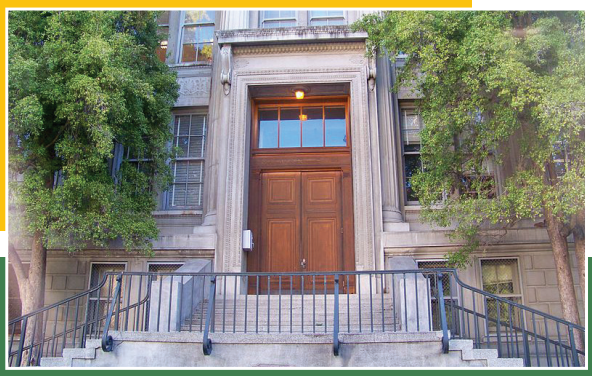
FUSRAP

Formerly Utilized Sites Remedial Action Program



Stakeholder Report

August 2018

U.S. DEPARTMENT OF ENERGY | Legacy Management

Cover Photos

Clockwise from left: Oak Ridge, TN site, Berkeley, CA site, Wayne, NJ site, Beverly, MA site.

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FUSRAP SITES

CONTACT US

Visit our website or send questions via email below. Let us know if there is more we can do to keep you informed of FUSRAP.

Web FUSRAP

https://www.energy.gov/lm/sites/lm-sites/programmatic-framework/fusrap-program-information

Email: FUSRAPinfo@lm.doe.gov

Phone: (720) 377–9672

Stakeholder Report:

https://www.energy.gov/sites/prod/files/2013/11/f5/FUSRAP_StakeholderReport.pdf

Message to Stakeholders

The U.S. Department of Energy (DOE) has operated the Formerly Utilized Sites Remedial Action Program (FUSRAP) since 1974. During that time, we have identified and remediated sites that were contaminated with radioactive materials in support of the nation's early atomic energy programs. DOE remediated FUSRAP sites until 1997, when that task was assigned to the U.S. Army Corps of Engineers (USACE).

The DOE Office of Legacy Management (LM) is responsible for 31 remediated FUSRAP sites (see the map on the next page). Our mission is to protect human health and the environment at these sites. To accomplish this, we evaluate risk for the sites and define long-term surveillance and maintenance (LTS&M) requirements to monitor site conditions, prevent unsafe activities where needed, and keep stakeholders informed.

Most FUSRAP sites have been remediated to a condition that allows unrestricted use. For all sites, LM manages site information to preserve knowledge of site conditions and a record of site activities. We are responsible for determining if a site is eligible for inclusion in FUSRAP and for keeping remediated sites safe by conducting LTS&M.

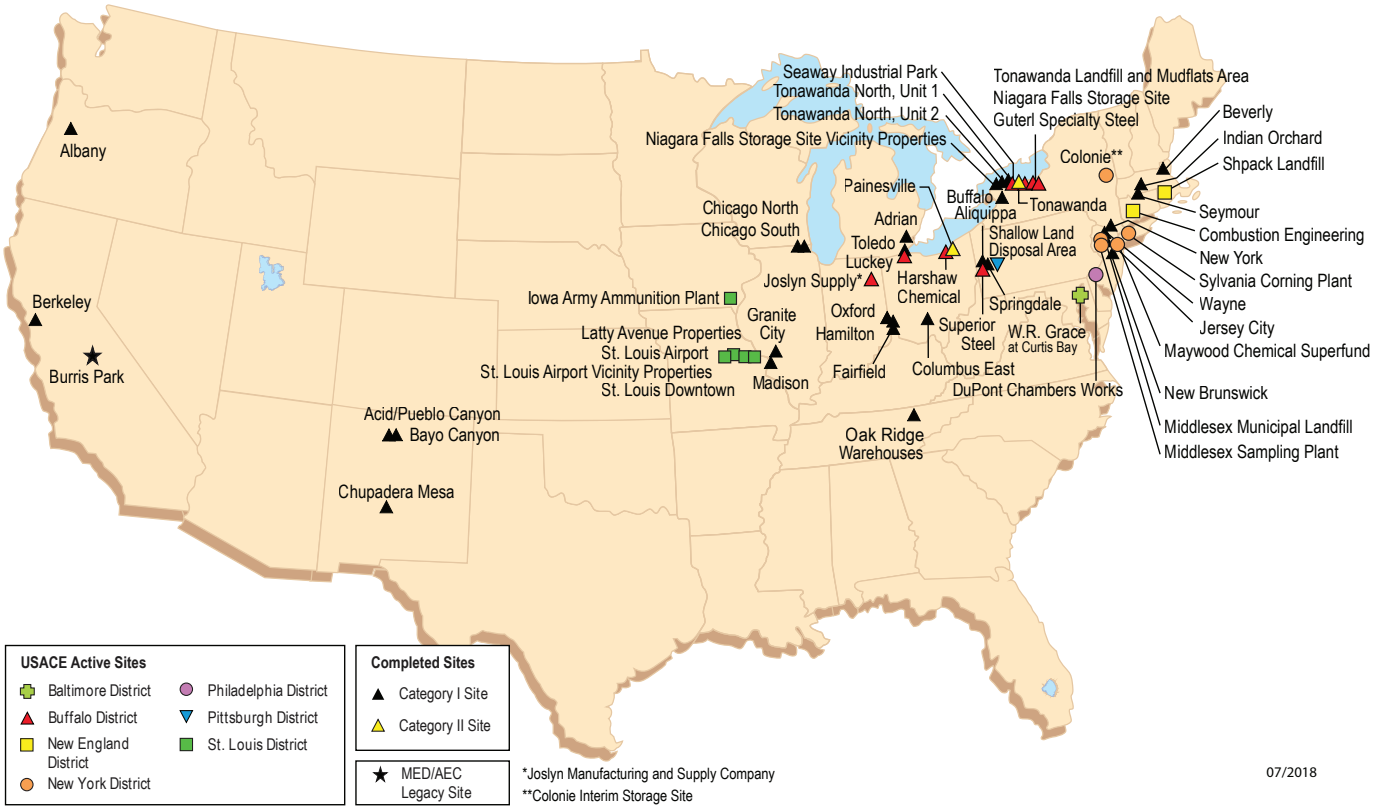
We have accomplished the following FUSRAP work since 1974:

- **Researched federal records across the country and identified more than 500 sites that may have residual radioactive contamination from early U.S. Army Corps of Engineers Manhattan Engineer District (MED) or U.S. Atomic Energy Commission (AEC) activities**
- **Evaluated radiological conditions and conducted surveys to identify sites that had residual radioactive contamination**
- **Established procedures and protocols for operating FUSRAP**
- **Conducted eligibility evaluations to determine if sites were eligible for remediation under FUSRAP, ultimately designating 46 sites for remedial action**
- **Remediated 25 sites and transitioned them to LTS&M**
- **Transitioned six sites to LTS&M that were remediated by USACE**
- **Coordinated DOE and USACE FUSRAP activities for referral and transition of site responsibilities between the agencies**

This report is part of our active outreach to stakeholders to ensure that the public and other stakeholders remain aware of FUSRAP sites and that essential FUSRAP knowledge is preserved.

Cliff Carpenter
LM FUSRAP Program Manager

FUSRAP SITES



What Is FUSRAP?

The Formerly Utilized Sites Remedial Action Program was established in 1974 to identify, investigate, and clean up or control exposure to residual contamination at sites that had supported Manhattan Engineer District (MED) or U.S. Atomic Energy Commission (AEC) activities.

When the nation began developing atomic weapons during World War II, no government-owned infrastructure existed to provide the specialized services needed to accomplish that task, so the federal government contracted for services from private enterprises with the needed expertise and facilities. As government-owned facilities were developed, the contracted facilities were cleaned up to standards in effect at the time and released for unrestricted use.

In the early 1970s the U.S. government strengthened cleanup requirements. Radiological and chemical contamination that remained at some of the former MED-contracted sites exceeded the new standards. AEC initiated FUSRAP to review the radiological conditions at the early atomic energy program sites, determine if a given site was eligible for government cleanup, and remediate any remaining contamination to current standards at eligible sites.

Early Atomic Weapons Research and Production

In August 1942, the U.S. Army Corps of Engineers (USACE) created MED to develop the technology and production facilities for the first atomic weapons. Popularly known as the Manhattan Project, MED hired contractors throughout the United States to store, sample, assay, process, and machine the uranium and thorium ores and metal used in the first atomic bombs. FUSRAP sites conducted many of the operations and processes used in early atomic weapons production and nuclear research. These sites were typically smaller facilities, usually privately owned, that were released for private use when their government contracts had been fulfilled.

In August 1946, President Harry S. Truman signed the Atomic Energy Act, which created the AEC, a civilian-controlled federal agency that replaced MED and assumed the responsibilities

for atomic weapons and early atomic energy programs. AEC continued to contract with private industry to support the nation's nuclear weapons and energy programs until 1975, by which time a government industrial base had been established. AEC was reorganized as the Energy Research and Development Administration in 1975, and in 1977 that agency was reorganized as DOE, which was established as a cabinet-level agency that consolidated the energy-related functions of a number of government agencies.

During the 1940s, uranium ore was obtained from the Belgian Congo, the western United States, and Canada. Uranium ore concentrates were refined to various compounds, which were then either converted to metals used in nuclear fuel fabrication or for use as enriched uranium. Machined uranium metal was sent to production reactors—primarily to Oak Ridge,Tennessee, or the Hanford Reservation in Washington State in the 1940s and the Savannah River Plant in South Carolina in the 1950s—to produce plutonium used to make nuclear weapons. Plutonium and enriched uranium provided by other federal operations were then sent to weapons production facilities.

Wastes from uranium ore processing and other operations were sent to storage and disposal facilities. Tailings waste from uranium mills were encapsulated in disposal cells approved by the U.S. Nuclear Regulatory Commission (NRC).

Other FUSRAP sites involved in early weapons production were used for beryllium and thorium production or were research facilities.

FUSRAP Sites Status

Although most FUSRAP sites were cleaned up to guidelines that were in effect at the time and released, by the 1970s some of those guidelines had been replaced by more stringent standards. AEC, then DOE, reexamined more than 500 sites to identify potential risks to public health, safety, and the environment where levels of radioactive contamination might exceed current standards. DOE identified 46 sites that required cleanup and began the cleanups in 1979. Eight additional sites have since been added to FUSRAP, for a total of 54 FUSRAP sites today.

DOE remediated 25 sites before Congress transferred responsibility for FUSRAP site characterization and remediation to USACE in 1997. As of August 2018, USACE has completed remedial action at six sites, and 23 active sites are currently undergoing remedial action. LM is responsible for determining whether a site is eligible for remediation under FUSRAP and for long-term care of completed FUSRAP sites. LM assumes perpetual responsibility for completed FUSRAP sites.

LM manages DOE's FUSRAP responsibilities to ensure FUSRAP sites remain protective of human health and the environment after remediation is complete. LM accomplishes this through its LTS&M program, which is designed to control residual risk and maintain safe conditions at completed sites.

Radioactive Contamination at FUSRAP Sites

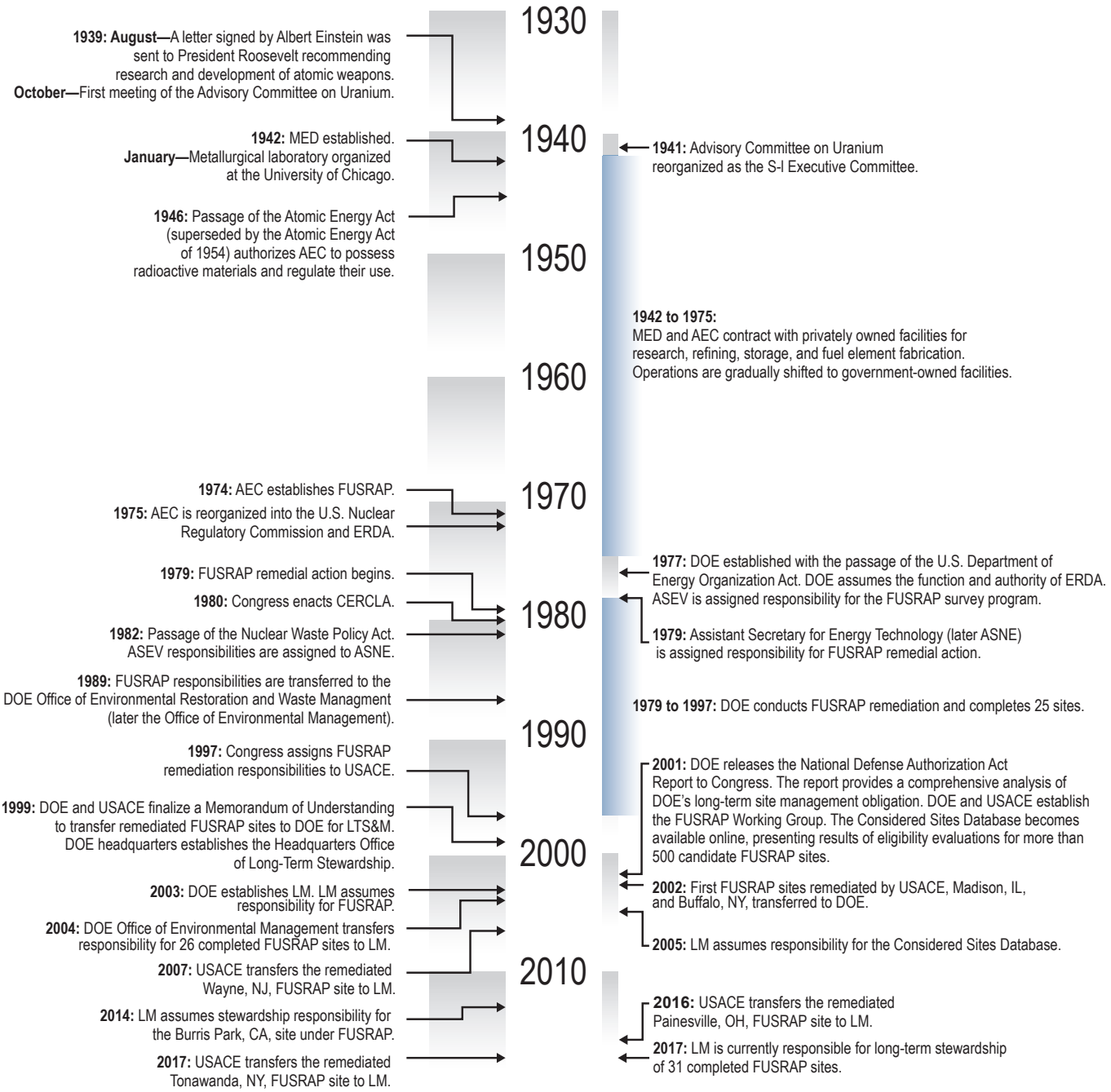
Residual radioactive contamination at FUSRAP sites usually consists of uranium and its decay products. Uranium is a naturally occurring element that is radioactive. Atoms of a radioactive element are unstable and spontaneously decay to lighter elements (decay products), while giving off gamma rays, alpha particles, or beta particles (electrons). The decay products are also radioactive and undergo decay, which leads to an entire series of ever-lighter elements in a decay chain that eventually ends with a stable isotope of lead.

Uranium ore contains all the elements in the uranium decay chain. Ore handling, analysis, and research resulted in radioactive contamination from uranium and its decay products at some FUSRAP sites. The ore was processed to remove the uranium, leaving the decay products as waste. In separate processes, the uranium was converted to metal or other forms, generating radioactive waste. Additional waste was generated when uranium metal was machined, creating uranium dust.

The research and development of these processes also generated radioactive waste at some FUSRAP sites.

Some FUSRAP sites were involved in thorium handling and processing. Thorium is also radioactive and has its own decay chain. Some sites that were not involved in AEC or MED activities, and were not otherwise eligible for remediation under FUSRAP, were added to the program through congressional action. Radionuclides from other processes may be present at these sites.

FUSRAP TIMELINE



AEC	U.S. Atomic Energy Commission	FUSRAP	Formerly Utilized Sites Remedial Action Program
ASNE	Assistant Secretary for Nuclear Energy	LM	Office of Legacy Management
ASEV	Assistant Secretary for the Environment	LTS&M	long-term surveillance and maintenance
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	MED	Manhattan Engineer District
		UMTRCA	Uranium Mill Tailings Radiation Control Act
DOE	U.S. Department of Energy	USACE	U.S. Army Corps of Engineers
ERDA	Energy Research and Development Administration		

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ROLES AND RESPONSIBILITIES

The responsibilities of DOE and USACE in implementing FUSRAP are independent and require coordination between the agencies to accomplish the FUSRAP goal of maintaining protectiveness. DOE and USACE signed a Memorandum of Understanding that defines roles and responsibilities and promotes coordination between the two agencies.

LM Responsibility: Preserving Historical Knowledge

Preserving historical knowledge by maintaining legacy site records is a core LM function of FUSRAP. Records that describe site operations, the extent of contamination, remedial action activities, final site conditions, site verification, and regulator concurrence are all critical to LM's ability to confirm that sites were cleaned up to the appropriate standards and remain protective. LM also relies on historical site records to determine whether a site is eligible for remedial action under FUSRAP. The site records are indexed and preserved for use by future custodians and stakeholders.

LM also provides information to the public on legacy sites that were evaluated to determine whether they were eligible for remediation under FUSRAP, and for remediated FUSRAP sites. The Considered Sites Database, available on the LM website: **https://www.energy.gov/lm/sites/lm-sites/considered-sites**, presents the results of eligibility evaluations for the more than 500 candidate FUSRAP sites. It contains documentation that supports the eligibility decisions, as well as cleanup and site closure documentation for the remediated sites.

DOE Responsibility: Eligibility Determination and Referral

LM evaluates a site to determine whether it is eligible for remediation under FUSRAP and then refers the eligible site to USACE. Referrals can occur when a new site is evaluated or when additional assessment or remediation is required for a previously completed site. LM determines FUSRAP eligibility based on the following criteria:

- **Work was conducted in support of MED or AEC activities (typically during the 1940s to early 1960s time frame)**
- **The activities resulted in residual radioactive contamination (primarily uranium, thorium, radium, and their daughter elements) that exceeds current cleanup criteria**
- **The authority to conduct remedial action at the site is prescribed within the Atomic Energy Act, as amended**
- **The site is not subject for remedial action under any other remedial action program, nor is residual radioactive contamination addressed under an NRC or state license**
- **Congress can add a site to FUSRAP through the Energy and Water Development Appropriations Act**

What Does Protectiveness Mean?

Protectiveness means that the potential risk to human health and the environment from exposure to residual radioactive contamination has been eliminated or reduced to acceptable levels.

Some sites can be released for unrestricted use and unlimited exposure, as they have been remediated to a condition that poses no unacceptable health risks under any land use scenarios.

The protectiveness of a completed site sometimes relies on properly managing residual contamination to prevent any uses that could result in exposure to the contamination. For sites where some residual contamination remains, protectiveness is ensured by controlling potential exposure to contamination by implementing land use controls and other restrictions as necessary.

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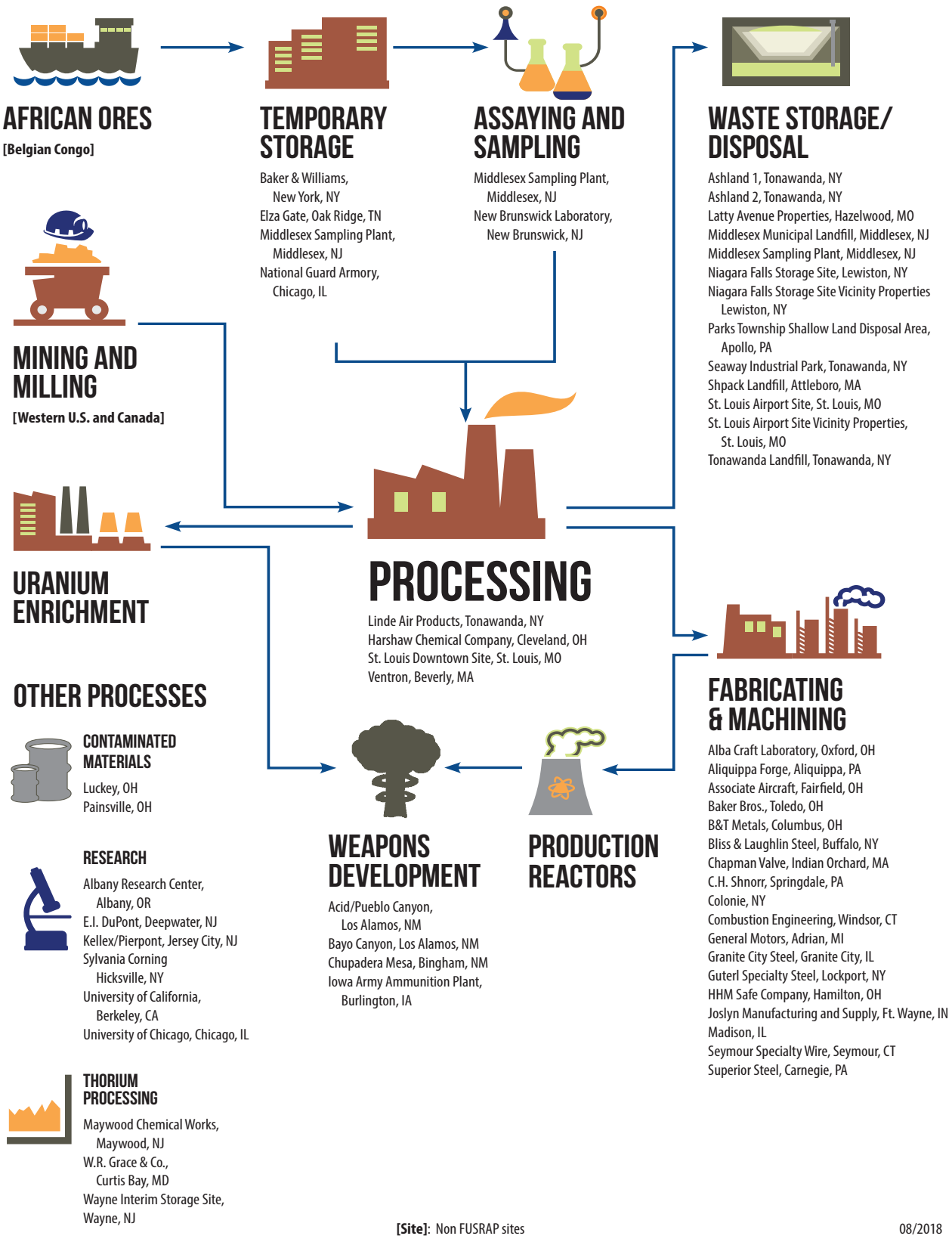
FUSRAP Sites Involved in MED and AEC Processes



DOE Responsibility: Eligibility Determination and Referral

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In the case of previously completed sites, LM determines if new information or changed site conditions warrant the referral of a site to USACE for additional assessment or remediation. LM uses the following criteria to determine if a site should be referred to USACE for further assessment:

- **A third-party characterization or survey reveals residual MED/AEC-related contamination that was not previously identified; or**
- **A review of historical records indicates the potential for existing MED/AEC-related contamination that was not previously identified; or an individual with credible institutional knowledge provides information that additional MED/AEC-related contamination might exist that was not identified in previous assessments**

Once an eligibility evaluation begins, LM informs USACE of the potential referral and keeps USACE staff informed of the progress of the evaluation. This allows USACE to begin to plan for the referral.

LM conveys site documentation to USACE in conjunction with a site referral, which includes operations documentation establishing that work was performed at the site for MED or AEC. In addition, the documentation defines the processes and potential contamination and any available radiological survey information about potential radiological contamination remaining on the site.

USACE Responsibility: Assessment and Remediation

In 1997, Congress directed USACE to conduct assessments and remedial action to clean up FUSRAP sites in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. When LM determines that a site is eligible, USACE determines whether the site should be designated as an active FUSRAP site requiring further action. The assessment may result in a finding that no further action is required on the basis that no radiological contamination that exceeds cleanup criteria is present, or that the contamination is not FUSRAP-related. If remedial action is required, USACE assesses site conditions, selects and implements a remedy, and works with the U.S. Department of Justice on cost-recovery actions.

Once it is determined that additional action is required, USACE assumes responsibility for the site until cleanup is completed with the remedy in place. If residual contamination remains on the property after completion of remedial action, and radiological conditions are such that the property cannot be released for unrestricted use, USACE will develop land use restrictions, which LM refers to as institutional controls (ICs), as part of the remedy. After cleanup is completed and the remedy is in place, USACE conducts a two-year-long operations and maintenance period to demonstrate that site hazards are controlled. Before a site can be transferred to LM, the regulator must concur that the selected remedy is operating successfully, which indicates the site is protective of human health and the environment.

Two Types of FUSRAP Sites

An "active" FUSRAP site is a site being remediated by USACE. A "completed" FUSRAP site has been remediated and transferred to LM to maintain records and perform LTS&M.

Transition from USACE to DOE

LM and USACE have established a process to transition site responsibilities to LM when remedial actions are completed. The process ensures that LM will be informed of necessary actions to ensure that the remedy remains protective, essential site knowledge is transferred and preserved in LM records, and stakeholders are informed that LM will provide LTS&M and respond to inquiries about site conditions.

Pre-transition activities may include an orientation visit and joint environmental monitoring, interviews with USACE project staff, and participation in public and stakeholder meetings.

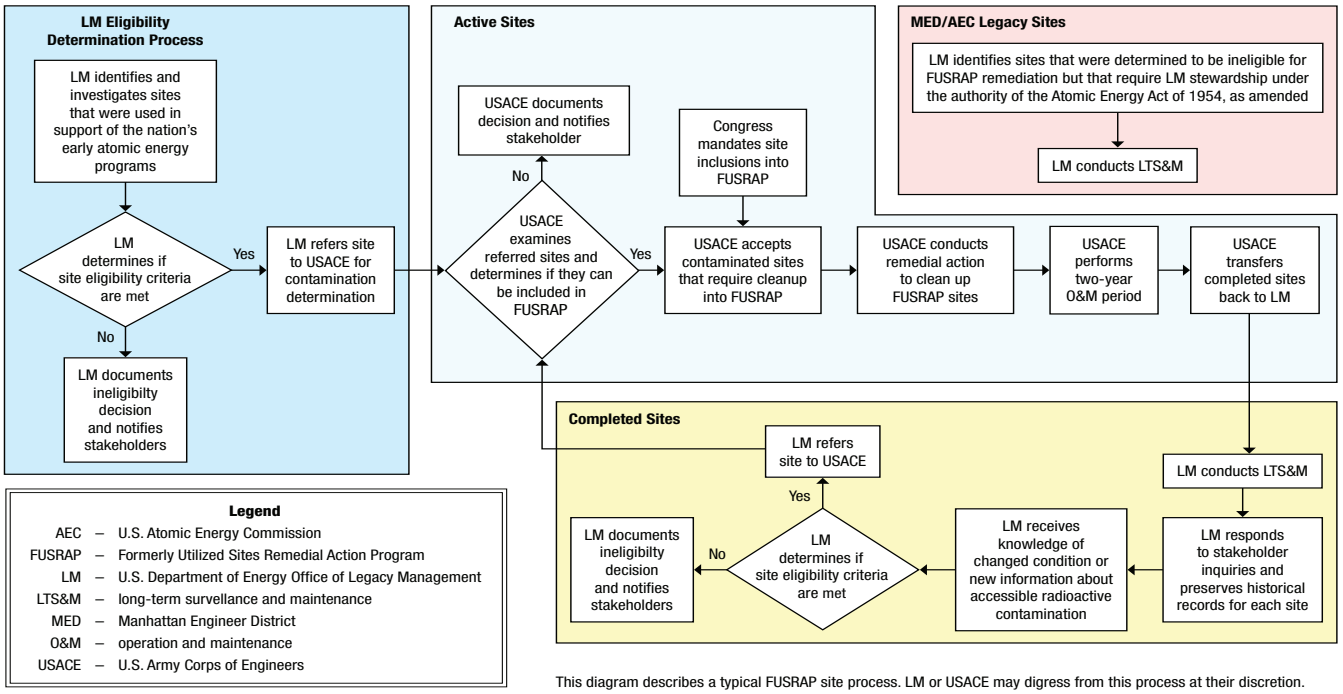
The 2018 FUSRAP Program Management Plan establishes procedures for managing LM-related FUSRAP activities, including LTS&M and referral and transition processes.

DOE Responsibility: LTS&M

Some FUSRAP sites can be released for unrestricted use, based on final radiological conditions at the site, and LTS&M requirements will consist of managing records and responding to stakeholder inquiries. Other sites may require specific long-term maintenance actions to maintain protectiveness. For those sites, LM develops site-specific LTS&M plans that establish the additional activities needed.

Site-specific LTS&M plan activities can include periodic inspections, environmental monitoring, maintenance, managing ICs, and conducting five-year reviews. Although no current FUSRAP sites are expected to require ongoing remedial actions such as groundwater treatment, maintaining and operating any such required system would also be a part of the site LTS&M plan.

FUSRAP LIFE CYCLE



This diagram describes a typical FUSRAP site process. LM or USACE may digress from this process at their discretion.

Beneficial Reuse

Beneficial reuse refers to the productive use of an LM site that no longer has a DOE mission after remediation, by LM or other entities, while being protective of human health and the environment. Reuse activities maintain protective use of lands and remedies, including revitalization of real property and disposal of land. DOE owns the real property at the Maywood, New Jersey; Colonie, New York; Middlesex Sampling Plant, New Jersey; and Niagara Falls Storage Site, New York, sites.

Upon transfer of these sites from USACE, LM will evaluate whether the property can be transferred to a private owner or another government agency for beneficial reuse. Other FUSRAP sites are government or privately owned, and LM does not control land use except through ICs.

What Are Institutional Controls?

When a site is not released for unlimited use or unrestricted exposure institutional controls (ICs) may be used to prevent certain activities.

An IC is a mechanism that prevents exposure to contamination. Usually the control consists of a legal agreement, such as a deed restriction, that prohibits certain activities. For example, a deed restriction at the New Brunswick, New Jersey, Site prohibits excavating into an area where contaminated soil was left under a clean soil cover. ICs are legally enforceable by an agency with the authority to halt an activity that has the potential to violate the restriction. Some regulatory systems consider any restriction an IC, including physical access barriers, markers, and engineered structures that isolate contamination from the environment.

Cleanup regulations followed by LM and USACE allow leaving contaminated material in place if (1) it poses no unacceptable risk if left undisturbed, and (2) certain other criteria are met, such as if the cost to remove the contamination far exceeds the benefit, or remediation would be unsafe or cause environmental harm. LM manages ICs through (1) surveillance of the site to ensure that IC restrictions are not violated, and (2) contact with owners, tenants, regulators, or local governments to ensure that they remain aware of the ICs.

FUSRAP SITE DESCRIPTIONS

These sites were involved in receiving, storing, sampling, assaying, and shipping uranium ore and materials.

Acid/Pueblo Canyon, New Mexico, Site

(DOE COMPLETED FUSRAP SITE)

The Acid/Pueblo Canyon site, owned by Los Alamos County, is located in the Pajarito Plateau region near Los Alamos. Between 1943 and 1964, MED and AEC conducted nuclear weapons research that resulted in contaminated soil and rock in the canyon beneath the Los Alamos laboratory complex.

AEC remediated the contaminated areas in 1966 and 1967. DOE completed additional remediation of the site under FUSRAP in 1982. DOE certified that the site conformed to applicable cleanup criteria in August 1984 and released the affected areas for unrestricted use. Los Alamos National Laboratory will conduct monitoring and, if necessary, additional remediation in conjunction with cleanup activities for the entire Los Alamos site.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Acid/Pueblo Canyon Fact Sheet
https://www.lm.doe.gov/Acid/Sites.aspx

Albany, Oregon, Site

(DOE COMPLETED FUSRAP SITE)

The Albany site is owned and operated by the DOE Office of Fossil Energy. Metallurgical research was conducted at this site for AEC and the Energy Research and Development Administration from 1948 to 1978. Activities involving radioactive thorium and uranium resulted in contaminated buildings, equipment, and soils.

The U.S. Bureau of Mines remediated portions of the site between 1948 and 1978. DOE remediated buildings, equipment, and soils under FUSRAP in 1987, 1988, 1990, and 1991. In 1992, DOE certified that applicable cleanup criteria had been achieved, and the site was released for unrestricted use. Supplemental limits were applied to drains and other inaccessible areas.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Albany Fact Sheet
https://www.lm.doe.gov/Albany/Sites.aspx

Adrian, Michigan, Site

(DOE COMPLETED FUSRAP SITE)

The Adrian site (General Motors) was operated by Bridgeport Brass Company in the 1950s. Uranium metal was extruded at the site for use in the fabrication of fuel elements for production reactors. General Motors Corporation remediated radioactive contamination at the site in the 1970s, and additional remediation was conducted under FUSRAP in 1995. Supplemental limits were applied to residual radioactive contamination left in below-grade utilities, and DOE released the site for use without radiological restrictions. In 2017, LM determined that no additional waste disposal restrictions were required for the supplemental limits material.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Adrian Fact Sheet
https://www.lm.doe.gov/Adrian/Sites.aspx

Supplemental limits may be applied in place of limits established in DOE guidelines in situations where the cost of remediation would be unreasonably high compared to the long-term benefits, and the residual contamination does not pose a present or future risk to workers or the public in its current configuration.

Aliquippa, Pennsylvania, Site

(DOE COMPLETED FUSRAP SITE)

At the Aliquippa site, the Vulcan Crucible Steel Company heated and rolled uranium metal into rods for AEC from 1948 to 1949, resulting in contaminated building surfaces, equipment, and soil. The site is currently used for light manufacturing.

The former owner decontaminated the site to then-applicable guidelines in 1950 while under contract with AEC. DOE conducted additional remediation under FUSRAP in 1988, 1993, and 1994. Supplemental limits were applied to uranium dust left in inaccessible areas. In 1996, DOE certified that applicable cleanup criteria had been achieved, and the site was released for unrestricted use.

Aliquippa, Pennsylvania, Site

(continued)

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Aliquippa Fact Sheet
https://www.lm.doe.gov/Aliquippa/Sites.aspx

Bayo Canyon, New Mexico, Site

(DOE COMPLETED FUSRAP SITE)

The Bayo Canyon site, owned by Los Alamos County, is located in the Pajarito Plateau region near Los Alamos. Los Alamos National Laboratory radiochemistry operations and explosives experiments, conducted between 1943 and 1961, contaminated buildings, sewer lines, and soils at this site.

AEC remediated contaminated areas from 1960 to 1963.DOE implemented additional remedial action under FUSRAP in 1982. DOE imposed an excavation restriction by erecting six permanent monuments to demarcate a 1.5-acre contaminated soil area until the year 2142, when the remaining residual radioactive contamination will decay and allow the release of the affected area for unrestricted use. DOE certified that the site conformed to applicable cleanup criteria and released the affected areas for restricted use. Los Alamos National Laboratory will conduct monitoring and, if necessary, additional remediation in conjunction with cleanup activities for the entire Los Alamos site.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Bayo Canyon Fact Sheet
https://www.lm.doe.gov/bayo/Sites.aspx

Berkeley, California, Site

(DOE COMPLETED FUSRAP SITE)

Gilman Hall is a four-story building on the campus of the University of California, Berkeley. Floors, wood sills, walls, and baseboards in the building were contaminated by radioactive materials in the 1940s while research under contract to MED and AEC was being conducted on the production and chemical properties of plutonium.

DOE designated the site for remediation under FUSRAP in 1979. Lawrence Berkeley Laboratories completed remedial action of the site in 1983. Residual contamination was fixed in place beneath floors or left in inaccessible areas. In 1985, DOE certified that the condition of the site was radiologically acceptable for restricted use, such as research and instructional purposes.

Other than operating within the controls of the University of California's state general license, no institutional controls are in effect at the site.

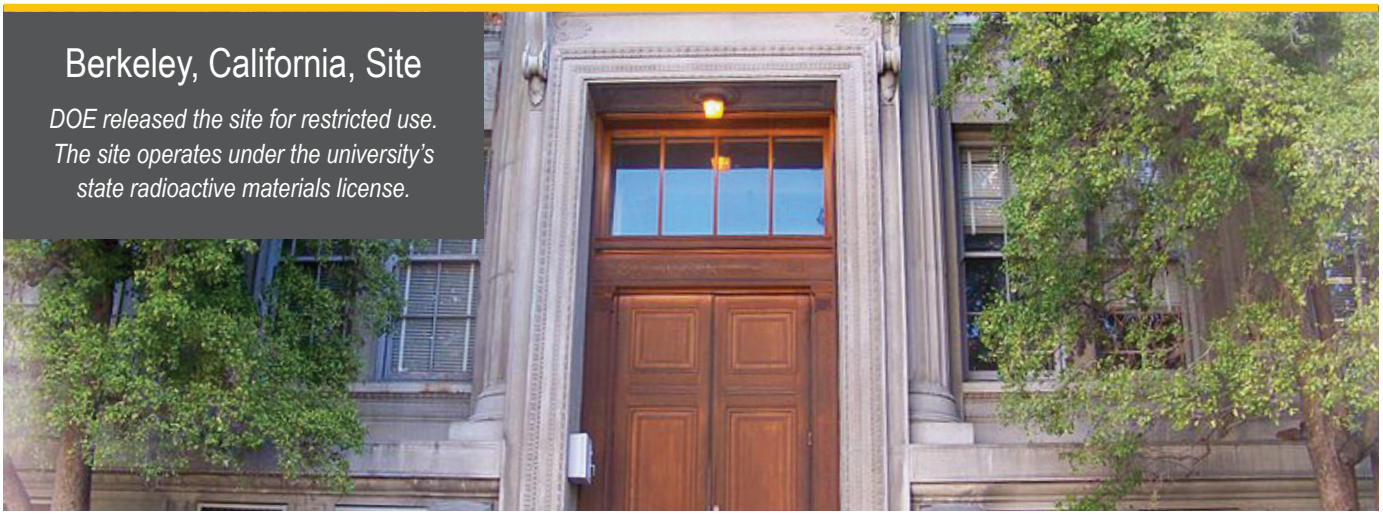
LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Berkeley Fact Sheet
https://www.lm.doe.gov/berkeley/Sites.aspx

Beverly, Massachusetts, Site

(DOE COMPLETED FUSRAP SITE)

From 1942 to 1948, the Metal Hydrides Corporation, which became the Ventron Corporation in 1965, conducted uranium processing operations that converted uranium oxide to uranium metal powder and uranium metal for MED and AEC. The Beverly site was later used by another private company to purify thorium compounds.



Beverly, Massachusetts, Site

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In 1986, DOE designated the site for remediation under FUSRAP. DOE remediated the site and certified that the site complied with applicable cleanup criteria in 2003. The privately owned property was released for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Beverly Fact Sheet

https://www.lm.doe.gov/beverly/Sites.aspx

Buffalo, New York, Site

(DOE COMPLETED FUSRAP SITE)

In 1952, the Bliss and Laughlin Steel Company machined and straightened uranium rods under subcontract to National Lead of Ohio, a prime AEC contractor. The activities generated waste cuttings, which were shipped to the Lake Ontario Ordnance Works. A 1992 preliminary survey of the building interior and exterior identified radioactive material in the floor of the finishing area.

Remediation of the Buffalo site began in December 1998 and continued through March 1999. USACE remediated the contaminated areas to site-specific numerical standards. After obtaining concurrence from the State of New York that site radiological conditions complied with the cleanup criteria, USACE issued the site closure report and declaration of completion for remedial action on September 30, 1999. Site responsibility transitioned to DOE in 2003.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Buffalo Fact Sheet

https://www.lm.doe.gov/buffalo/Sites.aspx

Chicago North, Illinois, Site

(DOE COMPLETED FUSRAP SITE)

The Chicago North site is owned by the State of Illinois and used as a National Guard armory. Between 1942 and 1951, MED and AEC used the building to store and process uranium metal, and the building was the central procurement and shipping location for the MED Metallurgical Laboratory. In 1951, AEC terminated use of the building and the property was returned to the State of Illinois.

Radiological characterizations of the site in 1977, 1978, and 1987 indicated that residual radioactive contamination exceeded DOE guidelines. In 1987 and 1988, DOE removed radiological contamination from interior building surfaces and exterior catch basins and soils. DOE certified that the site complied with applicable cleanup criteria and released the property for unrestricted use in 1989.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Chicago North Fact Sheet

https://www.lm.doe.gov/chicago_north/Sites.aspx

Chicago South, Illinois, Site

(DOE COMPLETED FUSRAP SITE)

In 1941, the National Defense Research Committee contracted the University of Chicago to construct a uranium and graphite pile to achieve a sustained nuclear chain reaction for use in developing the atomic bomb. That same year the work was transferred to the Metallurgical Laboratory, where it continued until 1946, when AEC was created. Work continued under the AEC contract through 1952, when the nuclear activities were transferred to the new Argonne National Laboratory site in DePage County. The Chicago South location was decontaminated using then state-of-the-art techniques.

In 1976, AEC directed Argonne National Laboratory to conduct radiological surveys, which identified only minimal contamination in the Kent, Jones, and Ryerson laboratories and Ekhart Hall.

Beverly, Massachusetts, Site

DOE remediated the site under FUSRAP and released it for unrestricted use in 2003. The privately owned property is currently being developed for residential housing.

Chicago South, Illinois, Site

(continued)

Remediation of those areas was completed in 1987. DOE has released the site for unrestricted use by the university.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Chicago South Fact Sheet
https://www.lm.doe.gov/chicago_south/Sites.aspx

Chupadera Mesa, New Mexico, Site

(DOE COMPLETED FUSRAP SITE)

The Chupadera Mesa site is privately owned land northeast of the White Sands Missile Range and the city of Bingham. The site is located within the fallout zone of the first nuclear weapons test, the Trinity test, conducted on July 16, 1945, under the Manhattan Project. AEC and successor organizations monitored the site between 1945 and 1985. In 1986, DOE determined that residual radioactive materials met applicable standards. No remediation was conducted under FUSRAP, and DOE released the site for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Chupadera Mesa Fact Sheet
https://www.lm.doe.gov/chupadera/Sites.aspx

Colonie Interim Storage Site, Colonie, New York

(USACE ACTIVE FUSRAP SITE)

Congress added the Colonie site to FUSRAP in 1983. The National Lead Colonie site fabricated and processed uranium metal for AEC, resulting in radioactive contamination from thorium and natural, enriched, and depleted uranium of site buildings, portions of the grounds, and 56 commercial and residential vicinity properties. DOE acquired the site in 1984 and used it for temporary storage of waste remediated from 53 vicinity properties and the onsite buildings. In 1997, USACE assumed responsibility for the remaining cleanup activities at the site.

Remedial actions have been completed and easements are being established for three areas, which will restrict subsurface excavation due to residual contamination (total of 0.2 acres). Groundwater monitoring and ICs are also in place.

Colonie Interim Storage Site, New York

USACE has completed remedial actions for this site and is in the process of transferring the property to LM.

Otherwise, the property is expected to be available for unrestricted industrial, residential, or recreational use.

Upon site transfer, DOE will become responsible for LTS&M. At that time, DOE will consider selling or transferring the property for beneficial reuse.

Anticipated transfer date—2020

Anticipated LTS&M requirements—groundwater monitoring, five-year periodic reviews, managing site records, and responding to stakeholder inquiries.

Colonie Fact Sheet
http://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487308/fact-sheet-colonie/

Columbus East, Ohio, Site

(DOE COMPLETED FUSRAP SITE)

At the former B&T Metals site, uranium metal was heated and extruded into rods for MED, contaminating building surfaces, drains, equipment, exterior soils, and manholes in nearby streets.

The owner removed contamination from site facilities and equipment after extrusion activities ceased in 1943. DOE conducted additional remediation of contaminated areas under FUSRAP in 1996. DOE certified that applicable cleanup criteria had been achieved, and the site was released for unrestricted use in 2001.

Columbus East, Ohio, Site

(continued)

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Columbus Fact Sheet

https://www.lm.doe.gov/columbus_east/Sites.aspx

Combustion Engineering Site, Windsor, Connecticut

(USACE ACTIVE FUSRAP SITE)

The Combustion Engineering site is a 600-acre area located along the Farmington River in Windsor, about 10 miles north of Hartford.

Highly enriched uranium is the primary radiological contaminant of concern at the site. In the 1940s and 1950s, the Combustion Engineering facility supplied non-nuclear components for reactor projects that were managed by AEC. In 1955, new contracts led to the use of highly enriched uranium. In the 1960s, the facility was authorized under license to NRC to fabricate low-enriched uranium for light-water-moderated power reactors and to conduct research and development activities on light-water reactor fuel. Commercial nuclear fuel fabrication ceased in 1993. The NRC license was terminated in September 2013.

Combustion Engineering was responsible for addressing any FUSRAP-related material as part of its site decommissioning efforts under a 2007 agreement between NRC and USACE. Combustion Engineering completed the FUSRAP cleanup in 2011 and provided seven Final Status Survey reports for USACE to review from July 2011 to May 2012. From these reports the Site Closure Report was drafted. It was issued in December 2016 followed by the Deceleration of Response Action Completion, which was issued for the site in February 2017.

Anticipated transfer date—2019

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Windsor Fact Sheet

https://www.lm.doe.gov/Considered_Sites/Combustion_Engineering_Co_-_CT_03.aspx

DuPont Chamber Works Site, Deepwater, New Jersey

(USACE ACTIVE FUSRAP SITE)

DuPont conducted uranium-refining activities under contract to MED and AEC in support of the nation's early atomic energy program. Operations involving uranium at the Chambers Works site began in 1942. As part of its work on the MED program, DuPont worked on developing a process for converting uranium oxide to produce uranium hexafluoride and small quantities of uranium metal. Other research activities were also performed. All MED activities were transferred to AEC in 1946. DuPont continued its research for AEC until late 1947. In 1948 and 1949, AEC conducted radiological surveys and decontaminated building surfaces at the site, primarily at locations of former AEC activities. Using then-existing criteria, AEC released the buildings to DuPont in 1949.

Oak Ridge National Laboratory conducted radiological surveys in 1977. Survey results indicated that uranium was present above contemporary action levels, and the Chambers Works was designated as a FUSRAP site.

Anticipated transfer date—2022

Anticipated LTS&M requirements—groundwater monitoring, five-year periodic reviews, managing site records, and responding to stakeholder inquiries.

Deepwater Fact Sheet

http://www.nap.usace.army.mil/Missions/FUSRAP/Chambers-Works-Site/

Fairfield, Ohio, Site

(DOE COMPLETED FUSRAP SITE)

In 1956, uranium metal was machined and shaped at the former Associate Aircraft site for AEC, resulting in contaminated interior building surfaces, drains, equipment, and soils.

The former owner removed some contamination in late 1956. DOE conducted additional remediation at the property under FUSRAP in 1994 and 1995. Supplemental limits were applied to uranium in the soil beneath the floor slab of a later building addition. DOE certified that applicable cleanup criteria had been achieved, and the site was released for unrestricted use in 1996.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Fairfield Fact Sheet

https://www.lm.doe.gov/fairfield/Sites.aspx

Granite City, Illinois, Site

(DOE COMPLETED FUSRAP SITE)

In the late 1950s and early 1960s, two federal government-owned betatron particle accelerators were used at the Granite City Steel site to X-ray uranium metal ingots. The procedure allowed AEC to check the quality of the metal and detect metallurgical flaws before fabrication and machining were performed.

In 1992, DOE designated the site for remediation under FUSRAP. Several discrete, localized areas of contamination in the interior of one of the X-ray buildings were remediated in 1993. DOE certified that the site complied with applicable cleanup criteria and standards in June 1994 and released the property for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Granite City Fact Sheet
https://www.lm.doe.gov/granite_city/Sites.aspx

Guterl Specialty Steel Site, Lockport, New York

(USACE ACTIVE FUSRAP SITE)

USACE is investigating the nature and extent of radiological contamination at the former Guterl Specialty Steel (formerly Simonds Saw and Steel) site. The site is located about 20 miles northeast of Buffalo in an industrial area near Lockport. The site contains several decrepit structures surrounded by a security fence.

MED and AEC used this site for atomic energy and defense activities between 1948 and 1955. The facility was used for foundry work and rolling mill operations on over 25 million pounds of uranium metal and over 30,000 pounds of thorium metal. Simonds Saw and Steel was sold to Wallace and Murray, which was then sold to Guterl Specialty Steel Corporation. In March 1984, Allegheny International (now Allegheny Ludlum Corporation) purchased the entire site with the exception of those areas that had been used for AEC-related activities.

Anticipated transfer date—2038

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Guterl Specialty Steel Fact Sheet
https://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Guterl-Steel-Site/

Hamilton, Ohio, Site

(DOE COMPLETED FUSRAP SITE)

Intermittently from 1943 to 1951, the Herring-Hall-Marvin Safe Company fabricated slugs from rolled natural uranium metal stock for use by MED and AEC in production reactors.

In 1994, DOE designated the Hamilton site for remediation under FUSRAP. DOE remediated areas of contamination identified on surfaces and in floor drains in the interior of the building in 1994 and 1995. DOE certified that the site complied with applicable cleanup criteria and standards in 1996 and released the property for unrestricted use. LM staff noted that the area was redeveloping from light industrial to commercial use during the site inspections in 2006 and found that the building was demolished in 2012.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Hamilton Fact Sheet
https://www.lm.doe.gov/hamilton/Sites.aspx

Harshaw Chemical Company Site, Cleveland, Ohio

(USACE ACTIVE FUSRAP SITE)

The 55-acre site is located at 1000 Harvard Avenue, approximately 5 miles southwest of downtown Cleveland in Cuyahoga County. The Harshaw Chemical Company began production of chemical and radiological compounds for MED in late 1942. From 1944 to 1959, various forms of uranium were processed in Building G-1 (formerly known as Plant C) for isotopic separation and enrichment at Oak Ridge, Tennessee. The site was included in FUSRAP in spring 2001.

Anticipated transfer date—2038

Anticipated LTS&M requirements—groundwater monitoring, five-year reviews, managing site records, and responding to stakeholder inquiries.

Harshaw Chemical Site Fact Sheet
https://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Harshaw-Site/

Indian Orchard, Massachusetts, Site

(DOE COMPLETED FUSRAP SITE)

The Indian Orchard site is privately owned. Interior surfaces of a building at this site were contaminated in 1948 by machining of uranium metal for MED and AEC to support Brookhaven National Laboratory defense-related projects.

DOE designated the site for remediation under FUSRAP in 1992, and remediation was completed in 1995. DOE certified that the site conformed to applicable cleanup criteria and standards and released the property for unrestricted use. The building was subsequently demolished, and the site has been redeveloped.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Indian Orchard Fact Sheet
https://www.lm.doe.gov/indian_orchard/Sites.aspx

Iowa Army Ammunition Plant, Middletown, Iowa

(USACE ACTIVE FUSRAP SITE)

The Iowa Army Ammunition Plant (IAAAP) is an active, government-owned, contractor-operated facility that occupies approximately 19,000 acres (about 30 square miles) in Des Moines County near Middletown in southeast Iowa. From 1947 to 1975, AEC conducted weapons assembly operations as a tenant on 1,630 acres of the 19,000-acre plant. The IAAAP was included on the National Priorities List (NPL) in 1990. In September 1990, the U.S. Army and EPA Region 7 entered into a Federal Facilities Agreement to define the roles and responsibilities for the Army's CERCLA activities at the site and the process for interagency coordination. In August 2006, a Federal Facilities Agreement to address the FUSRAP project at IAAAP was executed between USACE, DOE, EPA, and the State of Iowa.

Under the authority of FUSRAP, the USACE St. Louis District is remediating contaminants at the IAAAP site resulting from the atomic energy program. Approximately 7,000 cubic yards of contaminants were shipped and disposed of in fiscal year 2017.

Anticipated transfer date—2022

Anticipated LTS&M requirements—ICs monitoring, five-year reviews, managing site records, and responding to stakeholder inquiries.

Middletown Fact Sheet
http://www.mvs.usace.army.mil/Missions/FUSRAP/IAAAP/

Jersey City, New Jersey, Site

(DOE COMPLETED FUSRAP SITE)

The Kellex Corporation was formed in 1943 to conduct engineering research in gaseous diffusion for uranium enrichment for MED and AEC. From 1943 to 1953, site activities focused on fuel reprocessing and component testing with uranium hexafluoride, developing a solvent extraction process for the recovery of uranium, gas decontamination studies, and decontaminating waste streams.

DOE conducted a radiological survey of the site in 1977 and remediated radioactive contamination at the site between 1979 and 1983. DOE certified that the site complied with applicable cleanup criteria in 1983 and, with State of New Jersey concurrence, released the property for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Jersey City Fact Sheet
https://www.lm.doe.gov/jersey_city/Sites.aspx

Joslyn Manufacturing and Supply Company, Ft. Wayne, Indiana

(USACE ACTIVE FUSRAP SITE)

From 1943 to 1952, the Joslyn Manufacturing and Supply Company worked under government contract to temper, hot roll, quench, straighten, cool, grind, cut, and thread natural uranium billets into metal rods. The 23-acre Joslyn site was included into FUSRAP in 2009 and assigned to the USACE Buffalo District for remediation.

Anticipated transfer date—2038

Anticipated LTS&M requirements—groundwater sampling, managing site records, periodic site visits, and responding to stakeholder inquiries.

Ft. Wayne Fact Sheet
https://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Joslyn-Manufacturing-and-Supply-Co-Site/

Latty Avenue Properties Site (includes the Hazelwood Interim Storage Site), Hazelwood, Missouri

(USACE ACTIVE FUSRAP SITE)

Congress added the Latty Avenue site to FUSRAP in 1983. The Hazelwood Interim Storage Site and Latty Avenue Vicinity

Latty Avenue Properties Site (includes the Hazelwood Interim Storage Site), Hazelwood, Missouri

(continued)

Properties are in northern St. Louis County within the city limits of Hazelwood. The site is located at 9170 Latty Avenue, 3.2 miles northeast of the control tower of the St. Louis Lambert International Airport and approximately a half mile northeast of the St. Louis Airport site. Two properties on this site are listed on the NPL (MOD 980633176), the Hazelwood Interim Storage Site and the Futura property.

Uranium-ore processing residues were hauled to this site from the St. Louis Airport site; the residues resulted in contamination of site soil, groundwater, and building surfaces.

Properties at this site are privately owned. Land use near the properties is primarily industrial; other uses are transportation related, commercial, and residential. The residential areas nearest the property are approximately 0.3 mile to the east in Hazelwood.

It is expected that all proprieties at the site be released for unrestricted use with the exception of one property, which will require ICs.

Anticipated transfer date—2023

Anticipated LTS&M requirements—groundwater monitoring, five-year reviews, monitor ICs and land use controls, managing site records, and responding to stakeholder inquiries.

Hazelwood Fact Sheet

http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/

Luckey, Ohio, Site

(USACE ACTIVE FUSRAP SITE)

The Luckey site is a 40-acre inactive industrial site with derelict production buildings, located 24 miles southeast of Toledo. Between 1949 and 1958, the Luckey site was operated as a beryllium production facility by the Brush Beryllium Company (later Brush Wellman) under contract to AEC. In 1951, the site received approximately 1,000 tons of radioactively contaminated scrap steel to be used in proposed magnesium production at the site.

The USACE signed a Record of Decision for the Groundwater Operable Unit of the Luckey site in 2008. The remedy is monitored natural attenuation of groundwater. Groundwater wells are sampled annually for beryllium, lead, uranium, and gross alpha/gross beta. Sampling will continue until results show a progressive trend that indicates safe drinking water standards have been met. ICs concerning site groundwater will be implemented during the monitoring period to ensure that no new groundwater development or changes in groundwater use have occurred. In 2015, USACE awarded a contract for cleanup of contaminated soils. This effort is currently underway.

Anticipated transfer date—2033

Anticipated LTS&M requirements—groundwater monitoring, well replacement, IC monitoring, five-year periodic reviews, managing site records, and responding to stakeholder inquiries.

Luckey Fact Sheet

https://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Luckey-Site/

Luckey, Ohio, Site

USACE performing excavation in the Phase 1 cleanup area of the Luckey Site.

Madison, Illinois, Site

(DOE COMPLETED FUSRAP SITE)

During the late 1950s and early 1960s, the Dow Metal Products Division of Dow Chemical Company machined and shaped uranium metal and straightened uranium rods for AEC. Radiological surveys conducted in 1989 identified uranium dust on interior overhead surfaces that exceeded DOE guidelines. The site was designated for remedial action under FUSRAP in 1992. USACE completed remediation in 2000. Uranium dust was left in place on the roof because it posed no unacceptable risk.

Post-remedial-action survey results indicated that the radiological condition of the Madison site was in compliance with the standards established in the Record of Decision, and USACE released the site for unrestricted use. The site transferred to DOE in 2003.

Anticipated LTS&M requirements—groundwater sampling, managing site records, periodic site visits, and responding to stakeholder inquiries.

Madison Fact Sheet

https://www.lm.doe.gov/madison/Sites.aspx

Maywood Chemical Superfund Site, Maywood, New Jersey

(USACE ACTIVE FUSRAP SITE)

Congress added the Maywood site to FUSRAP in 1983. The Maywood site includes residential, municipal, and commercial properties in the boroughs of Maywood and Lodi, and the Township of Rochelle Park, in Bergen County. The primary contaminant at the site is thorium-232, which originated from extraction processes involving monazite sands by the former Maywood Chemical Works between 1916 and 1959.

The site includes 88 private and government-owned properties and is on the NPL.

DOE owns an 11.7 acre parcel at the site, which will be released for other uses when remedial action is complete.

Anticipated transfer date—2026

Anticipated LTS&M requirements—groundwater monitoring, well replacement, IC monitoring, five-year reviews, managing site records, and responding to stakeholder inquiries.

Maywood Chemical Works Website

http://www.fusrapmaywood.com/

Middlesex Municipal Landfill Site, Middlesex North, New Jersey

(USACE ACTIVE FUSRAP SITE)

Ownership of the Middlesex Municipal Landfill site is divided between the Middlesex Presbyterian Church and the Borough of Middlesex. In 1948, approximately 6,000 cubic yards of soil with radioactive contamination from the Middlesex Sampling Plant was disposed of at the former municipal landfill.

In 1961, AEC removed a portion of contaminated soil from the site and covered the area with 2 feet of clean soil. DOE designated the site for remediation under FUSRAP in 1980. In 1984 and 1986, DOE removed contaminated material from an area of approximately 3 acres at depths of 1 to 19 feet. DOE certified that the remediated portion of the site complied with applicable cleanup criteria and released the property for unrestricted use in April 1989.

In 2008, the New Jersey Department of Environmental Protection provided DOE with the results of a radiological survey performed by the Borough of Middlesex in 2001. DOE commissioned a survey of the entire property. Survey results identified above-background concentrations of radium-226 and uranium-238 inside the property

Madison, Illinois, Site

USACE remediated over 60,000 pounds of uranium dust. The site was released unrestricted use and has been restored to a condition acceptable to the owner.

Middlesex Municipal Landfill Site, Middlesex North, New Jersey

(continued)

boundary in areas that had not been previously remediated. In 2009, DOE referred the site back to USACE for further investigation under FUSRAP. The site was added in 2014.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Middlesex North Fact Sheet
http://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/563012/fact-sheet-middlesex-municipal-landfill/

Middlesex Sampling Plant, New Jersey, Site

(USACE ACTIVE FUSRAP SITE)

From 1943 to 1967, this site was used to store high-grade uranium ore (known as pitchblende) from the Belgian Congo and, later, to process and ship uranium, thorium, and beryllium ores and store thorium residues. The facility was used as a U.S. Marine Corps reserve training center from 1967 to 1979, when DOE acquired the site. DOE cleaned up contaminated vicinity properties in the 1980s and stored excavated soil at the site. USACE completed the soil cleanup, disposing of 68,000 cubic yards of contaminated soil in 1998 and 1999 and currently is completing groundwater characterization studies. The site is listed on the NPL.

When remediation is complete, DOE will assume responsibility for LTS&M and will consider selling or transferring the property for beneficial reuse.

Anticipated transfer date—2022

Anticipated LTS&M requirements—groundwater monitoring, well replacement, annual IC monitoring, five-year reviews, real and personal property management, annual maintenance, managing site records, and responding to stakeholder inquiries.

Middlesex South Fact Sheet
http://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487433/fact-sheet-middlesex-sampling-plant-msp/

Niagara Falls Storage Site, New York

(USACE ACTIVE FUSRAP SITE, includes three vicinity properties)

The Niagara Falls Storage Site is a 191-acre, DOE-owned site containing a 10-acre disposal cell that is located within the former 7,500-acre Lake Ontario Ordnance Works, about 19 miles northwest of Buffalo in Lewiston. In 1944, MED used the site for the storage and trans-shipment of uranium metal and radioactive residues and wastes from uranium-ore processing and research. Radioactive wastes and residues continued to be brought to the site for storage until 1952. In the 1980s, DOE placed the radioactive wastes in a temporary onsite disposal cell.

Remediation continued through 1997, when USACE assumed responsibility for cleanup. When remediation is complete, the site will transfer to DOE.

Anticipated transfer date—2038

Anticipated LTS&M requirements—unknown at this time, but could involve monitoring groundwater and air associated with the disposal site, grounds maintenance, security, managing site records, and responding to stakeholder inquiries.

Niagara Falls Storage Site Fact Sheet
https://www.lrb.usace.army.mil/Portals/45/docs/FUSRAP/NFSS/Documents/nfss-fs-site-2013-10.pdf

Maywood Chemical Superfund Site, New Jersey

USACE is currently completing the remediation of vicinity properties.

Niagara Falls Vicinity Properties, New York, Site

(DOE COMPLETED FUSRAP SITE)

Niagara Falls Vicinity Properties, located near Lewiston, consists of 26 properties that were formerly part of the Lake Ontario Ordnance Works and were sold to private owners. Another portion of the former ordnance works was transferred to AEC and became the Niagara Falls Storage Site.

Beginning in 1944, MED stored uranium-processing residues, uranium metal, and radiological waste at the former Lake Ontario Ordnance Works. Radiological surveys between 1970 and 1980 indicated that residual radioactive contamination exceeding FUSRAP guidelines remained on vicinity properties and in drainage ditches. Beginning in 1983, DOE remediated most of the vicinity properties to a condition that allows unrestricted use. USACE will complete remediation of the remaining properties.

Supplemental limits were applied to the downstream end of a drainage ditch, and the New York Department of Health maintains use restrictions on some of the vicinity properties. No other supplemental limits or ICs are in effect at the site, and DOE does not require onsite monitoring or surveillance.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Niagara Falls Vicinity Properties Fact Sheet

https://www.lm.doe.gov/niagara/vicinity/Sites.aspx

New Brunswick, New Jersey, Site

(DOE COMPLETED FUSRAP SITE)

From 1948 to 1977, MED and AEC operated the New Brunswick site as a general nuclear chemistry laboratory. The site was partially remediated in two phases between 1978 and 1983, including removing all aboveground structures, contaminated concrete foundations, onsite drain lines, and contaminated soils on the front two-thirds of the property. In 1990, DOE designated the site for additional remediation of residual soil contamination under FUSRAP. DOE remediated localized areas of contamination identified in 1996 and certified that the site complied with applicable cleanup criteria and standards in September 2001. In 2009, at the request of the state regulator, DOE collected additional radiological data on drain lines entering a sanitary sewer in the public right-of-way. After DOE found no indication of above-background radioactivity, DOE sold the site to a private party in November 2009.

LTS&M requirements include managing a deed restriction IC to prevent excavation in an area where soils with elevated arsenic levels are covered by a layer of clean soil. The property owner inspects the restricted area every other year and submits a certification of protectiveness to the state regulator and stakeholders. LTS&M requirements include managing site records and responding to stakeholder inquiries.

New Brunswick Fact Sheet

https://www.lm.doe.gov/new_brunswick/Sites.aspx

Middlesex Municipal Landfill Site, New Jersey

The Middlesex Municipal Landfill site is currently under investigation by USACE.

New York, New York, Site

(DOE COMPLETED FUSRAP SITE)

The Baker and Williams Warehouses site in Manhattan was used by MED in the early 1940s for the short-term storage of uranium concentrates that were later distributed to government facilities involved in nuclear reactor and atomic weapons programs.

In 1990, DOE designated the site for remediation under FUSRAP. DOE remediated contaminated areas in the warehouses and certified that the site complied with applicable cleanup criteria and standards in 1995. The poperty was released for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

New York Fact Sheet
https://www.lm.doe.gov/new_york/Sites.aspx

Oak Ridge, Tennessee, Warehouses Site

(DOE COMPLETED FUSRAP SITE)

The Elza Gate Warehouses site was used in the early 1940s by MED to store high-grade uranium ore and ore-processing residues. Later, AEC used the site to store equipment for Oak Ridge National Laboratory. In the 1970s, the site was vacated and decontaminated to then-current standards, transferred to the City of Oak Ridge, and later sold to a private metal fabrication company.

In 1988, the property was surveyed, and contamination was found that exceeded FUSRAP cleanup criteria. In 1991 and 1992, DOE remediated radioactive contamination on concrete pads and in soils and removed polychlorinated biphenyl and lead contamination. DOE released the site for unrestricted use in 1993.
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LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Oak Ridge Fact Sheet
https://www.lm.doe.gov/oakridge/Sites.aspx

Oxford, Ohio, Site

(DOE COMPLETED FUSRAP SITE)

The former Alba Craft Laboratory machined uranium metal for AEC at the site from 1952 to 1957. Machining operations contaminated the site and several nearby (vicinity) properties, all of which are privately owned.

AEC removed some contamination at the site in 1957. DOE conducted additional remediation of the site and the vicinity properties under FUSRAP in 1994 and 1995. DOE certified that the site conformed to applicable cleanup criteria in 1996 and released all properties for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Oxford Fact Sheet
https://www.lm.doe.gov/oxford/Sites.aspx

Painesville, Ohio, Site

(DOE COMPLETED FUSRAP SITE)

The Painesville site, a 30-acre privately owned site 22 miles northeast of Cleveland, is a former magnesium production facility that was operated by the Diamond Magnesium Company under contract to the federal government. The site transferred to LM for long-term stewardship in 2016.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Painesville Fact Sheet
https://www.lm.doe.gov/Painesville/Sites.aspx

Seaway Industrial Park (Tonawanda North, Unit 3) Site, Tonawanda, New York

(USACE ACTIVE FUSRAP SITE)

The Seaway Industrial Park site is located in the industrial area of Tonawanda, approximately 3 miles northwest of Buffalo. The site is a 93-acre commercial landfill that operated from 1930 to 1993, accepting municipal, commercial, construction, and industrial wastes. In the 1940s, the nearby former Linde Air Products Division of Union Carbide Corporation processed uranium ore under contract to MED. The processing residues were transported from the Linde site to the former Haist property, now known as the Tonawanda North Unit 1 site. During the mid-1970s, Ashland Oil constructed oil tanks on the Tonawanda North Unit 1 property. During construction, Ashland Oil removed materials containing radioactive residues and transported the materials to the Seaway landfill and the nearby Tonawanda North Unit 2 site for use as cover or grading material. During the USACE remediation of the Tonawanda North Unit 1 site, FUSRAP-related materials at elevated concentrations were found to extend onto the Seaway site.

Anticipated transfer date—2038

Seaway Industrial Park (Tonawanda North, Unit 3) Site, Tonawanda, New York

(continued)

Anticipated LTS&M requirements— fence and sign maintenance, site inspections, monitor/maintain leachate system, cap maintenance/repair, IC monitoring, five-year periodic reviews, managing site records, and responding to stakeholder inquiries.

Seaway Industrial Park Fact Sheet
https://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Seaway-Site/

Seymour, Connecticut, Site

(DOE COMPLETED FUSRAP SITE)

Research and development of a natural uranium metal extrusion process was performed at the former Seymour Specialty Wire site for AEC from 1962 to 1964. Operations contaminated interior surfaces of one building and two soil areas.

DOE designated the site for remediation under FUSRAP in 1985 and conducted remediation in 1992 and 1993.

In 1994, DOE certified that the site complied with applicable cleanup criteria and released the property for unrestricted use.

DOE applied supplemental limits to inaccessible uranium contamination that was grouted in place in a drain system beneath the building. In 2017, LM determined that no additional waste disposal restrictions were required for the supplemental limits material.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Seymour Fact Sheet
https://www.lm.doe.gov/seymour/Sites.aspx

Shallow Land Disposal Area, Parks Township, Pennsylvania

(USACE ACTIVE FUSRAP SITE)

Congress added the Parks Township site to FUSRAP in 2000. The Pittsburgh District of USACE has been assigned to clean up radioactive waste at the Parks Township Shallow Land Disposal Area (SLDA) site under FUSRAP. The privately owned site is located approximately 23 miles east-northeast of Pittsburgh. It is on the right bank of the Kiski River, a tributary of the Allegheny River, near the communities of Apollo and Vandergrift.

Radioactive waste disposal operations were conducted between 1960 and 1970. As part of work done under AEC contracts, low-level radioactive materials were produced, primarily for fuel for nuclear-powered submarines and power plants. Low-level nuclear wastes from the nearby decommissioned Apollo operation site were disposed of in a series of 10 trenches that constitute a total area of approximately 1.2 acres at the SLDA, placed over an area of 44 acres. Buried radiological wastes consist of mostly uranium and some thorium associated with manufacturing byproducts and from discarded protective clothing. Nonradiological waste included pieces of equipment, building materials, and trash. Disposal operations were conducted by the Nuclear Materials and Equipment Corporation in the early 1960s.

Anticipated transfer date—2038

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Parks Township Fact Sheet
http://www.lrp.usace.army.mil/Missions/Planning-Programs-Project-Management/Key-Projects/Shallow-Land-Disposal-Area/

Shpack Landfill Site, Attleboro, Massachusetts

(USACE ACTIVE FUSRAP SITE)

Congress added the Shpack Landfill site to FUSRAP in 2002. The 9.4-acre Shpack Landfill is located about 40 miles southwest of Boston in the towns of Norton and Attleboro. The landfill was operated from 1946 until the 1970s. Contents of this landfill include domestic and industrial waste (inorganic and organic chemicals) as well as radioactive waste. Radioactive contamination is believed to have come from Metals and Controls Incorporated, now Texas Instruments, which had used the landfill to dispose of trash and other materials from 1957 to 1965. The General Plate Division of Metals and Controls Incorporated began to fabricate enriched uranium foils at its Attleboro plant in 1952. In 1959, it merged with Texas Instruments, which continued the operations until 1981, using enriched and natural uranium for the fabrication of nuclear fuel for the U.S. Navy and commercial customers. The site was listed on the NPL in 1986, primarily to address other contaminants on site (MAD980503973).

Remedial action started at the site in August 2005 and was completed in July 2014. USACE issued Site Closure Report in December 2016 followed by the Deceleration of Response Action Completion site in February 2017.

Anticipated transfer date—2019

Anticipated LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Springdale, Pennsylvania, Site

(DOE COMPLETED FUSRAP SITE)

The former C.H. Schnorr site was a privately owned metal fabrication shop that provided uranium metal machining services to MED in the mid-1940s. Machining operations resulted in uranium contamination of interior concrete floor surfaces and soil under the concrete slab.

In 1992, DOE designated the site for remediation under FUSRAP and remediated the contamination in 1994. DOE certified that the site complied with applicable cleanup criteria in September 1996 and released the property for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Springdale Fact Sheet
https://www.lm.doe.gov/springdale/Sites.aspx

Staten Island Warehouse Site, Staten Island, New York

(POTENTIAL USACE ACTIVE FUSRAP SITE)

The site is located at the base of the Bayonne Bridge on Richmond Terrace Avenue on Staten Island. Miniére du Haut-Katanga Company stored high-grade Belgian Congo uranium ore that it owned at the site from 1939 to 1942. In 1942, 2,007 drums of uranium ore were stored at the warehouse, then owned by Archer-Daniels Midland Company. Following purchase of this material by the U.S. government, the uranium ore was shipped to various MED sites for storage and processing. In transferring and purchasing the ore, MED became responsible for the area of transfer under the Free Alongside Ship provision of Maritime Law.

The USACE New York District is preparing a preliminary site assessment to determine if the contamination in the potentially eligible portion of the Staten Island site is eligible for remediation under FUSRAP.

Staten Island Fact Sheet
https://www.lm.doe.gov/Considered_Sites/Staten_Island_Warehouse_-_NY_22.aspx

St. Louis Airport Site, St. Louis, Missouri

(USACE ACTIVE FUSRAP SITE)

In 1946, MED acquired the St. Louis Airport Site (SLAPS), a 21-acre site just north of the St. Louis Airport, for storage of residues and other material from the St. Louis Downtown Site operated by Mallinckrodt. In subsequent years, adjacent properties became contaminated as a result of erosion and spillage; those properties are included in the SLAPS Vicinity Properties. On October 4, 1989, SLAPS was added to the NPL (MOD980633176). The SLAPS site is the location of the storage and loadout area for the Latty Avenue Properties and the SLAPS Vicinity Properties.

Anticipated transfer date—2038

Anticipated LTS&M requirements—groundwater monitoring, five-year reviews, possible fast-response capability to manage radiologically contaminated soils under roads and around utilities, managing site records, and responding to stakeholder inquiries.

St. Louis Airport Fact Sheet
http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/

St. Louis Airport Vicinity Properties Site, Hazelwood and Berkeley, Missouri

(USACE ACTIVE FUSRAP SITE)

The SLAPS Vicinity Properties are located in the cities of Hazelwood and Berkeley. These properties were contaminated by residues that were removed at SLAPS and were hauled to Latty Avenue for reprocessing. The 78 properties include Coldwater Creek; adjacent ball fields to the north and east; Norfolk and Western Railroad properties adjacent to Coldwater Creek; Banshee Road to the south; ditches to the north and south; and St. Louis Airport Authority property to the south. Also included are the haul routes along Latty Avenue, McDonnell Boulevard, Pershall Road, Hazelwood Avenue, Eva Avenue, and Frost Avenue. Low-level radioactive contamination at the SLAPS Vicinity Properties is linked to both the St. Louis Airport Site and the Latty Avenue Properties. In 1966, Continental Mining and Milling Company of Chicago purchased uranium-bearing residues from MED and removed them from SLAPS. The company placed the residues in storage at Latty Avenue under an AEC license

Over time, residues migrated from other sites or were deposited as the residues were moved, contaminating the soils and sediments of the vicinity properties. In 1996, the volume of impacted soils, which are owned by commercial enterprises, private residences, or local governments, was estimated at 195,000 cubic yards. Cleanup activities have been completed or substantially completed on more than half of the properties that compose the SLAPS Vicinity Properties. Some residual radioactive contamination will be left in place beneath roads and around utilities.

St. Louis Airport Vicinity Properties Site, Hazelwood and Berkeley, Missouri

(continued)

Anticipated transfer date—2038

Anticipated LTS&M requirements—groundwater monitoring, five-year reviews, possible fast-response capability to manage radiologically contaminated soils under roads and around utilities, managing site records, and responding to stakeholder inquiries.

St. Louis Airport Vicinity Properties Fact Sheet
http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program

St. Louis Downtown Site, St. Louis, Missouri

(USACE ACTIVE FUSRAP SITE)

The St. Louis Downtown site (SLDS) is located in an industrial area on the eastern border of St. Louis, approximately 300 feet west of the Mississippi River. The property is about 11 miles southeast of the St. Louis Airport Site and the St. Louis Lambert International Airport. SLDS encompasses nearly 45 acres and is owned by Mallinckrodt Inc., (formerly Mallinckrodt Chemical Works) various private entities and the City. The Mallinckrodt property includes buildings and other facilities involved in chemical production.

From 1942 to 1957, under contract with MED and AEC, the site was used for processing various forms of uranium compounds, machining, and recovery of uranium metal. Remediation is ongoing, and some contaminated soil may be left in place beneath buildings on the site.

Anticipated transfer date—2026.

Anticipated LTS&M requirements—IC monitoring, five-year reviews, managing site records, and responding to stakeholder inquiries.

St. Louis Fact Sheet
http://www.mvs.usace.army.mil/Missions/Centers-of-Expertise/Formerly-Utilized-Sites-Remedial-Action-Program/

Superior Steel Site, Carnegie, Pennsylvania

(USACE ACTIVE FUSRAP SITE)

Uranium metal was processed in support of AEC's fuel-element development program at the former Superior Steel site, located southwest of Pittsburgh, from 1952 to 1957. The site was also licensed from 1957 to 1958 to receive thorium metal for processing and shaping.

The primary AEC operations performed at the Superior Steel site consisted of salt bathing, rolling, brushing, shaping, cutting, stamping, and coiling of uranium metal. Records indicate that natural and enriched uranium were processed at the site. Recycled uranium from reprocessed spent nuclear fuel may also have been processed onsite. USACE concluded that the site was used for AEC activities that supported the nation's early atomic energy program, and further investigation was recommended to determine the extent and nature of AEC-related contamination and the associated risks to human health and the environment. The site was added to FUSRAP in fiscal year 2008.

St. Louis Airport Site, St. Louis, Missouri

USACE uses a rail spur to ship material excavated from the various SLAPS Vicinity Properties. Upon completion of remediation, the rail spur will also be removed.

Superior Steel Site, Carnegie, Pennsylvania

(continued)

Anticipated transfer date—2038

Anticipated LTS&M requirements—groundwater monitoring, managing site records, periodic site visits, and responding to stakeholder inquiries.

Superior Steel, Carnegie Fact Sheet
https://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Superior-Steel-Site/

Sylvania Corning Plant Site, Hicksville, New York

(USACE ACTIVE FUSRAP SITE)

Congress added the Hicksville site to FUSRAP in 2006. The Sylvania Corning Plant/former Sylvania Electric Products Facility (also known as Sylcor) site occupies 9.49 acres in the westernmost portion of Hicksville on Long Island. From 1952 to 1965, the Sylvania Corning Plant operated under contracts with AEC for research, development, and production in support of the government's nuclear weapons program. From 1952 to 1967, a second operation concentrated on AEC-licensed work for the production of reactor fuel and other reactor core components. Operations at the site used natural, enriched, and depleted uranium; some involved thorium. Site contamination consists of these radioactive materials as well as nickel and volatile organic compounds.

GTE, a corporate predecessor to Verizon, entered into a voluntary cleanup agreement with the New York Department of Environmental Conservation to remediate the soils at the site to allow unrestricted future use.

Anticipated transfer date—2038

Anticipated LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Sylvania Corning Fact Sheet
http://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487310/fact-sheet-sylvania-corning/

Toledo, Ohio, Site

(DOE COMPLETED FUSRAP SITE)

During the early and mid-1940s, Baker Brothers, Inc. fabricated slugs from natural uranium metal for MED.

In 1992, DOE designated the Toledo site and its associated vicinity property for remediation under FUSRAP. DOE remediated localized areas of residual uranium contamination on interior building surfaces and exterior soil and concrete in 1995. DOE certified that the site and the vicinity property complied with applicable cleanup criteria and standards in 2001 and released the properties for unrestricted use.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Toldedo Fact Sheet
https://www.lm.doe.gov/toledo/Sites.aspx

Toledo, Ohio, Site

DOE remediated the site and associated vicinity property to unrestricted release criteria. The site had fabricated slugs from natural uranium metal in the 1940s.

Tonawanda, New York, Site

(DOE COMPLETED FUSRAP SITE)

The Tonawanda site is located in the Town of Tonawanda, approximately 3 miles northwest of Buffalo. MED and AEC contracted with Linde Air Products to refine uranium between 1942 and 1946. Waste generated from the uranium processing was stored at the Ashland #1 site (Tonawanda North, Unit 1, site). Radioactive contaminants include uranium, radium, and thorium.

In 1953, the Linde facilities were remediated to levels within radioactive guidelines in effect at that time. All of the structures used in processing have since been converted to other commercial and industrial uses. The Tonawanda site was designated as a FUSRAP site in 1980, and DOE initiated the cleanup process in 1996. The nearby Tonawanda Landfill is being remediated as a separate FUSRAP site. Remedial actions and restoration were completed by USACE in May 2013. The site transferred to LM for long-term stewardship in 2017.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Tonawanda Fact Sheet

https://www.lm.doe.gov/tonawanda/Sites.aspx

Tonawanda North, New York, Site, Units 1 and 2

(DOE COMPLETED FUSRAP SITE)

From 1944 to 1946, uranium-ore processing residues were transported from the Linde uranium refinery site to a 10-acre area known then as the Haist property, now called Tonawanda North Unit 1. In 1960, Ashland Oil Company acquired the property for an oil refinery. Soil containing radioactive residues removed during construction was transported to Unit 2 (another Ashland Oil Company property) and Unit 3 (Seaway Landfill C) for disposal. Unit 2 includes portions of Rattlesnake Creek.

USACE remediated Units 1 and 2 of the Tonawanda North site. Contaminated soil was excavated and shipped offsite for disposal or reprocessed as alternate uranium ore feed material. Remediation of Units 1 and 2 was completed in 2005. The properties were remediated to a condition that is safe for urban residential use. The site transitioned to DOE in 2008.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Tonawanda North Fact Sheet

https://www.lm.doe.gov/TonawandaNorth/Sites.aspx

Wayne, New Jersey, Site

(DOE COMPLETED FUSRAP SITE)

Congress added the Wayne site to FUSRAP in 1983. Rare Earths, Inc. and then W.R. Grace & Co. operated the 6.5-acre site for AEC as a rare earth and thorium processing facility from 1948 to 1971. Contaminated waste materials were buried onsite, and the facility license was terminated. DOE acquired the property for interim storage of contaminated soil and debris removed from nearby vicinity properties. The U.S. Environmental Protection Agency (EPA) placed the site on the NPL in 1984.

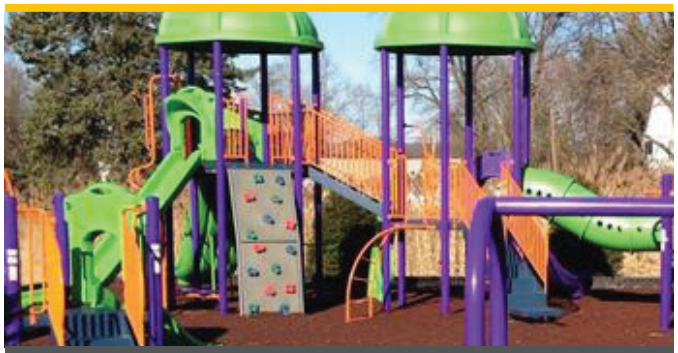
DOE began remediating the site and contaminated vicinity properties, and USACE completed remediation in 2003. The site was transferred to Wayne Township for recreational use in 2006. In 2010, USACE remediated residual radioactive contamination in public rights-of-way.

The site transferred to DOE in 2007, and EPA delisted the site from the NPL in 2012. DOE removed the groundwater IC on the site in 2012.

LTS&M requirements consist of managing site records and responding to stakeholder inquiries.

Wayne Fact Sheet

https://www.lm.doe.gov/wayne/Sites.aspx



Wayne, New Jersey, Site

When USACE completed remediation of the Wayne, New Jersey Site, it was transferred to Wayne Township for recreational use.

W.R. Grace at Curtis Bay Site, Curtis Bay, Maryland

(USACE ACTIVE FUSRAP SITE)

Monazite sand processing was conducted at the W.R. Grace Curtis Bay Facility in Baltimore from mid-May 1956 through the spring of 1957 under license to the AEC to extract thorium and rare earth elements. The processing was conducted in the southwest quadrant of Building 23, a 100-year old, five-story building, in the active manufacturing portion of the facility. Building components and equipment in this quadrant contained residual radiological contamination remaining from the monazite sand processing. Waste materials from the processing operations (termed gangue) were disposed of in the nonmanufacturing portion of the facility, in the area referred to as the Radioactive Waste Disposal Area.

Anticipated transfer date—2024

Anticipated LTS&M requirements—groundwater monitoring, five-year periodic reviews, managing site records, and responding to stakeholder inquiries.

Curtis Bay Fact Sheet
https://cdm16021.contentdm.oclc.org/digital/collection/p16021coll11/id/547

CONTACT INFORMATION

Resources & Contacts

DOE Legacy Management FUSRAP

Web: FUSRAP Program Information
https://www.energy.gov/lm/sites/lm-sites/programmatic-framework/fusrap-program-information

Email: FUSRAP
FUSRAPinfo@lm.doe.gov

Phone: (720) 377-9672

References & Links

The following documents and additional information on FUSRAP can be found at:

FUSRAP Program Fact Sheet
https://www.energy.gov/sites/prod/files/2017/04/f34/FUSRAPFactSheet.pdf

LTS&M Requirements
https://www.energy.gov/lm/downloads/long-term-surveillance-and-maintenance-requirements-remediated-fusrap

Considered Sites Database
https://www.energy.gov/lm/sites/lm-sites/considered-sites