Department of Energy
Oak Ridge Operations
Weldon Spring Site
Remedial Action Project Office
Route 2, Highway 94 South
St. Charles, Missouri 63303

October 16, 1987

M-K FERGUSON CO.
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WSSRAP CONTRACT 3589

Ms. Katherine Biggs
United States Environmental
Protection Agency
Region VII
726 Minnesota Avenue
Kansas City, Kansas 66101

Dear Ms. Biggs:

INTERIM RESPONSE ACTIONS (IRA'S)

Enclosed are six (6) copies of the documentation for the following four (4) Interim Response Actions:

1. Dismantling of Building 401
2. Dismantling of Building 409
3. Removal of PCB Transformers
4. Debris Consolidation

In addition, we are sending under separate cover, six (6) copies of the technical specifications and drawings from each of the four (4) proposed bid packages.

It is our intention to have copies of these documents in place in the repositories for public inspection, and to provide public notice of their availability on October 19, 1987. This will initiate the twenty one (21) day comment period.

If you have any questions, please give me a call.

Sincerely,

J H McCracken

Rod Nelson
for Project Manager
Weldon Spring Site
Remedial Action Project

Enclosures:
As stated

cc w/enclosures:
D. Bedan, MDNR

The public comment period on this interim remedial action ends on November 9, 1987. Comments may be sent to any of the following:

1. Ms. Katherine Biggs
   U. S. Environmental Protection Agency
   Region VII
   726 Minnesota Avenue
   Kansas City, Kansas 66101

2. Mr. David Bedan
   Missouri Department of Natural Resources
   Post Office Box 176
   Jefferson City, Missouri 65102

3. Mr. Rodney R. Nelson
   Weldon Spring Site Remedial Action Project
   Route 2, Highway 94 South
   St. Charles, Missouri 63303

DISMANTLING OF BUILDING 409

Site Background

The Weldon Spring site is located in St. Charles County, Missouri, about 48 km (30 mi) west of St. Louis. From 1941 to 1944, the U.S. Department of the Army operated the Weldon Spring Ordnance Works at the site for production of trinitrotoluene and dinitrotoluene. In the mid 1950s, a portion of the property was transferred to the U.S. Atomic Energy Commission (AEC), a predecessor of the U.S. Department of Energy (DOE).

From 1957 to 1966, the AEC operated a uranium processing facility at the Weldon Spring site. Impure uranium ore concentrates and some scrap uranium metal were processed at the chemical plant, and thorium-containing materials were also processed on an intermittent basis. Following closure by the AEC, the Army reacquired the chemical plant in 1967 and began converting the facilities to produce herbicides. The buildings were partially decontaminated and some equipment was dismantled. In 1969, prior to becoming operational, the herbicide project was canceled. Since that time, the plant has remained essentially unused and in caretaker status. The Army returned a portion of the Ordnance Works property to the AEC in 1971 but retained control of the chemical plant buildings. In 1984, the Army repaired several of these buildings; decontaminated some of the floors, walls, and ceilings; and removed some contaminated equipment to areas outside of the buildings. In 1985, custody of the chemical plant property was transferred to DOE.

Building 409 was used as an administrative office building during the operational period of the chemical plant. It is located in the eastern portion of the Weldon Spring complex (Fig. 1) about 90 m (300 ft) southwest of the plant, from which it is separated by a former laboratory building. Since the termination of site activities, Building 409 has remained unoccupied.

Site Characterization

The administration building is a two-story structure designed to house 250 persons. It measures 59 m × 29 m × 10 m (192 ft × 96 ft × 32 ft) and encloses about 3,500 m^2 (38,000 ft^2) of floor space. Office furniture and support equipment have been removed from the building but piping remains intact. Both floors are partitioned into numerous small work areas, including individual offices, telephone/teletype rooms, an equipment room, a vault, and a lobby.

The framework of Building 409 consists of structural steel and concrete. Interior walls are paneled with sheet metal, and exterior walls are composed of masonry blocks. The floor is tiled, and the roof is constructed of metal decking, insulation, and a built-up layer of tar and gravel.

The building was serviced by steam, water, and ethylene glycol lines, and these lines are insulated with asbestos-containing material. The bulk of the insulating material

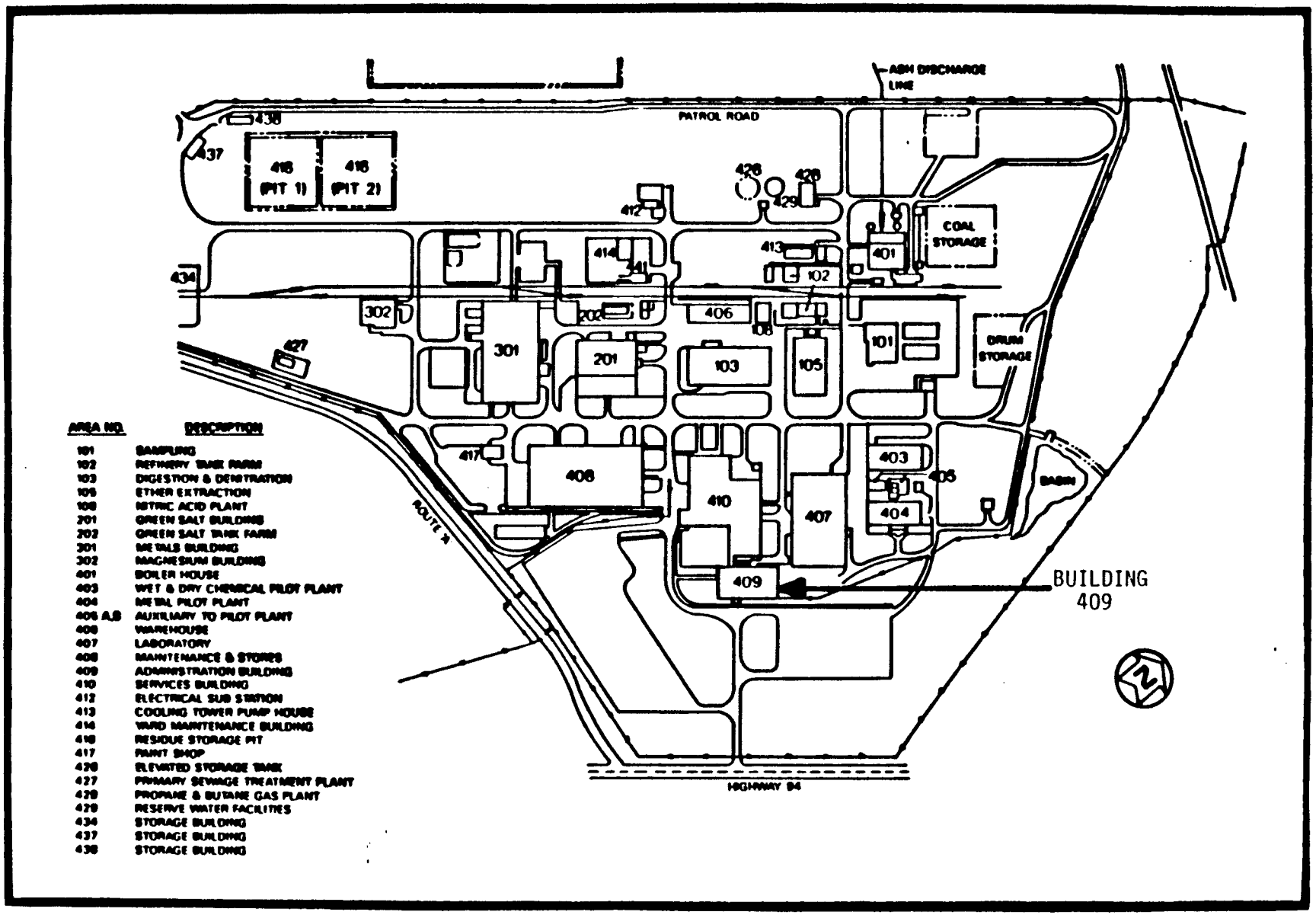

FIGURE 1 Location of Major Structures at the Weldon Spring Site (Source: Bechtel National 1986)

is located in ceiling space between the first and second floors. Although most of the insulation is currently in good condition, i.e., intact and contained by exterior wrappings, there are several localized areas in which friable asbestos has loosened.

A preliminary survey for polychlorinated biphenyls (PCBs) indicated the presence of detectable concentrations of PCBs in the enclosed corridor immediately west of Building 409. Swipe sampling of a 0.6 m × 0.6 m (2 ft × 2 ft) section of the concrete floor surface at this location indicated a PCB level of approximately 100 μg/100 cm^2. Further sampling will be performed to determine the presence and extent of PCB contamination in Building 409.

Results of a radiological survey of the building, presented in Table 1, indicate that contamination levels of the building's floors, walls, and equipment are below the release limits for unrestricted use. These limits are 1,000 disintegrations per minute (dpm)/100 cm^2 removable alpha contamination and 5,000 dpm/100 cm^2 total (fixed plus removable) alpha contamination (U.S. Department of Energy 1987). Since many of the surface areas were wet and muddy when surveyed (resulting in attenuation of alpha particles), beta-gamma measurements were used to estimate the level of alpha activity. Use of beta-gamma measurements will tend to overestimate the actual amount of alpha activity for uranium contamination. This will result in a conservative estimate of the amount of material contaminated in excess of DOE limits for unrestricted release.

Results of an initial survey indicated that three rooms in the building exhibit total beta-gamma contamination levels in excess of the DOE limit for removable alpha contamination (i.e., 1,000 dpm/100 cm^2) but below the limit for total alpha contamination (i.e., 5,000 dpm/100 cm^2). Subsequent sampling of the rooms indicated that the contamination is not removable. Thus, from a radiological standpoint, all of the material inside the building can be released for unrestricted use.

Results of the roof survey given in Table 1 indicate the presence of radioactive contaminants in the tar and gravel layer. The contamination resulted from airborne releases of radioactive dust (containing primarily uranium and its decay products) during the operational period of the chemical plant. Analysis of two samples from the tar/gravel layer identified uranium-238 concentrations of 35.3 and 107.7 pCi/g. (Two samples of the underlying insulation layer had only background levels of uranium.) These measurements indicate that the contamination levels in the built-up tar/gravel roofing material will require that this material be disposed of as radioactive waste.

Threat to Public Health and the Environment

Since its abandonment, the administration building has undergone substantial deterioration. Floor tiles have loosened and begun to break apart, and the roof has weakened to the extent that it leaks badly during rainstorms. Postponed dismantling of the building will result in increased occupational hazards to workers on-site. As an example of the hazards associated with this building, it was necessary to safety-rope a recent survey team during their roof characterization efforts because of unstable structural conditions.

TABLE 1 Summary of Radiological Survey Results for Building 409

Location	Measured Total (Fixed plus Removable) Beta-Gamma Activity	
	Range (dpm/100 cm^2)	Average (dpm/100 cm^2)
First-story floor	0-1,037	257
First-story walls	0-921	253
Second-story floor	0-1,037	212
Second story walls	0-921	297
Roof	2,112-25,147	9,403

Source: Data from MK-Ferguson and Jacobs (1987).

The potential for an asbestos-related health hazard will also increase if the deterioration of Building 409 remains unchecked because the protective coverings that isolate the asbestos from the environment will deteriorate further. In addition, possible PCB contamination of flooring within the building and the radiological contamination of the roof's tar/gravel layer may pose potential exposure hazards to on-site personnel.

Response Objectives

The objectives of this response action are as follows:

1. Reduction of the potential health hazard due to asbestos exposure from asbestos-containing material in Building 409;

2. Reduction of the potential health hazard due to radiation exposure associated with uranium contamination of the roof's tar/gravel layer;

3. Reduction of the potential health hazard due to exposure to floor surfaces that may be contaminated with PCBs; and

4. Removal of the potential safety hazard to on-site personnel due to deterioration of the building.

Proposed Response Action Alternatives

Interim response actions are designed to ensure the health and safety of on-site personnel and to minimize or preclude off-site releases of contamination. These actions are limited to those that can be performed under the Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act and remain within the constraints of the Council on Environmental Quality's regulations for the National Environmental Policy Act (i.e., limited to those that do not have an adverse environmental impact nor limit the choice of reasonable alternatives).

Alternative response actions identified for Building 409 are:

1. No action;

2. Removal of the tar/gravel roof layer and all PCB-contaminated materials for on-site storage, in-situ stabilization of asbestos-containing material, and repair of the building's structural deficiencies;

3. Removal of the tar/gravel roof layer for on-site storage, removal of all PCB-contaminated material for off-site treatment/disposal, removal of asbestos-containing material for off-site disposal, and repair of the building's structural deficiencies;

4. Dismantlement of Building 409, with on-site disposal of all material except that which exceeds the radiological criteria for unrestricted release (i.e., the tar/gravel roof layer, which will be stored on-site), and transport of all PCB-contaminated material to an off-site treatment/disposal facility; or

5. Dismantlement of Building 409, with off-site disposal of all material except that which exceeds the radiological criteria for unrestricted release (i.e., the tar/gravel roof layer, which will be stored on-site), transport of all PCB-contaminated material to an off-site treatment/disposal facility; transport of the remainder of the waste to a sanitary landfill for disposal; and reclamation of reusable materials that are not radiologically or chemically contaminated for salvage or on-site use.

Analysis of Alternatives

Alternative 1 affords no reduction in the potential health threat posed by the radioactive material and the PCB- and asbestos-contaminated material associated with Building 409. There would be no improvement in environmental conditions at the site if no action were taken. This alternative presents no technical barriers and costs nothing in the short term. However, the building is scheduled for eventual demolition. The costs associated with deferred dismantlement would be higher than those for dismantlement at

the current time, due to periodic maintenance activities required until future dismantlement. Most importantly, Alternative 1 is effectively precluded by institutional factors related to the community's strong desire for timely response actions at the Weldon Spring site.

Alternatives 2 through 5 are all technically feasible. Each of these alternatives reduces the potential hazards associated with exposure to PCBs, asbestos, and radiation. Implementation of Alternatives 2 and 3 would be more expensive in the long term, due to the need to repair structural deficiencies and perform future maintenance activities at Building 409. In addition, Alternatives 2 and 3 do not fully address the public sentiment for expedited response at the site. Even though Alternative 4 would be less expensive than Alternative 5, it is not consistent with DOE's intention to dispose of all nonradioactive waste off-site. Therefore, following the screening and analysis process for interim response action alternatives, Alternative 5 has been identified as the preferred alternative.

Description of Proposed Action

The proposed interim response action involves demolition of Building 409 with off-site disposal of all material meeting the criteria for unrestricted radiological release, including PCB-contaminated and asbestos-containing material. The response action will include the following operations.

1. Removal of all PCB-contaminated material for transport to a licensed off-site treatment/disposal facility;

2. Removal of the tar/gravel roofing material to a depth of approximately 5 cm (2 in.) for controlled on-site storage in a dry, concrete-floored building currently located at the Weldon Spring site; and

3. Removal of all asbestos-containing material and dismantlement of the remainder of Building 409, followed by scrap recovery and off-site disposal of the resultant waste material at a licensed sanitary landfill in Missouri.

The foundation and below-grade piping are not part of this action and will be addressed at a later date.

Under the proposed action, Building 409 will be dismantled in full compliance with all applicable regulations and procedures, with off-site disposal of all nonradioacative material (material that exceeds the radiological criteria for unrestricted release will be stored on-site). A representative fraction of material to be disposed of off-site will be radiologically surveyed prior to release. Asbestos removal, removal of the radioactively contaminated roof layer, and PCB decontamination/removal operations will also be performed in accordance with all applicable requirements. This compliance will ensure protection of the safety and health of on-site workers as well as limiting off-site releases of contaminants.

Demolition of Building 401 will proceed in accordance with all safety requirements and practices. Demolition at this time will preclude the associated adverse impacts on health and the environment resulting from continued deterioration of the building. Removal of the demolition debris will be consistent with DOE's goal of removing all nonradioactive waste from the site.

The total waste volume associated with this proposed action is estimated to be approximately 2,000 m^3 (2,700 yd^3), of which about 100 m^3 (130 yd^3) is asbestos-contaminated insulation material and 90 m^3 (120 yd^3) is radioactively contaminated roofing material (the approximate volume of PCB-contaminated material has not yet been determined). The nonradioactive waste will be shipped to a licensed sanitary landfill in Missouri, requiring an estimated 190 truckloads.

References

Bechtel National, Inc., 1986, *Characterization Plan for the Weldon Spring Chemical Plant*, DOE/OR/20722-85, prepared by Advanced Technology Division for U.S. Department of Energy, Oak Ridge Operations Office, Oak Ridge, Tenn. (Draft, Feb.).

MK-Ferguson Company and Jacobs Engineering Group, 1987, *Radiological Survey of Building 409, Draft*, prepared for U.S. Department of Energy, Oak Ridge Operations Office, Oak Ridge, Tenn. (Sept.).

U.S. Department of Energy, 1987, *U.S. Department of Energy Guidelines for Residual Radioactivity at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites* (Revision 2, March).