EM U.S. Department of Energy Office of Environmental Management

1996 BEMR

# Illinois (FUSRAP Site)

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*The only currently active Illinois site within the Formerly Utilized Sites Remedial Action Program (FUSRAP) is Madison. The three completed sites in Illinois are Granite City Steel, National Guard Armory, and University of Chicago. They are summarized in the overview of the FUSRAP program presented in the Tennessee section of this report. FUSRAP was established in 1974 under the provisions of the Atomic Energy Act to identify, investigate, and clean up or otherwise control previously decontaminated Manhattan Engineer District and Atomic Energy Commission sites, together with other sites assigned to the U.S. Department of Energy by Congress, where residual radioactive contamination exceeds current guidelines.*

*FUSRAP encompasses 46 sites in 14 states and is funded through the Oak Ridge Operations Office. For a general discussion of FUSRAP and associated costs, see the overview of the program presented in the Tennessee section of this report. All costs for waste management activities, program management, and relevant landlord activities attributable to the Department of Energy are provided for within the scope of environmental restoration. There are no FUSRAP sites with either current or planned nuclear material and facility stabilization activity needs. Funding for all sites is 100 percent nondefense.*

# MADISON

*The Madison site (formerly Dow Chemical Company plant) is located at College and Weaver Streets in Madison, Illinois, across the Mississippi River from St. Louis, Missouri. The site consists of a large, multisectional complex of 10 interconnecting buildings with a total area under roof of approximately 130,000 square meters (1.4 million square feet). The site covers approximately 300 hectares (735 acres).*

## LOCALITY MAP

## Estimated Site Total

*(Thousands of Current Year Dollars)*

| | FY 1996 | 1997 | 1998 | 1999 | 2000 | |
|---|---|---|---|---|---|---|
| Environmental Restoration | 128 | 9 | 13 | 15 | 21 | *Grey shaded area reflects annual cost estimates for the first five years of the site BEMR Base Case (as of October 1995) and includes 2% annual inflation, see Readers' Guide* |
| 1996 Appropriation | 143 | | | *These levels reflect the current estimates for compliance with applicable statutes and agreements (as of March 1996), see Readers' Guide.* | | |

| | | |
|---|---|---|
| 1997 Congressional Request | | 13 |

*(Five-Year-Averages, Thousands of Constant 1996 Dollars)*

| | FY 1996-2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | Life Cycle* |
|---|---|---|---|---|---|---|---|---|
| Environmental Restoration | 36 | 456 | | | | | | 2,464 |

** Total Life Cycle is the sum of the annual costs in constant FY 1996 dollars.*

## FACILITY MISSION

Lowlevel radioactive contamination, which is estimated at 7.5 cubic meters (10 cubic yards), found in dust on roof support beams at the Madison site originated from uranium extrusion and rod-straightening work conducted by the Dow Metal Products Division of Dow Chemical Company during the 1950s and 1960s. Dow operated under subcontract to Mallinckrodt Chemical Company, a prime Atomic Energy Commission contractor, and supplied materials (chemicals, induction heating equipment, and magnesium metal products) and services under purchase orders issued by Mallinckrodt. The site was included in FUSRAP in 1992. The Department of Energy's present objective at the site is to conduct environmental restoration activities to eliminate, reduce, or otherwise mitigate the potential for exposure to radioactive contaminants.

## SITE MAP

Uranium238 and thorium232 were the primary contaminants detected at concentrations exceeding guidelines during a 1989 radiological survey. The contamination was found in dust from overhead beams in Building 6, where the uranium extrusion and rodstraightening work occurred. Building 6 is a large multistory metal building with a concrete floor. The potential for contaminant transport is mainly through airborne particles. Potential exposure pathways are inhalation and ingestion of exposed radioactive contaminants. The site is classified as a lowpriority site based on its inaccessibility and the limited extent of the residual contamination. Because the radioactive contamination is localized and limited in extent, it is highly unlikely that, under current use, an individual working in or frequenting these remote areas would receive significant radiation exposure. However, additional scoping and survey measurements and sampling are recommended to further define the extent of indoor uranium contamination southward to Building 4 and northward further into Building 6. Under current use conditions, there is no significant exposure risk to site workers or the general public.

## FUTURE USE

The site will be released for use with no radiological restrictions after remedial action is complete. This report assumes that the property will continue to be used for industrial purposes.

## ENVIRONMENTAL RESTORATION

Environmental restoration of the Madison site will include removing a total of 7.5 cubic meters (10 cubic yards) of low-level waste, 1.5 cubic meters (2 cubic yards) of contaminated dust, and 6 cubic meters (8 cubic yards) of workrelated waste, including worker uniforms and personal protective equipment. Because the site is heavily involved in production operations for metal extrusion and machining, the present owner, Spectrulite Consortium, is expected to provide a window of opportunity within the next decade during which production operations can be interrupted long enough to allow the Department of Energy to remediate the property.

The environmental regulatory process will focus on compliance with National Environmental Policy Act requirements. Key regulators include Environmental Protection Agency Region V, the Illinois Environmental Protection Agency, and local governments as appropriate.

**Major Environmental Restoration Activity Milestones**

| TASK | COMPLETION DATE Fiscal Year |
|---|---|
| Assessment (Engineering Evaluation/Cost Analysis with Action Memorandum) | 2001 |
| Remedial Action | 2002 |

## ASSESSMENT

Field investigations at the Madison site consisted of a radiological survey in 1989 and a site scoping visit in 1993. The survey included gamma scanning of accessible floor and wall surfaces throughout the building and on overhead beams; collection and radiological analysis of indoor dust and debris; and determination of direct and removable betagamma and alpha activity levels on overhead beam surfaces.

The walkover survey and sampling of dust from overhead beams identified uranium238 and thorium232 at concentrations exceeding current guidelines. No additional sampling and monitoring of environmental media have been conducted because the contamination is inside a building that is currently involved in daily production. However, the site scoping visit found the overhead beams to be significantly more complex than originally thought, making cleanup more challenging. During the radiological survey, smear samples were taken only on the lower sections of the beam design, leaving large amounts of surface area unsurveyed. Conduit and piping that run through the overheads also are likely to be contaminated. The cleanup effort will require extensive scaffolding, and many areas are not easily accessible.

The initial site designation report addresses assessments of radioactive contamination. Detailed characterization, including sampling and analysis, will be conducted before cleanup begins.

## REMEDIAL ACTION

Investigators believe that remedial action was conducted at the Madison site after two major production campaigns in the late 1950s and early 1960s; however, no records providing details of the plant cleanup have been located.

The Department of Energy has not yet performed any remedial action at the site. The selection of a preferred cleanup option will be based on results of the upcoming characterization, which will provide further information about the nature and extent of contamination and site-specific waste management requirements.

The scenario used for the Baseline Environmental Management Report cost estimate assumes that the 7.5 cubic meters (10 cubic yards) of low-level waste will be disposed of at an outofstate commercial disposal facility. The cleanup approach is expected to be a streamlined removal action conducted under a Department of Energy FUSRAP-expedited protocol that is frequently used for cleanup of small volumes of contamination within buildings where there is little threat of contaminant release.

## Environmental Restoration Activities Cost Estimate

*(Five-Year Averages, Thousands of Constant 1996 Dollars)*

| | FY 1996-2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | Life Cycle* |
|---|---|---|---|---|---|---|---|---|
| FUSRAP - Madison Site | | | | | | | | |
| Assessment | 36 | 32 | | | | | | 340 |
| Remedial Action | | 425 | | | | | | 2,124 |
| Total | 36 | 456 | | | | | | 2,464 |

** Total Life Cycle is the sum of the annual costs in constant FY 1996 dollars.*

## FUNDING ESTIMATE

The following table presents estimated funding information for the Madison site.

## Nondefense Funding Estimate

*(Five-Year Averages, Thousands of Constant 1996 Dollars)*

| | FY 1996-2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | Life Cycle* |
|---|---|---|---|---|---|---|---|---|
| Environmental Restoration | 36 | 456 | | | | | | 2,464 |

** Total Life Cycle is the sum of the annual costs in constant FY 1996 dollars.*

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