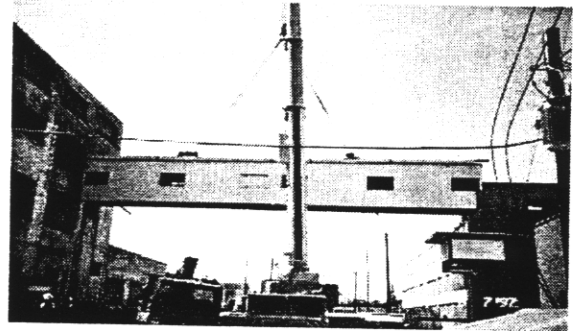
Summer Cleanup Activities

In June, DOE began the cleanup of low-level radioactive contamination along the road in front of nine commercial properties on Hazelwood and Latty avenues in North County. This cleanup is a continuation of remediation activities previously conducted along "haul routes" that became contaminated in the 1960s. Approximately 4,800 cubic yards of contaminated soil will be excavated, primarily from ditches along the sides of the road. The soil is being transported by truck to a staging area at the Norfolk-Southern Railroad siding at the intersection of Eva Avenue and McDonnell Boulevard; from there, it will be loaded onto gondola rail cars and shipped to an out-of-state licensed disposal facility. Clean soil will be brought in to fill the excavated areas.

Work going on this summer at the St. Louis Downtown Site has primarily been the removal of 365 cubic yards of asbestos from nine buildings that are to be demolished. Demolition activities have begun, and the buildings should be gone by the end of September. Approximately 1,500 cubic yards of demolition debris will be shipped offsite.



Workers prepare to remove asbestos from piping in Building 705 at the St. Louis Downtown Site.



An overhead walkway between SLDS Buildings 704 and 117 is lowered to the ground before being demolished. In addition, nine buildings at the site are being demolished.

St. Louis Site and Area Utilities Draft Response Policy

Working with area utility representatives, DOE has drafted a policy that outlines responsibilities for both St. Louis Site and utility personnel during utility work at or near the site. The policy is intended to protect the health and safety of site personnel and utility workers who may come into contact with low-level radioactivity in soils. The draft response policy is expected to be finalized by the end of September.

Under the proposed policy, site personnel will be available 24 hours a day to respond to calls from the utilities. Depending on the circumstances, site support might include the services of an onsite health physics technician, radiological surveying using field instruments, soil sampling, and providing utility workers with personal protective clothing. Upon arrival at the work site, qualified

St. Louis Site personnel will brief utility workers on radiological safety practices and make recommendations based on radiological conditions at the site.

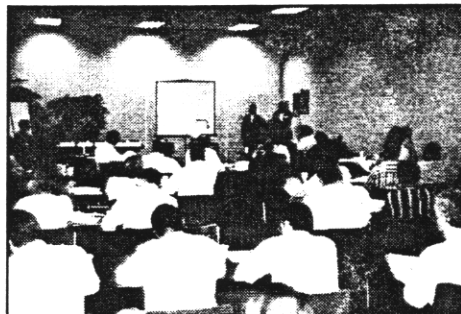
In cases where excavation is required, contaminated soils may be received by St. Louis Site personnel for controlled storage or disposal at a licensed disposal facility.

Many of these measures are being implemented as "best management practices," meaning they exceed minimum requirements established by law. The St. Louis Site vicinity properties are not considered hazardous waste sites as defined by the Occupational Safety and Health Administration (OSHA). Therefore, utility personnel working in these areas are not required to have OSHA Hazardous Waste Operations Training.

Technology Demonstration Conference

DOE hosted a pre-solicitation conference for technology vendors on July 1 at the St. Louis World Trade Center. This conference was the first step in a procurement process to identify onsite, cost-effective technologies that could be used for the remediation and treatment of soil contaminated with radium, thorium, and uranium at the St. Louis Airport Site (SLAPS).

Prospective subcontractors, representing 29 companies, attended the conference; they were given a 1-hour bus tour of SLAPS before the conference began to familiarize them with the site. Proposals to demonstrate a remediation technology that has the potential to reduce cost and risk will be due approximately September 5, 1997. Full remediation of the site will be addressed after the proposed technologies are evaluated.



Technology vendors at DOE's technology demonstration conference.



Do you have questions or topics for discussion about FUSRAP, the St. Louis Site, the environmental cleanup process, cleanup guidelines, or related issues? Send them to us, and we will reserve space to discuss them in future issues of the St. Louis FUSRAP Update. Address them to Steve McCracken at the DOE Site Office, 9170 Latty Avenue, Berkeley, MO 63134.

For more information...

If you have questions or comments about our work, please call us. You can reach us by calling our local site office in Berkeley at 524-4083, or call our toll-free information line at 1-800-253-9759. Leave a message with your name, phone number, and area of interest, and someone will return your call promptly. You can also visit our Internet home page; the address (or URL) for FUSRAP is:

<http://www.fusrap.doe.gov/>

Department of Energy
St. Louis Site Office
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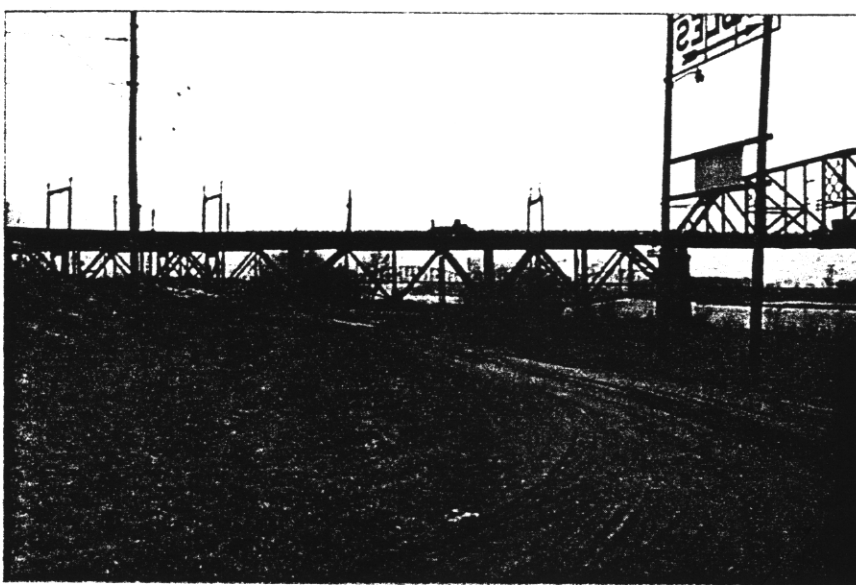
FUSRAP Update

The St. Louis Site

U.S. Department of Energy

Formerly Utilized Sites Remedial Action Program

Spring 1997



The Riverfront Trail, looking north toward McKinley Bridge.

Contaminated soils were excavated and replaced with clean fill. The area was then contoured and seeded.

Interim cleanups include North Riverfront Trail

The city of St. Louis' Riverfront Trail, part of the St. Louis Downtown Site, was the recipient of a DOE cleanup effort last fall that has allowed development of the area for recreational use. The work was recommended by the St. Louis Site Remediation Task Force as part of its

interim cleanup priorities for fiscal years 1996 and 1997.

The downtown site portion of the trail passes through areas containing radioactively contaminated soils, a legacy of the nation's early atomic energy program. The cleanup will

(continued on page 5)

From the Site Manager

As we approach the midpoint of the federal FY '97, I am happy to report on the completion of two additional cleanups, as well as other initiatives now underway at the St. Louis Site. This new work is made possible by the recently announced site budget of \$23 million for FY 97--a record funding level for the St. Louis Site.

The Riverfront Trail has exciting potential for the St. Louis community. Hikers, bicyclists, and rollerbladers are already enjoying the completed portions of the trail, which features 10-foot-wide paved lanes, turnouts for wildlife viewing, native plant restoration areas, and restroom facilities.

Over the summer, representatives of DOE, Mallinckrodt Chemical, and the St. Louis Site Remediation Task Force joined with the city and the Riverfront Trail Association to reach agreement on a cleanup plan that would allow trail construction to proceed. It was enormously satisfying to see all these groups

(continued on page 5)

1996 = great strides in N. County

The U.S. Department of Energy (DOE) made significant headway in 1996 with vicinity property cleanups in North County. After completing cleanups along the entire length of Frost Avenue in Berkeley, work crews turned the corner on Hazelwood Avenue, cleaning up several addition properties

along the way.

The cleanup involved excavating low-level contaminated soils, mostly along drainage ditches and road frontages. The work began in early April and was completed by the fall.

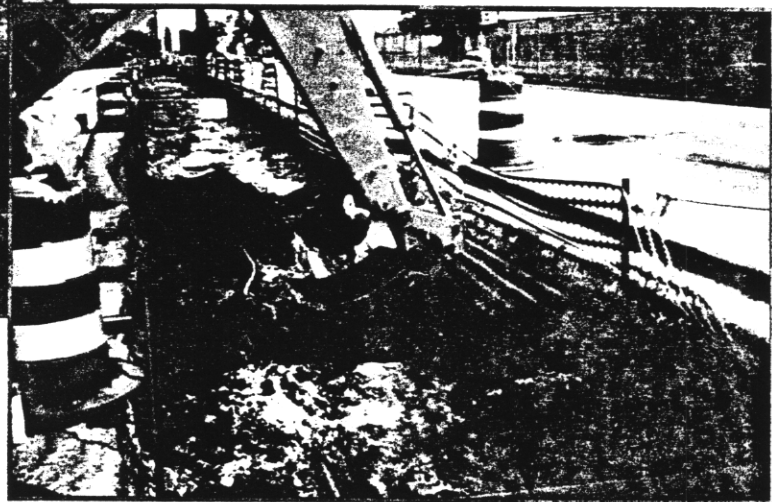
Frost and Hazelwood Avenue were among the "haul routes" that became contaminated in the 1960s. Processing residues that had been stored at SLAPS were purchased and trucked by private interests to Latty Avenue for storage and additional processing. During transport, some of the radioactive material dropped from trucks.

Following release of the properties by an independent verification contractor, DOE brought



Above: Workers excavate contaminated soil near the intersection of Frost and Hazelwood avenues. I-170 crosses in the background.

Right: Looking eastward on Frost. Across the street is McDonnell Douglas.



vicinity property cleanups ...

in clean fill, re-contoured and landscaped. Fences and other property improvements disturbed by the work were replaced.

The Frost and Hazelwood properties were given priority in part because of their relatively high elevation and drainage patterns, which make recontamination unlikely.

The excavated soils were staged on a Norfolk-Southern Railroad siding at Eva Avenue and McDonnell Boulevard, then loaded into gondola cars equipped with special impermeable plastic liners for the 1,450 mile trip to Utah.

The haul route cleanup was recommended to DOE by the St. Louis Site Remediation Task Force, an advisory board established by DOE to make recommendations on the cleanup of the St. Louis Site. Total cost of the project was about \$5.5 million.

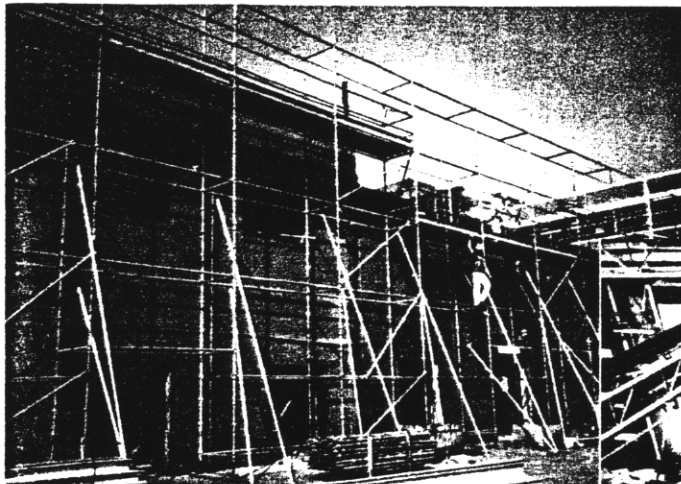
In the preceding year, DOE cleaned all contaminated residential properties along the haul routes. These, along with the Frost and Hazelwood commercial properties were cleaned to levels that are considered suitable for any future land use.



Above: Workers view a fresh cut made by an excavator. **Right** Only old-fashioned hand excavation will do near a utility conduit.

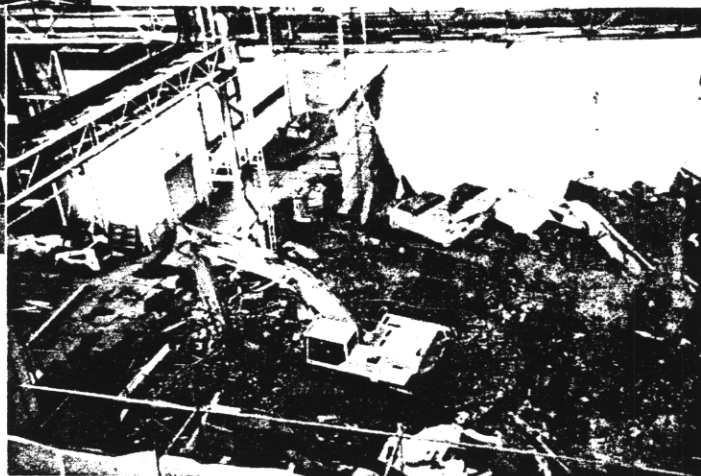


... and Downtown, too



Above -- Scaffolding system, east side of 50-Series buildings. Scaffolding was used to provide support for the enclosure system.

Below -- Demolition in progress. Machines are segregating various building components in preparation for disposal.



Cleanups paying dividends to local economy

After two years of accelerated interim cleanups at the St. Louis site, economic as well as environmental benefits are beginning to mount.

Local companies receive the lion's share of all cleanup-related hiring and purchasing, amounting to more than \$1.1 million in fiscal year 1995, and more than \$2.1 million in FY '96. (Waste transportation and disposal accounted for an additional \$8.9 million over both fiscal years.) Projected expenditures for this year are significantly higher.

St. Louis-area companies awarded cleanup-related contracts in 1996 included St. Charles Engineering and Survey, Remediation Services Incorporated, B&P Construction, Jani-King,

Zambrana Engineering, St. Louis Aerial, Schneider Electric, Collins & Herman, Garrett Trucking, and Spirtas Demolition. (As a matter of policy, FUSRAP uses small, disadvantaged businesses to the maximum extent possible.)

In addition to local contracting, purchase orders for goods and services amounted to more than \$350,000 in fiscal years 1995-1996. These local purchases range from gasoline and gravel to landscaping and traffic control.

These expenditures, along with local salaries and state and local taxes paid, represent a multimillion dollar investment impact on the St. Louis regional economy.

Interim cleanups

(continued from page 1)

allow the city to complete construction of the trail.

When fully completed, the Riverfront Trail will stretch from the Old Chain of Rocks Bridge in the north to the Merchant's Bridge in the south -- connecting numerous neighborhoods, commercial districts, and tourist attractions along the way.

The Task Force chose a recreational use cleanup standard for the trail area, which is somewhat less stringent than those applied to a residential area. Cleaning up to residential levels would have quadrupled the cost--putting the trail out of reach for an expedited cleanup.

Cleanup spoils from the cleanup are being shipped to a licensed, out-of-state facility for disposal.

Other recent interim cleanups at the Downtown Site included the decontamination and demolition of the 50-series of buildings. In the North County, cleanup continued along the haul route vicinity properties. (See related story and photos.)

Grumbly responds to Task Force report



Tom Grumbly

Tom Grumbly at a December meeting with Task Force members.

Grumbly agreed that no waste bunker was to be built in the St. Louis area, as had been proposed previously. Also in alignment with the Task Force, most of the downtown site is to be cleaned to industrial use standards, while vicinity properties and Coldwater Creek are to be cleaned to unrestricted use standards.

Grumbly noted a few areas, however, in which DOE is unable to accept the citizens group recommendations without further review, chief

The U.S. Department of Energy will heed many of the recommendations put forward by the St. Louis Site Remediation Task Force. That was the message delivered by DOE Undersecretary

among them its proposed remedy for the Airport Site. Grumbly called for a thorough review of all available data regarding groundwater issues at the site, before making a determination. Grumbly promised swift resolution of these issues.

Grumbly added that he wants to finish the St. Louis cleanup in 8 years, in time for the 100th anniversary of the World's Fair.

In addition, Grumbly:

- committed \$23 million in FY 97 for interim cleanups;
- promised a full-time, on-site DOE manager by February;
- offered to support the creation of a site-specific advisory board, should the community so desire;
- promised continued financial support for remedial studies at the non-FUSRAP West Lake Landfill.

Prior to the Task Force meeting, Grumbly met separately with state and local officials including Gov. Mel Carnahan, St. Louis County Executive Buzz Westfall, St. Louis Mayor Freeman Bosley, and EPA Region VII Administrator Dennis Gramms.

From the Site Manager

(continued from page 1)

come together in a spirit of cooperation, with a common goal and purpose.

In addition to the cleanup of radioactive residues, FUSRAP helped apply the finishing touches by redirecting a portion of the restoration funds to the Trail Association. This cooperative effort resulted in a first-class landscaping and beautification effort, that included the reintroduction of native plants.

Another downtown success story is the dismantlement and removal of the 50-Series of buildings. Later this year, we look forward to the cleanup of the 50-series' sub-slab soils.

In addition, radiological surveying and sampling of the K-series of buildings was completed in early February and decontamination is now underway.

Such cleanups, while relatively small in relation to the overall St. Louis Site, return valuable real estate to productive use -- creating jobs for local residents and tax revenues for

the city. Additionally, the cleanup work itself is providing good jobs at good wages for local contractors, craft, and labor.

So, congratulations and thanks to all who have worked diligently to make these projects a reality. And thanks especially to our stakeholder partners, whose can-do approach has moved us forward and helped set the stage for an effective, acceptable overall remedy for the St. Louis Site.


E. R. Valdez

Cyber-RAP

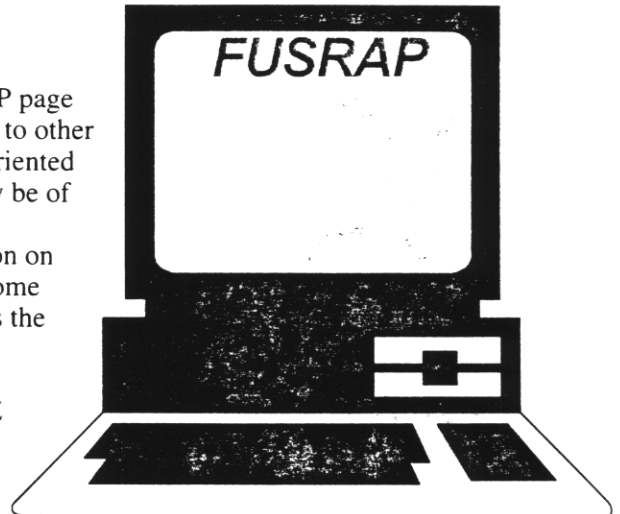
Want to learn more about FUSRAP and the St. Louis Site? Check out the FUSRAP home page on the Internet's World Wide Web. The address, or URL, is:

<http://www.fusrap.doe.gov/>

The FUSRAP home page provides an overview of the program and plenty of site-specific information that can be accessed with a click of a mouse on our USA locator map. Users can provide feedback or otherwise correspond with project officials by way of an automated E-mail fea-

ture. The FUSRAP page also includes links to other environmentally oriented Web sites that may be of interest.

For information on how to use your home computer to access the Internet and the FUSRAP home page, call the DOE Public Information Center at (314) 524-4083.



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FUSRAP Update

The St. Louis Site

U.S. Department of Energy •

Formerly Utilized Sites Remedial Action Program •

Spring 1996

'96 cleanups underway

Drawing from the recommendations of the St. Louis Site Remediation Task Force, DOE is planning several interim cleanup activities for fiscal year '96. These interim cleanups are part of DOE's commitment to implement focused interim cleanup measures, while continuing to work with stakeholders toward development of an overall, long-term remedy for the site.

North County

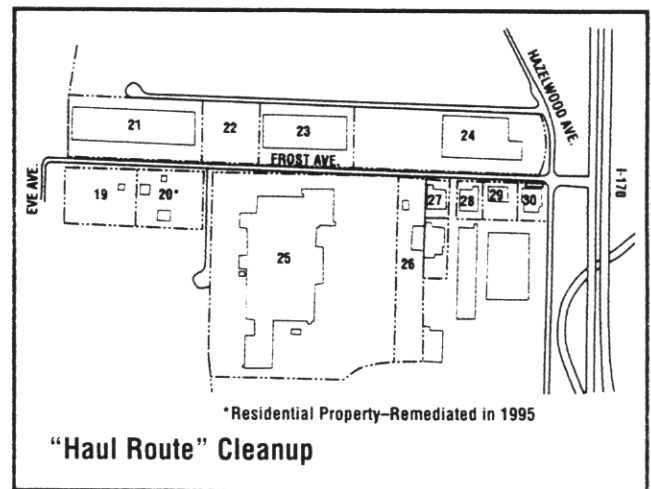
Haul Routes – Spring cleaning plans include commercial vicinity properties along Frost Avenue. There are seven commercial properties on Frost, with varying amounts of contamination, mostly along road frontages.

The Frost properties were chosen in part because of their relatively high elevation and drainage patterns, which will preclude recontamination from other areas. The cleanup will allow DOE to release an entire block of properties for use without radiological restriction.

Excavated soils from these properties will be staged at the Norfolk-Southern Railroad siding near the intersection of Eva Avenue and McDonnell Boulevard. From there, the soils will be loaded onto gondola cars for shipping to a licensed, out-of-state disposal facility.

Berkeley Ballfields – As part of its interim cleanup deliberations, the Task Force sought a way to return the Berkeley Ballfields (also known as Khoury League Park) to recreational use. Task Force members have asked DOE to look into removing the most radioactive soils from "hot spots" and covering the site with enough clean fill to make it safe for future use. Before DOE begins any work, it will seek public review and comment on any proposed plans.

Continues on page 2 . . .



St. Louis Site Task Force recommends cleanup priorities

Restoring the Berkeley Ballfields for public use is one of the priorities recommended to the U.S. Department of Energy (DOE) by the St. Louis Site Remediation Task Force.

At its September 12, 1995 meeting, the Task Force agreed to recommend a series of cleanup activities for the DOE to undertake for its fiscal years 1996 and 1997. Fiscal year 1996 began October 1, 1995. DOE has agreed to pursue the Task Force recommendations.

These near-term priorities were developed by the Task Force as it continues to refine a recommendation for an overall cleanup program at the St. Louis Site.

The DOE anticipates spending a total of \$30 million

Continues on page 4 . . .

From the Site Manager

After months of hard work, the St. Louis Site Remediation Task Force appears to be entering the home stretch. The group is shifting from an information gathering phase, such as the just completed Coldwater Creek investigation, to its alternative development phase. The Task Force's report is expected in September 1996.

It has been a long, often arduous process. And yet by any number of measures, it can already be considered a success. For the first time, the many diverse interests and viewpoints represented by the St. Louis Site have come together, dedicating their time and energies to addressing these important issues. The issues have been discussed in a spirit of openness and cooperation. Environmentalists, property owners, and regulators have found common ground and shared values. More tangibly, interim cleanup priorities have been established, and a range of long-term options has been identified and examined.

Public awareness has been enhanced as Task Force members have taken the groups' deliberations back to you and others who make up their various constituencies. This report-back function is even more critical now that we've entered the alternative development phase. I hope you will feel free to talk with members of the task force about your views and concerns. (Information about how to contact Task Force members is available from the DOE Public Information Center.) And of course, the Task Force meetings continue to be open to any interested member of the public, with time set aside for public comment.

The result of all these activities will be better, smarter decision making, and the best remedy possible for the St. Louis Site.

This has been a new and, at times, apprehensive experience for myself and others at DOE. Never before have we so empowered stakeholders at a FUSRAP site. Never before have stakeholders become so directly involved in the decision-making process. In my role as an ex-officio member of the Task Force, I have taken off my site manager's hat and served primarily as a resource. From that vantage point, I've witnessed an incredible amount of hard work and dedication on the part of Task Force members, and I've been greatly impressed by the level of sophistication they've developed regarding the many complex technological, logistical, and programmatic questions involved.

As I mentioned, the Task Force has already issued recommendations involving use of FY 1996 and 1997 funds for interim cleanups. This report has enabled DOE to plan for a significant amount of work this year. (See related stories in this **Update**.) Many key issues remain to be addressed as part of the final recommendation: How much of the site's contaminated material should be excavated? Where should the material be taken? To what extent should DOE pursue emerging technologies that may reduce the tremendous volumes of contaminated soil? And to what extent should future use of a site determine the level of cleanup to be performed?

Precisely how these findings may impact the Task Force's final recommendation remains to be seen. Whatever the outcome, one thing is certain: The Task Force experience has been a winning proposition for all concerned.



David Adler

FUSRAP Update is issued periodically to inform St. Louis residents about current activities at the radioactivity contaminated sites in the St. Louis area.

For more information about the FUSRAP site in St. Louis, call the DOE Public Information Center at (314) 524-4083. Or you may call DOE toll free at (800) 253-9759.

Documents and other relevant information about the St. Louis Site are located in two information repositories. One is at the St. Louis Public Library, 1301 Olive Street in St. Louis; the other is at the DOE Public Information Center, 9170 Latty Avenue in Berkeley.

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Cleanup Continued from page 1

A related aspect of this initiative would be the cleanup and improvement of adjacent roadside drainage ditches.

Downtown Site

Mallinckrodt and FUSRAP officials have met on several occasions to decide how best to apply the downtown site's share of FY '96 funding. They have settled on what is known as the 50-Series of buildings, situated between Mallinckrodt and Destrehan streets. Plans call for the buildings to be demolished.

The work is expected to be modeled on last year's successful Plant 10 cleanup in which Mallinckrodt and FUSRAP worked together to remediate an entire city block.

FUSRAP completes Plant 10 cleanup

FUSRAP recently cleaned up an entire city block of the St. Louis Downtown Site. Known as Plant 10, the area is part of an industrial complex owned by the Mallinckrodt Chemical Company, which plans to redevelop the property.



During . . .

Looking north from Anglerodt Street. Broadway is to the left and the Mississippi River to the right.

. . . and After

Recommendations Continued from 1

during this fiscal year and the next. DOE officials asked the Task Force to recommend how the money be allocated.

The recommendations reflect the Task Force's concern that funding be equitably distributed among the various properties in the St. Louis area. Task Force members also told DOE that they thought it important to focus on projects that will be consistent with whatever long-term cleanup recommendations are developed.

Additionally, as part of its recommendations, the Task Force asked DOE to ensure that all recommended cleanup actions will protect human health and the environment.

Specific recommended activities to be undertaken in fiscal years 1996 and 1997 include:

- Evaluate use of local disposal facilities for minimally contaminated soils.

Scope: Attempt to obtain approvals from appropriate regulatory agencies, particularly the State of Missouri. Coordination with the U.S. Nuclear Regulatory Commission and the Environmental Protection Agency would also be required.

Cost: \$200,000 per year (total \$400,000).

- Identify and evaluate suitable location(s) for a new in-state disposal or interim storage facility.

Scope: Work with the State of Missouri to identify a location(s) for construction of a permanent disposal or interim storage facility. Identify and use state criteria to identify land areas for evaluation as potential sites.

- Critically evaluate existing geological surveys and other siting studies

for hazardous waste facilities. Perform supplementary evaluations as needed incorporating values, criteria, and objectives stated in the alternative sites working group report of April 18, 1995.

Cost: \$200,000 per year (total \$400,000)

- Remove contaminated soils from haul route properties located in North County.

Scope: Continue cleanup efforts along Frost and Hazelwood avenues (public and private properties) by excavating soils alongside the roadways, then restoring roadsides using clean soil. Material located underneath roadways would not be removed. Generated soils could either be stored on a local property under engineered and monitored conditions, or shipped to a licensed disposal facility.

Cost: \$4 million per year (\$8 million total) with the disposal option to be recommended by the Task Force.

- Restore and stabilize the St. Louis Airport Site (SLAPS).

Scope: Projects include:

– Initiate actions to address the conclusions and recommendations of the Coldwater Creek Panel.

– Based on findings of that panel, address current erosion by mitigating the concentrated contamination in roadside ditches along McDonnell Boulevard.

– Create clean corridor(s) for relocation of multiple utility lines currently located on the south side of McDonnell Boulevard.

– Excavate and remove ballfield hotspots; cover remainder of contami-

nated ballfields with two feet of clean soil. Release ballfields for use.

– Ship soils generated by selected hotspot excavations to a licensed disposal facility.

Cost: \$3.5 million to \$4 million per year (total \$7 million to \$8 million).

- Continue cleanup efforts at the St. Louis Downtown Site (SLDS).

Scope: Plans are to clean up buildings known as the "50 Series" on a phased basis over two years, with work scheduled to begin in July 1996. Actual site restoration measures/techniques would be similar to those applied this year for the City Block 1201 cleanup at the SLDS. Resultant soil/rubble with above guideline contamination could either be managed on site or shipped to a licensed disposal facility.

Cost: \$4 million to \$4.5 million per year (total \$8 million to \$9 million).

- Continue soil treatability investigations for the St. Louis Site.

Scope: Options range from continuation of laboratory-based evaluation/refinement of treatment techniques to deployment of on-site pilot plants to conduct applied tests of field-scale treatment technologies. Use local resources where possible.

Cost: \$100,000 to \$250,000 per year depending on scope of effort.

The Task Force may modify its recommendations for the ballfields and St. Louis Airport Site (SLAPS) to reflect the conclusions of the Coldwater Creek Panel. (See related story.) The Task Force expects to receive the panel's final written report soon.

Panel assesses site impacts to Coldwater Creek and groundwater

An independent panel of expert geologists and hydrogeologists has delivered its findings about whether the radioactive wastes buried at the St. Louis Airport Site pose a significant threat to Coldwater Creek and deep ground water aquifer. The Task Force is considering the panel's report in developing recommendations for short- and long-term cleanup plans for the St. Louis Site.

The six-member panel was formed in September at the request of the St. Louis Site Remediation Task Force. Panel chairman David W. Miller presented the panel's findings at the January Task Force meeting and a draft report was released in February.

Key issues examined by the panel include the effects of contaminated groundwater at the St. Louis Airport Site (SLAPS) on Coldwater Creek, the effects of surface water runoff from SLAPS on the creek, and the effect of SLAPS on the deep groundwater aquifers.

Panel findings

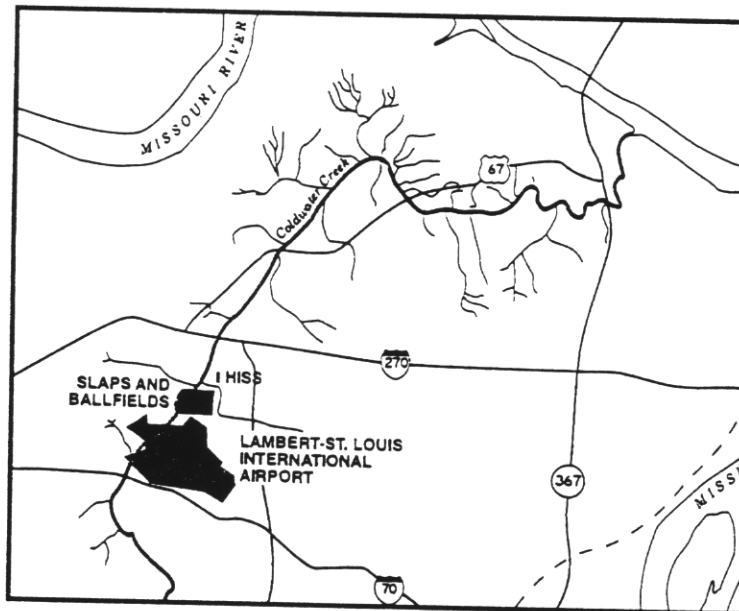
Specifically the panel found:

- Although surface water, sediments, and shallow groundwater quality have been affected in the past by stormwater runoff from SLAPS, "Results of the groundwater modeling also indicate that the levels of contamination that might eventually reach the creek should not impact surface water sediments so that DOE guidelines would be exceeded for at least 100 years.
- Stream bank erosion adjacent to SLAPS and sheet and gully continue to result in contribution of radionuclides

into surface waters of Coldwater Creek.

However, the panel also found that erosion appears to have been more significant in the past, prior to construction of a Gabion Wall to control bank erosion and the restoration of vegetative cover over parts of the site.

- The panel determined that the presence of radionuclides in the soil and upper aquifer system "will not have a significant impact on the lower aquifer system within the foreseeable future (100 years). "This conclusion is supported by investigations to date. However, the panel concluded that the deep groundwater system has not yet been sufficiently characterized."



- The panel acknowledged that although wastes are already present at the site, underlying hydrogeological features do not meet criteria for siting a radioactive waste storage or disposal facility.

The panel suggested several actions to address current site conditions.

- The panel expressed concern about "the proximity of radioactive contamination to the creek and the presence of contaminat-

ed material in the floodplain," noting that the "stormwater runoff ditches and pipe provide a rapid pathway for potential contaminated migration into the creek . . . therefore, at a minimum a site drainage control and prevention program should be designed and implemented.

- The panel called for the evaluation of additional facilities to maximize erosion protection during periods of flooding along the creek.
- The shallow soil contamination along McDonnell Boulevard and the railroad right-of-way by SLAPS should be considered for removal as part of the ongoing remediation activities.

The panel also concluded that more data is needed "to develop a more complete hydrogeological assessment of the deep groundwater system and a more comprehensive analysis of contaminant sources." The data would be gathered by way of wells and stream gauges.

In addition to Miller, other members of the panel include Thomas Aley, director of the Ozark Underground Laboratory; James Cox, Walsh Environmental, Inc.; and John D. Rockaway, professor and chair, Department of Geological and Petroleum Engineering at the University of Missouri-Rolla.

Serving in a technical advisory role only were Angel Martin, staff hydrologist for the U.S. Geological Survey, and Mimi Garstang, deputy director of the Division of Geology and Land Survey at the Missouri Department of Natural Resources.

Making sense of risk

This is the first of a regular series featuring various technical issues pertaining to the St. Louis Site. This article provides an introduction to risk assessment and how it is used in restoration activities.

What is Risk?

Risk is the chance that some harmful event will occur. In the case of environmental cleanups, we think of risk as the potential for negative health impacts as a result of exposure to contamination.

Health impacts are generally classified as carcinogenic or toxic. Carcinogenic risks are quantified as the risk of contracting cancer over a lifetime and usually are stated in scientific notation. (See discussion below about scientific notation.) Toxic health impacts are non-cancerous illnesses and are quantified using a health index. A health index of 1 or above is considered hazardous. Calculations of risk are used to identify threats and calculate cleanup levels.

Because of the probability, risk is expressed as a fraction, without units. It takes values from 0 to 1.0. Zero is the absolute certainty that there is no risk (which can never be shown). One is the absolute certainty that a risk will occur. Values between 0 and 1 represent the chance that a risk will occur.

For example, we say that a lifetime cancer risk from carcinogen A at an average daily dose of B is 1 in 100,000 (0.00001 or 10^{-5}). If this number is accurate, it means that one in every 100,000 people exposed to carcinogen A at a lifetime average daily dose of B will develop cancer over a lifetime. The probability also describes the extra risk incurred by each individual in that exposed population.

People are more familiar with

expressions of risk associated with various activities than they are with risks associated with chemical exposures. We speak, for example, of the annual risk of dying as a result of certain activities.

The annual chance of dying in automobile accidents for people who drive the average number of miles is about 1 in 4,000, according to federal statistics. The lifetime risk of developing cancer in the United States is about 1 in 5.

These types of expressions of risk are more familiar, but they mean roughly the same thing as those risks of toxicity from chemical exposure. However, information on death rates from automobile accidents, for example, is more reliable than statistics pertaining to most chemical risks.

Most of the risk associated with environmental chemical exposure are not so well known. So although chemical risk information often is expressed in the same form as directly-measured risks such as automobile fatalities, chemical risk information is calculated using different methods. Chemical risk information almost always includes estimates where measured risk data are not available.

What is Risk Assessment?

Risk assessment is the science of defining the health effects of exposure to hazardous materials and situations. At the St. Louis Site, risk assessment information helps determine what actions should be taken to clean up the site. Risk assessments are one type of information considered in risk management.

Although risk assessment is a science, it is not a perfect one. Most scientists agree that there is a great deal of uncertainty associated with risk assessment; however, to compensate for this uncertainty, the risk assess-

ment process is deliberately conservative. That is, it errs on the side of safety when calculating potential risks to people.

Risk is a function of how much of a contaminant is present (dose), how dangerous a chemical is to humans (toxicity), how the chemical enters the body (method of exposure) and how often a person is exposed to the chemical (level of exposure).

A risk assessment should be able to answer the questions: "What is the problem, and how bad is it?"

Therefore the calculation may be expressed as:

$$\text{Risk} = \text{Dose} \times \text{Toxicity} \times \text{Method of Exposure} \times \text{Level of Exposure}$$

- **Dose.** The dose of a contaminant is represented as the concentration of the compound of concern at the point of human contact. These concentrations may be present in soil, sediments, surface water, ground water, or air. If human contact occurs in more than one of these media, the dose in each case must be taken into account to identify the cumulative risk from the contaminant.

- **Toxicity.** The U.S. Environmental Protection Agency and other government agencies have calculated the toxicity of many hazardous compounds. Much of this information is gained from statistical evidence from laboratory tests on animals. Not all compounds have well understood toxicity values. Special consideration is given to populations such as pregnant women and children that may be especially susceptible to a contaminant's toxic effects.

- **Method of Exposure.** Exposure to contamination may occur from many routes, including direct ingestion from air inhalation, water consumption,

accidental consumption of soil or wind blown particulates, or eating contaminated foods. Exposure also can occur through direct contact between contaminants and skin.

• **Level of Exposure.** The level of exposure is defined by the activities taking place at the point of exposure. Factors calculated into level of exposure estimates include the amount of time (e.g, hours per day of direct exposure) or volume (e.g, liters of water consumed per day or number of breaths per day).

What is Risk Management?

Risk management is the process of weighing policy alternatives and selecting the most appropriate regulatory action. Risk management is not a science; rather it combines information about risk with economic, political, legal, ethical, and value judgments to reach decisions.

The term "risk management" describes a type of decision making. First, a decision must be made as to whether an assessed risk needs to be reduced to protect public health and the environment. Second, a decision must be made about the means to reduce that risk, should action be deemed necessary.

For environmental cleanups at Superfund sites, risk management decisions are primarily driven by legal requirements. The U.S. Environmental Protection Agency is responsible for developing risk assessment guidelines for Superfund. Current Superfund regulations consider the range of 1 in 10,000 to 1 in 1,000,000 excess lifetime risk of cancer to be acceptable. An excess lifetime risk of cancer is the probability above the 1 in 5 risk of developing cancer in the United States.

Interpreting Risk Numbers

Risk is expressed in *scientific notation*, which is the use of numbers raised to a power, such as 10^4 or 10^{-6} . Writing numbers in scientific notation is much more concise on a page, but that economy of space often sacrifices comprehension for the non-technical audience.

If the number has an exponent, it is multiplied by itself the number of times indicated. (The exponent is the small number to the upper right.) For example, 10^2 (2 is the exponent) is 100, or 10×10 .

Negative exponents are different; a negative exponent indicates a fraction. So 10^{-4} is the same as $1/(10 \times 10 \times 10 \times 10)$ or 1 divided by $(10 \times 10 \times 10 \times 10)$. This is $1/(10,000)$, which equals 0.0001. Another way to think about 10^{-4} is to think that it is 10,000 times

smaller than 1. Other examples of scientific notation are:

$$1.5 \times 10^1 = 15$$

$$7.3 \times 10^{-4} = 0.00073$$

$$4.18 \times 10^2 = 418$$

References and Further Reading

- *Calculated Risks: the Toxicity and Human Health Risks of Chemicals in Our Environment*, Joseph V. Rodricks
- *Risk Assessment in the Federal Government: Managing the Process*, National Research Council
- *Risk Analysis: A Guide to Principles and Methods for Analyzing Health and Environmental Risks*, John J. Cochrane and Vincent T. Covello
- *Risk Assessment Guidance in Superfund*, U.S. Environmental Protection Agency
- *Environmental Risks and Hazards*, Susan L. Cutter, ed.

Task Force elects new chair

The St. Louis Site Remediation Task Force unanimously elected Sally P. Price chair at its October meeting.

Former chair Alpha Fowler Bryan resigned from the Task Force because of professional commitments.

Price, a registered nurse, also serves as a member of the FUSRAP committee of the Environmental Management Advisory Board (EMAB), which is a national advisory board to DOE's assistant secretary for environmental management. She also is a member of the St. Louis County Radioactive & Hazardous Waste Oversight Commission.

Anna Ginsburg, director of the St. Louis City Neighborhood Stabilization Office, remains vice chair of the Task Force.

The Task Force was formed in August 1994 to develop a public consensus about cleanup and future courses of action at the St. Louis Site. DOE has agreed to carefully consider the Task Force's recommendations in making its decisions about the site. For more information about the St. Louis Site, the Task Force and its public meetings, call the DOE Public Information Center at (314) 524-4083.

The Task Force meets at 7:30 a.m. the third Tuesday of each month at the Hazelwood Civic Center East, 8689 Dunn Road, Hazelwood.

FUSRAP goes on-line with new Web page

FUSRAP has joined the world of on-line information and communication via the Internet. The program has established a site, or "home page" on the global network's World Wide Web. The site is:

<http://www.fusrap.doe.gov>

Visitors to the Web site are greeted by a U.S. map showing the location of FUSRAP's 46 cleanup sites in 14 states. Users can simply click on a given state for a brief description and the state's sites and their cleanup status. In addition, a menu directs users

to fact sheets on a variety of FUSRAP topics, such as detailed site backgrounders, laws and regulations governing the project, program success stories, news releases, and public participation opportunities.

Future upgrades will include site newsletters, video clips, and an administrative record index with downloadable project documents.

The FUSRAP home page includes links to several Web sites of related interest, such as DOE's Environmental Management home page. In addition, users can provide feedback on the FUSRAP home page or otherwise cor-

respond with project officials by way of an automated E-mail feature.

For information on how to use your home computer to access the Internet and the FUSRAP home page, call the DOE Information Center at 524-4083.

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9170 Latty Avenue
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FUSRAP Update **The St. Louis Site**

U.S. Department of Energy • Formerly Utilized Sites Remedial Action Program • Fall 1995

Task Force enters critical phase

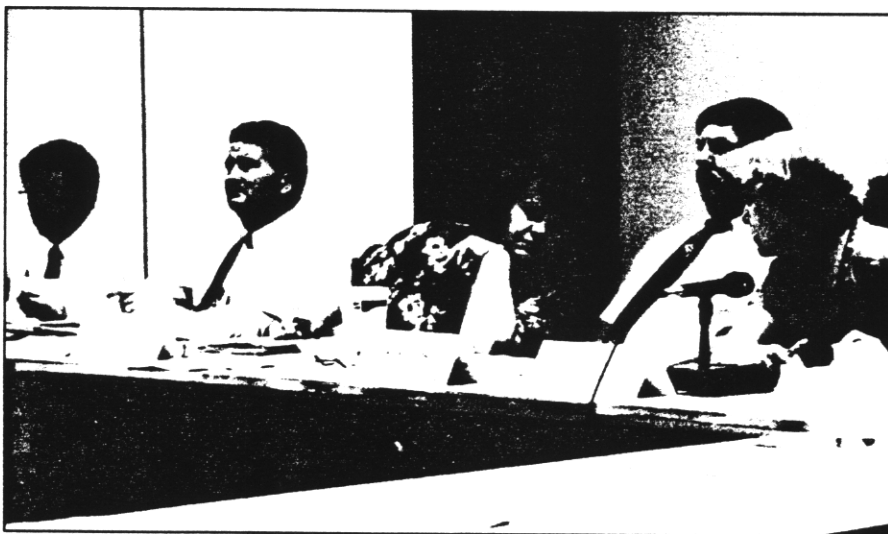
The St. Louis Site Remediation Task Force is steadily moving toward its goal of proposing a cleanup strategy to the U.S. Department of Energy.

Since beginning monthly meetings in October 1994, the task force has selected a facilitator, ranked criteria for evaluating site remedies, and organized several working groups. The working groups consist of 5 to 10 members who take a more in-depth look at specific issues. The groups meet more frequently, in some cases weekly, and are reporting recommendations back to the full task force.

Facilitator Jim Dwyer credits the "extraordinary dedication of those in the working groups" for the task force's momentum.

The alternative sites working group met weekly the first three months of this year. More recently, the priorities working group has met weekly to assess and rank interim cleanup options for the next two years. Other working groups have formed to assess site cleanup standards and to develop communications plans.

The task force meets at 7:30 a.m. the second Tuesday of each month, at the Hazelwood Civic Center East. All meetings are open to the public. The group plans to deliver a final report to DOE in the spring.



Members of the St. Louis Site Remediation Task Force discuss cleanup priorities at their September meeting.

FROM THE SITE MANAGER

During the next few months, we have what I believe is one of our best opportunities ever for reaching consensus on a remedy for the St. Louis Site.

Since last August, members of the Remediation Task Force have been working diligently toward that goal. Week after week, month after month, they've immersed themselves in FUSRAP— studying documents, reviewing proposals, and debating the issues. They've grappled with such weighty topics as disposal site alternatives, cleanup standards and health risks, and near-term cleanup priorities.

The challenge Task Force members have undertaken is not for the fainthearted — the issues are complex, the hours have been long, and at times the tensions high. It's no simple matter, finding a remedy that everyone can live with and that Congress will pay for. (Now more than ever, we must deal with stark fiscal realities. Whether on Capitol Hill or at the White House, budget cutting is the name of the game, and as you'll read elsewhere in this newsletter, FUSRAP has not been spared.)

Despite these hardships, the Task Force has persevered. The dedication of these people is commendable. I hope you'll join me in wishing them the best and expressing heartfelt appreciation for their efforts.



David Adler, Site Manager

Survey gauges attitudes toward St. Louis Site issues

Ever wonder what others in your neighborhood and beyond are thinking about the St. Louis FUSRAP site? The Energy, Environment Resources Center at the University of Tennessee recently conducted an awareness and opinion survey of St. Louis Site stakeholders. More than 1,000 surveys were mailed to a randomly selected sample of individuals living in proximity to either the North County sites or the downtown site. Of those, some 200 were returned.

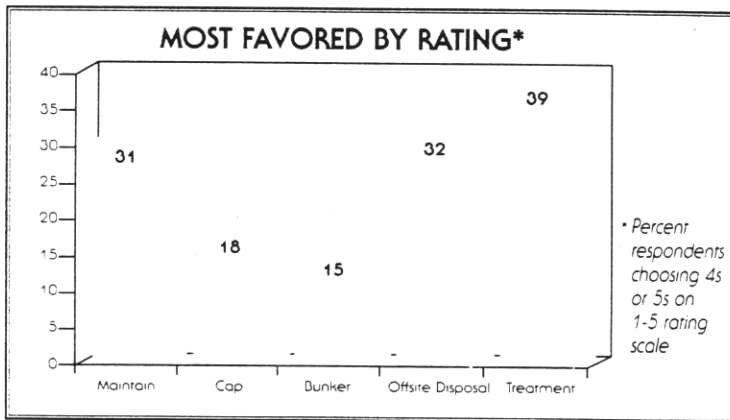
Views were sought on a variety of site-related issues such as perceived risks, preferred site remedies and public involvement. Treatment of soils to remove contaminants and reduce disposal volumes was the most preferred course of action. Next was excavation with off-site disposal; 32 percent gave it a favorable rating of 4 or 5 (on a scale of 1-5). However, 35 percent gave it an unfavorable rating (1 or 2), largely out of concern for costs.

Controlling and monitoring, but leaving the material in place ranked in the middle range of preferences. Equal percentages (32 percent) gave it low and high marks. Scenarios involving consolidation of contaminated materials and disposal on site received the lowest level of support.

In addition, nine site-related concerns — which are commonly voiced — were provided to respondents for ranking. The top three were water contamination (66 percent), overall health risks (59 percent), and the need for public involvement (57 percent).

Project director David Feldman said he was pleased with the level of response and noted the quality of additional written comments provided by respondents.

A summary report has been published and copies are available by calling 1-800-253-9759.



FUSRAP News

FUSRAP budget trimmed; DOE seeks cost-effective cleanups

As part of the national effort by the Administration and Congress to reduce the deficit and streamline government, the Department of Energy recently announced a strategic realignment and downsizing initiative. Congress also is in the midst of the appropriations process for the FY '96 budget year, which begins October 1, 1995.

Attendees of the National Summit in May will recall that DOE officials projected an increasing budget for FUSRAP. At that time our budget planning figures were: FY '95, \$74.1 million; FY '96, \$85.2 million; FY '97, \$129.1 million. As a result of the actions described above, these budget projections are being reduced. The FY '95 reduction is 3.2 percent. For FY '96, based on the recent House actions, our budget would drop by 10.4 percent; final congressional action is expected by the end of September.

For FY '97, the Administration is still formulating its budget proposal that will go to the Congress in January 1996, but at this stage, the DOE request to the Office of Management and Budget will reflect a reduction of 32 percent from the earlier projections.

Despite these reductions, FUSRAP officials expect to have sufficient funds to maintain a vigorous cleanup program, focusing on final actions at a number of small sites and interim actions at the larger sites, such as St. Louis.

"The fiscal realities facing the DOE put an even greater emphasis on our shared tasks of finding protective, cost-effective cleanup approaches at major sites that are acceptable to the affected communities," observed DOE Site Manager David Adler. "Public involvement is an essential ingredient in this process."

St. Louis County resident joins EMAB's FUSRAP committee

The FUSRAP Committee of DOE's Environmental Management Advisory Board (EMAB) met for the first time in St. Louis earlier this summer. The EMAB was established to serve as a board of advisors to assist DOE Assistant Secretary Thomas Grumbly on various program issues.

The FUSRAP committee of EMAB was formed to allow Mr. Grumbly to give the program appropriate attention as it pursues its nationwide mission. A major goal of the committee, as defined at the National Stakeholders Summit, is to propose a set of general principles for guiding the implementation of DOE's FUSRAP efforts. The principles will promote consistent and cost-effective remedies across FUSRAP projects.

St. Louis' own Sally Price has been named to the FUSRAP Committee. Price also serves on the St. Louis Site Remediation Task Force.

For more information, please contact Jeff Weaver, U.S. Department of Energy EM-5, 1000 Independence Ave., S.W., Washington, D.C. 20585, (202) 586-4400.

Missouri delegation attends national FUSRAP summit

More than 60 FUSRAP site stakeholders from around the country convened in Washington May 2-3 for the first FUSRAP National Stakeholders Summit. The independently facilitated event consisted of breakout groups and plenary sessions with DOE Environmental Management officials.

Summit participants identified and prioritized values and issues and developed action plans. The five major issues were funding, cleanup criteria, risk, remedy selection and community acceptance.

Representing the St. Louis Site were: Rita Bleser, City of St. Louis; Kay Drey, Remediation Task Force (RTF); Jim Dwyer, RTF facilitator; Mayor David Farquharson, Hazelwood and RTF; June Fowler, St. Louis County; Mayor Jean Montgomery, Berkeley and RTF; Sally Price, RTF; Elsa Steward, MDNR and RTF; Conn Roden, County Department of Health and RTF; and Alan Wehmeyer, EPA.

soil treatment

Initial lab tests show promise

In a recent test, researchers were able to remove 99.5 percent of the radioactive materials from a sample of contaminated St. Louis Site soil. The test was one of several being conducted for DOE by the Clemson Technical Center Laboratory in South Carolina to help determine the treatability of soils at the St. Louis site.

The 99.5 percent separation was achieved using chelants (pronounced key'-lants). Chelants are chemical agents that can surround and "grab" radioactive particles and metals so that they can be selectively removed from the rest of the soil. (One chelant, EDTA, is sometimes used by doctors to treat patients who have high levels of lead or other heavy metals in their bloodstream.)

The stakes for treatment are high. The St. Louis Site contains an estimated 800 million cubic yards of contaminated soil, enough to fill Busch Stadium. "The challenge," says DOE site

manager Dave Adler, "is to turn one very large pile of contaminated soil into two piles — a smaller one containing most of the radio-activity and a larger one consisting of clean dirt." Adler stressed that although encouraging, the Clemson tests are preliminary and require further verification.

Another technique studied by the Clemson researchers has shown less promise. Soil separation, in which soil particles are physically separated and sorted by size, appears to leave significant amounts of contamination in all the size fractions.

Whether treatment will actually save money is a question future tests will help determine. If the removal efficiency of chelants is confirmed and the chemical agents can be recycled effectively, the costs of the various disposal alternatives may be significantly reduced.

Task Force delegation visits Clemson Lab

In May a delegation from the Remediation Task Force traveled to South Carolina for a firsthand look at how treatability tests for St. Louis soils are being conducted. The Clemson Technical Center Laboratory welcomed RTF representatives Kay Drey, Jim Grant, Tom Binz, Dan Wall (EPA), Bob Geller (MDNR), and facilitator Jim Dwyer.

The Clemson Technical Center Laboratory welcomed RTF representatives Kay Drey (Coalition for the Environment), Jim Grant (Mallinckrodt Chemical), Tom Binz (Laclede Gas), Dan Wall (EPA-Region VII), Bob Geller (Missouri Department of Natural Resources), and facilitator Jim Dwyer.

The tour included several hands-on demonstrations, a review of Clemson's state-of-the-art technology, and an up-to-the-minute briefing on the status of St. Louis soil tests.

Accompanying the group was Dave Adler of the Department of Energy, which sponsored the trip.



Task Force members watch as Kay Drey checks her "pocket dosimeter," which monitors gamma radiation exposure, during a tour of the Clemson Lab. As a precautionary measure, dosimeters are issued to all visitors and workers upon entering the facility.

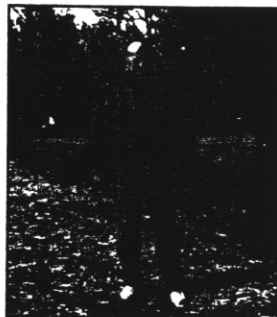
Residential cleanup complete

Residential property owners along Hazelwood Avenue in Hazelwood and Frost Avenue in Berkeley are resting a little easier now that roadsides fronting their yards are free of radioactive contamination. Although the material posed minimal health risk to the owners or their families, it had created other hardships and prevented them from enjoying the full use of their property.

The cleanup, which began October 18, was complete by the end of December. Ninety containers of contaminated soil were shipped by rail to a licensed disposal facility.

The project generated 1,300 cubic yards of wastes, a smaller volume than originally estimated.

David Adler, DOE site manager, said, "The cleanup went well, and we're as pleased as the owners are to have those properties declared clean and safe for unrestricted future use."



Property owner Dale Lakenburger admires the new landscaping along Hazelwood Ave.

Soil removed from two vicinity commercial properties

DOE cleaned up two commercial vicinity properties in North County.

One property on Latty Avenue was cleaned in two phases. Earlier this spring DOE removed a small amount of mixed wastes after improvements made by the tenant last year produced several piles of oil contaminated dirt, including one with radiation mixed in. The "mixed" pile, located in the rear of the commercial property, was removed by DOE and disposed of in a licensed disposal facility.

In September, DOE excavated additional radioactively contaminated soil from the front of this property along Latty Avenue. That remedial work is complete.

Another commercial vicinity property also was cleaned up in September. Approximately 1,450 cubic yards of soils were loaded onto 20 gondola cars and shipped for disposal.

Downtown site cleanup underway

Cleanup work has begun on a portion of the St. Louis Downtown Site known as Plant 10. FUSRAP and Mallinckrodt Chemical, Inc. engineers have worked closely together since early this year to plan the work.



Workers core drill for soil samples at the downtown site.

Plant 10 was known as Plant 4 back in the 1940s and early 1950s when several of the buildings were used in the production of uranium metal for the federal government. Although the buildings involved in the uranium work were decommissioned and demolished, some contamination remained.

DOE, Mallinckrodt, and the Remediation Task Force members began discussing a downtown component of an interim cleanup earlier this year. Mallinckrodt identified Plant 10 as a good cleanup target because of its potential value to future plant expansion and to the St. Louis city tax base. DOE's review of the Mallinckrodt proposal confirmed that the scope of the project was within the range of funding available in FY '95.

In order to make the contaminated soil accessible, Mallinckrodt had to first dismantle the existing buildings in Plant 10, none of which were used in uranium processing for DOE predecessor agencies.

Prior to the cleanup, FUSRAP technicians conducted sampling efforts at Plant 10 to more clearly define the areas of contamination. Sampling results showed the maximum depth of the contaminated soil to be some 6 to 8 feet. The waste generated during remediation will be shipped to a licensed disposal facility.

FUSRAP Update is issued periodically to inform St. Louis residents about current activities on the contaminated sites in the St. Louis area that are slated for cleanup under the U.S. Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites were contaminated during the early days of the nation's atomic energy program.

For more information about the FUSRAP site in St. Louis call the DOE Public Information Center
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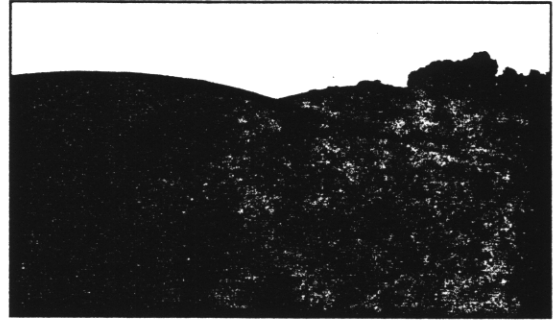
HISS piles not affected by May flooding

The rains came down, the creeks came up, and St. Louisans once again were coping with their second major flood in just two years. Yet, unlike the great flood of '93, in which the Mississippi and Missouri rivers covered giant swaths of lowlands, this flood was more localized.

Coldwater Creek, which flows past the Hazelwood Interim Storage Site on Latty Avenue, crested the night of May 16. Combined with the overflow from area storm drains, the floodwaters put the site under 12 to 18 inches of water.

While the DOE information center trailer and other site buildings incurred some minor water damage, the two HISS piles were unaffected. The piles, which contain low-level radioactive soils from previous area cleanups, were constructed with just such circumstances in mind.

Each is protected by geotextile membrane cover with overlying reinforcing grid. Rip-rap (large rocks supported by wire) surrounds the base of each pile, extending up the sides to a level 2 feet above the 100-year flood level for Coldwater Creek.



The HISS piles as seen from the DOE Information Center on Latty Avenue.

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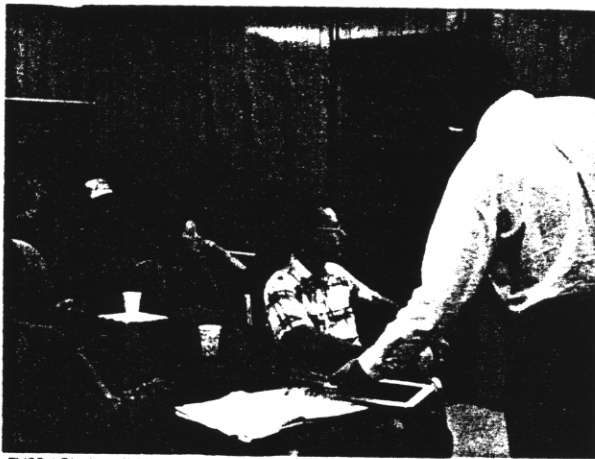


FUSRAP Update

The St. Louis Site

U.S. Department of Energy • Formerly Utilized Sites Remedial Action Program • November 1994

Cleanup of residential properties underway



FUSRAP's Joe Williams conducts a workshop for the residential property owners. (left to right: Dale Lakenburger, Leo Vasquez, Velma Vasquez, Jack Granicke).

Owner Jack Granicke said he is looking forward to having the contamination cleaned up. "It hasn't affected us adversely, but I will be happy to know that if I want to dig along the edge of my property, I can do so without disturbing contaminated soil."

An orientation for the owners was held at the Information Center in October to discuss how and when the work would be done and to answer questions.

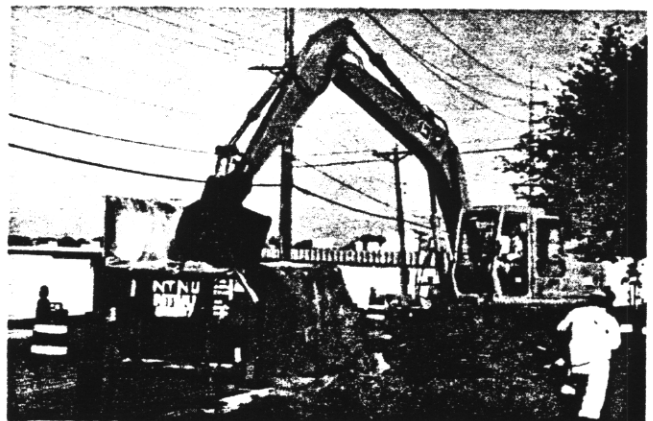
The cleanup began October 18 and should last approximately six weeks. After a brief staging at the airport site in steel waste shipping containers, contaminated soil will be shipped to a facility in Utah licensed to accept low level radioactive waste.

Residential properties near the St. Louis Airport will soon get a clean bill of health.

The properties were contaminated in the late 1960s when a commercial company hauled residues from the airport site to Latty Avenue. Because of hauling practices that would not be allowed today, some of these residues blew off the trucks and contaminated properties along road rights-of-way and portions of private properties along the haul routes.

The cleanup primarily affects road shoulders and ditches along portions of Hazelwood Avenue in Hazelwood and Frost Avenue in Berkeley.

All affected property owners recently signed agreements allowing the work to proceed and are pleased that the cleanup is underway.

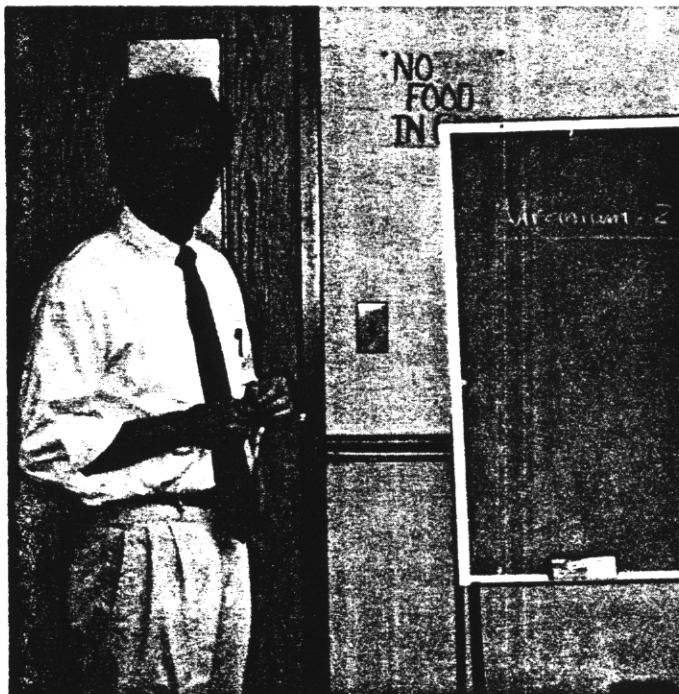


First buckets of contaminated soil are placed in an intermodal container.

DOE Conducts Neighborhood



FUSRAP's Bill Lenczuk answers a question about radioactivity.



FUSRAP's George Goveltz explains the characteristics of uranium.

"Enjoyable . . . informative . . . interesting." These are just a few of the comments from participants of the Grace Hill Neighborhood College environmental course, recently sponsored by the Grace Hill Wellness Initiative and the DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The course was designed specifically to address the environmental concerns of the staff and neighbors of Grace Hill, which is located near the St. Louis Downtown Site.

To date, approximately 60 people have attended three FUSRAP-sponsored classes focusing on radiation basics. Some of the topics included terminology and definitions, types and sources of radiation, health effects, radiation monitoring, and radon. The setting was structured but casual, and neighbors interacted with questions and comments throughout each segment.

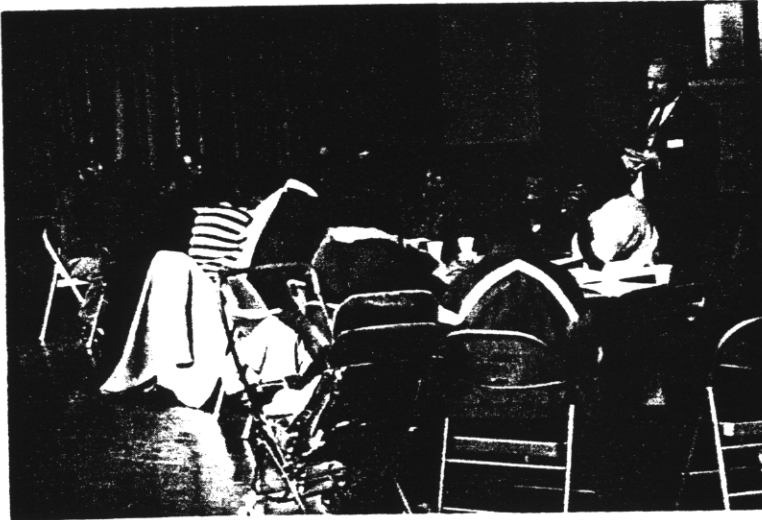
Class participants also involved their neighbors by asking them to compile a list of their top environmental concerns. They submitted names and addresses of neighbors to be added to the site mailing list and identified stakeholder groups that might be interested in learning about the site.

A highlight for one class was a field trip to the Information Center on Latty Avenue. The visit included a slide presentation and overview of the FUSRAP program, a history of the St. Louis Site, a segment on how neighbors can become involved in the decision-making process, and a tour of the Hazelwood Interim Storage Site, the St. Louis Airport Site, and vicinity properties.

Chris Byrne, director of the Air, Land and Water Branch of the St. Louis County Department of Health, was the graduation speaker for the class. He commended the neighbors for completing the course, and challenged them to put their knowledge to work in their community.

College Course

Sire Manager Dave Adler said he was pleased with the level of participation and interest shown by the Grace Hill neighbors. "We need more of this type of citizen involvement if we are to make sound decisions that are in the best interests of all concerned. I applaud the participants and the Grace Hill Wellness Council for making this forum available."

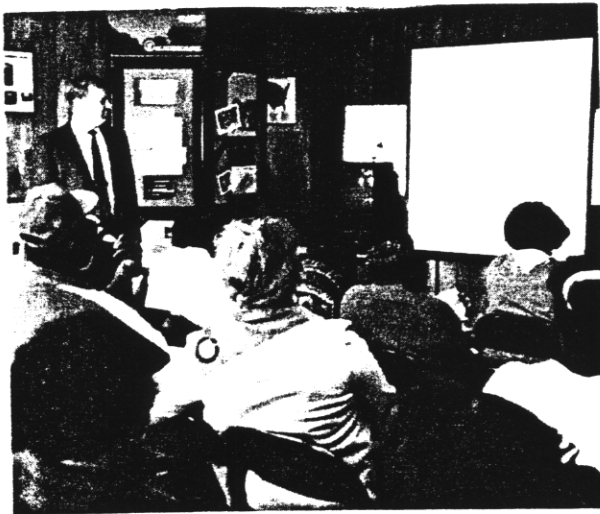


St. Louis County Health Department's Chris Byrne challenges a group of graduates to use their knowledge in their neighborhood.

FUSRAP Staffer Joins Grace Hill Board

Site Community Relations Coordinator Patti Hazel was recently named a member of the Grace Hill Wellness Advisory Board. Hazel is assisting the Wellness Initiative by defining needs, setting goals, and developing a fund-raising plan. To begin this process, Hazel toured several Grace Hill sites and met with residents and Wellness Council members to make a "wish list" of items that would enhance programs and facilities. The information will be compiled and a plan of action drafted and implemented.

Hazel said she is pleased to be working with an organization that assists people in such practical ways, and hopes that her input will help to accomplish lasting results.



FUSRAP's Gerry Palau gives FUSRAP overview at the Information Center.



FUSRAP's Patti Hazel informs class about public participation opportunities.

The St. Louis Stakeholder Summit: A turning point for the St. Louis site?

A group of more than 30 people comprised of property owners, environmental activists, and government officials met with DOE Assistant Secretary Tom Grumbly in August to voice their goals, frustrations and hopes about finding a permanent remedy for radiological contamination at the St. Louis Site.

Some 70 more concerned citizens made up the audience at the St. Louis Site Stakeholder Summit, held at the Henry VIII Hotel in Bridgeton.

The summit had its roots in Grumbly's visit to St. Louis last spring at which he acknowledged the lack of public consensus on a final remedy for the site. Grumbly suggested that his agency as well as site stakeholders take a fresh look at



DOE Assistant Secretary Tom Grumbly greets Jeanette Eberlin, Hazelwood city councilwoman.



More than one hundred area residents either participated in or attended the St. Louis Site Stakeholder Summit.

the various options, and called for a decision-making process that allows for broader stakeholder input.

"DOE is committed to a process that will lead to increased stakeholder input and involvement in decisions that affect both the near term cleanup and ultimate disposition of these materials," said Grumbly.

Grumbly announced that \$15 million would

be allocated for St. Louis Site activities in FY 95. That includes cleanup of the residential vicinity properties (see related article), as well as additional properties to be determined by DOE in consultation with stakeholders.

Regarding the final remedy for the site, Grumbly acknowledged there is currently a "general consensus against permanent disposal for these wastes in highly populated areas of the country such as Lambert field," and promised to explore alternatives such as soil treatment and the siting of a disposal facility elsewhere in Missouri.

Grumbly urged participants to "continue our momentum" by forming the core of a group that would study site-related issues and develop viable alternatives.

Several participants welcomed what they perceived as a new atmosphere of cooperation, and expressed hope for a timely resolution of site-related issues.

Innovative Technologies Tested at SLAPS

Safer. Faster. Cheaper. These are the goals of the Department of Energy (DOE) in characterizing and cleaning up radioactively contaminated sites. In September, Ames Laboratory mobilized at the St. Louis Airport Site to test prototype technologies and techniques in radiological characterization. The laboratory, which is affiliated with Iowa State University in Ames, Iowa, has a grant from the Department of Energy to develop new approaches involving both new technologies and new ways of looking at existing information.

The tests conducted at SLAPS on September 12 and 13 are called Expedited Site Characterization (ESC). ESC, pioneered for DOE by Argonne National Laboratory, emphasizes a concentrated coordination of the various steps of the characterization effort. It takes days, rather than weeks or months, to get back results needed to analyze a site.

Approximately 80 people attended the workshops and demonstrations. They not only observed the technology close up, but were able to interact

and exchange information with professionals about environmental cleanup issues and objectives.

Dave Adler, site manager for the St. Louis Site, welcomed the opportunity for Ames to demonstrate their technology. "The fact that so much data already exists at SLAPS will allow Ames to compare their techniques to those traditional ones we have used to date and assess their effectiveness. From what I've seen of their approach so far, it looks exceptional."

One promising technology being developed by Ames is a field screening tool, which is believed to be capable of quantifying radionuclides down to very low levels. The tool uses a laser to separate the elements from the soil, then passes the elements through an analyzer that

yields real-time analytical results. The laser can be tuned to different elements and focused on different soil depths.

"This type of technology could replace traditional sampling and lab analysis for screening and post-remedial action data," Adler said.

Ames is in the process of comparing their results to the existing data collected by DOE over the past several years. A report detailing the findings should be issued in the near future. From there, the new approach can be used to conduct safer, faster and cheaper site assessments.



A group observes one of the Ames Lab technology demonstrations at SLAPS.

Information Center Change of Address

You may have noticed a different address on recent mailings and information.

We haven't moved, but the Post Office has changed our address.

Our new address is 9170 Latty Avenue, Berkeley, MO 63134. Please send any correspondence to our new address.

FUSRAP Update is issued periodically to inform St. Louis residents about current activities on the contaminated sites in the St. Louis area that are slated for cleanup under the U.S. Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites were contaminated during the early days of the nation's atomic energy program.

For more information about the FUSRAP site in St. Louis, contact Parti Hazel at the DOE Public Information Center, 9170 Latty Avenue, Berkeley, MO 63134. Telephone (314) 524-4083.

Citizens Task Force to assist with radioactive waste issues

A task force made up of St. Louis-area officials and residents has organized to study St. Louis' radioactive waste problem and recommend remedies to the U.S. Department of Energy. The group met for the first time September 13 and began regularly scheduled monthly meetings on October 11.

At its organizational meeting, the group adopted the title "St. Louis Site Remediation Task Force" and elected Dr. Alpha Fowler Bryan task force chairperson. Bryan, who is director of the St. Louis County Health Department, has also been serving as chairman of the county's Radioactive and

Hazardous Waste Oversight Commission – an advisory panel to the county executive.

Also at that meeting, the group defined its mission and goals, considered a proposed charter, and discussed past impediments to progress.

The group's genesis was in the recent site "stakeholder summit" attended by DOE Assistant Secretary for Environmental Management Tom Grumbly, who said DOE needed to accommodate broader public input in St. Louis. Invitations to participate in the summit were based on an individual's unique position to represent site stakeholders – those who have a stake

in what is decided at the site. Task Force membership is expected to number about 30.

Task force proceedings are open to the public, with the first 10 to 15 minutes of each meeting set aside for audience comments and questions. The group meets on the second Tuesday of each month from 7:30 to 9:30 a.m. at the Hazelwood Civic Center East at 8969 Dunn Road. The December meeting will be held on December 6.

Post cards announcing the date and location of each meeting will be mailed to the site mailing list, and area media will also be notified.

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FUSRAP Update The St. Louis Site

U. S. Department of Energy •

Formerly Utilized Sites Remedial Action Program •

March 1994

DOE Conducts Neighborhood College Course

"Enjoyableinformative....interesting." These are just a few of the comments from participants of the Grace Hill Neighborhood College environmental course, recently sponsored by the Grace Hill Wellness Council and the Department of Energy's Formerly Utilized Sites Remedial Action Program. The course was specifically designed to address the environmental concerns of the staff and neighbors of Grace Hill, which is located near the St. Louis Downtown Site.

Twenty-five people attended the class, which focused on radiation basics. Some of the topics included terminology and definitions, types and sources of radiation, health effects, radiation monitoring, and radon.

The setting was structured but casual, and neighbors interacted with questions and comments throughout each segment.



George Goveltz, a FUSRAP health physicist, covered radiation basics such as how it affects the human body, determining exposure levels, and sources of radiation in the downtown area.

Class participants also involved their neighbors by asking them to compile a list of their top environmental concerns. They also submitted names and addresses of neighbors to be added to the site mailing list and identified stakeholder groups that might be interested in learning about the site.

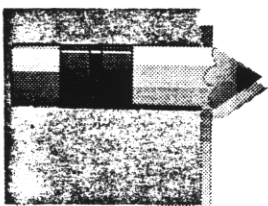
One of the highlights of the class was a field trip to the Information Center on Latty Avenue. The visit included a

slide presentation and overview of the FUSRAP program, a history of the St. Louis Site, a segment on how neighbors can become involved in the site decision-making process, and a tour of the Hazelwood Interim Storage Site, the St. Louis Airport

Site, and some of the vicinity properties.

Chris Byrne, Director of the Air, Land and Water Branch of the St. Louis County Department of Health, was the graduation speaker. He commended the neighbors for completing the course, and challenged

(continued page 3)



From the Site Manager to You

You have read a lot in this space lately about Department of Energy activities at the St. Louis FUSRAP site. You've read about the site's history. You have read about the complex process by which key decisions are made.

Now it's our turn to read and hear what you have to say. Since the early phases of this project, you've been providing valuable input — at the Public Scoping Meeting, in workshops and open houses, and in direct contact with the information center in Hazelwood. But now your input is more critical than ever.

You will soon receive notification that several key project documents have been finalized and are available. Of these documents, we want to know what you think about the Feasibility Study, which develops, evaluates, and compares the cleanup alternatives, and the Proposed Plan, which identifies the preferred alternative. You will have a 2-month opportunity later this spring to submit formal, written comments. Although this time limit is necessary for the practical reason of keeping our cleanup on schedule, we will always accept and listen to comments you make at any time. And to the extent possible, we will try to address any comments received at any time.

In addition, midway through those 2 months we will hold a public meeting, during which you may also make a statement for the record. The exact date, time, and location of the meeting will be announced in an upcoming mailing and in your local newspapers.

Your comments from the formal comment period, both written and verbal, will be incorporated into a Responsiveness Summary, which together with the Feasibility Study and the Proposed Plan will form the basis for the Record of Decision. The Record of Decision concludes the review process, documenting and mandating the chosen alternative.

Each of you has a stake in what happens at the St. Louis site. Each of you has a viewpoint that is important for us to hear. Your input has made, and will continue to make, a difference.

I look forward to working with you as we enter this next important phase of the project.

Sincerely,

David G. Adler
FUSRAP Site Manager
St. Louis Site



SLAPS Sampling Completed

As late night passersby may have noticed, FUSRAP personnel spent a cold and wet December conducting round-the-clock testing and sampling operations on the St. Louis Airport Site.

The work was in response to questions raised by the Missouri Department of Natural Resources and the U.S. Environmental Protection Agency regarding the St. Louis Site Feasibility Study and Proposed Plan.

The testing involved the groundwater and geology under the site, and required that wells be tested and monitored continuously throughout the period.

Results of the sampling and testing were provided to MDNR and EPA for review in January.



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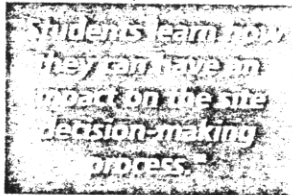
(from page 1)

DOE Conducts Neighborhood College Course

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If you are interested in scheduling a meeting for your organization, please call the Information Center at 524-4083.



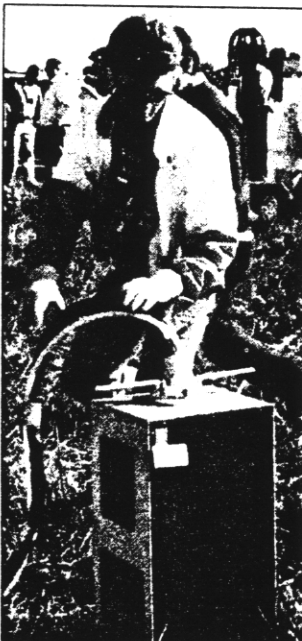
Course participants hear about DOE cleanup programs and the status of the St. Louis Site from FUSRAP Project Manager Gerry Palau.



Grace Hill neighbors review environmental course materials.



The college commencement speaker was Chris Byrne, Manager of the Air, Land & Water Engineering Branch for the St. Louis County Department of Health.



Innovative Technologies to be Tested at SLAPS

The Ames Laboratory has selected the St. Louis Airport Site to test prototype technologies and techniques in radiological characterization. The DOE-owned, Iowa State University-operated laboratory is developing new approaches involving both new technologies and new ways of looking at existing information.

Dave Adler, Site Manager for the St. Louis Site, welcomed the announcement. "The fact that so much data already exists at SLAPS will allow Ames to compare their techniques to those traditional ones we have used to date and assess their effectiveness. From what I've seen of their approach so far, it looks exceptional."

One promising technology being developed by Ames is a field screening tool, which is believed to be capable of quantifying radionuclides down to very low levels. The tool uses a laser to separate the elements from the soil, then passes the elements through an analyzer that yields real-time analytical results. The laser can be tuned to different elements and focused on different soil depths.

"This type of technology could replace traditional sampling and lab analysis for screening and post-remedial action data," Adler said.

Ames is planning to start field work by mid-summer.

FUSRAP's Hall Monitor for Health and Safety

When workers enter and exit controlled areas on the St. Louis site, the first and last person they see is Roger Hall. Roger checks everyone going into areas of contamination onsite to ensure they have the necessary training and are using the proper protective equipment, and then makes sure they don't leave the site with any contamination on them.

Roger serves as the site safety and health officer and is the site manager for the project's radiological support subcontractor, TMA/Eberline. Roger has worked on FUSRAP sites for the past nine years.

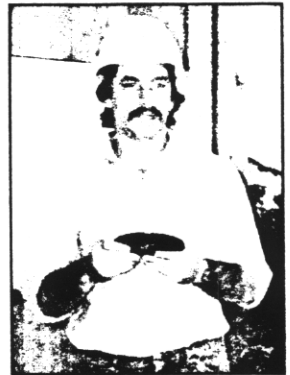
Roger grew up in a small desert mining town in southeastern Utah. He worked on drilling rigs exploring for uranium, and even worked as a uranium miner 700 feet underground. Roger has also drilled for oil, natural gas, oil shale, and gold.

Roger later worked for a uranium ore buying station where he began his career in environmen-

tal health and safety, collecting and analyzing air samples and performing exposure calculations. At another desert location, he collected various types of environmental samples for the start-up of a uranium mill.

"Having spent much of my life around uranium, I've developed a healthy respect for radiation," Roger says. "We can't see the radiation with our eyes but we can measure it and understand it. And as long as the hazards are identified and common-sense precautions are taken, there's really little or no cause for concern."

When he's not at the site keeping tabs on health and safety, Roger enjoys gardening, woodworking, computers, and spending time with his wife and their two children.



Site health and safety officer, Roger Hall

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FUSRAP Update The St. Louis Site

U. S. Department of Energy • Formerly Utilized Sites Remedial Action Program • December 1993

Commission to receive DOE grant

The St. Louis County Hazardous and Radioactive Waste Oversight Commission will receive up to \$50,000 in federal funding for independent technical services, the U.S. Department of Energy has announced. The commission is expected to use the funds to hire a technical consultant who will provide independent review of DOE's site-related documents, proposed plans, and future remedial actions.

Dr. Alpha Fowler Bryan, Director of the St. Louis County Department of Health and commission chairwoman, says, "Timing is critical; the commission will begin immediately to compile a list of possible candidates.

"Our goal," she added, "is to review and recommend to DOE the most efficacious, health-conscious, and reasonable solution to our local radioactive waste problem. Hopefully, the

selected technical consultant will help to assist and expedite our efforts."

DOE Site Manager David Adler will coordinate the grant for DOE. "Once the commission makes its selection, we will get a contract in place and work can begin," Adler said. "The whole process actually moves fairly swiftly."

"Aside from meeting some very basic contractual requirements, the contractor takes orders from the commission, and the commission only," Adler added. "We encourage this type of independent review because it raises everyone's comfort level regarding the decisions being made."

DOE makes technical services grants available to boards and commissions that have been created by local governments for the purpose of overseeing DOE activities. Adler said that although more than 40 FUSRAP sites have been designated in 14 states, only two other grants of this kind have been awarded to date.

Upcoming Events

Document Workshops

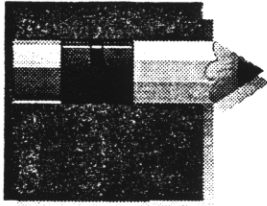
*At the DOE Information Center,
9200 Latty Avenue in Hazelwood*

Remedial Investigation	January 18
Feasibility Study	January 25
Baseline Risk Assessment	February 1

Information Sessions

At the Hazelwood Civic Center February 22-23

Dates are tentative. Please watch your mail for official announcements.



From the Site Manager to You

After many years of field studies and considerable expenditure of resources, we are finally close to proposing a remedy for conditions present at the St. Louis site.

Although much remains to be done, I'd like to thank all stakeholders who have participated in this critical phase of the process; Region VII of the Environmental Protection Agency, the Missouri Department of Natural Resources, the St. Louis County Radioactive and Hazardous Waste Oversight Commission, and most important the concerned citizens who have attended the open houses and workshops, visited or called our information center, and offered comments and suggestions.

When the proposed plan is released, along with several other key documents (see related article in this issue), you'll once again be encouraged to speak up and be heard.

A 60-day public comment period follows the release of the project documents. Midway through that period, we'll hold our second public meeting. Meeting notices will appear in St. Louis-area newspapers and radio.

Within a day or two of the public meeting, we'll hold our second open house at the Hazelwood Information Center on Latty Avenue. (I'd like to thank specifically Mayor Farquharson, Councilwoman Rickey, Bob Shelton representing Berkeley City Hall, and all Berkeley and Hazelwood residents who attended our first open house back in July. I'm convinced we all benefit from these informal exchanges of ideas and information.)

I've often said the actual implementation of a cleanup plan is the easy part; reaching consensus on a plan is the bigger challenge. Nevertheless, such lengthy decision-making processes help to ensure that all stakeholders are heard, all viewpoints examined, and the best alternative chosen.

Tremendous credit goes to all Missourians who have taken the time to learn about the project, to get involved and helped shape its outcome. Thank you again for your continued interest in this project.

Sincerely,

David G. Adler
FUSRAP Site Manager
St. Louis Site



St. Louis Site Well-Prepared for Flood of '93

Home and business owners weren't the only ones taking emergency action during the Great Flood of '93. As flood waters began to rise, DOE set about to assess potential threats to the St. Louis FUSRAP sites. It appeared that the only site that might be affected was the St. Louis Downtown Site, located close to the edge of the Mississippi River, about two miles north of the Arch.

Anticipating that the levee might break, DOE moved radioactive samples and hazardous chemicals into upstairs storage, above the projected flood crest level.

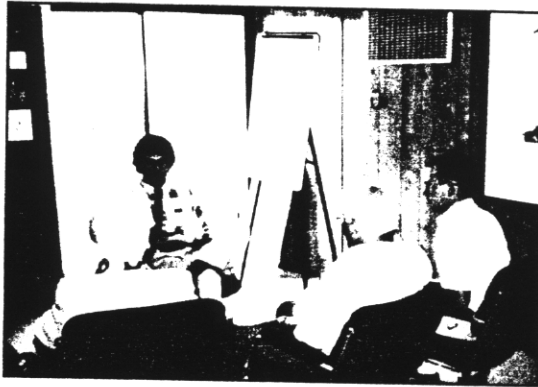
Buoyant objects were tied down to keep them from possibly causing damage. And finally, DOE coordinated with local businesses, the Army Corps of Engineers, and Metropolitan St. Louis Sewer District.

The flood did not reach the site, but just in case, all reasonable precautionary measures were taken.

FUSRAP Update is issued periodically to inform St. Louis residents about current activities on the contaminated sites in the St. Louis area that are slated for cleanup under the U. S. Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites were contaminated during the early days of the nation's atomic energy program.

For more information about the FUSRAP site in St. Louis, contact the DOE Public Information Center, 9200 Latty Avenue, Hazelwood, MO 63042. Telephone (314) 524-4083.

Local Residents Open House



Site Manager Dave Adler discusses St. Louis site issues with Hazelwood and Berkeley residents during the recent open house. Pictured left to right are Hazelwood City Councilwoman Molly Rickey, Mayor John Farquharson, and Hazelwood resident Jack Granicke. The open house also featured site tours and informational exhibits.



Deputy Project Manager Joe Williams takes Jack Granicke on a tour of the Hazelwood Interim Storage Site during the open house.

Document Daze

A virtual blizzard of documents is on the way to support cleanup activities at the St. Louis site. In the coming months, the St. Louis community will encounter such terms as RI, BRA, WP/IP, ISA, and others. These are all documents or studies required by the Comprehensive Environmental Response, Compensation, and Liability Act and the National Environmental Policy Act (CERCLA/NEPA). The release of these documents early next year will mark the beginning of the 60-day public comment period. Public comments will be incorporated into the feasibility study (FS), which will lead to the final record of decision (ROD) in mid-1995.

The following is a brief description of some of these documents and how they relate to the CERCLA/NEPA process.

• **Baseline Risk Assessment (BRA)** — an analysis of site

conditions if no remedial action were performed. The BRA defines the current and potential impact to public health and the environment, and it tries to assess potential risks based on likely future land use of the site and surrounding areas.

• **Environmental Impact Statement (EIS)** — assesses the environmental impact of proposed DOE actions. An EIS integrates NEPA policies into DOE programs, and it informs the public and decision-makers of significant impacts of proposed actions and reasonable alternative actions.

• **Remedial Investigation (RI)** — documents the results of field radiological, geological, and ecological investigations at a FUSRAP site. An RI also defines the nature and extent of contamination at the site and provides an assessment of

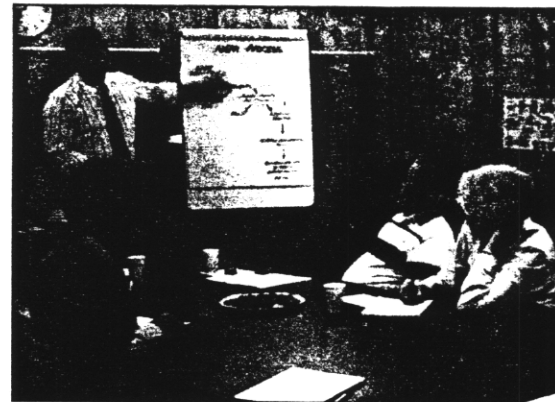
impacts to the surrounding population and environment.

• **Initial Screening of Alternatives (ISA)** — discusses all available cleanup alternatives and technologies appropriate for a particular FUSRAP site, along with associated advantages, disadvantages, and costs. Technologies that are not feasible are screened out; those remaining are evaluated in detail in the FS.



nts Attend Workshops

FUSRAP Health Physicist George Govelitz leads a workshop on health and safety issues. The workshop was held on two consecutive evenings at the DOE information Center in Hazelwood.



FUSRAP Project Manager Gerry Palau explains the remedy-selection decision-making process during a workshop at the Information Center. The workshop was presented a second time at the Hazelwood Civic Center.

• **Feasibility Study (FS)** — develops cleanup alternatives, evaluates them using a standard set of criteria, and gives detailed comparisons of those alternatives.

• **Work Plan-Implementation Plan (WP-IP)** — documents the actions and evaluations that will be made during a RI/FS at a FUSRAP site. A WP-IP (1) provides background information on the site, (2) identifies the type and extent of contamination onsite, (3)

identifies needs for additional data on the site and describes activities planned to fill those gaps, and (4) describes

the approach for evaluating potential cleanup alternatives for the site.

• **Community Relations Plan (CRP)** — describes how the public will be involved in the decision-making process.

• **Proposed Plan (PP)** — highlights key aspects of RI/FS reports, provides a brief analysis of cleanup alternatives, identifies the preferred alternative, and provides to the public information on how they can participate in the cleanup selection process.

• **Record of Decision (ROD)** — documents and mandates the cleanup alternative chosen at the end of the review process for a given site. The decision made is based on the EIS, testimony presented at public hearings, and comments on the final EIS. Once the decision is documented in a ROD, the decision-making process is closed and all subsequent cleanup activities are

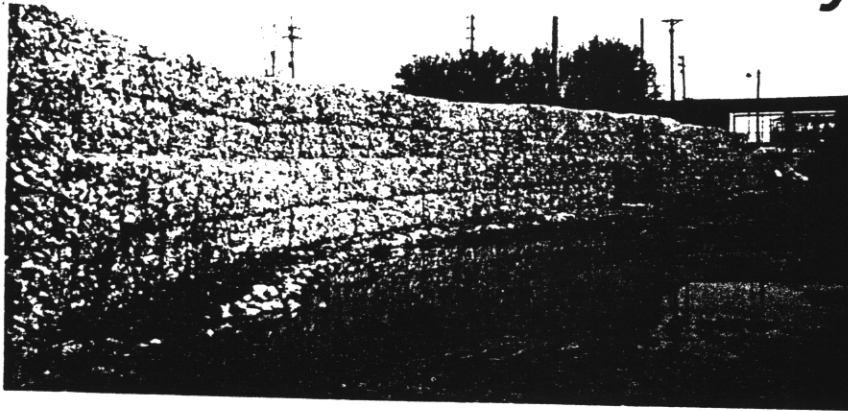
directed toward that end.

There are other required documents in the CERCLA/NEPA process that will be explained as they approach issuance, but the foregoing are the primary documents for the process.

The WPIIP has been published and is available to the public. The WPIIP is the primary document that controls the remedial investigation/feasibility study (RI/FS) work at the St. Louis FUSRAP site.

Public comments from the January 1992 public meeting were compiled into a responsiveness summary. This summary has been incorporated into the WPIIP.

Coldwater Creek Again Tests Favorably



Request for '93 flood relief inspires volunteer spirit

Images of the Flood of '93 brought out the sympathy and compassion of almost everyone who saw them. Teresa Adcox of Bechtel National in Oak Ridge, Tennessee, decided to do something about it. Bechtel is DOE's project management contractor for the St. Louis FUSRAP site.

"I saw an ad in the paper asking for volunteers," Adcox said. "So, I signed up to help out." Adcox said about 25 people from the Oak Ridge area

came to St. Louis from August 19 to 22 to aid in the cleanup work.

"When we got there, the floodwaters had receded some, so we didn't see it at its worst," she said. "But there were water lines, so you could see how high it had been. Some roads were still flooded out."

She started to work as soon as she arrived, cleaning up debris and making preparations for repair work. "One building we cleaned out had 6 inches of sludge," she said. "We carried out all the wet furniture and tore out a lot of ruined walls. It seemed like we almost had to tear the whole building down."

"We stayed at a church near Lambert Airport and camped out on the floor of one of the Sunday school rooms," she said. "We ate at the Salvation Army. They set their food station up in a cemetery and called it the 'Tombstone Cafe.'"

Adcox said she felt good about being able to help out in the crisis. "There was a lot of volunteer spirit, and I was glad to have been a part of it."



Bechtel's Teresa Adcox lends a hand in cleaning up flood-damaged St. Louis.

County Health Department Reports on Coldwater Creek

In its annual monitoring of water upstream and downstream from the St. Louis Airport Site on Coldwater Creek, the St. Louis County Health Department has reported that contamination levels are within guidelines. Overall readings remain consistently near background levels.

Mr. Chris Byrne of the County Health Department said, "The county's test results have compared favorably with those of DOE, their contractor, Bechtel, and the Missouri Department of Natural Resources. The health department will continue to monitor the creek water readings at the site."

In addition to surface water sampling, other types of environmental monitoring routinely performed at the St. Louis site include air, soil sediments, and ground water.

Results of the monitoring activities at the Hazelwood Interim Storage Site were recently compiled in a site environmental report for calendar year 1992. The report is now available at the Hazelwood DOE Information Center at 9200 Laffey Ave. in Hazelwood.

Long-time resident is key member of FUSRAP team

John Henry, a 10-year FUSRAP employee, has a vested interest in the operations of St. Louis sites — he and his family also are long-time residents of the area. John is in charge of site security, site maintenance and inspection, environmental monitoring, and several other technical jobs at the St. Louis sites.

John's family has lived in St. Louis for 27 years, and in addition to his FUSRAP duties, he and his wife Linda are involved in many projects to make their community a better place to live. John and Linda are active members in the Forest Park Southeast Block Unit. The Block Unit gets youths involved in community activities, encour-

ages them to "Just Say No" to drugs, and to keep their neighborhood safe and clean. John says, "One of the most important values I try to teach to our young people is to be proud of who they are in the world."

In what little spare time he has, John likes to go bowling with his family and he jogs and exercises regularly, "to keep my mind clear and my body in shape," he says.

John's "can do" attitude naturally carries over into his work on FUSRAP. "Working for the Department of Energy is always a challenge. By using our skill and training to respond to whatever problems arise, our team works like clockwork every time."



Site Maintenance Supervisor John Henry monitors automatic well sampler at Hazelwood Interim Storage Site

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9200 Latty Avenue
Hazelwood, MO 63042

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FUSRAP Update **The St. Louis Site**

U. S. Department of Energy

• Formerly Utilized Sites Remedial Action Program

• July 1993

Oversight commission hears DOE site manager

The St. Louis County Radioactive and Hazardous Waste Oversight Commission met on May 10 with David Adler, St. Louis FUSRAP site manager. Appointed by County Executive Buzz Westfall and chaired by Dr. Alpha Fowler Bryan, director of the St. Louis County Department of Health, the group's purpose is to provide input to DOE in selecting the best cleanup and disposal option for the St. Louis site.

Commissioners had the opportunity to discuss DOE's plans with the site manager, who answered questions and provided information on costs and time frames for implementation of alternative cleanup options. Group members were told that a recommended remedial action is being reviewed by the Environmental Protection Agency and the Missouri Department of Natural Resources, and that this proposal will be presented for public

comment in February 1994. Adler also distributed copies of the environmental monitoring reports for the Hazelwood Interim Storage Site.

The commission membership includes a variety of local elected officials, educators, technical experts, and environmental activists. They are Karen Acker, project engineer for Environmental Science and Engineering; Kay Drey, citizen activist; David Farquharson, mayor of Hazelwood; Nancy Lubiewski, Florissant Environmental Quality Commission member; William Miller, mayor of Berkeley; Sally Price, registered nurse; Geri Rothman-Serot, county councilwoman from the 3rd District; Dr. Barry Siegel, professor of radiology and medicine and director of the Division of Nuclear Medicine at Washington University; and Dr. Lee Sobotka, professor of chemistry and physics at Washington University.

In their first meeting, held March 23, members were presented with a site history and an overview of what's been done so far. The commission met again in early July.

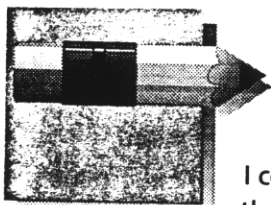
Dr. Bryan chairs Oversight Commission

Dr. Alpha Fowler Bryan, director of the St. Louis County Department of Health, has been named chair of the county's Radioactive and Hazardous Waste Oversight Commission.

Appointed by County Executive Buzz Westfall, Dr. Bryan assumes a challenging role as head of the commission. "My goal is to mediate parties from varied backgrounds with a multiplicity of ideas and ideals to some common ground of agreement in order to perfect our overall mission. No doubt, this goal may be as ambitious as the cleanup itself," Dr. Bryan said.



(continued next page)



From the Site Manager to You

I consider communicating with members of the St. Louis community to be one of the most important parts of my job. I recently met and had excellent discussions with several groups about the cleanup and disposal options for the St. Louis FUSRAP site.

In the coming months, my goal is to meet and talk with as many of you as I possibly can about the cleanup and disposal options for the FUSRAP St. Louis site. I am gathering as much input as I can prior to finalizing the drafts of the feasibility study and proposed plan, which will be available for public comment in early 1994.

We don't have to wait until 1994 to have a discussion about the options being considered. I look forward to having informal meetings with small or large groups in the St. Louis area to present information and answer your questions.

Please call Patti Hazel at DOE's Hazelwood Public Information Center to set up a date and time. (See related article elsewhere in this newsletter.)

The Department of Energy is also very much looking forward to working with the Oversight Commission appointed by the St. Louis County Executive. This group will serve as an effective interface between DOE and those who seek an independent review of our FUSRAP sites in St. Louis.

Now, we are close to decision-making time, and your participation is extremely important. Please call or come by the Information Center for information that will help you in this process.



David G. Adler
FUSRAP Site Manager
St. Louis Sites

Bryan

(continued from first page)

In her 15 years as a health professional, Dr. Bryan has had a wide range of experience. After receiving her medical degree from Meharry Medical College in Nashville, Dr. Bryan spent two years as an ophthalmology intern at Homer G. Phillips Hospital in St. Louis and later entered a residency in family practice at Lutheran Medical Center. In her affiliation with the Southern Illinois Healthcare Foundation from 1985 to 1991, she served as medical director of Centreville's Community Health Center. She was appointed to head St. Louis County's Department of Health in April 1991.

According to Dr. Bryan, "In the St. Louis Metropolitan area we all live with the legacy of the 'Manhattan Project.' Some would say that not only the St. Louis region, but the entire country in general, benefited from this operation. Others might disagree. Regardless of where one stands on the issue, it is an established fact that multiple radioactive and hazardous waste sites now exist in our region which must be remediated."

FUSRAP Update is issued periodically to inform St. Louis residents about current activities on the contaminated sites in the St. Louis area that are slated for cleanup under the U. S. Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites were contaminated during the early days of the nation's atomic energy program.

For more information about the FUSRAP site in St. Louis, contact the DOE Public Information Center, 9200 Latty Avenue, Hazelwood, MO 63042. Telephone (314) 524-4083.



◀ Congressional field office staff members listen as DOE Site Manager David Adler explains cleanup alternatives.

Local officials, legislators attend DOE workshops

DOE recently held workshops at the Hazelwood Public Information Center for congressional field staff, members of the state legislature, and the mayors and city councils of Hazelwood and Berkeley.

The workshop for field staffers and legislators was attended by a number of state senators and representatives, as well as field staffers for two Missouri congressmen and both U.S. senators.

Mayors William Miller of Berkeley and David Farquharson of Hazelwood were among those who attended a February 8 workshop for Berkeley and Hazelwood city officials. Both city managers and a majority of council members also attended the session.

Attendees at both workshops received an update on site cleanup and disposal options that are outlined in the draft "Feasibility Study for the St. Louis FUSRAP Site." They also had the opportunity to ask questions of David Adler, DOE's St. Louis FUSRAP site manager.

City of Berkeley Public Relations Specialist Bob Shelton observed, "This workshop gave city officials one of the best opportunities they've had so far to see where DOE is going with the cleanup effort."

Those attending the legislative workshop included Jo-Ann Digman, representing U.S. Sen. Kit Bond; Brent Evans, representing U.S. Rep. Jim Talent; Linda Getz, representing Missouri State Sen. Frank Flotron; Wayne



Berkeley and Hazelwood city officials, DOE Site Manager David Adler. From Steve Thieme, Berkeley City Councilman Gerry Palau, Adler, and Berkeley C

Recent studies address residents' safety

Residents of Nyflot Avenue and Heather Lane in Hazelwood have received more good news about health risks associated with living

"...the types of radiation found in the area and the most likely routes of exposure for the current residents are not likely to lead to the types of cancer found in the residents."

near sites contaminated with low levels of radiation. According to a recent study by the Missouri Department of Health, "the waste sites do not appear to pose a current threat to residents."

An inquiry from Nyflot Avenue residents concerned about the possibility of a high number of cancer cases in

the area prompted the study, which was initiated in 1989.

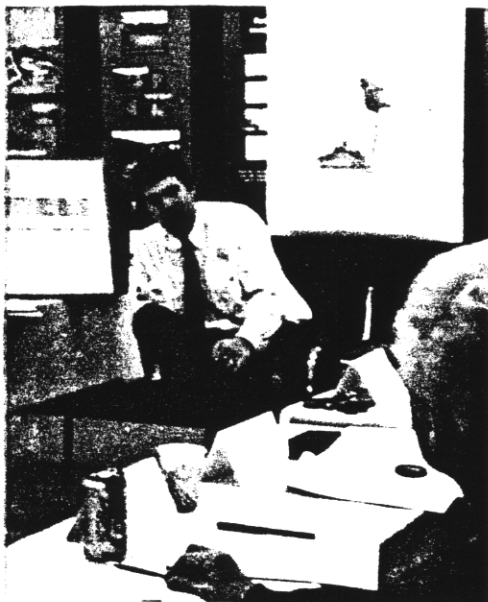
Through interviews with current and former residents, examination of medical records, and a chronological construction of the deposition of radioactive materials, the Department's Division of Chronic Disease Prevention and Health Promotion was able to ascertain that "the types of radiation found in the area and the most likely routes of exposure for the current residents are not likely to lead to the types of cancer found in the residents."

This confirms the results obtained from two previous studies, which also concluded that the St. Louis area FUSRAP sites do not pose an unaccept-

able cancer risk to residents.

The Federal Agency for Toxic Substances and Disease Registry conducted an independent study released in 1991 that determined that a "cancer cluster" (a grouping of a number of cases of the same type of cancer) "did not exist in the area."

More recently, DOE's draft "Baseline Risk Assessment" indicated that "current radiation exposures fall well below DOE standards for the protection of human health." Janet Johnson, PhD., a health physicist acting as an independent consultant for the study conducted by MDOH, confirmed that "DOE's risk assessments are accurate and are based upon conservative assumptions."



▲ Discuss site cleanup alternatives with left to right are Site Superintendent Theodore Hoskins, Project Manager Councilwoman Jean Montgomery.

Goode, Missouri state senator; David Hale, Missouri state representative; Ron Keeven, Missouri state representative; Mary Renick, representing U.S. Rep. Richard Gephardt; Karla Roeber, representing U.S. Sen. John Danforth; and John Shear, chairman of the St. Louis County Council.

Those attending the workshop for Berkeley and Hazelwood city officials included:

Norma Caldwell
Hazelwood city clerk
Edwin Carlstrom
Hazelwood city manager
Jeanette Eberlin
Hazelwood city council
David Farquharson
Mayor of Hazelwood
Arbon Hairston
City manager of Berkeley

Theodore Hoskins
Berkeley city council
Louvenia Mathison
Berkeley city council
William Miller
Mayor of Berkeley
Jean Montgomery
Berkeley city council
Mollie Rickey
Hazelwood city council
Judy Shaw
Berkeley city council
Bob Shelton
City of Berkeley public relations specialist
Carol Stroker
Hazelwood city council

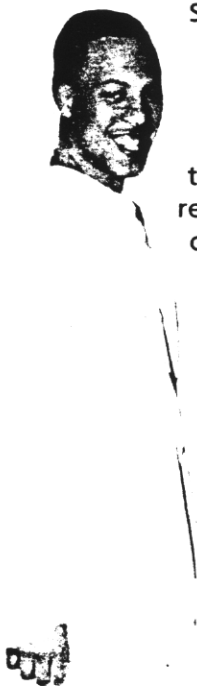
To schedule a workshop for your group, call Patti Hazel at 524-4083, or write to her at the DOE Public Information Center.

FUSRAP Speakers Bureau Established for St. Louis

Now that a speakers bureau has been established to keep the public informed about the St. Louis FUSRAP site, it's easier than ever to get the word out regarding cleanup alternatives. Recent engagements have included everyone from curious third-graders, to civic groups, to Japanese legislators.

The following individuals represent just a few of the experts available to speak to your group. Each is part of the management team and well-qualified to address the issues related to the clean up of the St. Louis site:

David Adler is DOE's site manager for the St. Louis Site. He's responsible for overseeing the entire monitoring, characterization, cleanup, and restoration process. He earned a B.S. in environmental science from Rutgers University and a



master's degree in environmental toxicology from the University of Michigan School of Public Health. Prior to joining DOE, Adler worked for the Michigan Department of Natural Resources in the area of Surface Water Quality. While working for the U.S. Environmental Protection Agency as a policy analyst, he was involved in the writing of environmental regulations.

Gerry Palau is project manager for Bechtel, DOE's project management contractor. His job includes overseeing field work, controlling cost and schedule, and coordinating activities with EPA, the Missouri Department of Natural Resources, and local officials. A nuclear engineer, Palau has a B.S. and an M.S. from Pennsylvania State University. He has spent 14 years working in various areas of radioactive waste management, including research development of decontamination technology, and cleanup of contaminated facilities.

Joe Williams is Bechtel's deputy project manager. He provides technical oversight of engineering and design, directs field work, and is responsible for document preparation. He holds

a B.S. degree in civil engineering from the University of Tennessee. Before coming to FUSRAP, Williams was decontamination superintendent and then civil field engineer at the Pilgrim Nuclear Power Station in Plymouth, Mass.; before that, he was a facilities engineer on the cleanup of Three Mile Island.

Tom Gangwer is project manager for Science Applications International Corporation, the FUSRAP environmental compliance contractor. His responsibilities include ensuring that all regulatory requirements are met for any proposed remedial action. He has a B.S. in chemistry from Lebanon Valley College, and a Ph.D. in physical chemistry from the University of Notre Dame. Dr. Gangwer's 21 years of experience span the areas of chemistry, radioactive waste management, project management, regulatory compliance/licensing, management with a nuclear utility and management with a national laboratory.

These folks, as well as a host of other team specialists such as geologists, engineers, and safety and health professionals, are ready, willing, and able to share their expertise and answer your questions. Your group is welcome to meet in the conference room at the Public Information Center on Latty Avenue, or, if you prefer, our speakers will come to you.

To schedule a speaker, call Patti Hazel at 524-4083, or write to her at the DOE Public Information Center, 9200 Latty Avenue, Hazelwood, MO 63033.

◀ An ecology student tries on a Tyvek protective suit. FUSRAP Deputy Project Manager Joe Williams recently spoke to students at Clayton High School.

Berkeley resident promoted at DOE center

If you want general information on the St. Louis site, Patti Hazel is the person to see. Need a site map? Somebody to speak to your civic group? How about a tour of the information center?

As an administrative assistant with Bechtel for the past two years, Patti's had plenty of opportunities to respond to all kinds of requests for information.

With her recent promotion to site community relations coordinator, her responsibilities have expanded. With the overall goal of increasing community awareness of the the St. Louis Site, Patti's the front line of communication between FUSRAP personnel and area residents. From responding to requests for site

background information to monitoring the local community for changes that may have an effect on the site, she really does it all. Patti is also available as a speaker, and does a good general overview presentation on the St. Louis FUSRAP site.

And because she's been a resident of this area for the past eight years, she's uniquely qualified to provide this kind of information from a home-town perspective. Patti and her family live in Berkeley and attend church in Hazelwood. She says she's really come to love this part of the country and especially enjoys taking advantage of the many cultural and recreational opportunities in the St. Louis metropolitan area.



▲
*Site Community Relations
Coordinator Patti Hazel,
pictured here with son
Benjamin, says meeting people
is her favorite part of the job.*

DOE Public Information Center
9200 Latty Avenue
Hazelwood, MO 63042

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FUSRAP - St. Louis Information Update

U.S. DEPARTMENT OF ENERGY
Formerly Utilized Sites Remedial Action Program

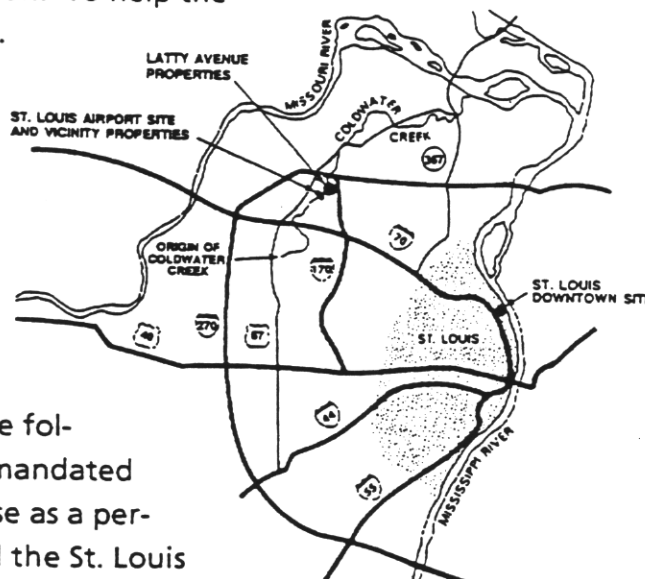
February 1993

This Information Update 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). Information Updates are one part of an effort to provide public information on environmental restoration and waste management.

In 1995, a formal decision will be made regarding the long-term cleanup of the four FUSRAP sites in St. Louis. The public will be involved as we go about the lengthy and complex process of making that decision. To help the public develop informed opinions, the U.S. Department of Energy (DOE) is issuing preliminary information on the process, and will seek input from local residents and officials to ensure that the public's concerns are considered when the final cleanup alternative is selected.

The cleanup alternatives and disposal options being considered are shown on the following pages. In 1985, the U.S. Congress mandated one option, the acquisition of SLAPS for use as a permanent disposal cell for the waste from all the St. Louis sites. When the U.S. Environmental Protection Agency (EPA) placed a portion of the airport site on the National Priorities List, DOE was then allowed to consider a broader range of disposal options. DOE has decided to address all St. Louis sites as a single, large site, with a total volume of waste possibly as much as 730,000 cubic yards of contaminated soil.

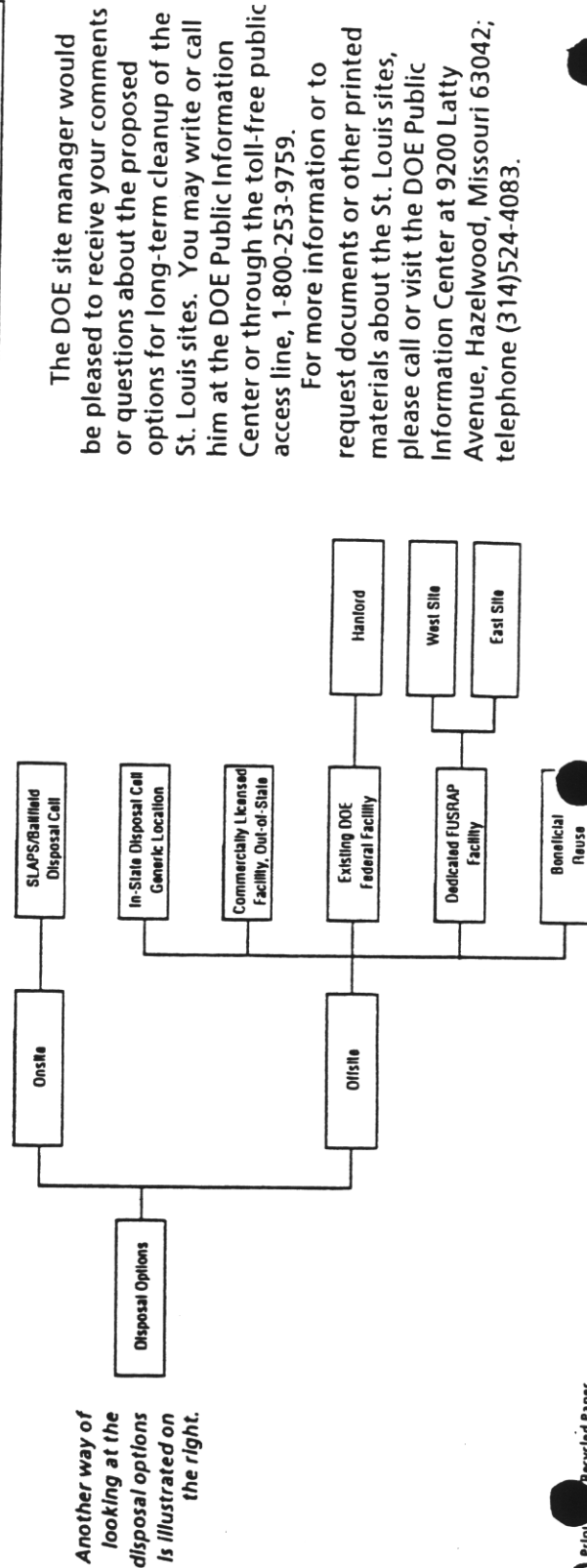
All the alternatives (except for the no-action alternative) have as a common trait protectiveness of people and the environment. Also the reader should note that only alternatives 4 and 5 entail construction of a new waste disposal cell. In the discussion of waste excavation, the difference between partial and complete excavation has to do with how accessible the waste is. Finally, none of the options call for waste treatment. Currently no practical way exists of removing radiation from waste (the only advantage is reduction of waste volume), so this alternative was screened out early in the



	NO ACTION	INSTITUTIONAL CONTROLS AND SITE MAINTENANCE
Description of Cleanup Option	Included to satisfy CERCLA and NEPA regulations and to provide a baseline with which to compare other alternatives.	Involves the use of deed restrictions and site security measures (e.g., fences), to restrict site access and prevent significant public exposure to the site contaminants.
Implementation Costs	\$2.7 Million	\$16 Million
Implementation Time Frame	N/A	Establishes perpetual surveillance and maintenance requirements
Soil Volume Requiring Excavation	0	Less than 50,000 yd ³
Special Considerations	<ul style="list-style-type: none"> • Not protective to human health or environment • Required by NEPA/CERCLA • Established to provide baseline for comparison to other alternatives 	<ul style="list-style-type: none"> • Protective • Depends on institutional and legal controls vs. engineering controls on future exposure • Eliminates unrestricted-use option for affected properties; may cause burden on property owners • Low cost • Does not comply with relevant soil cleanup guidelines • Potentially difficult to enforce on privately owned vicinity properties • Minimal waste transportation requirements • Takings clause not costed

CONSOLIDATION AND CAPPING	PARTIAL EXCAVATION	PHASED COMPLETE EXCAVATION																																										
<p>alternative, DOE would use the St. Louis Airport Site and use it for consolidation of soil and building from offsite areas. Waste then be covered using natural materials that prevent water from entering the soil, and blocks releases into the surface environment.</p> <p>\$115 Million</p> <p>14 years</p> <p>490,000 yd³</p> <p>Complies with Congressional restrictions of groundwater use beneath the site; no engineered liner beneath waste; dependent on site geology and groundwater monitoring to ensure protection of drinking water.</p> <p>DOE have successfully used this at other large sites. This use of groundwater complies with soil cleanup guidelines.</p> <p>Large volume of waste to be transported</p>	<p>Accessible contaminated soil would be excavated for disposal using one of six disposal options. Institutional controls would be used to prevent future exposure to access-restricted soils.</p> <table> <tr> <td>SLAPS Onsite</td><td>\$206 Million</td><td></td></tr> <tr> <td>Hanford Ben. Reuse*</td><td>\$220 Million</td><td></td></tr> <tr> <td>U.S. East</td><td>\$320 Million</td><td></td></tr> <tr> <td>In-state</td><td>\$354 Million</td><td></td></tr> <tr> <td>U.S. West</td><td>\$356 Million</td><td></td></tr> <tr> <td>Comm. Disposal</td><td>\$542 Million</td><td></td></tr> <tr> <td>Hanford Current*</td><td>\$889 Million</td><td></td></tr> </table> <p>14-36 years</p> <p>740,000 yd³</p> <ul style="list-style-type: none"> • Protective • Considered highly effective in reducing long-term exposure • Complies with soil cleanup guidelines • Minimizes disruption of businesses activities and transportation routes at affected properties • Significant volume of waste to be transported <p>* "Not Tested" with State of Washington.</p>	SLAPS Onsite	\$206 Million		Hanford Ben. Reuse*	\$220 Million		U.S. East	\$320 Million		In-state	\$354 Million		U.S. West	\$356 Million		Comm. Disposal	\$542 Million		Hanford Current*	\$889 Million		<p>All contaminated soil would be excavated and disposed of. Excavation of restricted-access soils would be delayed until they are made accessible by property owners.</p> <table> <tr> <td></td><td></td><td>\$217 Million</td></tr> <tr> <td></td><td></td><td>\$233 Million</td></tr> <tr> <td></td><td></td><td>\$340 Million</td></tr> <tr> <td></td><td></td><td>\$378 Million</td></tr> <tr> <td></td><td></td><td>\$382 Million</td></tr> <tr> <td></td><td></td><td>\$598 Million</td></tr> <tr> <td></td><td></td><td>\$994 Million</td></tr> </table> <p>14-40 years</p> <p>840,000 yd³</p> <ul style="list-style-type: none"> • Protective • Highest degree of permanence and effectiveness to reduce long-term exposure • Complies with soil cleanup guidelines • Dependent upon continuously accessible disposal capacity • Requires longest time to complete • Substantial volume of waste to be transported 			\$217 Million			\$233 Million			\$340 Million			\$378 Million			\$382 Million			\$598 Million			\$994 Million
SLAPS Onsite	\$206 Million																																											
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Description	ONSITE DISPOSAL			OFFSITE DISPOSAL			
	CAPPING	ENCAPSULATION	IN-STATE	OUT-OF-STATE	OUT-OF-STATE AT DOE FACILITY	OUT-OF-STATE AT COMMERCIAL FACILITY	BENEFICIAL REUSE
	St. Louis waste consolidated at SLAPS and a barrier constructed over all waste.	SLAPS waste excavated and set aside; liner placed, and all St. Louis waste placed and covered at SLAPS.	Construction of a new disposal facility in Missouri on land acquired by DOE.	Construction of a new disposal facility on federal land in the eastern or western U.S.	Shipping waste to a DOE facility capable of accepting FUSRAP waste.	Shipping waste to an existing commercial facility.	Excavation of contaminated soil for use as backfill for roads, airport runway, or certain disposal facilities.
Relevant Comments	Requires use of _____ acres at SLAPS.	Requires use of _____ acres at SLAPS.	Needs site suitability study.	Needs site suitability study.	Hanford, WA, is such a facility.	Two such facilities are expected to be licensed.	
	Directed by Congress in 1985 Energy and Water Development Appropriations Act; CERCLA/NEPA now requires broader considerations.		Considerable delays would result from need to site a new facility.	Considerable delays would result from need to site a new facility.	Requires acceptance by receiving state.	Very high transportation and disposal costs.	Relatively low cost; dependent on identification of suitable end-use.





FUSRAP Update

The St. Louis Sites

St. Louis, Missouri



Department of Energy
Field Office, Oak Ridge
Post Office Box 2001
Oak Ridge, Tennessee 37831-8723

Dear St. Louis Resident:

August 1992

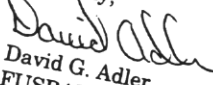
The April issue of *FUSRAP Update* focused on the Department of Energy's proposal to conduct limited cleanup measures in the Hazelwood/Berkeley area. DOE continues to seriously pursue this proposal, but we are awaiting an opportunity to discuss technical issues with an oversight committee that is being appointed by St. Louis County before proceeding.

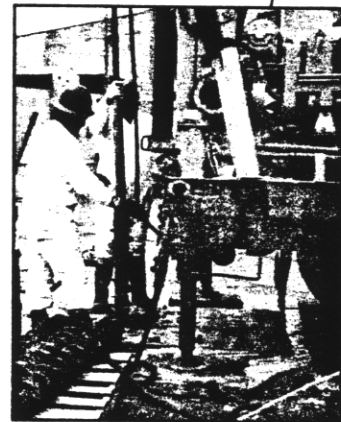
This decision allows time for DOE to respond to technical issues raised during the public comment period and in a hearing conducted by the St. Louis County Council. We are pleased that the County Council adopted a resolution calling for appointment of an oversight committee which will conduct an independent assessment of the issues. We look forward to meeting and working with the County's technical panel. See page 2 for more information.

Although we are not performing the interim cleanup on North County properties this summer, DOE is conducting a limited field sampling activity on all four of the St. Louis sites. The photo inset shows one of the field sampling crews. This field sampling will provide all data needed to complete the Feasibility Study for St. Louis. See page 2 for more information.

In response to an invitation from State Representative Louis H. Ford, DOE met on June 11 with community leaders in the neighborhood surrounding the St. Louis Downtown Site. The agenda included a discussion of what effect, if any, the SLDS contamination would have on the community. A preliminary decision was made by the community leaders to work more closely with DOE in following the characterization schedule leading to a decision on cleanup and tentatively to set up an oversight committee for the SLDS.

Thank you again for your interest in the FUSRAP environmental restoration projects in the St. Louis area. If you would like to meet or talk with me, you can reach me at either 524-4083 or (615) 576-9634.

Sincerely,

David G. Adler
FUSRAP Site Manager
St. Louis Sites



Issues raised by public comments

Technical experts to discuss interim cleanup

DOE's plan to pursue interim cleanup in the North County area is the main agenda item when discussions begin between DOE and a technical review committee appointed by St. Louis County.

The delay allows time for DOE and the County's oversight committee to resolve issues that were raised during a recent public comment period. The St. Louis County Executive is in the process of appointing a group of technical and public health

professionals to work with DOE representatives.

The proposed interim removal action for the North County properties was detailed in a report called an engineering evaluation/cost analysis-environmental assessment (EE/CA-EA). The document was released to the public this spring. A public comment period conducted from April 8-May 8 provided opportunity for residents and public officials to let DOE know their thoughts on the proposal.

The proposed interim removal action is part of the comprehensive environmental review of the St. Louis FUSRAP sites that DOE is conducting in accordance with federal, state, and local regulations.

Copies of the EE/CA-EA are still available and may be requested from the DOE Public Information Center in Hazelwood, telephone 524-4083.

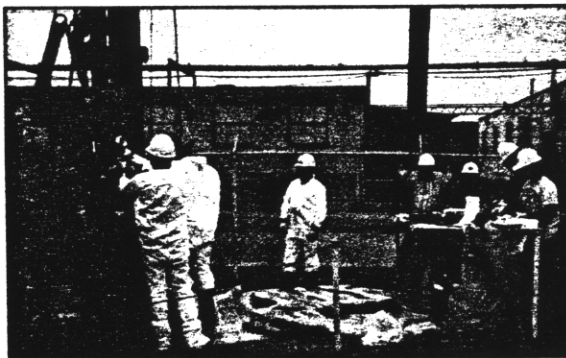
Field sampling underway at St. Louis FUSRAP sites

DOE is conducting a limited field sampling activity on and around the St. Louis FUSRAP sites. The work began in mid-July and will continue for about eight weeks.

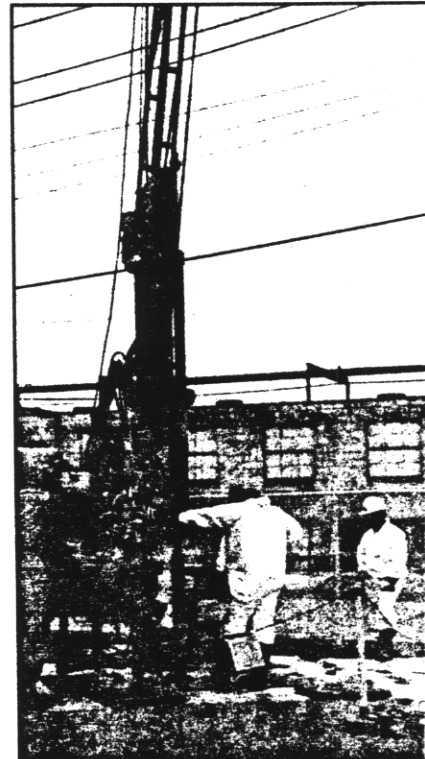
St. Louis residents may see workers taking soil samples on such locations as the ball fields across from the St. Louis Airport Site. Crews will also be taking samples on SLAPS, the Latty Avenue properties, and at the St. Louis Downtown Site.

The field sampling results supplement existing data to support the Feasibility Study (FS) for the St. Louis Site. Results from the current sampling activities are expected to provide all remaining information necessary to complete the FS.

The FS is the culmination of characterization activities that DOE has been conducting at the St. Louis sites under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act and the National Environmental Policy Act. Site characterization is required under these laws prior to reaching a decision on cleanup of the properties.



Sampling crews operate drill rig at St. Louis Downtown Site.



How to learn more about the St. Louis Sites

The resources available at the DOE Public Information Center, 9200 Latty Avenue, Hazelwood, provide everything from general to technical information about the St. Louis FUSRAP sites. The Center is located at the Hazelwood Interim Storage Site.

Visitors are welcome at the DOE Public Information Center on Latty Avenue. That's Bob Gebhardt, site superintendent, on the entrance ramp.



Here are just a few of the resources:

- A 13-minute videotape, "FUSRAP Overview"
- Four Fact Sheets
 - "Formerly Utilized Sites Remedial Action Program"
 - "Principal Laws and Regulations Affecting the FUSRAP Cleanup Program"
 - "Administrative Record Requirements for FUSRAP"
 - "The St. Louis Site"
- Site Maps
- An observation deck with a view of the small storage pile
- Administrative Record containing all the documents that form the basis for selecting a response document at a Superfund Site.
- A large exhibit with a graphic display about FUSRAP and the St. Louis sites.

The public is welcome to visit the site at any time week days between the hours of 9 a.m.- 2 p.m. Some space limitations exist, so it is recommended that larger groups call ahead. To obtain directions or a map, please call the Center at 524-4083.

FUSRAP Update is issued periodically to inform St. Louis residents about current activities on the contaminated sites in the St. Louis area that are slated for cleanup under the U.S. Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites were contaminated during the early days of the nation's atomic energy program.

For more information about the FUSRAP sites in St. Louis, contact the DOE Public Information Center, 9200 Latty Avenue, Hazelwood, MO 63042. Telephone (314) 524-4083.

Student letters bring FUSRAP speaker to Clayton High

Twenty students studying ecology at Clayton High School wrote letters to DOE expressing their views on the proposed interim cleanup in the Hazelwood/Berkeley area. One student added this postscript, "A response would be appreciated."

This student's note prompted David Adler, DOE's site manager, to contact the teacher, Barbara Riley. Adler's idea was to respond to concerns expressed by the students while at the same time providing more information about the federal, state, and local requirements regulating environmental cleanup.



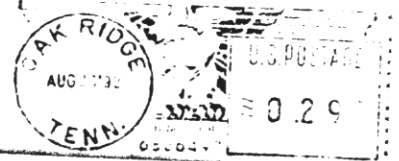
▲ *Joe Williams and other members of the St. Louis FUSRAP team will speak to area groups or organizations.*

On June 1, Joe Williams, a civil/environmental engineer and deputy project manager, addressed both of Ms. Riley's ecology classes. The students "asked many questions on their own and a few expressed an interest in visiting DOE's information center," he said. One of the sessions was quite lively, according to Williams, who enjoyed it all immensely.

These students are an important part of DOE's philosophy of public participation, Adler said. DOE views the public as a partner and a resource in the decision-making process in solving environmental problems.

Please contact the DOE Information Center, 524-4083, if you would like to schedule someone on DOE's St. Louis FUSRAP team to talk with your group or organization.

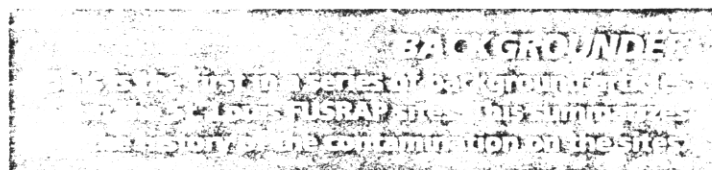
DOE Public Information Center
9200 Latty Avenue
Hazelwood, MO 63042



Your toll-free number to the DOE Public Information Center is 1-800-253-9759



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St. Louis contamination begins with atomic age



▲
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 nation'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 Mallinckrodt 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.

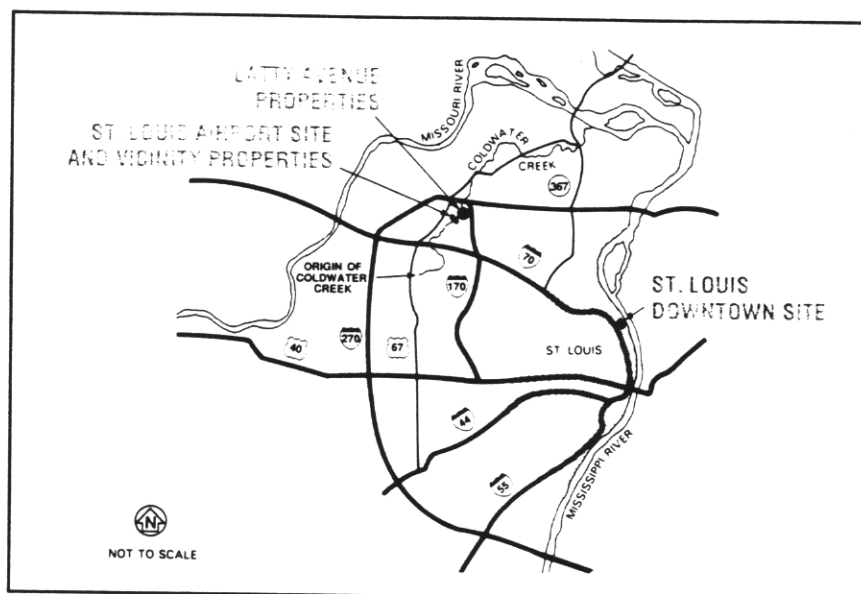
The primary radioactive contaminant on the St. Louis sites is thorium-230. Analyses have also identified the presence of uranium-238 and radium-226. Given present land use, the low-level radioactivity found on these properties poses no immediate threat to public health or the environment. However, performing remedial action and

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 cur-



Locations of FUSRAP properties in the St. Louis, Missouri, area.

achieving cleanup standards will ensure that the contamination poses no significant risk if land use changes in the future.

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

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.



FUSRAP Update

The St. Louis Sites

St. Louis, Missouri



Department of Energy
Field Office, Oak Ridge
Post Office Box 2001
Oak Ridge, Tennessee 37831-8723

Dear St. Louis Resident:

April 1992

Much has happened since the last *FUSRAP Update* was issued in December 1991. I am pleased to report that the engineering evaluation/cost analysis-environmental assessment (EE/CA-EA) was issued by the U.S. Department of Energy in March 1992 for the proposed decontamination of specific properties in Hazelwood and Berkeley. See page 2 for more information.

I believe that the proposed activities would be beneficial both for affected property owners and the DOE's cleanup program. As examples, implementation of the proposal could allow decontamination of residential properties and the athletic complex located in the Hazelwood/Berkeley area. Benefits to the cleanup program include preventing the uncontrolled disturbance of contaminated soils and prevention of waste volume growth due to such disturbance.

Please write to me during the public comment period which ends May 8, 1992, and let me know your thoughts on this interim cleanup measure. My address is given at the end of the article on page 2.

Other highlights of the past few months include the public scoping meeting that was held January 28 at Berkeley Senior High School. We are most appreciative that so many residents chose to attend and provide testimony. This written and oral testimony is an important part of the decision-making process. A document which responds to all of the public concerns raised at the meeting is currently under preparation and should be available for public review soon.

On January 15, copies of the work plan and the community relations plan for the St. Louis Site were distributed to approximately 35 public and state officials and other interested parties. Anyone else who would like a copy can request one by calling the DOE Public Information Center on Latty Ave., telephone (314) 524-4083.

Please feel free to contact me if you require any additional information or would like to meet to discuss this matter further.

Sincerely,

David G. Adler
David G. Adler
FUSRAP Site Manager
St. Louis Sites

DOEA-ORNL Rev. 1

Engineering Evaluation/Cost Analysis-
Environmental Assessment for the
Proposed Decontamination of Properties
in the Vicinity of the Hazelwood Interim
Storage Site, Hazelwood, Missouri

March 1992



U.S. Department of Energy
Oak Ridge Operations
Former Sites Restoration Division

DOE proposing interim cleanup in Hazelwood and Berkeley

The U.S. Department of Energy is moving a step closer toward removal of radioactively contaminated soil from the properties of several homeowners, businesses, and roadway right-of-ways in the communities of Berkeley and Hazelwood.

The opportunity for activity could come as early as this Spring and Summer. Details of DOE's interim plan that would expedite cleanup in the North County area are contained in a report called an engineering evaluation/cost analysis-environmental assessment (EE/CA-EA).

David Adler, DOE's site manager, said that the interim action proposed by the report would relieve property owners and municipalities of the burden associated with contamination on their properties. He said that residential properties are first in line for cleanup if the plan is approved. These property owners have already been contacted regarding radiological surveys and access agreements needed for each property slated for cleanup.

For a 30-day period which ends May 8, 1992, Adler would like to receive written comments from the public. "We believe that we have a technically sound plan for cleaning up the contaminated material, and we would like to know what the people in the communities think about it," Adler said.

Please address your written comments to David G. Adler, FUSRAP Site Manager; U.S. Department of Energy Oak Ridge Field Office; Former Sites Restoration Division; P.O. Box 2001; Oak Ridge, TN 37831-8723.

How to review or get a copy of the EE/CA-EA

In order to learn more about DOE's interim cleanup plan for Hazelwood and Berkeley, you will probably want to review or request your own copy of the EE/CA-EA. Here are several ways to gain access to the document:

- DOE Public Information Center
9200 Latty Avenue
Hazelwood, MO
Telephone: (314) 524-4083
- Government Information Section of the St. Louis Public Library
1301 Olive Street
St. Louis, MO
- St. Louis County Library
Prairie Commons Branch
915 Utz Lane
Hazelwood, MO

FUSRAP Update is issued periodically to inform St. Louis residents about current activities on the contaminated sites in the St. Louis area that are slated for cleanup under the U.S. Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites were contaminated during the early days of the government's atomic energy program.

For more information about the FUSRAP sites in St. Louis, contact the DOE Public Information Center, 9200 Latty Avenue, Hazelwood, MO 63042. Telephone (314) 524-4083.

Public meeting records citizen concerns

More than 250 St. Louis residents participated in DOE's public scoping meeting on January 28 at Berkeley Senior High School.

Approximately 30 private citizens and 16 public officials made statements for the record. Many of the speakers encouraged DOE and the Environmental Protection Agency to expedite the environmental review process and remove contaminated material from the St. Louis area.

A display advertisement announcing the public scoping meeting for the St. Louis Sites Remedial Investigation/Feasibility Study-Environmental Impact Statement and availability of the work plan was published in the *St. Louis Post-Dispatch*. A news release announcing the meeting was issued by the DOE Public Information Office in Oak Ridge. Announcements about the meeting were sent to some 300 people on the St. Louis Site mailing list.

Media coverage at the meeting included the *St. Louis Post-Dispatch*, the Suburban Newspaper Group, two television stations, and one radio station.

These St. Louis residents arrived early to sign in and stayed late so that their opinions could be heard at the public scoping meeting on January 28.





These 20 fifth graders from Grace Chapel Lutheran School visited the DOE Information Center on Latty Avenue on February 19 to learn more about radioactivity and specifics about the St. Louis FUSRAP sites. They were accompanied by their teacher Renee Borgman and parent chaperone Edward Heinz. Roger Hall, a site manager for TMA/Eberline, is shown demonstrating radiation monitors for the class.

DOE Public Information Center
9200 Latty Avenue
Hazelwood, MO 63042

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