DOE/EA-1295

# ENVIRONMENTAL ASSESSMENT

PROPOSED DECONTAMINATION AND DECOMMISSIONING OF

BUILDING 301 HOT CELL FACILITY

AT ARGONNE NATIONAL LABORATORY


U. S. Department Of Energy
Chicago Operations Office

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# ACRONYMS

| | |
|---|---|
| ANL-E | Argonne National Laboratory-East |
| ASA | Auditable Safety Analysis |
| CFR | Code of Federal Regulations |
| Ci | Curie |
| CP-5 | Chicago Pile - 5 |
| D&D | Decontamination and Decommissioning |
| DOE | U.S. Department of Energy |
| EBWR | Experimental Boiling Water Reactor |
| FFCA | Federal Facilities Compliance Act |
| HEPA | High Efficiency Particulate Air (filter) |
| IEPA | Illinois Environmental Protection Agency |
| mrem | millirem |
| NEPA | National Environmental Policy Act |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| NRC | Nuclear Regulatory Commission |
| OSHA | Occupational Safety and Health Administration |
| PCB | Polychlorinated Biphenyl |
| RCRA | Resource Conservation and Recovery Act |
| USEPA | United States Environmental Protection Agency |
| WMO | Waste Management Operations |
| yr | Year |

## 1.0 BACKGROUND

### 1.1 Facility Description and History

Building 301, also known as the Hot Cell Facility, is located in the south central area of Argonne National Laboratory-East (ANL-E) (see Figure 1). Constructed in 1950, it 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 nuclear reactor development program. The design included work areas that were alternately referred to as either “hot cells” or “caves”. These areas provided shielding from radiation so that the researchers could work safely with radioactive materials without exposing themselves to high doses of radiation.

During the 1950's, 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 1(1950) and 2(1951) were the first cells built after the completion of the building. They were constructed using high-density concrete. Later, Cells 3 A/B/C(1954), 4A/B(1958), and 5(1960) were added. These cells were built of steel shells filled with a magnetite material. Starting in the 1970s, research became focused on uranium oxide mixtures. In 1974, paint was applied to the previously unpainted floors and walls to fix contamination. Part of the first floor and the second floor of Building 301 were used for office space by the workers. At the present time, the second floor and a portion of the first floor are not radiologically controlled areas.

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 (see Figure 3). Dimensions of the main building are 104 ft x 104 ft with the southeast wing being 52 ft x 52 ft and the covered loading dock 28 ft x 26 ft. The building contains a partial basement service floor and a sub-basement retention tank room, a main floor, and a partial second floor containing offices and a lunch room, (see Figures 2,3,4). A "penthouse" laboratory is located in the area originally designed to house the elevator machinery. There is also a dirt “crawl space” area below the hot cells that is only accessed through a hatch located outside the east wall.

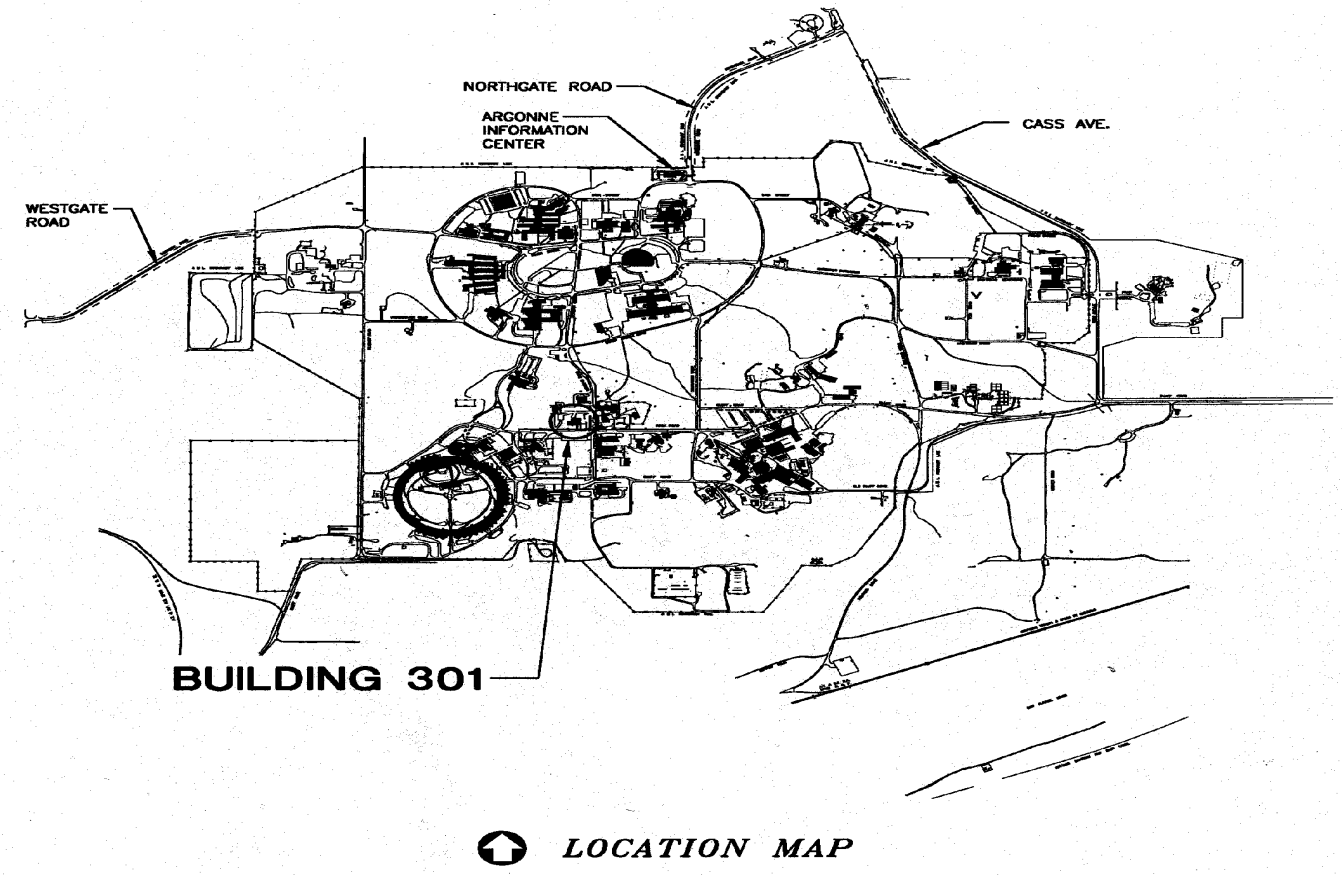



**Figure 1 Location of Building 301 at the ANL-E Site**

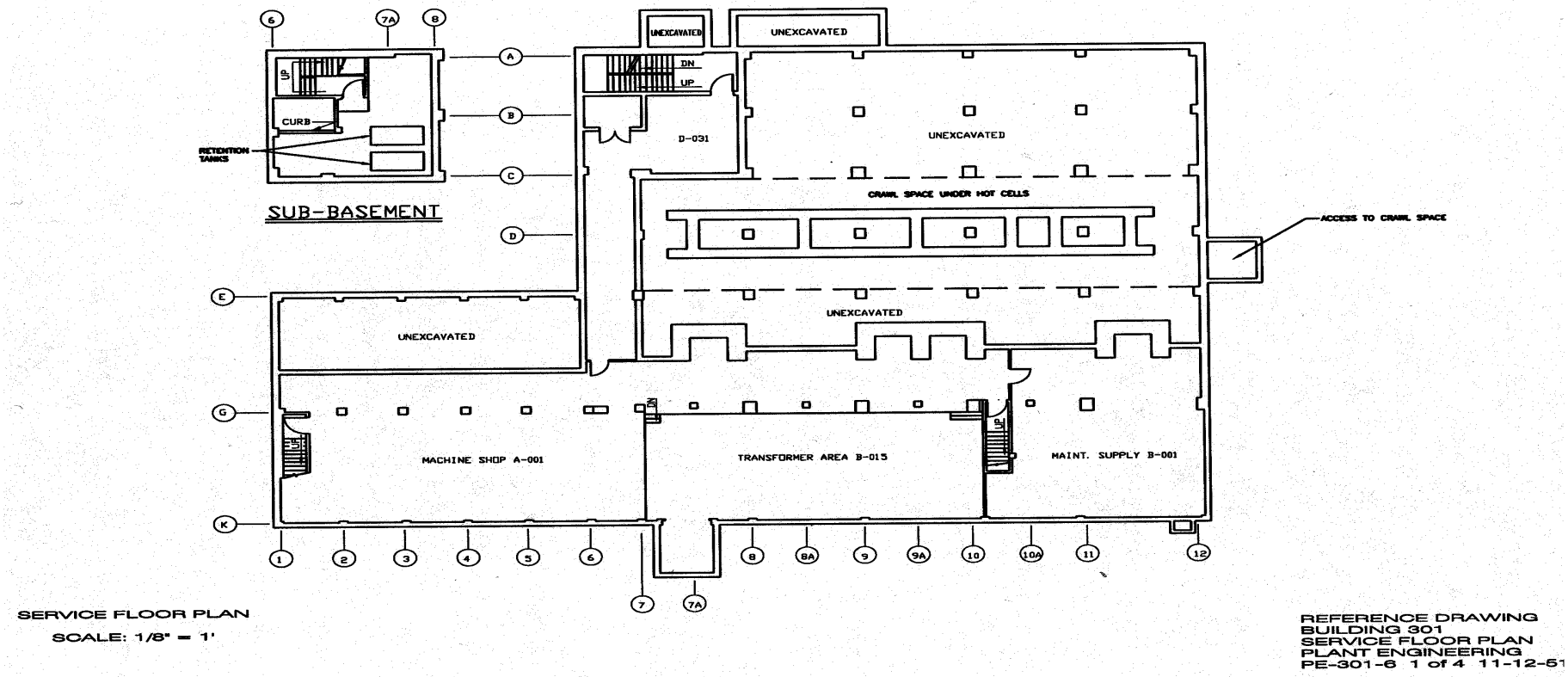



**Figure 2 Basement Service Floor Plan**

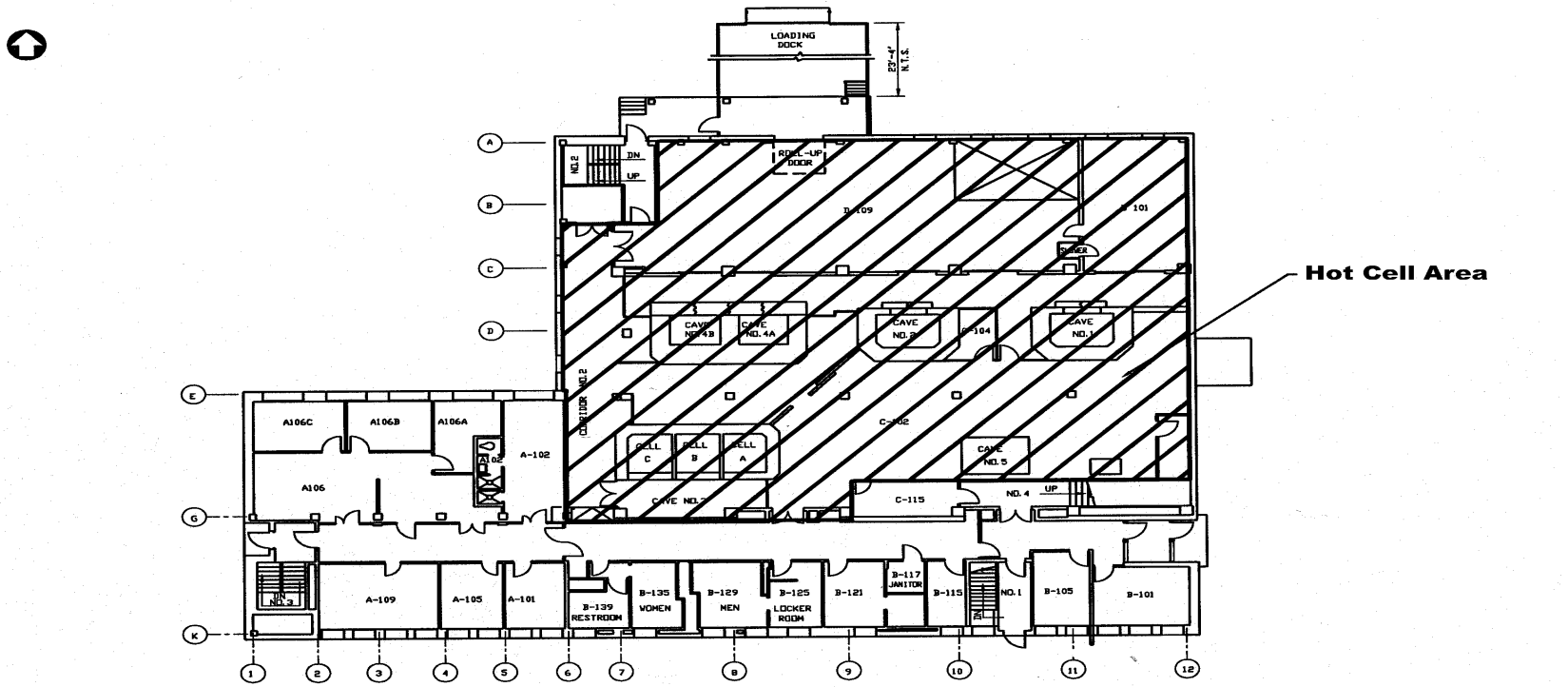
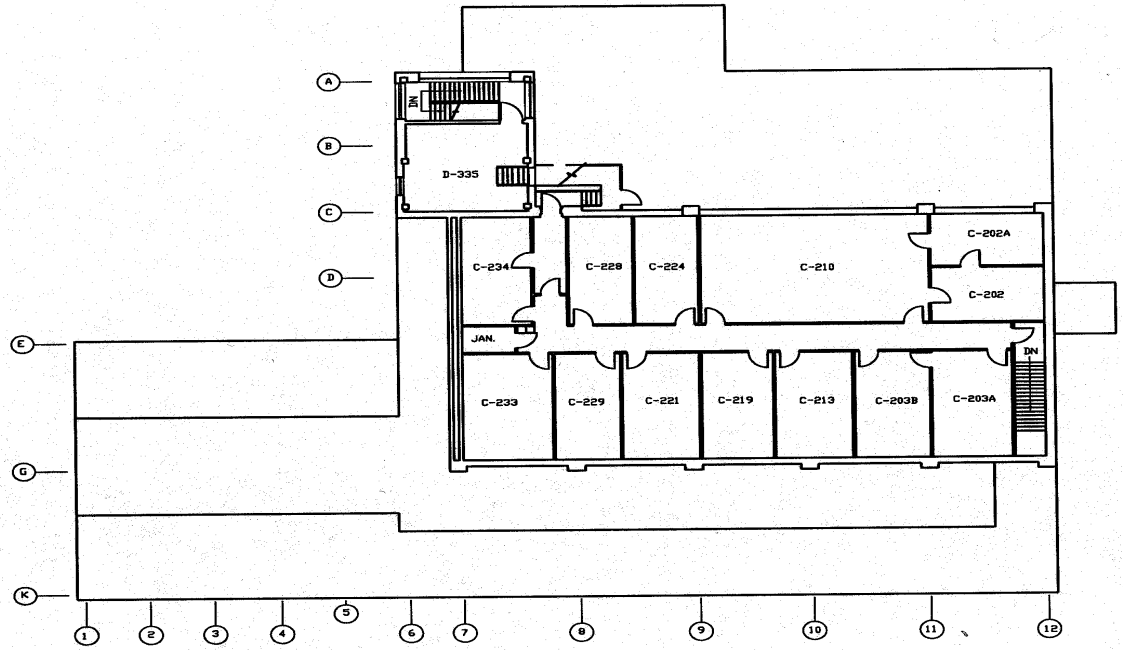



**Figure 3 Hot Cell Area in Building 301 (shaded area) and Main Floor Plan**




SECOND FLOOR AND MACHINE ROOM PLAN
SCALE: 1/8" = 1'

REFERENCE DRAWING
BUILDING 301
SECOND FLOOR AND
MACHINE ROOM PLAN
PLANT ENGINEERING
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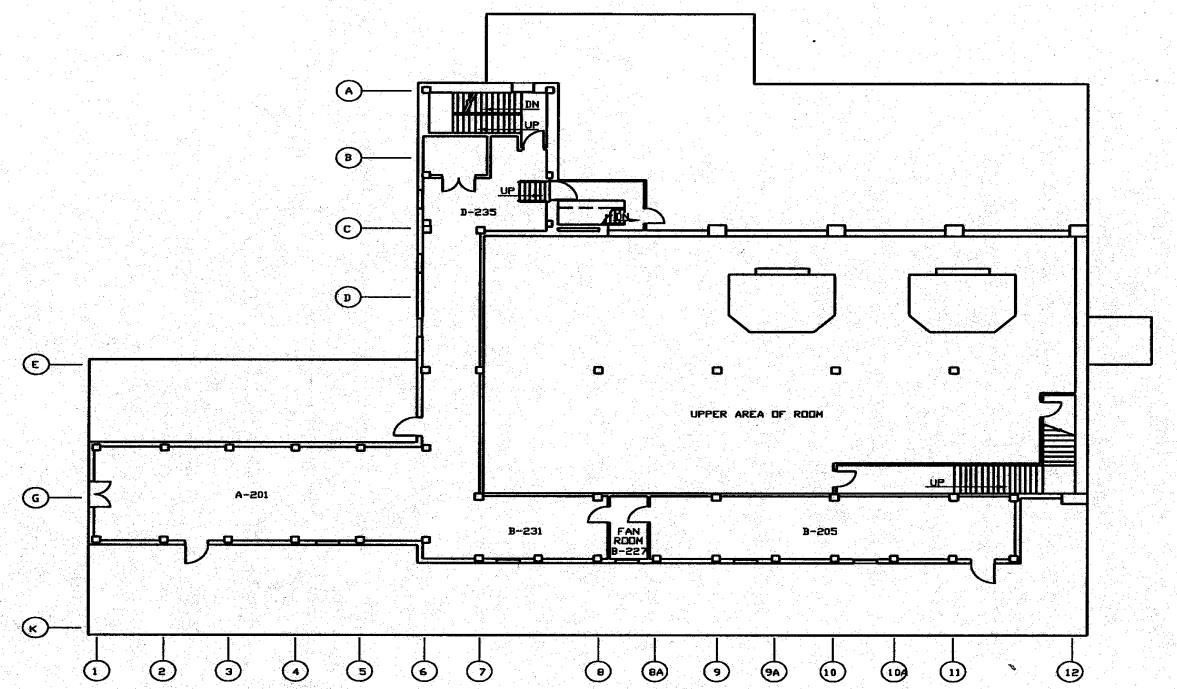
**Figure 4 Second Floor and Machine Room Plan**




FAN LOFT PLAN
SCALE: 1/8" = 1'

REFERENCE DRAWING
BUILDING 301
FAN LOFT PLAN
PLANT ENGINEERING
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**Figure 5 Fan Loft Plan**

## 1.2 Current Status

Offices on the second floor and a partial area of the first floor have recently been vacated. The electrical substation and emergency generator are in service and performing as designed. The hot cell area (Figure 3) was shut down in the early 1990's and is contaminated with low level radioactive material. The hot cell area is posted as a radiologically contaminated area and the entrance door is locked. Access to the area is controlled.

Building 301 was characterized in early 1998 and a Characterization Report was issued in July 1998. Additional sampling was conducted and a supplemental characterization report was issued in April 1999. The key points of the characterization findings are as follows:

- The total radioactive material inventory is approximately 2.32 mCi.
- 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 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 cm layer of the concrete floor.
- The predominant nuclide detected inside the hot cell area was Cs-137, with small quantities of Am-241, Bi-214, Eu-154, Eu-155, Sr-90, Co-60, and Pu-238.
- Soil samples were taken in the crawl space under the hot cells and contamination was found. Radioactive contaminants of Pu-238, Pu-239, Pu-240, U-235, U-236 and U-238 were found in the upper 12 inches of soil.
- General area dose rates are below 1 mrem/hr throughout the facility.

# 2.0 PURPOSE AND NEED

The purpose of this project is to remove radiologically contaminated components and equipment in such a fashion as to limit the spread of contamination and to minimize waste. The project is needed because it promotes the cleanup of contaminated surplus facilities at the ANL-E site.

## 3.0 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

### 3.1 The Proposed Action

The proposed action is the decontamination and decommissioning (D&D) of Building 301. This includes 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. This work would be performed indoors in Building 301. The D&D would leave Building 301 in a safe lay-up condition. There are no current plans to reuse this structure for other ANL-E operations. Although DOE's original proposal had been to demolish Building 301 following the building's D&D, due to funding constraints there are no plans to demolish Building 301 within the next five to ten years. Thus demolition is no longer part of the proposed action analyzed in this environmental assessment. An additional NEPA review would be done at the time there is a proposed action concerning the disposition of the building.

The proposed activities are broken down into phases of work, as listed in Table 1. These phases are organized around major components of the facility and may not necessarily be performed in the sequence presented. Figures 2, 3, 4, and 5 denote the location where the following activities would take place.

**Table 1 Proposed Activities**

| PHASE OF WORK | TYPES OF ACTIVITIES DURING WORK |
|---|---|
| Lead Removal | Disassemble, survey and package lead bricks and items as either mixed waste or recoverable material. |
| Electrical Equipment | Electrically isolate and remove all electrical components and associated wiring from within the hot cell area. |
| Miscellaneous Equipment | Survey for "free release" all miscellaneous materials (i.e., furniture, tools and equipment). "Free release" refers to items that have been checked for radioactive contamination with no contamination present and are released for unrestricted use. Package activated/contaminated items as low level radioactive waste and "clean" material as surplus or recycle. "Clean" material is material that has been free released and contains no radioactive contamination. |

| PHASE OF WORK | TYPES OF ACTIVITIES DURING WORK |
|---|---|
| Cells 1,2 &5 (see Figure 3) | Disassemble doors, remove electrical boxes, conduit and other attachments. Remove paint and contamination from all surfaces by mechanical methods (grit blasting, scabbling, and scraping) or decontamination solution. Survey for "free release". Remove and package ceilings and walls as clean waste. |
| Cells 3 A/B/C (see Figure 3) | Disassemble doors, remove electrical boxes, conduit and other attachments. The manipulator arms will be deenergized and removed. Two sets of manipulator arms will be properly stored pending identification of a curation facility (see appendix Memorandum of Agreement). Drain and remove viewing windows. Remove paint and contamination from all surfaces by mechanical methods (grit blasting, scabbling, and scraping) or decontamination solution. Survey for "free release". Remove and package ceilings and walls as clean waste. |
| Cells 4 A/B (see Figure 3) | Disassemble doors, remove electrical boxes, conduit and other attachments. Remove paint and contamination from all surfaces by mechanical methods (grit blasting, scabbling, and scraping) or decontamination solution. Survey for "free release". Remove and package ceilings and walls as clean waste. |
| Room D-109 (see Figure 3) | Remove fume hoods, lab benches, overhead crane, shielded glove box and in-floor specimen area. Remove paint and contamination from all surfaces by mechanical methods (grit blasting, scabbling, and scraping) or decontamination solution. |
| Room D-101 (see Figure 3) | Remove concrete block wall (4 ft. high). Remove paint and contamination from all surfaces by mechanical methods (grit blasting, scabbling, and scraping) or decontamination solution. |
| Ducts/Fan Loft/Stacks (see Figure 5) | Remove exhaust ducts leading to the fan loft, the fans, filters and exhaust ducts in the fan loft, and the exhaust stacks on the building roof. Package as low level waste. Temporarily patch openings in the walls, floor and roof. |
| Penthouse Area (see Figure 4) | Survey and decontaminate (by mechanical methods or decontamination solution) as necessary. Remove lead traps from the chemical sinks. Survey lead for contamination and release for recovery or dispose of as mixed waste. |

| PHASE OF WORK | TYPES OF ACTIVITIES DURING WORK |
|---|---|
| Sub-basement (see Figure 2) | Survey and decontaminate (by mechanical methods or decontamination solution) as necessary. Remove two (2) 1,000-gallon retention tanks and interconnecting piping and package as low level waste. |
| Crawl Space below Hot Cell Area | Survey, remove and package contaminated soil as low level waste. The maximum amount of soil removal would be 1000 $ft^3$. Remove any contaminated piping in the area and package as low level waste. |
| Area Decontamination | Decontaminate by mechanical methods or decontamination solution any additional contamination discovered during the D&D of Building 301. |
| Final Survey | Perform a final radiological survey to confirm cleanup levels. |
| Asbestos Removal | Remove and package asbestos waste. Dispose of per WMO procedures and DOE policies and procedures |
| Surveillance and Monitoring | Perform activities after the completion of the D&D to ensure the safe and efficient operation of the Building 301 support facilities, equipment and administrative functions. Activities include periodic inspections, maintenance and heath physics surveys of the building. |

No hazardous materials would be introduced into the project area. Cleaning supplies, decontamination solutions and other non-hazardous materials would be stored in cabinets designed for that purpose. Storage amounts expected to be used would be kept to the minimum and would be inventoried periodically.

## 3.2 No Action Alternative

Under a No Action Alternative, Building 301 would not be decontaminated and the existing equipment would not be removed. The facility would be maintained as at present in its present condition. Surveillance and monitoring activities would continue to ensure adequate containment of radioactive contamination, maintain HEPA filters in the ventilation system, provide physical safety and security controls and to preserve the facility to allow for personnel access.

## 4.0 THE AFFECTED ENVIRONMENT

### 4.1 Site Description

The ANL-E site is approximately 27 miles southwest of downtown Chicago and 24 miles west of Lake Michigan. The ANL-E site is surrounded by the 2,040 acre Waterfall Glen Forest Preserve, which is used as a public recreational area, nature preserve, and demonstration forest. ANL-E occupies 1,500 acres in southern DuPage County, Illinois. There are between 4,000 and 5,000 people who work daily at the site.

The land use in the surrounding area is varied and includes residential, commercial and industrial properties. No permanent residents live within 1 mile of the center of the project site.

### 4.2 Cultural Resources

#### 4.2.1 Archaeological Sites

The entire ANL-E facility has been surveyed for archaeological sites (Bird 1992; Bird and Johnson 1993; Demel 1993a-c). Forty-six sites have been identified. Three of the sites are eligible for the National Register of Historic Places (Demel and Lurie 1994; Elias and Greby 1990), 21 sites have been determined ineligible, and 22 sites have yet to be formally evaluated. None of the archaeological sites would be affected by the D&D of Building 301.

#### 4.2.2 Historic Structures and Objects

Building 301 is significant for its architectural and engineering value. It is characteristic of the earliest buildings at ANL-E and is unique in that it retains considerable integrity. Building 301 contains five caves that provide a representative timeline in cave development and engineering for the peak years of nuclear research 1950-1960. These facilities in Building 301 were instrumental for the development of reactor fuel studies. Building 301 is eligible for nomination to the National Register of Historic Places under Criterion C for its engineering and architectural value (Illinois Historic American Buildings Survey, IL HABS No. DU-1999-1). Two sets of manipulator arms used in the hot cells are also considered to be of significance.

### 4.3 Air Quality

Routine continuous monitoring of sources of radionuclide air emissions at ANL-E has indicated that the amount of radioactive material released to the atmosphere 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 1999, from radionuclide air emissions other than radon-220, was 0.043 mrem which is 0.043 % of the 100 mrem per year DOE standard. The maximum individual dose to an off-site member of the public in 1999 from all radionuclide air emissions, including radon-220, was 0.076 mrem. (Golchert and Kolzow 2000)

Air monitoring was also conducted at ANL-E perimeter and off-site sampling stations for total alpha activity, total beta activity, strontium-90, isotopic thorium, isotopic uranium, and plutonium-239 (Golchert and Kolzow 2000). No statistically significant difference was identified between samples collected at the ANL-E perimeter and samples collected off-site.

# 5.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

## 5.1 Environmental Impacts of Decontamination and Demolition

### 5.1.1 Sensitive Resources

The proposed D&D activities would be conducted indoors. The only outside activity would be the transportation of waste. There would be no environmental impact on wetlands, flood plains, or endangered species.

### 5.1.2 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 lab and of its importance in the development of hot cells. The D&D of Building 301 would be an adverse effect (Haaker 1998). DOE would mitigate for this adverse effect by completing Illinois Historic American Engineering Record documentation for Building 301 and having the manipulator arms properly stored in accordance with a memorandum of agreement with the Illinois Historic Preservation Agency (Crawford 1999a and b) (see Appendix).

### 5.1.3 Waste Disposal Capacity

Table 2 shows the types and amounts of waste generated for the proposed D&D activities. Approximately one (1) truck load of clean waste, thirty-five (35) truck loads of low level waste and one (1) truck load of mixed waste would be shipped from ANL-E to off-site facilities during D&D.

Table 2 Waste Generated

| **TYPE OF WASTE** | **AMOUNT** |
|---|---|
| Wastewater | < 55 gallons |
| Hazardous waste (zinc bromide solution, lead based paint chips) | Approximately 8.7 $m^3$ (310 $ft^3$) |
| Low-level waste including soil from the crawl space | Approximately 182 $m^3$ (6,500 $ft^3$) |
| Hazardous and radioactive mixed waste (i.e., surface contaminated and/or activated lead) | Approximately 0.6 $m^3$ (20 $ft^3$) |
| Asbestos waste | Approximately 1.4 $m^3$ (50 $ft^3$) |
| Non-contaminated waste materials (e.g. concrete, metal, wood and plastic from D&D) | Approximately 14 $m^3$ (500 $ft^3$) |

5.1.3.1 Sanitary and Laboratory Wastewater

If outside contractors were used to perform the proposed action instead of ANL-E personnel, thirty contractor personnel would be on site for a period of about twenty-four months. The increase in sanitary water handling requirements would be negligible and well within the excess handling capacity of the laboratory system.

It is anticipated that little if any wastewater will be generated during the project (< 55 gallons total for the project). All wastewater will be collected within the project site and sampled to determine if it meets laboratory wastewater discharge requirements. Minimal impact would result from this small amount of additional wastewater.

5.1.3.2 Conventional Waste

The proposed D&D action would generate approximately 14 cubic meters (500 cubic feet) of non-contaminated waste materials such as concrete, metal, wood and plastic from structures and equipment. Materials would be disposed of at a municipal or commercial landfill with adequate capacity to accept the waste.

5.1.3.3 Hazardous Waste

The proposed action would generate less than 8.7 cubic meters (<310 cubic feet) of hazardous waste in the form of lead-based paint chips and zinc bromide solution. Hazardous waste would be transferred to the ANL-E waste management facility for disposition by a contract vendor in accordance with applicable ANL-E waste management procedures and state Resource Conservation and Recovery Act (RCRA) requirements.

5.1.3.4 Mixed Waste

The proposed action would generate approximately 0.6 cubic meters (20 cubic feet) of mixed waste 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 ANL-E projects as shielding. The remaining lead would be treated and disposed of in accordance with the Federal Facilities Compliance Act (FFCA) Site Treatment Plan for ANL-E.

5.1.3.5 Radioactive Waste

The proposed D&D action would generate approximately 182 cubic meters (6,500 cubic feet) of low level radioactive waste in the form of contaminated concrete, soil, wood, and metal; and surface contaminated plastic, paper and cloth. The major radioactive isotopes are Cs-137, Am-241, Bi-214, Eu-154, Eu-155 and Pu-238. This material would be packaged and shipped to a low level radioactive waste disposal facility, e.g. Hanford, Envirocare, Nevada Test Site.

5.1.3.6 Asbestos

The project will generate approximately 1.4 cubic meters (50 cubic feet) of asbestos waste. The asbestos will be removed by an Illinois licensed contractor and disposed of per ANL-E Waste Management Operations (WMO) procedures and DOE policies and procedures.

5.1.4 Air Quality Impacts

This project would generate very small amounts of particulate air emissions (dust) indoors from size reduction of contaminated lead, metal and concrete. The dust would include lead and small amounts of the radionuclides Cs-137, Am-241, Bi-214, Eu-154, Eu-155 and Pu-238 during D&D operations. Portable HEPA filters that will only be discharged within the building would control air emissions. A NESHAP permit (#98120076) was issued by IEPA for this activity. Work areas would be monitored for airborne activity and respiratory protection would be used when required. The calculated dose rate for this project is $1.16 \times 10^{-4}$ mrem/yr.

5.1.5 Noise Impacts

Noise would be associated with the operation of machinery and equipment such as coring machines, scabblers, jack hammers, fork lifts and portable HEPA filter units. Receptors of such noise would be limited to persons who work in or near Building 301. Noise impacts to persons beyond the site and its buffer zone (Waterfall Glen Nature Preserve) would not be noticed because of the distances from the source. The wearing of hearing protection would be required for workers in areas where noise levels would exceed permissible noise exposures defined in 29 CFR 1910.95.

### 5.1.6 Socioeconomic Impacts/Environmental Justice

Expenditures for the proposed action would be incurred over two years and represent a small fraction of ANL-E's annual operational expenditure. Thus the economic impact of the proposed action would be minor in the context of ANL-E 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 effects of the proposed action. 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 or nonexistent. The area immediately surrounding ANL-E contains neither predominantly low-income nor minority populations.

### 5.1.7 Radiological Impacts

Worker personnel exposures from direct radiation are expected to average less than 100 mrem per worker and the estimated collective worker dose would be approximately 0.313 person-rem. (Vann and Wiese 1999). Based on an occupational risk factor of $4 \times 10^{-4}$ fatal cancers per person-rem (International Commission on Radiological Protection (ICRP) 1991), workers engaged in this proposed project would incur a $8.32 \times 10^{-5}$ collective risk for a fatal cancer.

Worker exposure to radiation would be controlled under established ANL procedures that require doses be kept as low as reasonably achievable and that limit any individual's dose to less than one rem per year. There would be no air emissions from the building. Therefore, there would be no radiological impacts on workers on the ANL-E site or members of the public.

## 5.2 Environmental Impacts of Transportation

Approximately one truckload of clean waste, thirty-five truckloads of low level radioactive waste, and one truckload of mixed waste would leave the site for shipment to disposal sites throughout the twenty four-month duration of the D&D project. This compares to the annual average of about 45 shipments of low-level waste from ANL-E and represents a 78 % increase in low level waste shipments. The projected total of one shipment of clean waste compares to the annual average of about 520 shipments of clean waste from ANL-E and represents a negligible increase in shipments.

Approximately 252,700 vehicle-kilometers would be traveled to dispose of the waste generated by the proposed action. This represents thirty-six round-trip shipments to the Hanford site in Washington State and one round-trip shipment to a local landfill. The Hanford site was used as

bounding assumption since all other possible disposal sites are located closer than ANL-E. Based on national average transportation accident rates of 0.25 accidents and 0.02 fatalities per million kilometers (Saricks and Kvitek 1994) the proposed waste shipments would result in an estimated $6.32 \times 10^{-2}$ risk of an accident and a $5.05 \times 10^{-3}$ risk of a fatality. The risk of fatality would be due to crash impacts, not as a result of cargo hazard.

## 5.3 Natural Hazards and Accidents

An Auditable Safety Analysis (ASA) (Vann and Wiese 1999) has been prepared for the proposed action. The major safety considerations are operational hazards, including fire, and natural phenomena hazards. The ASA shows the potential for only localized consequences.

### 5.3.1 Natural Hazards

Risk associated with earthquake, lightning and floods are considered negligible (Vann and Wiese 1999). All of the proposed disassembly work involving radioactive material would be done inside Building 301, a brick and concrete structure. 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; and would not be readily dispersed (Vann and Wiese 1999).

### 5.3.2 Accidents

Potential accidents in all proposed action operations would include maintenance, on-site transportation, characterization, disassembly, and packaging for off-site disposal. Potential causes of accidents include vehicles, contact with objects and equipment, and falls. Based on about 84,500 person hours of effort required to implement the proposed action and an occurrence rate for fatalities of about $7 \times 10^{-8}$ fatalities per hour for construction-related activity (Bureau of Labor Statistics [BLS] 1996a), no fatal accidents would be expected to occur during the proposed action. 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), no nonfatal occupational injuries and illnesses are anticipated.

The numbers of fatalities and injuries estimated for the proposed action (less than one) is 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 D&D workers at ANL-E. Three recently completed large D&D projects, the Experimental Boiling Water Reactor (EBWR), the Janus Reactor and the CP-5 Reactor, involved 325,000 person hours of work with no loss time accidents and only minor injuries occurred during the performance of these projects. Lessons learned from the D&D of EBWR, Janus, and CP-5 would be incorporated into the plans and procedures for the D&D of Building 301 to further reduce the probability of an injury.

## 5.4 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..." Impact analyses have taken into consideration ongoing ANL-E actions. The incremental impact of the proposed action would be minimal and would not be significant when added to impacts from other projects at ANL-E, including ongoing operations. Other D&D projects in the area of Building 301 include the Building 310 Retention Tanks, Building 335 Juggernaut Reactor, and Building 330 CP-5 Reactor.

## 5.5 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 environmental laws, regulations, DOE Orders and relevant permits are summarized below:

- IEPA air permit for air discharges to the environment.
- IEPA RCRA Part B permit for the treatment and storage of hazardous and mixed waste.
- DOE Orders governing radioactive waste storage and decontamination/decommissioning of certain structures.
- OSHA Standards, made applicable by DOE Orders.
- U.S. Department of Transportation regulations governing shipment of hazardous and radioactive materials.

## 5.6 Pollution Prevention

The proposed action would be in accordance with ANL-E's waste minimization and pollution prevention practices. Efforts would be made during the disassembly process to recycle lead brick to the ANL-E lead bank for future use on-site. Only non-hazardous decontamination solutions would be used.

## 5.7 Environmental Impacts of the No Action Alternative

Under the No Action Alternative, Building 301 would not be decontaminated, the existing equipment would not be removed, and the building would not be demolished. Surveillance and maintenance activities would be continued to ensure adequate containment of radioactive materials, to provide physical safety and security controls and to allow for personnel access. This

alternative would result in continued potential for radiation exposure to surveillance and maintenance personnel and the continued potential for localized risk of release of material due to accidents or natural hazards. Releases to the air and water would not increase, transportation risks would be avoided, and cultural resources would not be affected.

## 6.0 RELATIONSHIP OF THE PROPOSED ACTION TO OTHER NEPA REVIEWS

There are no known NEPA reviews that are related to the proposed D&D of the Building 301.

## 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)

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**APPENDIX**

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 14 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