U.S. Department of Energy
Finding of No Significant Impact
Proposed Low-Level Radioactive
Waste Handling Building
at
Fermi National Accelerator Laboratory, Batavia, Illinois

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: The U.S. Department of Energy (DOE) has prepared an Environmental Assessment (EA), evaluating the impacts associated with the proposed Low-Level Radioactive Waste Building at the Fermi National Accelerator Laboratory (Fermilab) in Batavia, Illinois. As a result of the high energy physics program at Fermilab, small quantities of low-level radioactive wastes are generated. These wastes are collected, sorted and packaged for shipment to an off-site disposal facility in Hanford, Washington. The proposed project includes the construction of a new building to house all low-level radioactive waste handling operations. The building would provide workspace for five full-time workers. The proposed project would improve the efficiency and safety of the low-level radioactive waste handling at Fermilab by upgrading equipment and consolidating operations into one facility.

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Based on the analysis in the EA, the DOE has determined that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an Environmental Impact Statement is not required.

DESCRIPTION OF THE PROPOSED ACTION

The proposed action consists of the construction of a single, modern facility to upgrade and consolidate the current low-level radioactive waste handling operation, currently operated at two facilities separated by approximately one mile. Utility extensions needed for the proposed building include gas, electricity, communications, and sanitary sewer. Utilities would be extended from existing lines within approximately 1300 feet. The facility would include a high bay area with an overhead crane, loading dock, sorting and screening areas, a waste compactor area, a cutting area, and a liquid waste solidification area. This portion of the building would accommodate forklifts, provide storage for equipment and containers, and provide adequate space to carry out all low level radioactive waste handling activities. An attached low bay area would provide office space for five full time workers. The proposed facility would be located nearer to the center of the laboratory site to improve security and diminish the distance travelled from points of generation to the facility. Nearly a mile of roadway would be eliminated from use as a route for low-level radioactive waste. Normal operations in this facility would be unchanged from those presently carried out at Fermilab. No change in the volume, concentration of radioactivity or procedures is proposed or anticipated.

ALTERNATIVES

Three alternatives to the proposed action were considered: (1) upgrading the existing structure, (2) building on an alternative site, and (3) no action.

Upgrading the Existing Structure

This alternative was found to be unreasonable because upgrading the existing structure would not address the need to consolidate operations into one facility, nor would it allow the use of increased mechanization for waste handling operations.

Building on an Alternative Site

An alternative site was found to be reasonable, but it was rejected because it would locate the proposed facility slightly nearer the laboratory boundary and further from the center of laboratory activities. This site offered no environmental or human health advantages to the preferred site.

No Action

The no action alternative is a continuation of ongoing low-level radioactive waste handling activities. This alternative would fail to address the environmental concerns of the Illinois Department of Nuclear Safety and the communities surrounding Fermilab. No action would necessitate the continued storage of large bulk items out of doors, where they would continue to be exposed to the elements. The small potential for radioactive dust dispersion during sorting and screening out of doors would also continue.

ENVIRONMENTAL IMPACTS

The EA analyzes the impacts of construction and operation of the proposed Low-Level Radioactive Waste Building. The environmental impacts are summarized below.

Impacts of Construction

The primary construction impacts would be due to excavation and the removal of approximately three acres of previously disturbed upland old-field habitat. Impacts due to the construction activities would be minor and measures such as silt fencing and straw bale dikes would be used during construction to control soil erosion and sedimentation. Most of the excavated soil would be removed to an established storage area and the remaining soil would be used in re-vegetating the construction site. Additional minor impacts would be expected due to installation of underground utility lines. Trenching and backfilling would occur to connect the site with existing utilities. Utility installation impacts would involve very narrow linear paths in a highly disturbed area within an existing developed area. Following backfill of utility trenches, mulching and reseedling would be performed in unpaved areas to minimize soil erosion potential until local species become re-established.

Impacts of Normal Operation

Direct and indirect impacts of this project are expected to be minor due to the extremely low level of radioactivity involved and the fact that the project does not involve any changes in volumes of waste to be processed, type of processing performed (e.g., cutting, compaction, solidification and storage), or transportation and disposal of waste after it leaves Fermilab. Neither site groundwater nor surface water would be affected by operation of this facility. The

planned facility would connect with existing Fermilab site utilities including water and sanitary waste. Impacts from off-site transportation would be the same for the proposed action as for current operations. In the past 10 years, there have been 62 truck shipments offsite to the Hanford disposal site with no accidents. Impacts from on-site transportation are expected to be reduced due to the shorter mean distance from points of generation to the proposed facility. There would be no change in the number of trips per year from points of generation to the facility.

Human Health

Operation of this facility would expose workers to low levels of radiation. Worker exposures to radiation under normal operations would be controlled under established procedures that require doses to be kept as low as reasonably achievable and that limit any individual's dose to less than 1.5 rem per year. This project would have no net impact on radiological exposure to workers or the public since no changes in the amount of waste processed or stored are anticipated. Radiological impacts on the public are expected to be extremely low, since the distance from the radioactivity to the public is nearly one mile. Other health hazards are limited to negligible exposures to chemical materials that are part of the waste stream. The impact of the proposed project on industrial safety would be positive. Current facilities necessitate a considerable amount of manual handling of drums, bags and boxes of waste, as well as bulk items. The increased space available in the proposed facility would facilitate the use of forklifts and make possible the use of an overhead crane, allowing efficient movement of wastes while minimizing the exposure of workers to the chance of spills, back injuries and other accidents.

Impacts of Off-Normal Operation

In the event of a spill, adequate measures would be implemented according to the Spill Plan eliminating any reasonable potential for impacts. Other "off-normal" operations could occur in the event of a natural disaster, such as a tornado. During the period from 1876 and 1985, ten tornadoes have been reported in the Fermilab area. The likelihood of Fermilab experiencing a tornado with winds up to 300 mph is 10^{-6} occurrences per year. The danger of exposure to workers and the general public would be extremely slight and comparable to that concluded in the analysis of normal operations. The enhanced structural integrity of the proposed building relative to the existing facilities would further decrease the likelihood of damage resulting in negative impacts to the environment or to workers.

Cumulative Impacts

Cumulative effects from this project are expected to be limited to the impact of adding a building of this size to the overall Fermilab operation. Impacts of the building would include the loss of approximately three acres of upland old field community, a community that is plentiful at Fermilab and throughout the region. The stormwater runoff generated as a result of the additional impermeable surfaces is expected to be negligible because the project would be a very small proportion of the watershed, which is otherwise undeveloped. There would be no cumulative human health effects on either workers or the public due to low-level radioactive waste processing, since the process itself is not expected to change fundamentally. This applies equally to effects of normal and off-normal operation.

DETERMINATION

Based on the analysis in the EA, the DOE has determined that the proposed construction and operation of the Low-Level Radioactive Waste Handling Building at Fermilab does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969. Therefore, the preparation of an Environmental Impact Statement on the proposed action is not required.

PUBLIC AVAILABILITY: Copies of this EA (DOE/EA-1000) are available from:

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ENVIRONMENTAL ASSESSMENT
PROPOSED LOW-LEVEL RADIOACTIVE WASTE HANDLING BUILDING

FERMI NATIONAL ACCELERATOR LABORATORY

NOVEMBER 1994

U. S. DEPARTMENT OF ENERGY

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ENVIRONMENTAL ASSESSMENT

PROPOSED LOW-LEVEL RADIOACTIVE WASTE HANDLING BUILDING

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NOVEMBER 1994

U. S. DEPARTMENT OF ENERGY

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LIST OF ABBREVIATIONS AND ACRONYMS

DOE	Department of Energy
ES&H	Environment Safety and Health
HWSF	Hazardous Waste Storage Facility
IDNS	Illinois Department of Nuclear Safety
INHS	Illinois Natural History Survey
LLWCP	Low Level Waste Certification Program
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
RCRA	Resource Conservation and Recovery Act
RWPA	Radioactive Waste Processing Area
USEPA	United States Environmental Protection Agency

DOCUMENT SUMMARY

Fermi National Accelerator Laboratory (Fermilab) is a federal research laboratory owned and supported by DOE and operated by Universities Research Association, Inc. In the process of conducting high energy physics experiments, relatively small amounts of low-level radioactive wastes are produced, primarily in the form of activated metal accelerator components, liquids, and compactible/disposable items such as rags or clothing. Fermilab's low-level radioactive waste handling facility segregates compactible from non-compactible waste (sorting), separates radioactive from non-radioactive waste (screening), reduces waste volume by compaction or crushing, and prepares the waste for shipment off-site to the DOE treatment facility at Hanford, Washington. These radioactive wastes have extremely low concentrations of radioactivity. Fermilab procedures limit handling to items exposing workers to less than 100 mrem/hour at 30 cm. Materials with radiation concentrations exceeding this limit are stored for decay in a separate shielded area.

The process is conducted in facilities that are currently inadequate to efficiently carry out the necessary operations. Waste is processed in two facilities, separated by nearly a mile of roadway. Space limitations occasionally require moving waste items between facilities for storage. Large items that cannot be packaged in drums or steel boxes are stored out of doors. Structural limitations of the main processing facility do not allow the use of mechanized material handling equipment such as overhead cranes or forklifts, necessitating manual handling of waste, which exposes workers to high potential of accident and injury. Space is inadequate to perform sorting and screening in the facility, so when weather permits, these activities must be conducted outside under a canvas tent. The condition and location of both facilities make it difficult to provide adequate security for them. The present facilities are inadequate to comply fully with DOE Orders and industry standards. The state of Illinois, and the communities surrounding Fermilab have expressed concern and interest in this problem in the past.

The proposed action would address these concerns with minimal environmental consequences. Fermilab proposes the construction of a single, modern facility to upgrade and consolidate the current low-level radioactive waste handling operation. The facility would include an overhead crane, accommodate forklifts, provide storage for equipment and containers, and provide office space for five full time workers. The location of the proposed facility, nearer the center of the laboratory site, would improve security and diminish the distance travelled from points of generation to the facility. Nearly a mile of roadway would be eliminated from use as a route for low-level radioactive waste.

Normal operations in this facility would be unchanged from those presently carried out at Fermilab. Therefore, no major impacts would be expected as a result. No change in the volume, concentration of radioactivity or procedures are proposed or anticipated. The primary effect of the project would be to vastly improve efficiency by consolidating the two current handling areas, and allow increased mechanization of material handling.

Alternatives to the proposed action were considered, including the "no action" alternative, upgrading the existing structure, and one alternative site on which to build the proposed building. The no action alternative would simply continue the current procedures. Upgrading the current facility would only partially address the need for the project, and would leave many of the deficiencies remaining, especially those dealing with structural characteristics of the current facility. The alternate site for the proposed building is essentially similar to the preferred site, with most of the same impacts, etc. However, the preferred site was chosen due to its conformity with long-range planning goals, and its location nearer the center of the laboratory. None of the alternatives completely fulfill the stated purpose and need for the project.

The location and scale of the project would result in no substantial adverse environmental impacts. Direct impacts of the proposed action would be extremely minor, because there are no fundamental changes in the procedures. Radiological effects on workers and the public from the proposed action are shown to be minor. There are no threatened or endangered species or critical habitats impacted by this project. Cumulative impacts of the proposed action would be limited to those connected to the loss of a small area of an abundant type of habitat, and minor increases in stormwater runoff. Increased stormwater flow would be mitigated by the installation of permanent controls.

1.0 INTRODUCTION

Fermi National Accelerator Laboratory (Fermilab) is a federal research laboratory owned and supported by DOE and operated by Universities Research Association, Inc., a consortium of 80 universities. The Fermilab complex includes an office and administration center, research centers, the accelerator complex, underground structures and equipment for performing high energy physics experiments, and associated support structures (Figure 1.1).

The high energy physics program at Fermilab investigates the structure of matter by using the collisions of particles to create new matter which is studied using large complex detectors. The duration of experiments varies with the programmatic constraints of the laboratory and the experiment but many last for a number of years. As a result of these activities, small quantities of low-level radioactive wastes are generated. Low-level radioactivity at high energy proton accelerators such as Fermilab is produced by interactions of high energy particles with atomic nuclei in materials exposed to these beams. These so-called spallation reactions result in the breaking of large nuclei into smaller nuclei of lower atomic weight, some of which are radioactive. Such material constitutes the main source of low-level radioactive waste generated at Fermilab.

The radionuclides and specific activity present in the waste depend on the type of material, the duration of exposure to the beam and the length of time the item has been allowed to undergo radioactive decay. Principal isotopes of concern in activated scrap metals and discarded metal accelerator components are ^{54}Mn , ^{60}Co and ^7Be in iron and steel, and ^{22}Na and ^7Be in aluminum. By the time radioactive wastes are shipped off-site, they have been held for several weeks to several months (see Table 1.1). Given the relatively short half-lives of these isotopes, a substantial amount of the radioactivity decays prior to shipment.

Table 1.1
Radioisotopes at Fermilab

Radioisotope	Half-Life
^3H	12.3 years
^7Be	53 days
^{22}Na	2.6 years
^{54}Mn	312.2 days
^{60}Co	5.2 years

Some radioactivity is produced in cooling water contained in primary, closed-loop magnet cooling systems. When the radioactivity of the cooling water reaches a certain level, the water is drained from the system and replaced, and the radioactive water becomes low-level waste. This cooling water may also become waste when it is drained and replaced due to programmatic requirements (e.g., necessary repairs to heat exchanger systems). Leaks from the cooling system also generate low-level radioactive waste water. The two radionuclides of concern in radioactive water are ^3H and ^7Be . Most of the ^7Be is removed by ion exchange. ^3H remains in the waste water and is placed in 30 gallon drums at the point of generation. Maximum activity concentration in water due to ^3H is 0.2 milli-Curies per milliliter (mCi/ml). Maximum activity due to ^7Be remaining in water after ion-exchange regeneration is 3 micro-Curies per milliliter ($\mu\text{Ci/ml}$). Spent ion-exchange resins generated by this process are also

LEGEND

- DISCONTINUE ROUTE
- OFF-SITE ROUTE
- ON-SITE TRANSPORT

FERMLAB SITE PLAN

SCALE: 1"=3400'-0"

FIGURE 1.1

low-level radioactive waste. The typical concentration of radioactivity encountered in this waste stream is measured in pico-Curies per milliliter (pCi/ml), and the maximum annual volume generated is approximately 1 m³, although volumes of this waste generated are highly variable year to year.

Low-level radioactivity is also produced in oil by spallation of nuclei in oil-cooled vacuum systems placed near targets and other beam loss points. The radionuclide of most concern in radioactive oil is ³H. Other sources of low-level radioactive waste include miscellaneous items exposed in radiation areas such as discarded protective clothing, masks, tools, cleaning materials, and expendable items such as light bulbs, etc.

Low-level radioactive wastes are characterized as such by the generator at the point of generation, then transported to a Radioactive Waste Processing Area (RWPA) for processing prior to shipment offsite for disposal. Fermilab has approved a Low-Level Waste Certification Program⁹ which describes procedures for processing all low-level waste generated at Fermilab. Virtually all of the low-level radioactive waste is transported from the A0 or D0 stations of the main accelerator ring, the cross-gallery high bay area near A0, or the Experimental Areas. A small portion (less than 1%) of waste is received from the Industrial Area and various shops located in the Fermilab Village area. Waste is picked up by lab personnel and transported over laboratory roadways either to the Boneyard RWPA or Site 67 RWPA (see Figure 1.1). Items too large to be packaged in 55 gallon drums are transported to the Boneyard. Any items that produce radioactive dose equivalent of 100 mrem/hr at 30 cm are stored in shielded "caves" at the Boneyard. All other items are transported to Site 67 where they are stored for later processing.

No hazardous wastes are stored or processed at the RWPAs. Hazardous wastes, as defined in the Resource Conservation and Recovery Act (RCRA), including activated hazardous wastes, are processed at the Hazardous Waste Storage Facility (HWSF) located at Site 55 (see Figure 1.1). The HWSF is a RCRA Part B permitted facility and operates independently of the RWPAs. Small volumes of activated waste defined by the State of Washington as "Toxic D, Dangerous Waste", may be accumulated and stored at Site 67 pending shipment. This waste is kept segregated from the other low-level radioactive waste. Under normal conditions, the volume of this waste is less than 100 cubic feet.

Site 67 is an approximately 70 year-old barn in which low-level waste is processed for eventual shipment and disposal off-site. A tin shed attached to the barn is used for storage of filled waste containers. Radioactive waste transported to Site 67 may undergo various processes before being shipped off-site, including the following:

- The items are sorted into compactible and non-compactible waste streams.
- The volume of compactible materials such as protective clothing, rad waste bags, labels, etc., is reduced in a mechanical compactor. The air from this compactor is filtered through a High Efficiency Particulate Air (HEPA) filter before venting.
- Fluorescent bulbs taken from radiation areas are crushed for volume reduction.
- Oil, water, and small volumes of resin are solidified by combining with Portland cement.
- The items are screened to segregate radioactive from non-radioactive waste streams. Non-radioactive items may enter the low-level radioactive waste stream unintentionally when generators fail to adequately separate them at the point of generation. Screening at Site 67 is an additional quality assurance check to insure the minimization of volumes disposed of as radioactive waste.

- Minimal characterization is done at Site 67, since the radioactive characterization is the responsibility of the generator. Characterization is limited to occasional analysis of oils to ascertain the absence of PCBs and analyses to determine whether hazardous wastes may be present. Any RCRA hazardous waste discovered is immediately transferred to the HWSF at Site 55.
- Items ready for shipment are packaged in metal 55 gallon drums, or occasionally 3.5 ft. x 4ft. x 4ft. steel boxes.
- Packaged waste is prepared for shipment, including labelling and eventual loading of packaged waste onto trucks.

The Boneyard RWP is a 40,000 sq. ft. fenced area located within the Railhead Storage Area near the northern boundary of the laboratory site (see Figure 1.1). Large bulk items are transported to the Boneyard for processing. Anything too large to fit into a 55 gallon drum or a 3.5 ft. x 4ft. x 4ft. steel box is considered to be a large bulk item. The Boneyard area includes enclosures assembled from large concrete shielding blocks and tunnel sections in which such large bulk radioactive items may be stored. Items whose radioactivity level exceeds 100 mrem/hr at 30 cm are segregated and held for decay in shielded "caves". These items are not processed until activity drops to less than 100 mrem/hr at 30 cm. Typical operations carried out at the Boneyard include the following:

- Large bulk items are reduced to manageable size, i.e., to fit into 3.5 ft. x 4ft. x 4ft. steel boxes. This is accomplished using either torches or saws to cut the large pieces into smaller ones.
- Large items that cannot be reduced in size (e.g., large magnets) are painted or coated to eliminate transport of radioactivity through rusting and subsequent sloughing.
- Items are marked and labelled for shipment.
- Items are prepared for transportation offsite including loading onto trucks.

The volume of low-level radioactive wastes prepared and shipped from Fermilab has averaged approximately 1200 cubic feet per year over the last five years. Waste volume over that time ranged from 585 cubic feet to 2733 cubic feet. The number of truckload shipments from Fermilab over this period has ranged from one to five, the mean number of loads being two per year. The annual total radioactivity of all low-level wastes processed and shipped from Fermilab varies, but during the last five years has ranged from 143 to 688 Mci. Radiation exposures typically encountered at the Boneyard and Site 67 are extremely low. Area surveys taken at both facilities in February and March of 1994 revealed dose rates of from 0.01 to 0.15 mrem/hr. As an extreme example, assuming a worker spent 2000 hours in one year working in the area, he/she would receive 300 mrem. This is only 20% of the Fermilab Administrative control level for radiation workers, which is 1.5 rem/yr¹¹.

2.0 PURPOSE AND NEED

Conditions at the two RWPA's are considered to be inadequate. Primary deficiencies at the facilities involve efficiency, security, worker safety, logistical problems, and non-compliance with accepted industry standards and DOE Orders.

The low-level radioactive waste handling operations are currently inefficient due to the constraints imposed by the facilities. Potable water and sanitary facilities are not available at either facility, necessitating absence of employees from their job sites periodically, thus hindering the completion of their work. Decontamination facilities (e.g., eye wash stations, emergency showers) are not available at either site. There currently is no lighting or heating in the tin shed attached to the barn at Site 67. This structure has a leaky roof and is used to store full drums which must be covered with plastic to

protect against rain. Present operations are split between two facilities separated by over a mile, necessitating excess travel between the two. Wastes sorted, screened and packaged at Site 67 are periodically moved to the Boneyard for storage prior to shipping by forklift. This activity results in unnecessary wear and tear on the forklift, and exposes operators to traffic hazards en route. Screening (segregation of radioactive from non-radioactive material in the waste stream) is not possible within the present Site 67 facility due to size and shielding limitations, and because the barn is not large enough to accommodate a forklift. Adequate shielding to ensure a low background radiation level for this activity must be erected outside the barn and covered by a canvas tent as shown in the Appendix A. Therefore, screening can be accomplished only when weather permits, usually between the months of April and September. Because of the potential dispersal of radioactive waste by wind, no compactible wastes are screened. All such waste is assumed to be radioactive, thus bypassing the quality assurance screening step for this waste stream. There is a very small potential for radioactive dust to be dispersed by wind during the sorting and screening procedure when it is done outside.

The facility at Site 67 is an old structure located in a relatively remote part of the site, making security difficult. The age and condition of the structure make controls against unauthorized entry difficult to install and enforce. The Boneyard area is located adjacent to the laboratory boundary in a likewise remote area. Although the railhead is surrounded by a security fence, unauthorized entries into the area have occurred in the past. Structural characteristics of the building at Site 67 do not allow the use of efficient handling equipment (e.g., forklifts, overhead crane). As a result, all handling of wastes and waste containers within the Site 67 facility is done by hand. This practice maximizes the potential for worker injuries due to accidents, or back injuries. In addition, the manual handling of waste increases worker exposure and the potential for spills or accidental releases.

Compliance with industry standards and DOE orders is a major concern with the present operation. The DOE Tiger Team appraisal conducted in May, 1992 found the facility operations in violation of parts of DOE orders 5820.2A and 5400.5, stating:

Fermilab currently does not have a program in place that adequately protects the environment from potential releases of radioactive contamination that could occur from known or potentially activated materials stored in outdoor areas. (Finding RAD/CF-1)¹⁴

Fermilab's Tiger Team Corrective Action Plan, approved by DOE in September, 1993, includes tasks specifically directing the construction of a Radioactive Waste Sorting and Repackaging Building, and the assessment of outdoor storage of radioactive materials at the Railhead area, including radioactive wastes stored at the Boneyard. In addition, other DOE and internal appraisals and assessments have noted the inadequacy of the current facilities to meet applicable standards. Violations of parts of DOE Orders 5480.11 and 6430.1A, National Fire Protection Association (NFPA) standards, and American Conference of Governmental Industrial Hygienists (ACGIH) standards have been identified.

The purpose of this project is to provide a modern facility to enable Fermilab personnel to accomplish the following:

- increase efficiency, safety, and environmental protection of low-level radioactive waste processing operations,
- improve security of the waste operation,
- optimize transportation patterns for radioactive waste, and,
- fully comply with all applicable laws, DOE orders, and industry standards.

These goals can be most efficiently accomplished by providing a centrally located facility within which low-level radioactive waste handling activities are consolidated.

The need for this action has been documented in the above discussion of the inadequacies of the current facilities. In addition, the Illinois Department of Nuclear Safety (IDNS) supports implementation of this project. In a letter from Thomas W. Ortziger, Director of IDNS, dated November 10, 1993, he states the following:

An item of concern to us in the past has been the project to construct the new low-level radioactive waste handling building. While in the past we have been disappointed with the low priority assigned to it by DOE, we note that DOE is expected to grant Fermilab's request to support this activity this fiscal year.

Similarly, the City Administrator of Warrenville, Illinois, which is located on Fermilab's southeastern border, commented in a letter to the Batavia Area Office Manager:

...[the] Fermilab Low-Level Radioactive Waste Handling Building should receive high priority as reviewed by the Warrenville City Council.

3.0 LOW-LEVEL RAD-WASTE BUILDING PROPOSED ACTION AND ALTERNATIVES

3.1 **Description of the Proposed Action**

This project would include construction and operation of a new facility to include consolidation of operations currently carried out at the Boneyard and at Site 67. The new low-level radioactive waste handling building would be a steel framed, industrial-type building enclosing approximately 14,200 total square feet as shown in Figure 3.1. It would consist of high-bay waste handling and storage areas of approximately 11,200 square feet (80' x 140') which would be serviced by a 25-ton capacity, full travel, overhead crane and an adjacent low-bay office and support area of approximately 3,000 square feet (30' x 100'). A new facility would allow the re-assignment of five full-time workers from the current area in Wilson Hall to the new offices. Future increases in low-level waste volumes are not expected to exceed normal annual variation experienced in the past. This proposed facility would be capable of accommodating all such increases. The proposed action is described in detail in the Conceptual Design Report.³

Paved parking areas would be provided adjacent to the office area of the building and a perimeter hardstand area would be provided for vehicular access to the high-bay portion of the building. The project would also include the construction of an access drive connecting Road A-2 to the perimeter hardstand. A chain link fence would enclose the hardstand area around the building perimeter and control access to the roll-up doors and the building high-bay. Passage from the office area to the high-bay portion of the building would be controlled internally by the building occupants. The total area affected is approximately 3.0 acres.

Decommissioning of the existing RWPA facility at Site 67 would occur subsequent to the commencement of normal operations at the new facility. Decontamination and decommissioning procedures would be followed, including complete radiation and contamination surveys. No radioactive materials have been generated at the present facilities, so decontamination is not expected to be necessary prior to decommissioning.

The RWPA located at the Boneyard would not be decommissioned as part of the proposed project. Large bulk items exhibiting radioactivity levels greater than 100 mrem/hr at 30 cm. would continue to be stored within shielded caves until the activity declines to levels at which normal processing could take place.

3.1.1 Location of the Proposed Action

The proposed project site is located in the southwest corner of Batavia Road and Road A-2, in the north central area of the 6800-acre Fermi Laboratory site (see Figure 1.1). Batavia Road is a public access, paved road which is used primarily for travel within the laboratory. Road A-2 is a dead-end roadway. The average traffic volume of Batavia Road at the proposed project site is less than 25 trips per day. The utilities would not pass through any wetland areas.

A layout of the area of this proposed action is illustrated in Figure 3.2. A photograph showing the preferred location is provided in Appendix B. Figure 3.3 is a topographic map of the location. The project site was chosen due to its proximity to utilities, central location to provide better security, proximity to experimental areas generating low-level rad-waste, and its low potential for adverse environmental impacts. The proposed site is located approximately one mile from the nearest Fermilab site boundary. The proposed site location would discourage unauthorized entry by its more secure location near other utility and experimental areas.

On-site transportation from points of generation of low-level radioactive waste would be over the same routes as presently used. However, the central location of the proposed facility and the consolidation of the two currently operated RWPA's at Site 67 and the Boneyard would result in a decrease in miles traveled, and the discontinuation of the use of approximately one mile of roadway for radioactive waste transportation (see Figure 1.1).

3.1.2 Construction

Work on site preparation and utilities is proposed to commence in early 1995, and the construction of the building is proposed to begin in May of 1995 (see Table 3.1). Construction procedures and practices would follow industry standards for this type of structure. The building and associated structures are of a type widely used throughout the private sector. No special techniques or procedures are required for this project.

Stormwater runoff would be diverted from the building and paved areas into the storm water/roadside ditch system. Illinois' "Procedures and Standards for Urban Soil Erosion and Sedimentation Control"¹⁶ would be consulted for stormwater management planning. Standards published in the Illinois Environmental Protection Agency for "Standards and Specifications for Soil Erosion and Sediment Control,"²² (the so-called "yellow book") would be followed to design appropriate erosion controls, such as silt fencing and straw bale dikes. Conventional practices would be employed during construction for dust and noise control as well as storm water runoff.

SITE PLAN

Figure 3.2

FIGURE 3.3

DESIGNED	NAME	DATE
DRAWN	C. FEDEROWICZ	10-27-84
CHECKED		
APPROVED		
SUBMITTED

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

LOW LEVEL RADWASTE BLDG.
SITE PLAN

DRAWING NO. 10-4-5 C-1 REV.

TABLE 3.1
PROPOSED CONSTRUCTION SCHEDULE

	Sitework/Utilities	Building
Conceptual Design Complete	January 1993	January 1993
Start Environmental Assessment (EA)	March 1993	March 1993
First EA Draft	July 1993	July 1993
Complete EA Draft	March 1994	March 1994
Start Title I Design	September 1994	September 1994
Title I Complete	November 1994	November 1994
Value Engineering	December 1994	December 1994
FONSI Determination	December 1994	December 1994
Title I DOE Approval	February 1995	February 1995
Title II Final Design Complete*	January 1995	March 1995
Contract Award	January 1995	May 1995
Start Title III Construction	February 1995	May 1995
Title III Construction Complete	June 1995	July 1996

* Title II will not commence until the FONSI determination unless an alternate schedule is approved.

3.1.2.1 Excavation

Construction site preparation would include excavation of approximately 2300 cubic yards of soil. Soil would be removed to an existing permanent soil storage area located approximately 1 mile away at the intersection of Eola Road and Road C West (see Figure 1.1). Construction of surface runoff and soil erosion control measures would take place prior to excavation activities. All truck or other vehicle entrances would be stabilized prior to use during construction and staging. There is no reason to suspect any contamination of soil at the site, since there have been no activities located in the vicinity that would have caused any contamination to occur. Therefore no soil testing is anticipated.

3.1.2.2 Utility Service

Utilities for the new facility would be extended from existing utility lines located adjacent to the proposed project in the Meson experimental area. Utility corridors are indicated in Figure 3.3. These utilities would be located in previously disturbed areas as described within Section 4 (The Affected Environment).

3.1.2.3 Building Construction

Standard construction with reinforced concrete would be used for the building foundation, floor slab and the dividing wall between the high-bay and the low-bay areas. Insulation and metal wall panels

would enclose the building perimeter along with insulated roll-up doors to provide vehicular access into the building for waste delivery and shipment. Exterior walls at the office areas would also be provided with windows to allow natural light into the occupied office spaces. Roof areas would consist of built-up felt roofing over insulation and metal roof decking.

3.1.2.4 Other Services

The building would be provided with an ordinary hazard, wet pipe sprinkler system throughout for fire protection. Toilet facilities would be provided in the office area and the building would be serviced by all normal utility systems including domestic water, industrial cold water, sanitary sewer, power, communications and natural gas. The project would also provide all emergency systems required for the proper functioning of the building, including fire alarm, emergency lighting, emergency eye-wash and shower facilities, and exhaust systems. No unusual power distribution requirements are anticipated in the building. General lighting and power distribution would be included as well as a plumbing system and natural gas-fired HVAC system.

3.1.2.5 Landscaping

Following final grading and facilities installation, vegetative landscaping would be implemented using trees, shrubs, and grass seeding. This would provide long-term stabilization of soil for stormwater control in the surrounding area of the building.

3.1.3 Operation

Normal operations would commence at the new facility as soon as construction was complete and all equipment installed, inspected and certified to be sufficient to carry out the required functions within safety standards. The new facility would consolidate all low-level radioactive waste handling operations currently carried out at the RWPAs located at Site 67 and the Boneyard. No new functions would be undertaken at this facility. The processes to be accomplished have been presented in section 1.0 and would be continued in the new facility. The effect of the project would alter some aspects of the operations, however. Sorting and screening would occur on a regular basis rather than being dictated by weather conditions, wastes would be transported shorter distances in order to get to the facility, and efficiency would increase due to consolidation and improvements in handling equipment and facility furnishing.

3.1.3.1 Normal Operations

Normal operations at a new facility would include receiving and handling low-level radioactive waste materials consisting of solids, oils, water, resins, and absorbed liquids. Procedures would remain fundamentally unchanged except for improvements in transportation routes, efficiency in handling waste, storage capacity, and operator safety and comfort.

Transportation from the points of generation of low-level radioactive waste would follow the same roadways currently used except for the elimination of the use of McChesney Road to the Boneyard RWPA and Wilson Road east of Road C. The extremely small amounts of waste generated in the Village area and the Industrial area would be transported via Batavia Road and Road D, respectively. This remains unchanged from present practice (see Figure 1.1 for transportation routes).

Upon arrival at the new facility, items would be off-loaded by forklift for sorting and screening (see Figure 3.1). The new facility would include a radioactive sorting and screening facility with an area of approximately 1200 sq. ft. This area would accommodate sufficient shielding to provide a low background radiation area for accurate screening and allow efficient handling of all low-level radioactive wastes. The contents of 55-gallon drums and 3.5 ft. x 4 ft. x 4 ft. boxes would be sorted and screened in this area. Unlike the current procedure, this would include all compactible waste and would be performed on a regular basis rather than only as weather permits. The contents of the containers would also be inspected to insure that no substance or manufactured item is present that would constitute a violation of disposal site rules. Sorted and screened waste would be packaged in drums or boxes and moved to the storage area to await shipment. Fermilab currently sends low-level radioactive waste to the DOE facility at Hanford, Washington (Hanford). This would be expected to continue under the proposed action. Fermilab procedures for shipping this waste include strict compliance with all applicable requirements and conditions set forth by DOE, DOT and the State of Washington.

Low-level radioactive oil, resin and water would be retained in the liquid waste containment area until enough of one of the waste streams was generated to allow solidification. The storage area would be approximately 15' by 30' with a 6-inch high secondary containment dike to contain approximately 1700 gallons. Solidification would be done in an area of approximately 1000 square feet located in the east end of the proposed facility. After solidification and packaging, these wastes would also be stored to await shipment to Hanford.

Areas in the north end of the facility would be used for handling and storing large bulk items. Upon completion of the proposed facility, all low-level radioactive bulk items currently stored at the Boneyard RWPB would be moved to the new building. Some processing to be carried out in the new facility, e.g., torch cutting, would be carried on outside, adjacent to the building. Currently, all such handling is done at the Boneyard.

The proposed action would provide adequate space for storage of empty containers to be used for low-level radioactive waste. A 450 sq. ft. area would be used to store up to two truckloads (700 drums) of empty DOT 17H 55-gallon drums. A 225 sq. ft. area would be used to store up to 25 steel 3.5 ft. x 4 ft. x 4 ft. boxes and a 110 sq. ft. area would be used to store up to 60 empty 30-gallon drums. In addition, an area of 400 square feet would be used for special packaging materials (e.g., D.O.T. Type A boxes, absorbent packing materials, steel banding, and drum liners).

The area required to store boxes, drums and unpackaged bulk items prepared for shipment to the disposal facility would vary depending on the amount of waste accumulated prior to shipment. The minimum space required would be 600 square feet. Ideally, no more than 3000 square feet of low-level radioactive waste would be stored at any given time. State of Washington "Toxic D, Dangerous Waste" would continue to be retained in the building pending shipment. This waste would be kept segregated from the other low-level radioactive waste.

The compactor facility would be an enclosed 20 ft. by 30 ft. room and would contain the waste compactor and its associated HEPA filter system. Compactible waste would be compacted and fluorescent bulbs crushed into 55-gallon drums in this facility. A portion of the facility would be used to temporarily store compactibles and fluorescent bulbs until enough are collected to process. HEPA vacuum cleaners would be emptied of low-level material, cleaned, maintained and efficiency-tested within this facility.

A 4 ft. by 4 ft. platform scale would be used in the building to weigh 55-gallon drums and steel boxes prior to shipment. Larger and heavier items would be weighed using a scale attached to an overhead crane.

3.1.3.2 "Off-Normal" Operation

"Off-normal" events are defined in DOE Order 5000.3B, entitled *Occurrence Reporting and Processing of Operations Information*. The most likely example of off-normal operations would be an accidental waste spill. Handling of potential spills is addressed in the Fermilab Spill Plan.¹² In the event of a spill, personnel would contact the emergency operator, don personal protective equipment, minimize the spread of the spill and prevent any release to the environment. The area would then be isolated and the contents of the spill would be transferred into an appropriate container, which would then be labelled and prepared for disposal using normal procedures. Contaminated areas would be removed from use until samples were taken to verify cleanup.

Off-normal operations resulting from natural disasters, including fire or tornado would involve containment and re-packaging and processing of any debris, followed by radioactive surveys and decontamination of affected areas if necessary.

3.1.4 New or Modified Permits and Licenses

No permits are required for this Proposed Action. Due to the small area to be disturbed for construction (less than 5 acres), a storm water runoff NPDES permit is not required. No floodways or wetlands would be affected. No discharges of wastewater requiring separate permits would occur. There are no regulatory requirements for low-level radioactive waste processing and storage.

3.2 Alternatives

Alternatives to the proposed project include the no action alternative, construction of a new facility at an alternate site at Fermilab, and the upgrade of existing facilities at Site 67. No alternative to the proposed project fully meets all the elements of the purpose and need for the project as stated in section 2.0. No feasible alternatives to the transportation of waste to Hanford for disposal exist because commercial low-level radioactive waste disposal site acceptance criteria could not be satisfied, and because DOE Order 5820.2A Requires that "DOE low-level waste shall be disposed of on the site at which it is generated, if practical, or if on-site disposal capability is not available, at another DOE disposal facility." The DOE facility at Hanford is the only such facility available for this purpose.

3.2.1 No Action

Without the new proposed project, Fermilab would continue to operate the present facility as it has done in the past. These procedures have already been discussed in detail in the above sections.

3.2.2 Construction at Another Site at Fermilab

Other areas available at Fermilab for a project of this size were determined to be not reasonable because they would not meet the stated purpose and need due to more complicated transportation routes, longer utility extensions, or potentially greater environmental impact. One alternate site north

of Batavia Road was considered reasonable. This site offers many of the advantages of the preferred location. However, the proposed site is somewhat closer to the center of the laboratory.

3.2.3 Upgrading of Existing Facility

The inadequacies of the current RWPAs have been enumerated. Some, though not all, could be remedied. Upgrading the existing facility at Site 67 would necessitate the following items that would partially remedy the current inadequacies described in Section 2.0:

- Install domestic sewer and water lines to Site 67 to provide potable water and sanitary facilities. This would also necessitate the construction of a lift station and manhole.
- Install a fire suppression water line and install a sprinkler system on first and second floor of the barn.
- Construct a sorting and screening facility of approximately 2500 square feet including a washroom and office area.

In addition to the items listed above, the following items would be implemented to upgrade habitability and safety in the existing facility:

- Repair siding and insulate the second floor of the barn.
- Install heaters in the second floor of the barn and the tin shed.
- Seal all cracks in the barn's concrete floors.
- Repair roof and siding and insulate the tin shed.

After such an extensive upgrade, the purpose of the proposed project would be only partially met. The division of operations between the two RPWA facilities would continue. As a result, transportation and security problems would remain. Material handling capabilities would continue to be limited at an upgraded building due to structural limitations (an overhead crane cannot be accommodated and forklifts cannot be used due to space constraints).

Upgrading the existing facility at Site 67 would have environmental effects similar to "no action". Because this alternative would not consolidate operations, the environmental impacts associated with outdoor storage of activated items at the Boneyard would not be addressed. The upgrade alternative would also have impacts similar to the preferred alternative regarding construction activities. For these reasons, the upgrade of site 67 was determined not to be a reasonable alternative because of its failure to meet the purpose and need for the action.

3.3 Relationship of Proposed Action to Other Actions

Fermilab is currently constructing the Fermilab Main Injector, a major upgrade of the scientific apparatus, in the southwest portion of the laboratory site (see Figure 1.1). The other major project being constructed at Fermilab is the Kaons at the Tevatron (KTeV) experiment, for which a FONSI was approved. KTeV will be carried out in the experimental area of the laboratory. Neither of these projects are connected to the present proposal.

4.0 AFFECTED ENVIRONMENT

4.1 Site Description

The project site is an upland area, currently vacant, and characterized by weedy old-field vegetation. The area was previously used as cropland until 1989. Since then it has been maintained by mowing on an annual or semi-annual basis. (Hall 10/28/93 Fermilab memo)

4.2 Surface Water

There are no naturally occurring surface water systems within the proposed construction site. The nearest wetland to the proposed site is a small wet meadow classified as palustrine emergent on the most recent National Wetlands Inventory map (April 1984) as shown in Figure 4.1. This area lies approximately 250 feet south of the proposed site. Evaluation of floodplain maps (FIRM #1701970020D, DuPage County) confirms that the entire project area is above the 500-year floodplain. Drainage from the area follows the grassy swale of the field terrain into a series of constructed open ditches and is conveyed northeasterly into an existing reservoir for non-contact cooling water and fire protection storage. Inundation from surface runoff or local ponding is unlikely due to the sloping topography.

4.3 Flora and Fauna

A study of endangered and threatened plant species at Fermilab was conducted in 1985 by the Illinois Natural History Survey (INHS)⁸. The authors found that 26 of 59 threatened, endangered, or candidate plants known for Kane and DuPage counties may find suitable habitat at Fermilab. However, no federally listed endangered or threatened plants occur in the area and suitable habitat is absent from this project site for federally listed plant species. No documented occurrences of any of the plant species have been recorded in the project area. Since there are no wetland habitats present or adjacent to the project site, protected plant species characteristically occurring in wetland areas could not reasonably be expected to exist at the site.

The dominant plant species consist of non-native grasses (e.g. *Bromus* spp.), crown vetch (*Coronilla varia*), goldenrod (*Solidago* spp.) and Queen Anne's lace (*Daucus carota*). Recent cuttings and remnant brushy stubble observed in the field in October 1993 indicate past presence of the occurrence of small diameter dogwood (*Cornus* spp.) saplings in sparse patches of 5 to 15 feet in diameter. Similar growth patterns were observed in a nearby area adjacent to the project area.

The INHS survey also listed 66 animal species that have been recorded from Kane, DuPage, and adjacent counties. Of these, potential habitat exists at Fermilab for 42 species. Among those recorded, only four bird species might be expected to utilize the project site to any degree. Three of these species (Northern harrier, Peregrine falcon, and Short-eared owl) are raptors whose use of the area would be only as a minor portion of their foraging territories. The fourth species, the upland sandpiper, is known to breed at Fermilab. Sightings of upland sandpipers have been restricted to an area north of Batavia Road near its intersection with Eola Road which is approximately one mile from the project site² (Illinois Department of Conservation correspondence, 1993, Appendix C).

NATIONAL WETLANDS INVENTORY MAP
AURORA, ILLINOIS
APRIL 1984
SCALE: 1:24000

FIGURE 4.1

4.4 Cultural Resources^{19,20}

Fermilab has performed a Phase I archaeological survey of the Fermilab site, including the project area, to determine whether any archaeological or historic resources are present. It is unlikely that any unidentified sites exist in the area.

4.5 Alternate Site

The Alternate Site is located directly across Batavia Road from the proposed site. Due to its proximity, the characteristics of the alternate site are essentially identical to the proposed site.

5.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

Due to the similarity of the proposed and alternate sites, the environmental consequences described here will refer to both sites. Included in this discussion are impacts to be expected due to the "no action" alternative and the upgrade of the existing facilities at Site 67.

5.1 Construction

The primary impacts to this site would be due to excavation and the removal of approximately three acres of previously disturbed upland old-field habitat. Impacts due to the construction activities would be minor. The project would require excavation to prepare the site for construction. Measures such as silt fencing and straw bale dikes may be used during construction to control soil erosion and sedimentation, depending on site conditions. Most of the excavated soil would be removed to an established storage area approximately one mile from the project site (see Figure 1.1). The remaining soil would be used in re-vegetating the construction site. Transport of the excess soil would be by truck over public, on-site roadways that normally experience very low traffic volume. The impact of the addition of this small amount of soil to the stockpile would be mitigated by erosion control measures, including stabilization of the additional soil by planting of a cover crop. Disturbances to soil and vegetation at the project site would be mitigated using backfilling, grading, and re-vegetation upon completion of the construction phase of the proposed project.

Additional minor impacts would be expected due to installation of underground utility lines. Trenching and backfilling would occur to connect the site with existing utilities. Utility installation impacts would involve very narrow linear paths in an area that is currently highly disturbed. Following backfill of utility trenches, mulching and reseedling would be used to minimize soil erosion potential until local species can become re-established over the installed lines.

Construction noise and dust would be minimized by implementing standard construction best management practices such as water application and scheduling noisy applications at the least offensive times or erecting barriers where applicable. Any resulting impact would be minor and of short duration.

No threatened or endangered floral and faunal species would be affected based on evaluation of results from previous Fermilab studies, reports, state/federal agency consultations, and two project site reconnaissance visits.

Regarding cultural resources, if a potentially important discovery is made during construction, reasonable efforts will be made to avoid or minimize harm until the appropriate consultation has taken place.

5.2 Impacts of normal operations

Direct and indirect impacts of this project are expected to be minor due to the extremely low level of radioactivity involved and the fact that the project does not propose any changes in volumes of waste to be processed, overall procedures and techniques used, or transportation and disposal of waste after it leaves Fermilab. Normal operations would not have adverse effects on flora and fauna. Habitat for the protected loggerhead shrike and upland sandpiper would not be affected. Most impacts on both environment and human health will, in fact, be positive. Positive impacts would include increased efficiency of low-level radioactive waste processing operations; better transportation patterns for radioactive waste, minimizing the potential for accidental spills; and full compliance with all applicable laws, DOE orders, and industry standards.

5.2.1 Radiological Effects

Operation of this facility would expose workers to low levels of radiation. Worker exposures to radiation under normal operations would be controlled under established procedures that require doses to be kept as low as reasonably achievable and that limit any individual's dose to less than 1.5 rem per year.

The levels of exposure typically encountered as part of the handling of low-level radioactive wastes at Fermilab were discussed in section 1.0. This project would have no net impact on radiological exposure to workers or the public since no changes in the amount of waste processed or stored are anticipated. Based on a design life for the facility of twenty years, and an occupational risk factor of 4×10^{-4} latent cancer fatalities per person-rem, the maximum exposure expected based on historical data (approximately 20% of the administrative limit, or 0.3 rem/year) would result in an additional 0.002 fatalities per worker.¹ This is an extremely conservative estimate based on maximal dosage to workers residing in the facility 100% of the work week. Typically, workers would be expected to spend less than one-half their time within the facility. The proposed project would result in no change in the current situation, and therefore this calculation represents a reiteration of the present risk rather than an additional burden due to the project.

Radiological impacts on the public are expected to be non-quantifiably low, since the distance from the radioactivity to the public is nearly one mile. The maximum possible dose from this facility of 100 mrem/hr at 30 cm. would be attenuated to less than 10^{-5} mrem/hr at the site boundary. An individual standing at the site boundary 24 hours per day for 365 days could expect an exposure of less than 1 mrem. This would be less than 0.3% of the normally expected background dose of 360 mrem due to natural sources.²⁰

5.2.2 Other Human Health Effects

Other than minor radiological impacts, health hazards are limited to negligible exposures to chemical materials that are part of the waste stream. These concerns are similar to those currently encountered. The primary components in this category would be waste oils. As stated above, no RCRA Hazardous wastes would be processed or stored at the facility and no chemicals are used for treatment in this

operation. The impact of the proposed project would most likely be positive due to the discontinuation of divided operations between Site 67 and the Boneyard, and the conduct of this operation in a superior facility.

The impact of the proposed project on industrial safety would be positive. As stated before, the current facilities necessitate a considerable amount of manual handling of drums, bags and boxes of waste, as well as bulk items. The increased space available in the proposed facility would facilitate the use of forklifts and make possible the use of an overhead crane, allowing efficient movement of wastes while minimizing the exposure of workers to the chance of spills, back injuries and other accidents.

5.2.3 Surface Water and Groundwater Effects

Neither site groundwater nor surface water would be negatively impacted during operation of this facility. The planned facility would connect with existing Fermilab site utilities including water and sanitary waste.

5.2.4 Transportation

Batavia Road east of Receiving Road is a low-volume traffic area. Impacts from off-site transportation would be the same for the Proposed Action as for current operations. In the past 10 years, there have been 62 truck shipments offsite to the Hanford disposal site with no accidents.

Impacts from on-site transportation are expected to be reduced due to the shorter mean distance from points of generation to the proposed facility as shown in Figure 1.1. There would be no change in the number of trips per year from points of generation to the facility.

5.2.5 Cumulative Effects

Cumulative effects from this project are expected to be limited to the impact of adding a building of this size to the overall Fermilab operation. Impacts of the building would include the loss of approximately three acres of upland old field community, a community that is plentiful at Fermilab and throughout the region. The stormwater runoff generated as a result of the additional impermeable surfaces is expected to be negligible because the project would be a very small proportion of the watershed, which is otherwise undeveloped.

There would be no cumulative human health effects on either workers or the public due to low-level radioactive waste processing, since the process itself is not expected to change fundamentally. This applies equally to effects of normal and off-normal operation.

5.3 Off-Normal Operation

In the event of a spill, adequate measures would be implemented according to the Spill Plan, as described earlier (see section 3.1.3.2). Implementation of this plan would eliminate any reasonable potential for impacts.

Other "off-normal" operations could occur in the event of a natural disaster, such as a tornado. During the period from 1876 and 1985, ten tornadoes have been reported in the Fermilab area. Fermilab is

located within a ten mile wide tornado belt that exists between Aurora and Evanston, Illinois. The likelihood of Fermilab experiencing a low intensity tornado (winds of <100 mph) is estimated at 10^{-3} occurrences per year. The likelihood of Fermilab experiencing a tornado with winds up to 300 mph is 10^{-6} occurrences per year. Such a tornado would likely cause severe damage. Since Fermilab ships a minimum of one truckload of waste off site per year, a conservative estimate of the amount of waste on hand would be the annual average volume shipped. As stated above, that is approximately 1200 cubic feet of solid waste with an average total activity of less than 1 Ci. The maximum amount of liquid waste stored at the facility awaiting solidification, based on prior experience, would be 1200 gallons. Maximum average activity concentration in liquid waste would be approximately 8000 pCi/ml. This would result in an additional 0.004 Ci. The limit on exposure rate for all material processed at the facility would remain 100 mrem/hr at 30 cm. Thus, the danger of exposure to workers and the general public would be extremely slight and comparable to that concluded in the analysis of normal operations above in section 5.2.1. The enhanced structural integrity of the proposed building relative to the existing barn at Site 67 would further decrease the likelihood of damage resulting in negative impacts to the environment or to workers.

The potential for impacts would be mitigated by normal operating procedures designed to minimize the potential for such impacts by minimizing waste inventories. Liquids are solidified and compactibles are processed and packaged as soon as there is a sufficient amount for practical handling. Packaged wastes are shipped to the disposal facility as soon as practical after a truckload is generated.⁹

5.4 Decommissioning

Decommissioning of the existing facility at site 67 would be carried out according to guidelines published in Chapter 8070 of the Fermilab ES&H Manual.¹³ No radiological impacts are expected from decommissioning this facility due to the extremely low levels of radioactivity encountered during present operations. No component in the building is classified as low-level radioactive material or waste.

Decommissioning of the proposed low-level radioactive waste building is contingent upon future experimental work at Fermilab and the funding to support such work. This building would be included in Fermilab's Decontamination and Decommissioning (D&D) site-wide plan.

Dismantling impacts would be similar to construction activity impacts. Specific D&D procedures to minimize impacts of decommissioning this proposed facility would be developed according to established procedures. Additional NEPA documentation would precede any proposal to D&D this proposed facility.

5.5 Impacts of Reasonable and "No Action" Alternatives

The "no action" alternative has potential environmental impacts. The present facility includes limited indoor storage capacity resulting in the continued storage of activated bulk items out of doors, where they are exposed to the elements. The small potential for radioactive dust to be dispersed by wind during the sorting and screening procedure would continue. The "no action" alternative would result in the continuation of a finding identified by the May, 1992, DOE Tiger Team Assessment (see section 2.0) as well as facility deficiencies identified by Self-Assessment Reviews conducted internally by ES&H Section personnel. This alternative would also fail to address the environmental concerns of the IDNS and communities adjacent to Fermilab.

Due to the proximity and similarity of the preferred and alternate sites, the potential for impacts of the alternate site is expected to be similar to those of the proposed action.

5.6 Compliance With Other Regulations

There are no permit requirements for this Proposed Action. Therefore, there are no impacts on regulatory compliance due to the Proposed Action, or any alternative, including the "no action" alternative.

5.7 Conclusions

The conclusions of this analysis are summarized in Table 5.1. Impacts expected as a result of the proposed action would be minor due to the nature of the activities involved, and because no fundamental changes in procedures and levels or concentrations of radioactivity are being proposed. The most notable impacts of the proposed project on human health are positive, due to proposed changes that would result in higher efficiency, greater safety for workers and the public, and increased protection of the environment.

Construction impacts are identical to those expected from the construction of any medium-sized support building. Impacts of excavation would be minimized by appropriate erosion and sedimentation controls, and mitigated by landscaping after the completion of the building. Traffic associated with construction would have a minimal effect, because of the low volume of traffic currently utilizing the adjacent roads.

Decommissioning of the current facility would not be expected to present any impacts.

Radiological effects of normal operations would be minimal. Workers exposed to the maximum possible dose at the facility under the most conservative assumptions would be expected to experience only 0.002 extra cancer fatalities per person over a twenty year period. The dose equivalent experienced by the public due to this facility is less than 1% of normal background.

Impacts on human health of workers would be expected to be positive, due to the elimination of a large proportion of manual handling of waste and the elimination of shuttling between two facilities.

Impacts due to off-site transportation of wastes to the disposal site would not change as a result of the proposed action. Therefore, there would be no impacts attributable to it. Overall mileage due to on-site transportation of wastes to the proposed facility would decrease due to the central location of the facility, which is closer to the major generators of low-level radioactive waste than either of the current two facilities. Approximately one mile of public roadway would be eliminated from the transportation routes.

Direct impacts on the environment would be minimal. There are no threatened or endangered species, or critical habitat at or near the project site. There are no impacts expected on groundwater or surface water. Any stormwater impacts would be minimized by appropriate controls.

Table 5.1
Comparison of Potential Impacts

Alternative	Potential Environmental Impacts					
	Construction	Radiation	Human Health	Flora & Fauna	Transportation	Cumulative
No Action	none	none	Accident Potential	none	none	none
Upgrade of Site 67	none	none	Accident Potential	none	none	none
Proposed Action	Removal of old field habitat	Decrease from current	Decrease from current	none	Decrease from current	Slight increase in runoff
Alternative Action	Removal of old field habitat	Decrease from current	Decrease from current	none	Decrease from current	Slight increase in runoff

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11. Fermilab Radiological Control Manual, April 1993, Fermi National Accelerator Laboratory.
12. Fermilab Spill Plan (SPCC), September 1993.
13. Fermilab Environment Safety and Health Manual, Fermilab, June 1993.
14. Fermilab Tiger Team Corrective Action Plan, Fermilab, January, 1993.
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18. Recommendations for the Preparation of the Environmental Assessments and Environmental Impact Statements, U.S. Department of Energy, Office of NEPA Oversight, May 1993

19. Report on the Wooded Areas Survey, Gazebo Site Testing, Collector Interviews, and Review of Prehistoric Site Status and Location at Fermi National Accelerator Laboratory, Batavia, Illinois, R. Lurie, Midwest Archaeological Research Services, Inc., January 28, 1990.
20. Report on the 1990 Historical Site Survey at Fermi National Accelerator Laboratory, Batavia, Illinois, Midwest Archaeological Research Services, Inc. (Final), May 13, 1993.
21. Site Environmental Report for Calendar Year 1992, Fermilab 92/150 1104.100 UC-41, May 1993.
22. Standards and Specifications for Soil Erosion and Sediment Control. Illinois Environmental Protection Agency, 1987.

LISTING OF AGENCIES AND PERSONS CONSULTED

Consultants

Mr. Jeff Mengler and
Dr. Benjamin N. Tuggle, Ph.D.
Field Supervisor
Chicago Metro Wetlands Office
U.S. Fish and Wildlife Service
1000 Hart Road, Suite 180
Barrington, Illinois 60010
(708) 381-2253

Mr. Glen Kruse
Project Manager
Endangered and Threatened Species Program
Illinois Department of Conservation
524 South Second Street
Springfield, Illinois 62701-1787
(217) 785-8687

Consultation Requested

Review of project site and determination of wetlands, threatened and endangered species and critical habitats.

Review of project and determination of threatened and endangered species and critical habitats.

APPENDICES

Appendix A Photo of tent currently used for sorting and screening operation

Appendix B Photos of preferred and alternative sites

Appendix C Letter from Illinois Department of Conservation

Appendix D Letter from U.S. Fish and Wildlife Service

Current Low-Level Radioactive Handling
Temporary Tent

PROPOSED SITE

ALTERNATE SITE

Illinois Department of Conservation

LINCOLN TOWER PLAZA • 524 SOUTH SECOND STREET • SPRINGFIELD, ILLINOIS 62761 • PHONE: (217) 785-6200 • FAX: (217) 785-6201

Brent Manning, Director

John W. Comerio, Deputy Director

Bruce F. Clay, Assistant Director

December 14, 1993

Donna Urbikas
Fluor Daniel Environmental Services, Inc.
200 West Monroe Street
Chicago, IL 60606

RE: Environmental Assessment
Radioactive Waste Handling Building
Fermi National Accelerator Laboratory

Dear Ms. Urbikas:

Per your request, we have reviewed the DOE Environmental Evaluation Notification Form for the referenced project.

Several Illinois endangered and threatened species have been documented at the Fermi National Accelerator Laboratory. Most of the known occurrences of such species are on parts of the facility far from the proposed waste handling facility and are not likely to be affected by construction of the facility as planned.

Two species, the Upland Sandpiper and the Loggerhead Shrike, have occurred on portions of the Fermi Lab relatively near the proposed waste handling facility. The Upland Sandpiper nests in grassy areas and the Loggerhead Shrike nests in small trees (usually hawthorn or other thorny species) that grow within the grassy areas.

The small area involved in construction of the waste handling facility makes it unlikely that there will be a significant loss of nesting habitat at Fermi Lab for either of these two birds. We would encourage land managers at Fermi Lab to maintain the existing grassy areas around the proposed facility in a condition that will allow for use by these species. If specific recommendations would be useful, we can provide such advice on request.

If you have any questions about our review, please contact me at (217) 785-6200.

Sincerely,

Glen Kruse
Project Manager

for: Deanna Glosser, Ph.D.
Endangered and Threatened Species
Program Manager

IN REPLY REFER TO

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Metro Wetlands Office
1000 Hart Road - Suite 180
Barrington, Illinois 60010

FWS/AES-CIFO

708-381-2253

January 13, 1994

Donna Urbikas
Fluor Daniel Environmental Services, Inc.
200 West Monroe Street
Chicago, IL 60606

Dear Ms. Urbikas:

This is in response to your December 31, 1993 request for additional input into your Environmental Assessment (EA) for the proposed low-level radioactive waste handling building at Fermilab.

Based on the location for the facility depicted on your enclosures, we have reviewed our maps and file information for any natural resources of concern in the area. A site inspection was conducted on January 13, 1994 and the area does not appear to contain any wetlands or other natural resources of concern.

Based on the information provided with your letter, we do not believe that the proposed project would adversely affect any federally endangered or threatened species. Transient state or federally listed bird species may fly over the site; however, it does not appear to provide any suitable habitat (see The Birds of Fermilab, a report by Victoria Byre dated November 15, 1988). This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended.

If you have any questions, please contact Mr. Jeff Mengler at 708/381-2253.

Sincerely,

Benjamin N. Tuggle, Ph.D.
Field Supervisor

cc: R. Walton, Fermilab