DOE/EA-1585

# ENVIRONMENTAL ASSESSMENT

PROPOSED DECONTAMINATION AND DEMOLITION OF
BUILDING 301 AT ARGONNE NATIONAL LABORATORY

U. S. Department of Energy
Argonne Site Office
Argonne, Illinois

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ALARA | as low as reasonably achievable |
| ANL | Argonne National Laboratory |
| ASA | Auditable Safety Analysis |
| CFR | Code of Federal Regulations |
| DOE | U.S. Department of Energy |
| EA | environmental assessment |
| EBWR | Experimental Boiling Water Reactor |
| EPA | U.S. Environmental Protection Agency |
| FY | fiscal year |
| HAER | Historic American Engineering Record |
| HEPA | high efficiency particulate air (filter) |
| IEPA | Illinois Environmental Protection Agency |
| LLW | low-level radioactive waste |
| MACE | Melt and Cool Experiment |
| mrem | millirem |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NPDES | National Pollutant Discharge Elimination System |
| NTS | Nevada Test Site |
| PCB | polychlorinated biphenyl |
| RCRA | Resource Conservation and Recovery Act |
| SHPO | State Historic Preservation Office |
| U.S.C. | United States Code |

*Chemical Elements*

| | |
|---|---|
| Am | americium |
| Bi | bismuth |
| Cs | cesium |
| Co | cobalt |
| Eu | europium |
| Pm | promethium |
| Pu | plutonium |
| Sb | antimony |
| Sm | samarium |
| Sr | strontium |

## 1.0 BACKGROUND

The U.S. Department of Energy (DOE) is proposing to complete the decontamination and demolition of Building 301 at Argonne National Laboratory (ANL) in Argonne, Illinois.[1] Under this proposed action, DOE would demolish the building, clean up underground radioactive contamination, and return the site to available space for future use. This work would begin in fiscal year 2007 (FY07), with expected completion by the end of FY09. DOE has prepared this environmental assessment (EA) in accordance with the National Environmental Policy Act (NEPA), 42 United States Code (U.S.C.) §§ 4321 *et seq*., and applicable regulations (Title 40, Code of Federal Regulations [CFR] Parts 1500 – 1508 and 10 CFR Part 1021).

### 1.1 Facility Description and History

Building 301, the Physics and Metallurgy Hot Laboratory, is located in the south-central area of DOE's ANL in Argonne, Illinois (see Figure 1). Construction of Building 301 started in 1949 and was completed in 1950. Building 301 is a brick building with a wing extending from the southwest corner and a loading dock on the north side of the building. Dimensions of the main building are 104 feet × 104 feet (32 meters × 32 meters) with the southeast wing being 52 feet × 52 feet (16 meters × 16 meters) and the covered loading dock 28 feet × 26 feet (9 meters × 8 meters). The building contains two main floors, a basement service floor, a sub-basement retention tank room, and a penthouse laboratory on the third floor above ground level (see Figures 2 – 5). There is also a dirt crawl space area below the hot cells that is accessed only through a hatch located outside the east wall. The building was designed to include an elevator shaft and machine room, although the elevator was never installed. The penthouse occupies the space designed for elevator machinery. The basement service floor area contains an emergency generator and an electrical substation that supplies power to several other buildings in the 300 area.

Building 301 was one of the first permanent buildings constructed at the present Argonne site. The building was designed for use as a "hot" laboratory to support the reactor program. The design included work areas that were referred to as "hot cells" or "caves." These areas provided shielding from radiation so that researchers could work safely with radioactive materials without exposing themselves to high doses of radiation.

During the 1950s, research and development of nuclear reactor fuel components and materials were conducted. Large amounts of plutonium and uranium were machined, polished, and examined. High levels of loose and airborne contamination were generated during these activities. Hot Cells Numbers 1 and 2 were the first cells built. They were constructed using high-density concrete. Later, Hot Cell Numbers 3 A/B/C, 4A, 4B, and 5 were added. These cells were built of steel shells filled with a magnetite material. The interior floors and walls were unpainted during this period. The second story of Building 301 was used for office and lunchroom space by the workers.

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[1] Decontamination of the interior of Building 301 has been partially completed. This action was analyzed in the *Environmental Assessment for the Proposed Decontamination and Decommissioning of Building 301 Hot Cell Facility at Argonne National Laboratory*, DOE/EA-1295 (DOE 2000). A Finding of No Significant Impact was issued on September 29, 2000.

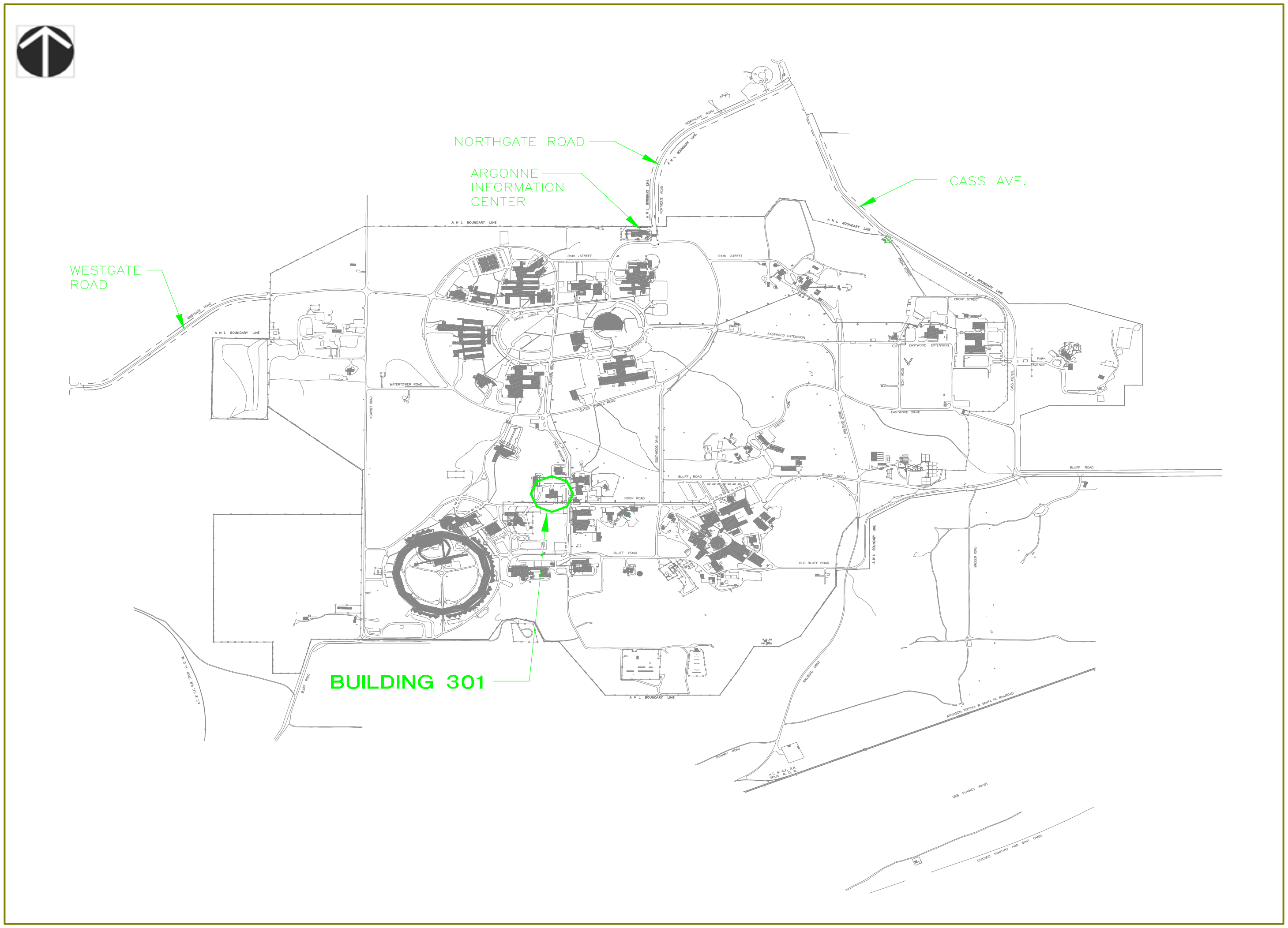


**Figure 1. Location of Building 301 at the ANL Site**

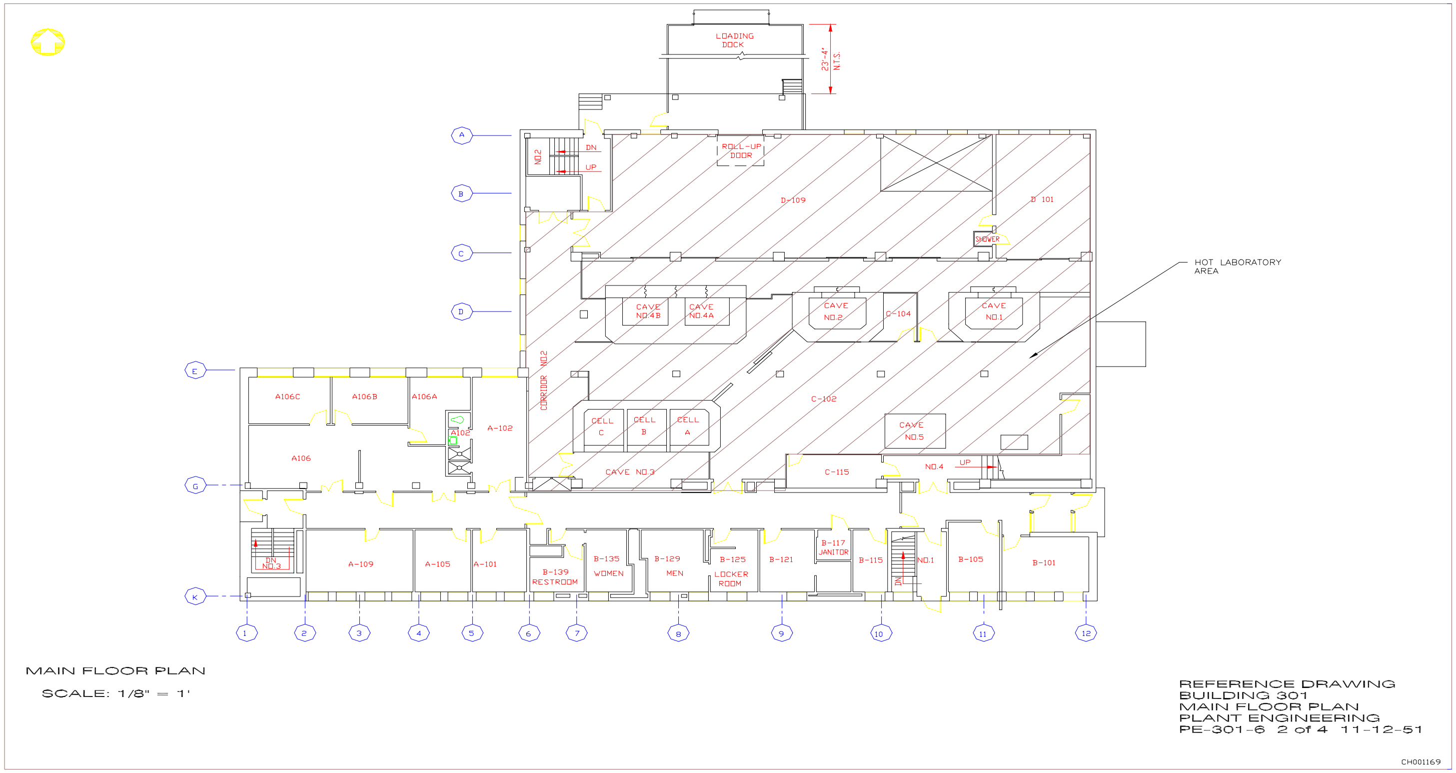


**Figure 2. Building 301 First Floor Plan**

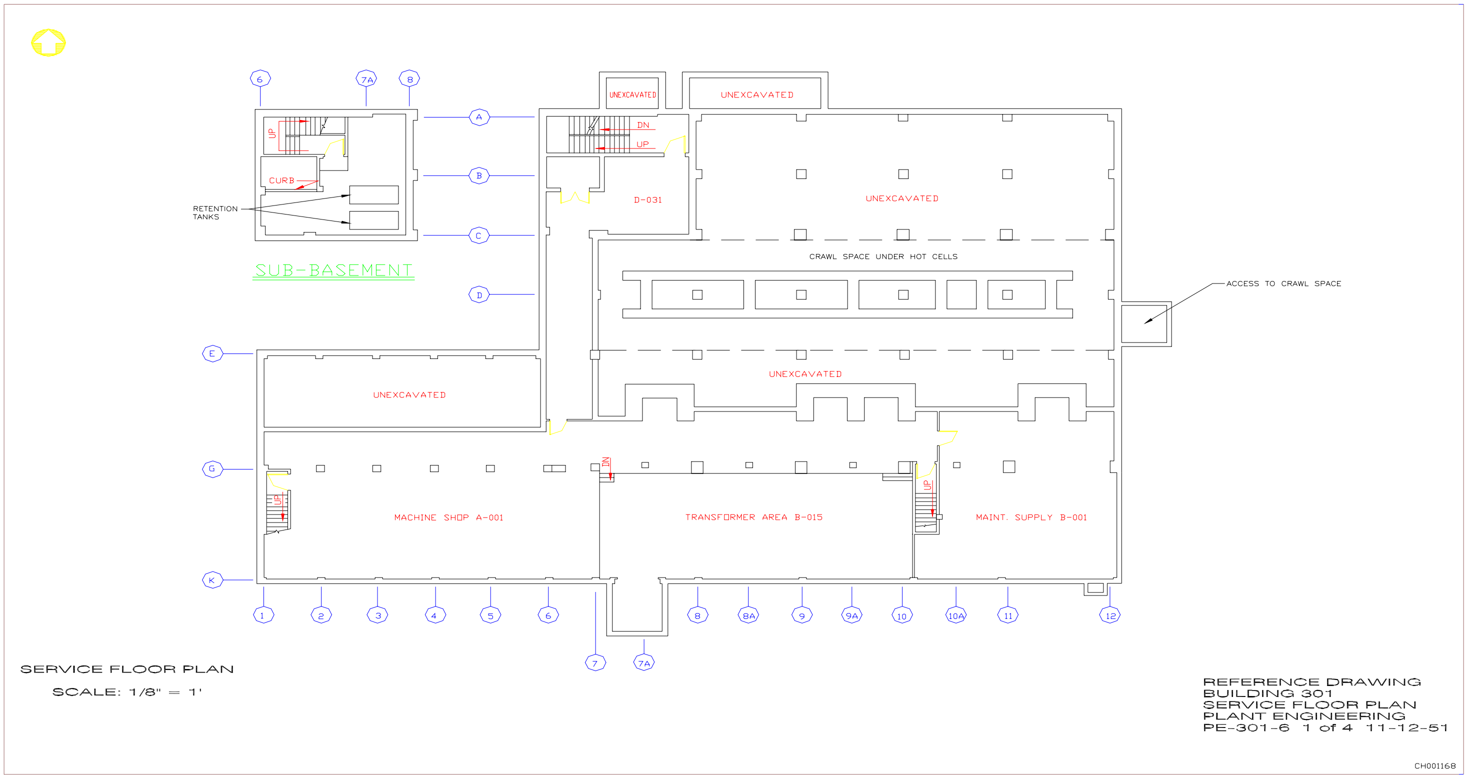


Figure 3. Service Floor Plan

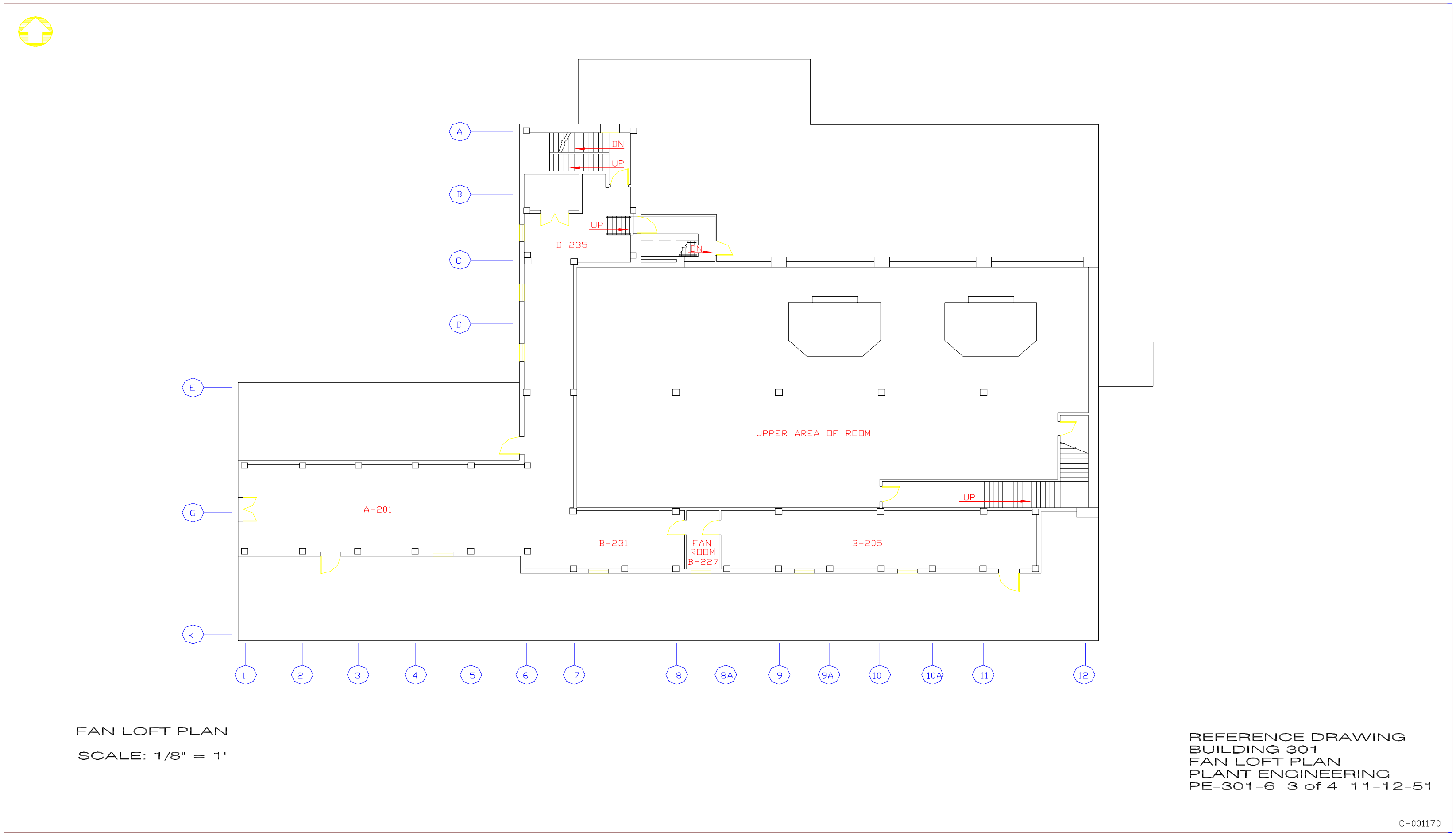


**Figure 4. Fan Loft Plan**

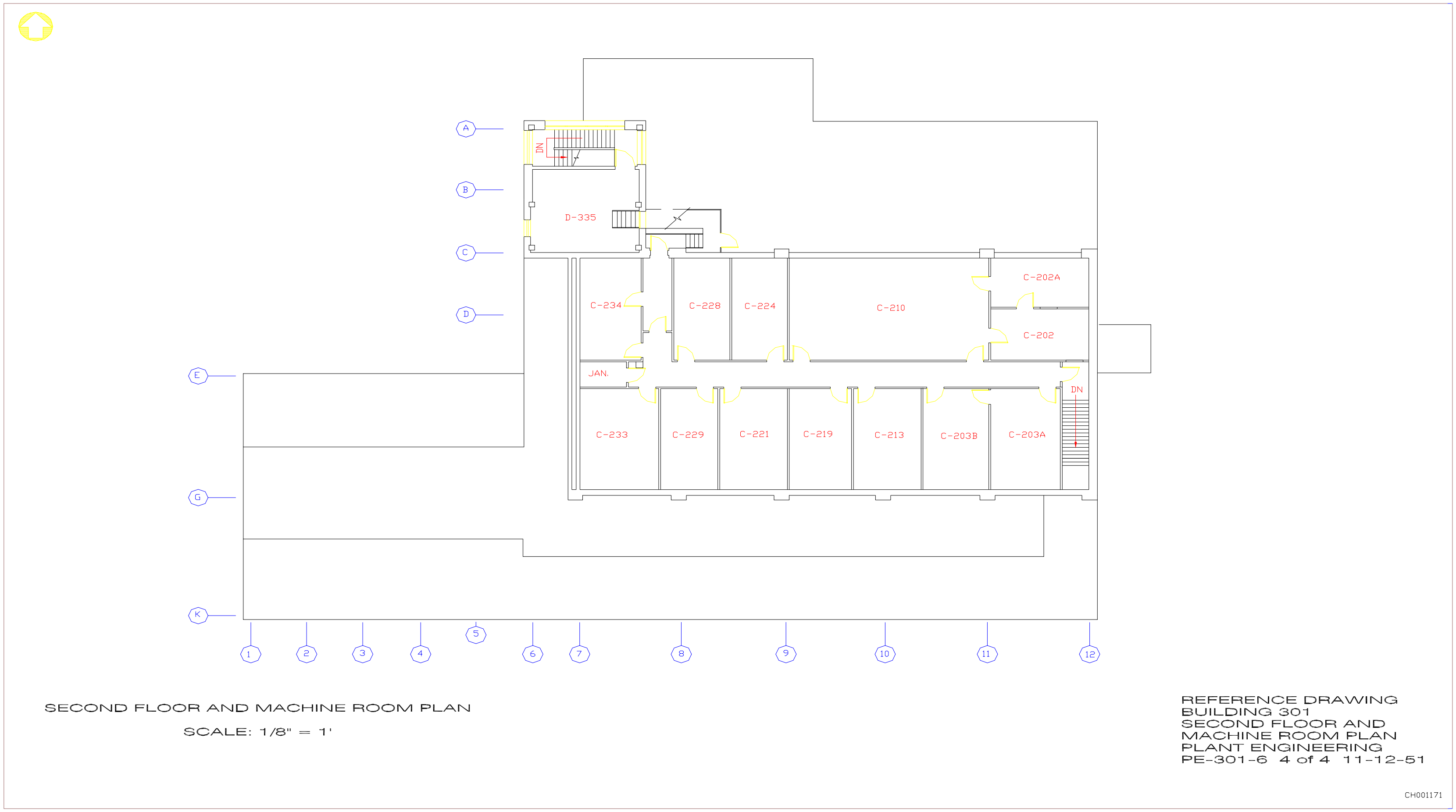


**Figure 5. Second Floor and Machine Room Plan**

In 1974, paint was applied over floors and walls to fix contamination. At that time, the work conducted in the building involved some use of radioactive materials, including the Melt and Cool Experiments (MACEs) with uranium oxide mixtures. These experiments and analyses contributed to increased radioactive contamination, including typical spent fuel fission products such as plutonium, radium, cesium-137 (Cs-137), and cobalt-60 (Co-60). The work continued at a diminished level until the early 1990s. In 1992, a MACE setup exploded in Hot Cell Number 1, blowing out a window and moving the cell door off its track. By 1998, the second floor of Building 301 and a portion of the first floor had been released for use as office space because the space had never been contaminated.

In September 2000, DOE issued the *Environmental Assessment for the Proposed Decontamination and Decommissioning of Building 301 Hot Cell Facility at Argonne National Laboratory* (DOE/EA-1295) (DOE 2000). This document described the potential environmental impacts of decontaminating Building 301, including activities such as equipment and systems disassembly, size reduction by mechanical saws or torches, removal of contaminated paint from building surfaces by grit blasting or scabbling coupled with a high efficiency particulate air (HEPA)-filtered recovery system, and all packaging and disposal of resultant waste. A Finding of No Significant Impact was issued on September 29, 2000, in which DOE determined that the proposed decontamination and decommissioning of Building 301 would not constitute a major federal action within the meaning of NEPA.

## 1.2 Current Status

The electrical substation and emergency generator are in service and performing as designed. Of the work described in the 2000 EA, only some internal decontamination has been completed:

- Decontamination and removal of Cave-5;
- Decontamination of Room D-109, except for the rod storage tubes;
- Removal of items in miscellaneous areas, including fume hoods and glove boxes, transformers/controls, miscellaneous equipment, and the wood partition wall; and
- Decontamination of certain areas of the building floor.

Although some of the work currently proposed was addressed in the earlier EA, DOE has analyzed the potential environmental impacts of the decontamination, demolition, and removal of Building 301 in its current condition.

Building 301 was characterized in early 1998; a characterization report was issued in July 1998 and later modified in 1999 (*Characterization Report for the Building 301 Hot Cell Facility*, July 1998 [ANL 1998], as modified, *Building 301 Phase II Characterization Survey Supplemental Report*, April 1999 [ANL 1999]). Since that time, additional characterization has been completed, with the following findings:

- The total radioactive material inventory is approximately $2.73 \times 10^4$ microcuries.

- The dominant floor contaminant is Cs-137 as determined from in-situ and concrete sample gamma spectrometry. No other nuclides in significant quantities except a few isolated hot spots, less than 0.09 square meter (1 square foot), were observed on the floor. From detailed floor surveys and concrete samples, it is estimated that the Cs-137 is within the top 0.5-centimeter layer of the concrete floor.

- The predominant nuclides detected inside the hot cell area were Cs-137, strontium-90 (Sr-90), and promethium-147 (Pm-147), with small quantities of Cs-134, samarium-151 (Sm-151), antimony-125 (Sb-125), europium-154 (Eu-154), Eu-155, Co-60, and plutonium-239 (Pu-239).

- Nine soil samples were taken outside of the building. One soil sample was found to be contaminated with less than 4 picocuries per gram of Cs-137 in the top 0.6 meter (2 feet) of soil. Other contaminants were less than 1 picocurie per gram.

- General area dose rates are below 1 millirem (mrem) per hour throughout the facility.

- The major isotope in the radioactive waste is expected to be Cs-137, with smaller amounts of americium-241 (Am-241), bismuth-214 (Bi-214), Eu-154, Eu-155, and Pu-238.

### 1.3 Public Involvement

DOE sent the draft version of this EA to the Illinois Environmental Protection Agency (IEPA) for review on February 27, 2007. On March 7, 2007, IEPA responded, expressing no objection to the proposed action. The only IEPA comments were that required permits must be obtained from IEPA and that wastes must be properly disposed.

## 2.0 PURPOSE AND NEED

The purpose and need for agency action is to protect human health and the environment from risks associated with an unneeded and deteriorating structure which contains radioactively contaminated areas and material. DOE’s Office of Environmental Management needs to demolish this building as part of its mission to dispose of unneeded and radioactively contaminated buildings.

## 3.0 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

### 3.1 The Proposed Action

The proposed action is the decontamination and demolition of Building 301. The scope of the proposed action would involve the completion of decontamination activities, as necessary, of all interior and exterior building spaces; the removal of hazardous waste; the demolition of all interior mechanical, electrical, and architectural systems and components; and the open-air demolition and removal of the physical structure, including the concrete foundations, sidewalk and asphalt surfaces adjacent to the facility, any soil contamination under the building, and the small parking lot east of the building.

All decontamination and demolition activities would be performed in accordance with an approved work plan and program that meets the requirements of 10 CFR Part 835, Occupational Radiation Protection, including requirements to implement measures to keep radiological exposure as low as reasonably achievable (ALARA).

Applicable federal limits for public exposure are set at 10 mrem per year by the U.S. Environmental Protection Agency (EPA) National Emission Standards for Hazardous Air Pollutants regulations, 40 CFR Part 61, for the airborne pathway and 100 mrem per year by DOE Order 5400.5 for the sum of all exposure pathways. The following steps would be taken to ensure compliance with the limits and ALARA principles in the implementation of the proposed action:

- Post-decontamination radiation surveys would be conducted and samples would be collected for radiological and hazardous waste characterization and other analyses as required.

- Air monitoring would be performed at the Building 301 location and at the site boundary as appropriate to verify that no threat to the public was present and that cumulative emissions of radionuclides during the proposed decontamination, demolition, and excavation activities would not result in members of the public receiving more than the DOE primary dose standard (an effective dose equivalent of 100 mrem annually).

- Airborne contamination controls would be provided to ensure that no worker would receive a radiation dose in excess of the federally allowed limit. These controls may include, but would not be limited to, barriers, filters, containment structures, dust suppression techniques, and differential pressures between adjacent areas/rooms/cells, as appropriate.

- Personal protective equipment such as respirators and anti-contamination clothing, worn by workers in contaminated areas, also would minimize radiation exposures.

- Area radiation monitors, personal contamination monitors, friskers, and other radiation detection equipment would be used as appropriate to ensure that workers were made aware of any abnormal radiological conditions in a timely manner.

- ALARA reviews and other activities as appropriate would be performed during work planning and implementation.

***Decontamination***

Decontamination tasks would include activities such as equipment and systems disassembly, size reduction by mechanical saws or torches, removal of contaminated paint from building surfaces by grit blasting or scabbling coupled with a HEPA-filtered recovery system, and all packaging and disposal of resultant waste. Depending on the amount, type, and level of contamination, decontamination could also include removing building components, cells, tanks, piping, ventilation, fixtures, equipment, and debris; washing or wiping surfaces; and applying sealants or fixatives. Additional surveying may be required as part of detailed planning and before applying sealants and fixatives. This work would be performed indoors in Building 301.

Polychlorinated biphenyls (PCBs) are present in light fixtures and in the paint used in the Building 301 Hot Cell area. Light fixtures would be removed and disposed of by trained workers during decontamination activities. Recycling this material would be considered if it is not radiologically contaminated.

Special chemicals may be used to remove paints or other hazardous materials such as asbestos. Adhesives would be used to fix radionuclides or hazardous materials. However, no additional hazardous materials would be introduced into the project area. Cleaning supplies, decontamination solutions and other nonhazardous materials would be stored in cabinets designed for that purpose. Inventories would be kept to the minimum expected to be used and would be inventoried periodically.

Soils beneath the building are contaminated as a result of activities conducted within the building. In accordance with DOE remediation standards in DOE Order 5400.5 (DOE 1993), these soils would be excavated, removed, and disposed of off-site. Approximately 4,180 square meters (5,000 square yards) would be disturbed during excavation.

***Demolition***

Demolition would be accomplished after any required decontamination work was completed. Demolition would include disconnecting all building utilities, removing salvageable equipment or materials, demolishing the building and foundations, removing and disposing of resultant waste, and restoring the area. During demolition, dust dispersion would be controlled to reduce releases into the atmosphere and exposure to both involved and noninvolved workers at and around the work site.

Small amounts of liquid waste may result from the demolition of the retention tanks. This is expected to be less than 760 liters (200 gallons). Absorbents would be used to solidify these wastes. Supply water and discharge water systems may contain some residual volumes of liquids. After testing for contamination, this water and wastewater would be disposed of in the ANL sanitary sewer system or, if contaminated, would be collected, treated, and properly disposed.

During rubble reduction, water used to control dust from clean debris would be collected and pumped to the laboratory sewer system after filtering for debris, sand, etc. All water collected for discharge would be tested for contaminants before discharging it into the laboratory sewer system.

Demolition would be conducted in open air. Water would be misted over all surfaces for dust control. Up to an estimated 53,000 liters (14,000 gallons) of water per day would be used to suppress dust. This would require collecting and properly disposing of the potentially radioactively contaminated wastewater. If the wastewater met the ANL release criteria (see Section 10.17, *ANL Environment, Safety and Health Manual* [ANL 2007]), up to 57,000 liters (15,000 gallons) a day could be released into the laboratory sewer system. If the material required treatment, DOE would use a commercial waste disposal contractor to store, treat, and transport the contaminated water for disposal.

After demolition and site backfilling were complete, the site would be graded. Recycled soil containing some topsoil qualities would be used for finish grading. Native plantings of grasses would be used to finish the area.

### *Transportation and Waste Disposal*

The waste generated by decontamination and demolition activities would be transported off-site using trucks.[2] Table 1 shows the types and estimated volumes of waste that would be generated as a result of the proposed decontamination and demolition activities, and the locations where the wastes would be disposed. Although much of the debris waste would be clean (not radiologically contaminated), DOE assumed for purposes of analysis that all debris waste would have some level of radioactive contamination and would need to be disposed as low-level radioactive waste (LLW).

**Table 1. Types and Estimated Volumes of Waste to be Generated under the Proposed Action**

| Type of Waste | Volume of Waste ($ft^3$) | Type of Container | Number of Shipments (round-trips) | Disposal Location(s) |
|---|---|---|---|---|
| **Debris waste**[a] | 215,000 | Intermodal containers | 216 | NTS<br>Energy Solutions |
| **LLW** (including soil) | 174,000 | B-25 boxes | 138 | NTS<br>Energy Solutions |
| **Mixed LLW** | 400 | B-25 boxes | 1[b] | NTS<br>Energy Solutions |
| **Asbestos-containing material**[c] | 8,908 | Intermodal containers | 9 | Licensed commercial landfill within 100 miles of ANL |
| **Hazardous waste** (including lead and PCBs) | 400 | 55-gallon drums | 1[d] | NTS<br>Energy Solutions |

a. For purposes of analysis, DOE assumed all debris waste would be slightly radioactive and would be disposed of as LLW. Any debris waste found to be clean of radioactive contamination could be disposed of at a licensed, commercial landfill within 160 kilometers (100 miles) of ANL, resulting in far fewer transportation impacts. Assuming all the waste is contaminated with radionuclides conservatively bounds the transportation impacts.
b. One LLW shipment would consist of fourteen B-25 boxes. The mixed LLW shipment would consist of five B-25 boxes, a partial load conservatively rounded to one shipment.
c. For purposes of analysis, DOE assumed that all asbestos-containing material would be disposed of at a licensed commercial disposal site within 160 kilometers (100 miles) of ANL.
d. The hazardous waste shipment would consist of 54 drums, a partial load. It was conservatively rounded to one shipment, although these drums could be loaded onto a truck with the five mixed LLW B-25 boxes.

Note: NTS = Nevada Test Site

**Debris Waste**. The proposed action would generate an estimated 6,100 cubic meters (215,000 cubic feet) of solid waste, consisting mainly of concrete building debris, metal, wood, and plastic. Although much of the material is expected to be eligible for recycling or to be

[2] Argonne has no on-site rail access. It is possible that waste could be loaded into containers and transported by truck to a local railway point and, from there, to appropriate disposal sites. For purposes of analysis, however, DOE assumed that all waste would be transported by truck to its final destination. In general, potential impacts are greater for transportation by truck than transportation by rail because fewer numbers of trips are required for transportation by rail, and impacts are primarily a factor of the number of trips. For this reason, DOE believes that the truck transportation analysis bounds the potential impacts of transporting waste by rail.

salvaged as scrap, DOE assumed for purposes of analysis that all of this material would be slightly radioactive and would be disposed of as LLW. This assumption conservatively bounds the potential impacts of transporting this waste.

The debris waste would be loaded into intermodal containers having a capacity of 28 cubic meters (37 cubic yards); a single container would constitute one truck shipment. A total of 216 round-trip truck shipments would be required to transport this waste to the selected disposal location.

**Low-Level Radioactive Waste (LLW)**. The proposed action would generate approximately 4,930 cubic meters (174,000 cubic feet) of LLW in the form of wood, metal, and soils and of surface-contaminated plastic, paper, and cloth. The major radioactive isotopes in the waste are Cs-137 and Sr-90, with smaller amounts of Pm-147, Sm-151, Eu-154, Eu-155, and Pu-239. This material would be packaged and shipped to the LLW disposal site at the Nevada Test Site (NTS) near Mercury, Nevada, or to Energy Solutions (a commercial disposal facility formerly known as Envirocare) near Clive, Utah, in accordance with DOE policies and procedures. One LLW shipment would contain fourteen B-25 boxes; 138 round-trip shipments would be required to transport all LLW off-site.

**Mixed LLW**. The proposed action would generate approximately 11 cubic meters (400 cubic feet) of mixed LLW, predominantly in the form of contaminated lead bricks. This material would be surveyed. Lead with low dose rates and no loose contamination would be segregated for use at other projects as shielding. The remaining waste would be treated and disposed of in accordance with the draft Federal Facilities Compliance Act Site Treatment Plan for ANL. The mixed LLW generated would be loaded into approximately five B-25 boxes and shipped off-site in one truck shipment.

**Asbestos-Containing Material**. The proposed action would generate approximately 252 cubic meters (8,908 cubic feet) of asbestos-containing material. The asbestos would be removed by an Illinois-licensed contractor and disposed of in accordance with ANL waste management procedures and DOE policies and procedures. The asbestos-containing waste would be double-bagged and loaded into intermodal containers having a capacity of 28 cubic meters (37 cubic yards); a single container would constitute one truck shipment. Nine round-trip truck shipments would be required to transport the asbestos-containing waste to the selected disposal location.

**Hazardous Waste**. The proposed action would generate less than 11 cubic meters (400 cubic feet) of hazardous waste in the form of lead-based paint, PCBs, and zinc bromide solution. Hazardous waste would be transferred to the ANL waste management facility for disposition by a contract vendor in accordance with applicable ANL waste management procedures and state Resource Conservation and Recovery Act (RCRA) requirements. The hazardous waste would be loaded into fifty-four 55-gallon drums. Although the hazardous waste drums could be shipped with the mixed LLW boxes, it was conservatively assumed that these wastes would be shipped separately in one shipment.

The potential off-site disposal locations for LLW or mixed LLW are the NTS or Energy Solutions. However, the building and site would be surveyed, and materials that could be recycled (such as concrete, steel, glass, or metals that were not in controlled areas) would be separated out. Uncontaminated materials that could not be recycled would be disposed of at a municipal or commercial landfill within 160 kilometers (100 miles) of ANL.

Any contaminated liquids encountered while draining pipes or tanks would be solidified for off-site disposal; this waste is included in the estimates provided in Table 1. Depending on the specific dust suppression techniques selected for use during demolition, a secondary waste stream of potentially contaminated water may also be generated. For example, a large-scale, open-air demolition project conducted at the Hanford Site used two 14-gallon-per-minute fog cannons for dust suppression during demolition of the 233-S Plutonium Concentration Facility, generating 51,000 liters (13,400 gallons) of contaminated wastewater per day (DOE 2004). Standard industry practices such as diversion, retention, and testing would be used to minimize the potential for generating waste and spreading contamination, and the water would be tested and disposed of appropriately.

### 3.2 No Action Alternative

Under the no action alternative, Building 301 would not be decontaminated and demolished. The facility would be maintained as at present in a safe lay-up condition. Surveillance and monitoring activities would continue to (1) ensure adequate containment of radioactive contamination, (2) maintain HEPA filters in the ventilation system, (3) provide physical safety and security controls, and (4) preserve the facility to allow for personnel access. Continued maintenance, surveillance, and monitoring would cost approximately $80,000 annually.

### 3.3 Other Alternatives Considered

DOE considered alternatives to both decontamination and demolition. A value engineering study conducted in late May through early June 2006 considered seven alternative methods of decontamination (ANL 2006a). These alternatives are briefly described in Table 2.

**Table 2. Alternatives for Building Decontamination**

| Name | Description |
|---|---|
| **1. Cells Hot / Building Clean** | Hot cells removed as contaminated, building removed as clean. Gross decontamination, fix contamination, demolish and remove cells inside building. Decontaminate and free-release building and demolish as a clean facility. |
| **2. No Decontamination of Hot Cells** | Similar to first alternative, but no decontamination of hot cells. |
| **3. Cells Diamond Wire** | Similar to first alternative, but cut and dismantle cells using diamond wire and flat saws. |
| **4. Cells Delaminated** | Similar to first alternative, but rubbleize cell walls with explosive delamination or expansive grout delamination. |
| **5. Cells & Building Clean** | Decontaminate hot cells and entire building to free-release condition, then demolish entire structure as clean. |
| **6. Dismantle Clean Areas / Demolish Contaminated Building** | Fix loose contamination, dismantle clean areas such as upper floors and office spaces, then demolish the remainder of building, including the hot cells and basement below, as LLW. |
| **7. Demolish All as Contaminated** | Fix loose contamination and demolish the entire building as radioactive waste using larger equipment, fogger, and dust suppression. Use concrete crusher to rubbleize concrete and brick or ship low-activity waste for disposal. |

All of the decontamination alternatives were determined to be feasible; in other words, they would meet DOE’s purpose and need for agency action. The preferred alternative, “Demolish All as Contaminated” (Alternative 7), would be the least expensive option to implement because it would not involve extensive decontamination before demolition. The other alternatives, however, are likely to have fewer environmental impacts because they would result in the generation of a lower volume of LLW. Thus, the environmental impacts associated with implementing the “Demolish All as Contaminated” alternative conservatively bound the impacts that would occur if any of the other alternatives were implemented.

The building could also be cleaned up for reuse, as was evaluated in the 2000 EA (DOE 2000). However, no future use has been found for this excess facility, which is in a deteriorating condition. The cost of maintenance would increase over time, and ultimately the building would need to be demolished. Therefore, no alternatives to demolition (such as building reuse) are being considered.

# 4.0 AFFECTED ENVIRONMENT

## 4.1 Project Site Description

ANL occupies 600 hectares (1,500 acres) in southern DuPage County, Illinois. The ANL site is completely surrounded by the 830-hectare (2,040-acre) DuPage County Waterfall Glen Forest Preserve, which is used as a public recreational area, nature preserve, and demonstration forest. The ANL site is approximately 43 kilometers (27 miles) southwest of downtown Chicago and 39 kilometers (24 miles) west of Lake Michigan.

Building 301 is located in the south-central area of ANL (see Figure 1), at the northwest corner of Meridian and Rock Roads. It is located close to the center of the site and is over 600 meters (2,000 feet) from the closest site boundary. The area near the building is developed, and several other buildings are in close proximity.

Land use in the area surrounding ANL is varied, including residential, commercial, and industrial properties. No residential populations live within 1.6 kilometers (1 mile) of the center of the project site.

## 4.2 Cultural Resources

This section describes archeological and historic sites at ANL.

### *4.2.1 Archaeological Sites*

As described in the 2005 ANL *Annual Site Environmental Report* (ANL 2006b), 46 archaeological sites have been recorded at ANL. These sites include prehistoric chert quarries, special-purpose camps, base camps, and historical farmsteads. Of the 46 recorded sites, 4 sites have been determined to be eligible for the National Register of Historic Places, 21 have been determined to be ineligible, and 21 have not been evaluated for eligibility. None of the archaeological sites are in the area that would be disturbed or otherwise affected by the decontamination and demolition of Building 301.

### 4.2.2 Historic Structures

Building 301 itself is significant for its architectural and engineering value. It is characteristic of the earliest buildings at ANL and is unique in that it retains considerable integrity. Building 301 contains five caves or hot cells that provide a representative timeline in cave or hot cell development and engineering for the peak years of nuclear research from 1950 to 1960. These caves allowed the safe study, inspection, and handling of highly radioactive materials. The facilities in Building 301 were instrumental for reactor fuel studies.

Building 301 and the hot laboratory caves contained in the building were determined to be eligible for listing on the National Register of Historic Places in 1998. In 1999, in anticipation of the decontamination and decommissioning of Building 301 and the hot laboratory caves, DOE entered into a Memorandum of Agreement with the Illinois State Historic Preservation Office (SHPO) concerning the facility. DOE agreed to document Building 301 and the hot laboratory caves to the Illinois Historic Building Survey/Historic American Engineering Record (HAER) Level II standards to mitigate the adverse effects resulting from the decontamination and decommissioning of this historically significant property. DOE also agreed to preserve two sets of the manipulator arms that were used in the Building 301 hot laboratory caves.

The documentation was completed and accepted by the Illinois SHPO in 1999 (IL HAER No. DU-1999-1) (see Appendix A). Prior to demolition, DOE would notify the SHPO by letter that the building and the hot laboratory caves were to be demolished. The letter would reiterate that the building had been documented to the required standards to mitigate the adverse effects resulting from demolition and that the manipulator arms were being preserved as agreed to in the Memorandum of Agreement.

## 4.3 Biological Resources

The area adjacent to and surrounding Building 301 is previously disturbed and provides little or no wildlife habitat. No state-listed or federally listed threatened or endangered species are known to reside at or around the Building 301 site.

## 4.4 Air Quality

Routine continuous monitoring has demonstrated that the amount of radioactive material released to the atmosphere by emissions sources at ANL is extremely small, resulting in a very small incremental radiation dosage to the neighboring population. The calculated potential maximum individual off-site dose to a member of the general public for 2005, from radionuclide air emissions other than radon-220, was 0.034 mrem, which is 0.34 percent of the 10-mrem-per-year National Emissions Standard for Hazardous Air Pollutants for radionuclide emissions (40 CFR 61 Subpart H). The maximum individual dose to an off-site member of the public in 2005 from all radionuclide air emissions, including radon-220, was 0.036 mrem (ANL 2006b).

Air monitoring was also conducted at ANL perimeter and off-site sampling stations for total alpha activity, total beta activity, Sr-90, isotopic thorium, isotopic uranium, and Pu-239 (ANL 2006b). No statistically significant difference was identified between samples collected at the ANL perimeter and samples collected off-site at surrounding communities.

National Ambient Air Quality Standards (NAAQS) are set by EPA, and the IEPA ensures compliance through its state implementation plan. The NAAQS of concern for the proposed decontamination and demolition of Building 301 is for particulate matter (dust). ANL is in a moderate non-attainment area for ozone and fine particulate matter (2.5 microns or less).

### 4.5 Waste / Wastewater Disposal Capacity

The ANL laboratory sewer system has a treatment capacity of 0.46 million gallons per day. Waste disposal at Energy Solutions or NTS would be in accordance with their waste acceptance criteria and their available disposal capacities. Neither Energy Solutions nor NTS is nearing its capacity for LLW disposal.

### 4.6 Transportation Infrastructure / Capacity

Roads within ANL are sufficient to accommodate the additional truck traffic required to transport the waste generated from the Building 301 site through ANL and to off-site disposal locations. No road upgrades, new roads, or new access gates would be required. Off-site, trucks would use interstate highways that are immediately adjacent to the site. These interstate highways are currently major truck routes.

### 4.7 Environmental Justice

Executive Order No. 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, directs federal agencies to identify any disproportionately high and adverse human health or environmental effects of their actions on minority or low-income populations. To identify such impacts, it is first necessary to identify the minority or low-income populations that could be affected by the proposed action or no action alternative. Approximately 8.9 million people live within an 80-kilometer (50-mile) radius of ANL, and approximately 145,000 people live within 8 kilometers (5 miles) of ANL (ANL 2006b). On the basis of 2000 census data, 51 percent of the population within 80 kilometers (50 miles) and 24.5 percent of the population within 8 kilometers (5 miles) of the site consists of minorities, as compared with the state averages of 32.2 percent for Illinois, 14.2 percent for Indiana, and a national average of 30.9 percent (U.S. Census Bureau 2004a).

With respect to low-income populations, based on 2000 census tract data, 10.6 percent of the population within 80 kilometers (50 miles) and 3.4 percent of the population within 8 kilometers (5 miles) of the site are comprised of low-income populations, as compared with the state averages of 12.7 percent for Illinois, 9.5 percent for Indiana, and a national average of 12.3 percent (U.S. Census Bureau 2004b).

## 5.0 ENVIRONMENTAL CONSEQUENCES

### 5.1 Environmental Impacts of the Proposed Action

The following sections describe the potential environmental impacts of the proposed decontamination and demolition of Building 301.

### 5.1.1 Impacts on Sensitive Resources

Decontamination activities would be conducted inside the building and would have no impact on wetlands, floodplains, or threatened or endangered species. Demolition activities would be conducted outdoors, but impacts would be confined to the already disturbed Building 301 site. All proposed decontamination and demolition activities would be conducted in a manner that controls the airborne spread of dust and radioactive contamination. For this reason, there would be no environmental impact on wetlands, floodplains, or threatened or endangered species as a result of demolition activities.

### 5.1.2 Impacts on Cultural Resources

DOE has determined that Building 301 is eligible for listing on the National Register of Historic Places because it is an excellent example of early construction at the laboratory and of its importance in the development of hot cells. The decontamination and demolition of Building 301 would be an adverse effect (Haaker 1998). DOE has mitigated for this adverse effect by completing Illinois HAER documentation for Building 301 in accordance with a Memorandum of Agreement with the Illinois Historic Preservation Agency (Crawford 1999a, 1999b) (see Appendix A). As noted above, DOE has also agreed to preserve two sets of the manipulator arms that were used in the Building 301 hot laboratory caves.

### 5.1.3 Impacts on Waste Disposal Capacity

Table 1 shows the types and estimated volumes of waste that would be generated as a result of the proposed decontamination and demolition activities and the number of shipments required to transport the waste off-site for disposal. These wastes would be disposed of off-site at the DOE disposal facility at NTS or at commercial disposal sites in accordance with their waste acceptance criteria. Neither Energy Solutions nor NTS is nearing its capacity for LLW disposal.

### 5.1.4 Wastewater Disposal Impacts

Under the proposed action, between 16 to 20 current ANL personnel or outside contractors would conduct the proposed decontamination and demolition activities for a period of about 30 months. In either case, the increase in sanitary water handling requirements would be negligible and well within the excess handling capacity of the existing laboratory system.

The ANL laboratory sewer system is expected to have adequate wastewater treatment capacity. If radioactively contaminated wastewater met the ANL release criteria (see Section 10.17, *ANL Environment, Safety and Health Manual* [ANL 2007]), up to 57,000 liters (15,000 gallons) a day could be released into the laboratory sewer system. If the material required treatment, DOE would use a commercial waste disposal contractor to store, treat, and transport the contaminated water for disposal. All wastewater would be collected within the project site and sampled to determine if it meets laboratory wastewater discharge requirements. In either case, ANL has adequate waste-handling capacity to manage the wastewater. The 57,000 liters (15,000 gallons) of wastewater collected per day would be a very small fraction of the 1.7 million liters (0.46 million gallons) per day average daily volume discharged into the laboratory sewer system. DOE would develop a stormwater pollution prevention plan to contain runoff from the Building 301 site. Implementation of this plan would avoid any impacts to the nearby creek and a National Pollutant Discharge Elimination System (NPDES) Permit outfall.

### 5.1.5 Air Quality Impacts

The proposed action would generate particulate air emissions (dust), although demolition activities would follow standard construction practices for demolition, including dust suppression. The dust could include lead and small amounts of the radionuclides such as Cs-137, Sr-90, Co-60, europium, uranium, plutonium, and americium during decontamination and demolition operations. The dust from demolition activities would be subject to the terms of the ANL Title V air permit (permit condition 5.3.2). However, by employing dust suppression techniques, the demolition activities would be unlikely to violate this permit condition. Work areas would be monitored for airborne dust, and respiratory protection would be used when required. Protective clothing and personnel monitoring devices would be used. Portable HEPA filters would be used during internal decontamination.

An air permit would be required if there were a potential to release any radionuclides as a result of the decontamination and demolition. CAP88-PC or HOTSPOT air modeling would be used to prepare the permit application if the building would not be decontaminated to free-release levels before open-air demolition.[3] Air monitoring may be performed during the project to verify emissions levels in order not to exceed the permit limits.

Minor emissions from small trucks and equipment would also be generated during demolition activities. These emissions would be transient and would be unlikely to result in the exceedance of air quality standards.

### 5.1.6 Noise Impacts

Noise would be associated with the operation of machinery and equipment such as coring machines, scabblers, jackhammers, saws, forklifts, and portable HEPA filter units. Receptors of such noise would be limited to persons who work in or near Building 301. Workers in areas where noise levels would exceed permissible noise exposures defined in 29 CFR 1910.95 would be required to wear hearing protection. Noise levels would be monitored weekly. Persons

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[3] While these air models are reliable in calculating radiation dose to off-site residents, the calculated radiation dose to nearby noninvolved workers is less reliable due to the limitations of the model. This is discussed in Maheras et al. (1994), which stated "Miller and Hively (1987) reviewed validation studies for the Gaussian plume atmospheric dispersion model. This review examined studies where predictions and observations were correlated in time and space. At highly instrumented flat sites, uncertainties of 20% were estimated for ground-level releases at short distances (<10 km). For elevated releases, uncertainties of 35% were estimated.

"When long-term releases over flat terrain were considered by Miller and Hively (1987), the geometric standard deviation of the ratio of the predicted-to-observed air concentrations associated with the Gaussian plume atmospheric dispersion model was 1.5 for distances within 10 km of the release point and 2.2 for distances 10 to 150 km from the release point.

"The uncertainty for short-term releases was estimated to be greater than the uncertainty for long-term releases. For wind speeds greater than 2 m/s, the geometric standard deviation of the ratio of the predicted-to-observed air concentrations ranged from 2.7 to 4.2. For wind speeds less than 2 m/s, the geometric standard deviation was 3.8.

"For complex terrain or meteorology, the geometric standard deviation of the ratio of the predicted-to-observed air concentrations was 3.8 for annual average conditions. For urban areas, the geometric standard deviation of the ratio of the predicted-to-observed air concentrations was 2.2 for annual average conditions. The uncertainty may be greater for short-term releases involving complex terrain or meteorology or urban areas."

beyond the ANL site boundary and its buffer zone (Waterfall Glen Forest Preserve) would not notice noise impacts because of the distances from the source. Major demolition equipment such as bulldozers, graders, compactors, and wrecking balls could cause vibrations that could affect ongoing experimental activities at the Advanced Photon Source facility, requiring that activities be coordinated or that vibrations be dampened to acceptable levels.

### 5.1.7 Socioeconomic Impacts / Environmental Justice

The total cost of the proposed action would be approximately $17 million (ANL 2006a). This expenditure would take place over 30 months and represents a small fraction of ANL's annual operational expenditure. Thus, the economic impact of the proposed action would be minor in the context of ANL and extremely small in the context of the regional economy. There would be no social impacts such as those related to relocation of residents or impacts on lifestyle and living conditions.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires federal agencies to analyze disproportionately high and adverse environmental effects of proposed actions on minority and low-income populations. DOE has analyzed the affected area of the proposed action and determined that implementing the action would not have adverse human health or environmental impacts in any area occupied by predominantly low-income or minority populations. Off-site impacts of the proposed action would be minimal and limited to the area immediately surrounding the ANL site. The area immediately surrounding ANL contains neither predominantly low-income nor minority populations.

### 5.1.8 Radiological Impacts on Workers and the Public

Assuming no additional decontamination prior to demolition, worker personnel exposures from direct radiation are expected to average less than 30 mrem per worker, and the estimated collective worker dose would be approximately 0.507 person-rem (Williams 2001). Based on an occupational risk factor of $6.0 \times 10^{-4}$ fatal cancers per person-rem (DOE 2002), workers engaged in this proposed project would incur a $3.0 \times 10^{-4}$ collective risk for a fatal cancer, or about 1 chance in 3,300.

Worker exposure to radiation would be controlled under established ANL procedures that require doses to be kept ALARA and that limit any individual's dose to less than 1 rem per year.

The only potential radiological effect to noninvolved workers in Building 301 or on the ANL site or to members of the public would be from radiological air emissions (Section 5.1.5.). Assuming no additional decontamination prior to demolition and no dust suppression, the estimated radiation dose for a nearby resident from this project is 0.083 mrem per year, which is much less than the 10 mrem-per-year National Emission Standard for Hazardous Air Pollutants contained in 40 CFR 61, Subpart H. This radiation dose is equivalent to a latent cancer fatality risk of $5.0 \times 10^{-8}$, or 1 chance in 20 million. Radiation doses to nearby noninvolved workers would be 7.7 mrem during the decontamination and demolition of Building 301. This is equivalent to a latent cancer fatality risk of $4.6 \times 10^{-6}$, or 1 chance in 360,000. Doses for nearby residents and noninvolved workers would be different because residents are off-site and noninvolved workers are assumed to be in the immediate vicinity of Building 301. As with worker exposures, public and noninvolved worker exposure to radiation would be controlled under established ANL procedures that require doses to be kept ALARA.[4]

### *5.1.9 Impacts Resulting from Transportation*

As indicated in Table 1, 216 truckloads of potentially radioactive debris waste, 138 truckloads of LLW, and 1 truckload of mixed LLW (a total of 355 shipments) would leave the site for transport to either NTS or Energy Solutions. This number is an outside limit, based on the conservative assumption that all of the debris waste would be radioactive. It is more reasonable to assume that most, if not all, of the debris waste could be disposed of at a local landfill. In addition, one shipment of hazardous waste would be shipped to either NTS or Energy Solutions and nine shipments of asbestos-containing waste would be transported to a local permitted landfill as an Illinois special waste.

The transport of all types of waste to the disposal sites would occur at random intervals over a 16-month period. Currently, the annual average number of shipments of LLW from ANL is about 26. Thus, the 355 LLW and mixed LLW shipments represent over a 1,000 percent increase in LLW shipments. The project total of 365 shipments of debris waste, LLW, mixed LLW, and the asbestos-containing and hazardous waste compares to the annual average of about 41 shipments of waste from ANL and represents an approximate 890 percent increase in shipments. However, on-site roads and gates would be adequate to accommodate this volume, as would the nearby interstate highways. The additional truck traffic associated with the off-site transportation of waste for disposal would be temporary and would be a very small increase in the volume of truck traffic on the interstate highways in the vicinity of the site and nationwide.

The total 2,272,416 vehicle-kilometers that would be traveled are represented by 356 round-trip shipments to the DOE NTS site in the State of Nevada (fewer vehicle-kilometers would be traveled if the LLW, mixed LLW, and hazardous waste were transported to Energy Solutions in Utah) and 9 round-trip shipments to a local landfill. Since standard flatbed semi-trailer trucks would be used, the round-trip assumption is very conservative. In all likelihood, the truck driver would find another load and eventually make it back to Illinois, making the impact from a one-way trip, rather than a round trip, a valid estimate of the overall impacts.

The national average transportation accident rate is 0.25 accidents and 0.02 fatalities per million kilometers (Saricks and Tompkins 1999). Based on the state-specific accident and fatality rates, also developed by Saricks and Tompkins, for all the proposed waste shipments, the probability of an accident is estimated to be 0.37 and the probability of a fatality is estimated to be 0.041. The fatality risk total considers five terms:

- The collective latent cancer risk to the general public from normal transport would be $6.0 \times 10^{-3}$, or 1 chance in 160.

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[4] The radiation dose for noninvolved workers was calculated using HOTSPOT model. As noted above, this model is reliable in calculating radiation dose to off-site residents. However, the calculated radiation dose to noninvolved workers is less reliable due to the limitations of the model. Because of these inherent uncertainties, use of the model generated conservative (high) dose estimates for noninvolved workers. In addition, the dose assumes no dust suppression to control fugitive dust emissions.

- The collective latent cancer risk to occupational workers (mainly truck drivers) would be $9.3 \times 10^{-3}$, or 1 chance in 100.[5]
- The collective latent cancer risk from accidental releases of radioactive materials following accidents severe enough to damage the containers would be $1.2 \times 10^{-10}$, or 1 chance in 8 billion.
- Collective pollution health effects would be $2.2 \times 10^{-3}$, or 1 chance in 450.
- Traffic fatalities would be 0.023, or 1 chance in 43.

The 356 round-trip shipments to the NTS site and 9 round-trip shipments to a local landfill were used to bound the transportation risk; actual vehicle-kilometers traveled are expected to be less.

### *5.1.10 Natural Hazards and Accidents*

A draft Auditable Safety Analysis (ASA) (Williams 2001) was prepared for the proposed decontamination of Building 301. The major safety considerations are industrial, natural phenomena, and radiological hazards. The ASA showed the potential for only localized consequences. Required health and safety analyses would be included in the project health and safety plan.

#### *5.1.10.1 Natural Hazards*

Risks associated with earthquakes, lightning, and floods are considered negligible (Williams 2001). The impact of a tornado would be negligible because most of the limited amount of radioactive material in Building 301 is in the form of contaminated metals and concrete, which would not be readily dispersed (Williams 2001).

#### *5.1.10.2 Accidents*

Accidents could occur in all proposed action operations, including maintenance, on-site transportation, characterization, disassembly, and packaging for off-site disposal. Potential causes of accidents could include vehicular crashes, forceful contact with objects and equipment, and falls. Based on about 78,000 person-hours of effort required to implement the proposed action and an occurrence rate of about $7 \times 10^{-8}$ fatalities per hour for construction-related activity (BLS 1996a), no fatal accidents would be expected to occur during the proposed action (risk of 0.0055, or 1 chance in 1,800). Based on a rate of nonfatal occupational injuries and illnesses of about $5 \times 10^{-5}$ cases per hour for heavy construction workers, except highway (BLS 1996b), about 4 nonfatal occupational injuries and illnesses are anticipated.

The numbers of fatalities and injuries estimated for the proposed action (less than one) are based on average construction industry rates. Accident rates for the proposed action would be expected to be lower because of the safety programs that would be in place for decontamination and

[5] Specific measurements of dose rates for the shipping containers are not available. Rather than conducting detailed shielding analyses for specific containers, DOE assumed that the dose rate for the containers was 1 mrem per hour at 1 meter from the containers, which is a typical dose rate used for LLW shipping analyses. This is an overestimate and results in a conservative collective dose estimate for transportation workers.

demolition workers at ANL. Three large decontamination and demolition projects—the Experimental Boiling Water Reactor (EBWR), the Janus Reactor, and the CP-5 Reactor—involved 325,000 person-hours of work with no lost-time accidents, and only minor injuries occurred during the performance of these projects. Lessons learned from the decontamination and demolition of EBWR, Janus, and CP-5 would be incorporated into the plans and procedures for the decontamination and demolition of Building 301 to further reduce the probability of an injury.

#### *5.1.10.3 Terrorism or Sabotage*

Although ANL is a secure site with security gates and security guards on duty at all times, DOE also considered the potential for a terrorist attack or sabotage during the decontamination and demolition of Building 301 and during the transportation of waste. The impacts of such an unlikely event would be similar to those associated with natural hazards such as tornadoes or the impacts of an accident involving a truck carrying waste from the site. These impacts are addressed in Sections 5.1.10.1 and 5.1.9, respectively.

### *5.1.11 Other Potential Direct, Indirect, Cumulative or Long Term Impacts*

Cumulative impacts are defined as "the impact which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions" (40 CFR § 1508.7). Based on the impact analysis of past decontamination and decommissioning projects such as those conducted for the CP-5 Reactor and the EBWR, the incremental impact of the proposed action would be minimal and would not be significant when added to impacts from other projects at ANL, including ongoing operations. There are no planned future actions in the vicinity of Building 301.

### *5.1.12 Compliance with Environmental Laws, Regulations, Permits, and Orders*

The proposed action would comply with applicable federal, state, and local laws and regulations as well as current permits. The applicable and potentially applicable environmental laws, regulations, DOE Orders, and relevant permits are summarized below:

- IEPA Title V air permit for ANL and construction permit for radionuclide emissions to the environment
- IEPA regulations for air pollution control
- IEPA NPDES permit for ANL
- IEPA RCRA Part B permit for the treatment and storage of hazardous and mixed waste
- DOE Order 435.1 governing radioactive waste management and DOE Order 5400.5 governing decontamination / decommissioning of certain structures
- Occupational Safety and Health Administration standards and/or 10 CFR Part 851
- Department of Transportation regulations governing shipment of hazardous and radioactive materials

### *5.1.13 Pollution Prevention*

The proposed action would be performed in accordance with ANL's waste minimization and pollution prevention practices. Efforts would be made during the disassembly process to recycle lead brick to the ANL lead bank for future use on-site. Efforts would also be made to recycle metal, bricks, and equipment that are not activated or contaminated.

## 5.2 Environmental Impacts of the No Action Alternative

Under the no action alternative, Building 301 would not be decontaminated and the building would not be demolished. Surveillance and maintenance activities would continue to ensure adequate containment of radioactive materials and would provide physical safety and security controls to allow for personnel access. This alternative would result in continued radiation exposure to surveillance and maintenance personnel and the continued risk of release of material due to accidents or natural hazards or terrorism. Releases to the air and water would not increase, transportation risks would be avoided, and cultural resources would not be affected.

## 5.3 Environmental Impacts of Other Alternatives

As noted in Section 3.3, DOE considered alternatives to both decontamination and demolition. Decontamination Alternatives 1 – 6 (see Table 2) would involve more decontamination activities and result in the generation of a smaller overall volume of LLW because not all waste materials would be considered to be LLW. This would result in fewer public and worker human health effects because the radiation dose from demolition of decontaminated surfaces would be even lower than those from the "Demolish All as Contaminated" alternative. The lower volume of LLW would require fewer vehicle miles traveled because much of the demolition waste considered to be LLW under the "Demolish All as Contaminated" alternative could go to local landfills rather than to specialized LLW disposal facilities in Utah or Nevada. Fewer vehicle miles traveled would result in fewer human health impacts.

As an alternative to demolition, the cleanup of Building 301 for reuse was evaluated in the 2000 EA (DOE 2000), resulting in a Finding of No Significant Impact. However, no future use for this building has been found for this facility since that time. Over time, increasing costs for maintenance and repair will necessitate the demolition of this building.

# 6.0 RELATIONSHIP OF THE PROPOSED ACTION TO OTHER NEPA REVIEWS

There are no currently known actions undergoing NEPA reviews that are related to the proposed decontamination and demolition of Building 301. As noted above, an EA prepared in 2000 on the *Proposed Decontamination and Decommissioning of Building Hot Cell Facility at Argonne National Laboratory* (DOE 2000) addressed removal of contaminated equipment and decontamination of hot cells.

# 7.0 INDIVIDUALS AND AGENCIES CONSULTED

Illinois Historic Preservation Agency, A.E. Haaker, (March 22, 1999)

Advisory Council on Historic Preservation, T.M. McCulloch (April 14, 1999)

## 8.0 REFERENCES


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## APPENDIX A: INTERAGENCY CORRESPONDENCE

Illinois Historic Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1507 • (217) 782-4836 • TTY (217) 524-712

DuPage County
Argonne National Laboratory-East
DOE-Eligibility Assessments--Buildings 314/315/316, 211 and 301
DOE-Eligibility Re-assessment--Building 829
IHPA Log #10101598; 05041498 (829)

December 1, 1998

RECEIVED
DEC - 3 1998
U.S. DEPARTMENT OF ENERGY
ARGONNE GROUP

Timothy Crawford
Argonne Group Manager
Department of Energy
9800 South Cass Avenue
Argonne, IL 60439

Dear Mr. Crawford:

Thank you for requesting comments from our office concerning the eligibility of several buildings at Argonne National Laboratory-East. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

Our staff has reviewed the National Register Eligibility Evaluation of the 314/315/316 Building Complex; the additional map provided for the layout of 314/315/316; the National Register Eligibility Evaluation of the 60-inch Cyclotron in Building 211; the National Register Eligibility Evaluation of the Physics and Metallurgy Hot Laboratory, Building 301; and the Addendum to the National Register Eligibility Evaluation of the Hydrogen Test Building (Building 829).

We concur with the recommendations that Building 301 and Building Complex 314/315/316 are eligible. It should be noted that the 314 addition of the 314/315/316 complex is a non-contributing addition. We also concur with the recommendation that Building 211 is not eligible. We have also reviewed the additional information provided regarding the re-evaluation of Building 829. We agree that based upon this additional information, Building 829 is not eligible.

Please contact our office regarding the specifics of the IL HABS/HAER documentation for Building 301, ZPR VI and the ZPR IX control panel at your convenience. If you have any further questions, please contact Tracey A. Sculle, Cultural Resource Manager, 217/785-3977.

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:TAS

MAR 2 2 1999

Ms. Anne E. Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

References: 1. Letter, T. Crawford to A. Haaker, dated October 14, 1998

2. Letter, A. Haaker, to T. Crawford, dated December 1, 1998

Enclosed is a draft memorandum of agreement addressing the decontamination and decommissioning and eventual demolition of Building 301 (IHPA Log #10101598) on the Argonne National Laboratory site (enclosure 1).

We need to decontaminate and decommission (D&D) this building because it is contaminated with radioactive materials. We have also requested funding to demolish the building and restore the area to a condition suitable for potential future development. We would like to demolish the building because we do not have a use for it. The building is expensive to maintain; it cannot be economically converted to meet anticipated future needs; and it may be necessary to demolish the building to confirm removal of contaminated soil under the building.

Building 301 has 30,550 gross square feet and includes obsolete caves, a high bay, and a few supporting ancillary offices. We considered using Building 301 to provide office space, since we have a shortage of office space on site. We estimated costs to correct the deficiencies noted in enclosure 2, expand the office space, and operate Building 301 and compared these with estimated costs to construct and operate a new building. We concluded that use of Building 301 as office space would not be cost effective.

We also considered other potential future uses for Building 301. However, it would not make an efficient storage facility and the high bay area is too confined to be practical for most uses. It would be difficult to open up the building interior for more flexible uses due to the existing masonry construction.

Since the caves and high bay areas in Building 301 have not been used for several years, nearly all of the equipment used in these areas is gone. However, two sets of manipulator arms remain. These were used to allow workers outside the hot cells to move radioactive materials inside the cells. We plan to salvage and properly curate these manipulator arms.

If you have any questions or would like us to make any changes to the draft documents, please contact Donna Green at (630) 252-2264.

Sincerely,

SIGNED BY

Timothy S. Crawford
Argonne Group Manager

Enclosures:
As Stated

cc: T. McCulloch, Advisory Council on Historic Preservation, w/encls.
L. Thompson, EH-412/FORS, w/encls.

APR 1 4 1999

Mr. Thomas M. McCulloch
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW #809
Washington, D.C. 20004

Dear Mr. McCulloch:

Enclosed is a proposed memorandum of agreement for acceptance by the Advisory Council on Historic Preservation. The agreement addresses decontamination, decommissioning, and demolition of Building 301 at Argonne National Laboratory-East; the Department of Energy and the Illinois Historic Preservation Agency have signed it. Also enclosed is a National Register eligibility evaluation report for Building 301.

If you have any questions, please contact Donna Green at (630) 252-2264.

Sincerely,

SIGNED BY

Timothy S. Crawford
Argonne Group Manager

Enclosures:
As Stated

cc: A. Haaker, Illinois Historic Preservation Agency, w/o encls.
L. Thompson, EH-412/FORS, w/o encls.

MEMORANDUM OF AGREEMENT
BETWEEN THE U.S. DEPARTMENT OF ENERGY AND
THE ILLINOIS HISTORIC PRESERVATION OFFICER
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
PURSUANT TO 36 CFR 800.5(e)(4)
REGARDING THE DECONTAMINATION, DECOMMISSIONING,
AND DEMOLITION OF BUILDING 301

WHEREAS the U.S. Department of Energy, Argonne Group (DOE-ARG) proposes to decontaminate and decommission (D&D) building 301 for reasons of environmental concern, human health, and safety; and

WHEREAS the DOE-ARG has requested funding to demolish building 301 because the building is not needed, is expensive to maintain, cannot economically be made to meet anticipated future needs, and may need to be demolished to verify removal of contaminated soil; and

WHEREAS the Department of Energy has established that the proposed project's area of potential effects, as defined at 36 CFR 800.2(c), to be the Argonne Illinois site; and

WHEREAS the Department of Energy has determined that demolishing building 301 will have an adverse effect on this property which is eligible for inclusion in the National Register of Historic Places; and

WHEREAS the Department of Energy has consulted with the Illinois State Historic Preservation Officer (SHPO) in accordance with Section 106 of the National Historic Preservation Act, 16 U.S.C. Section 470 (NHPA), and its implementing regulations (36 CFR Part 800) to resolve any adverse effect of the D&D and demolition of building 301 on potentially historic properties;

NOW, THEREFORE, DOE-ARG and the SHPO agree that upon acceptance of the MOA by the Advisory Council on Historic Preservation (Council), and upon DOE-ARG's decision to proceed with the D&D and demolition of building 301, DOE-ARG shall ensure that the following stipulations are implemented in order to take into account the effects of D&D and demolition of building 301 on historic properties.

STIPULATIONS

DOE-ARG will ensure that the following measures are carried out:

I. Prior to demolishing building 301, DOE-ARG shall document this building in accordance with the Illinois Historic American Buildings Survey/Historic American Engineering Record (IL HABS/HAER) Standards.

A. IL HAER recordation number will be Du 1999-1.

B. Level III shall be required.

C. DOE-ARG will ensure that the recordation will be conducted by a person qualified to perform the work as required under 36 CFR Part 61, Appendix A and agrees to meet IL HABS/HAER Standards.

D. The SHPO will review the completed IL HABS/HAER documentation and accept the final submittal in accordance with IL HABS/HAER Standards.

E. After SHPO acceptance, completed IL HABS/HAER documentation will be deposited with the archives section of the Illinois State Historical Library. The SHPO requires one standard and one microfiche copy of accepted documentation.

II. Two sets of manipulator arms that were used to move materials in the building 301 caves will be properly stored pending identification of curation facility.

III. In the event a party to this MOA determines the terms of the MOA cannot be met or that a change is necessary to meet the requirements of the law, that party will immediately request that the other parties to this MOA consider an amendment or addendum. Any necessary amendment or addenda will be executed in accordance with 36 CFR 800.5(e)(5).

Execution of this MOA by the DOE-ARG and the Illinois SHPO, its subsequent acceptance by the Advisory Council on Historic Preservation (Council), and implementation of its terms, shall constitute evidence that the DOE-ARG has afforded the Council an opportunity to comment of the nature and extent of the planned demolition of building 301 and that DOE-ARG has taken into account the effects of the undertaking on historic properties as required by Section 106 of the National Historic Preservation Act.

Signature sheet for the foregoing Memorandum of Agreement Among the United States Department of Energy and the Illinois State Historic Preservation Office covering D&D and demolition of building 301 at Argonne National Laboratory-East.

U.S. Department of Energy, Argonne Group

By:______________________ Date: 3/22/99

Timothy S. Crawford, Manager
Argonne Group

Illinois State Historic Preservation Officer

By:______________________ Date: 4/8/99

This Memorandum of Agreement Among the United States Department of Energy and the Illinois State Historic Preservation Officer covering demolition of building 301 at Argonne National Laboratory-East has been accepted for the Advisory Council on Historic Preservation.

Advisory Council on Historic Preservation

By:______________________ Date: 5/25/99

Mr. John M. Fowler, Executive Director