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SUBJECT FINAL ISSUE OF NFSS PROJ MGMT PLAN FOR SIGNATURE

FROM NEMEC TO CAMPBELL COMM DATE 09/03/85

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PLEASE RETURN TO PDCC FOR CORRECTIONS

JFW 9/5 Wing cy. Campbell Atkin 39500

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Bechtel National, Inc.
Engineers — Constructors

Jackson Plaza Tower
800 Oak Ridge Turnpike
Oak Ridge, Tennessee

Mail Address: P.O. Box 350, Oak Ridge, TN 37831-0350
Telex: 3785873

SEP 3 1985

U.S. Department of Energy
Oak Ridge Operations
Post Office Box E
Oak Ridge, Tennessee 37830

Attention: L. F. Campbell, Deputy Director
Technical Services Division

Subject: Bechtel Job No. 14501, FUSRAP Project
DOE Contract No. DE-AC05-81OR20722
Final Issue of the Niagara Falls Storage Site
Project Management Plan for Signature
File No. 148, WBS 202-K

Dear Mr. Campbell:

Attached for signature is one unbound copy of the subject document. All comments from TSD have been incorporated and reviewed by Bob Atkin and Jeannette Hoffman. Joe Mahler has reviewed the updated costs in Appendix D of the Information Supplement. Upon return of the signed copy we will publish the document and provide you with seven bound copies, as requested by Bob Atkin.

Very truly yours,

Joseph F. Nemec

Joseph F. Nemec
Project Director - FUSRAP

JMH/jmh

cc: J.F. Wing (with attachment)
R.G. Atkin

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002801

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NIAGARA FALLS STORAGE SITE
PROJECT MANAGEMENT PLAN

Approved by: Lowell F. Campbell — 9/19/85 Date

Lowell F. Campbell
Project Manager, NFSS
Oak Ridge Operations Office

Approved by: E. L. Keller — 9/20/85 Date

E. L. Keller, Director
Technical Services Division
Oak Ridge Operations Office

Approved by: for J. W. Benedict — 9/24/85 Date

John T. Milloway
Assistant Manager for
Construction and Engineering
Oak Ridge Operations Office

TSD FILE NO.: 202.3

EE12346

ROUTING AND TRANSMITTAL SLIP

Date: 9/17/85

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Lowell Campbell, CE-53	LFC	9/19/85
2. E. L. Keller, CE-53	ELK	9/20/85
3. John Milloway, CE-50	JMW	9/23/85
4. Bob Atkin, CE-53 (Last)	RGA	9/27/85
5. File		

	Action		File		Note and Return
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	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

NFSS PROJECT MANAGEMENT PLAN

Attached for your review and concurrence is the subject document. BNI has incorporated all TSD comments/corrections. Note that footnote "a" on page D-2 of the supplement will be changed to $1M to reflect the latest estimate for decontamination of the SCA warehouse & road repair.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Robert G. Atkin Robert G. Atkin	Phone No.

5041-102

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ORO-845 Rev. 1

NIAGARA FALLS STORAGE SITE

PROJECT MANAGEMENT PLAN

SEPTEMBER 1985

Prepared by

UNITED STATES DEPARTMENT OF ENERGY

OAK RIDGE OPERATIONS OFFICE

TABLE OF CONTENTS

E=12346

Page

LIST OF FIGURES

LIST OF TABLES

E-12346

1.0 INTRODUCTION

E-12346

The Niagara Falls Storage Site (NFSS) is a U.S. Department of Energy (DOE) surplus facility located in Niagara County, New York. The site covers approximately 191 acres and is presently used for the storage of radioactive residues and contaminated soils and rubble.

The NFSS is a small portion of the U.S. Army's original Lake Ontario Ordinance Works (LOOW), portions of which were used by the wartime Manhattan Engineer District (MED) for the storage and transshipment of radioactive materials. As a result of these operations, some portions of the former LOOW other than the present NFSS are also contaminated. [redacted]

To manage and plan the ultimate disposition of surplus DOE-owned facilities such as the NFSS, DOE has established the Surplus Facilities Management Program (SFMP), under the direction of the DOE Division of Facility and Site Decommissioning Projects (DFSDP). The contaminated materials in the [redacted] and on vicinity properties are the responsibility of the Formerly Utilized Sites Remedial Action Program (FUSRAP), another DOE program under the direction of DRAP.

The purpose of this Project Management Plan is to describe the interim remedial actions that are under way at the NFSS to place the site in a condition that minimizes potential risks to the public, the environment, and on-site personnel until final disposition of the site is planned and implemented. It describes interim remedial actions related to on-site cleanup and storage of radioactive residues, contaminated soils, and rubble, [redacted]. In addition, this Project Management Plan describes the

process that will lead to a decision by DOE for the long-term disposition of the site and its wastes. This Project Management Plan will be updated as necessary to reflect the overall plan for final site and waste disposition.

2.0 PROJECT OBJECTIVES

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The overall objectives of the SFMP and FUSRAP relating to the NFSS are to:

- Continue to provide surveillance and maintenance of the site as necessary to maintain public safety and reduce impact on the public, the environment, and on-site personnel to as low as reasonably achievable
- Perform interim remedial actions as necessary to consolidate and control all radioactive material stored at the site in a manner that will eliminate off-site migration of waterborne effluents and reduce annual surveillance and maintenance costs, but that will not preclude or jeopardize any long-term disposition alternative for the site
- Perform interim remedial actions as necessary to decontaminate on-site and [redacted]
- Perform interim remedial action on the NFSS vicinity properties, placing any excavated materials in an interim waste storage facility on the NFSS
- Perform the necessary environmental, geological, engineering, and other studies as required to support the decision-making process for eventual long-term disposition of the site
- Select, after complying with the procedures that implement the National Environmental Policy Act (NEPA), a preferred alternative for long-range disposition of the wastes and residues at the site
- Plan and implement the remedial action program required to accomplish the selected alternative for long-term disposition
- Perform planning and remedial activities in coordination with DOE and other waste-management programs.

As stated in the Introduction, this Project Management Plan describes those activities supporting and leading to the DOE decision for the disposition of the site. Following that decision, the Plan will be revised to address the actions necessary to accomplish the long-term disposition of the site.

3.0 FACILITY DESCRIPTION

3.1 LOCATION

The NFSS, located in northwestern New York, lies within the Town of Lewiston (Niagara County), and is approximately 4 mi south of Lake Ontario, 10 mi north of the city of Niagara Falls, and 15 mi west of the city of Lockport. The site is generally level, sloping gently to the northwest and lying at elevations between 317 and 323 ft. The NFSS and its regional context are shown in Figure 3-1.

The facility is presently maintained by Bechtel National, Inc., (BNI), which was chosen by DOE as the Project Management Contractor (PMC) for the NFSS project in 1981. As part of its duties as PMC, BNI maintains the security of the site, performs maintenance as required, and carries out an environmental monitoring program. Access is controlled by a 7-ft fence which encloses the DOE property. Daily inspections of the site are performed by the BNI Site Operations Supervisor permanently stationed at the facility. (Other activities of the PMC are described in Subsection 4.1.4).

The NFSS is bordered on three sides by privately owned property. To the west, property is owned by Niagara Mohawk Power Company. To the north and northeast, the site is bordered by industrial land owned by Chemical Waste Management, Inc. (formerly SCA Chemical Services, Inc.). To the east, property is owned by Modern Landfill. The site's southern boundary borders property owned by the U.S. Department of Labor. [redacted]. With regard to radiological characterization and any remedial action required, these vicinity properties are also the responsibility of DOE (under FUSRAP).

3.2 SUMMARY OF SITE HISTORY

The current 191-acre NFSS is a small portion of the original LOOW established by the U.S. Army in the early 1940's. Part of the

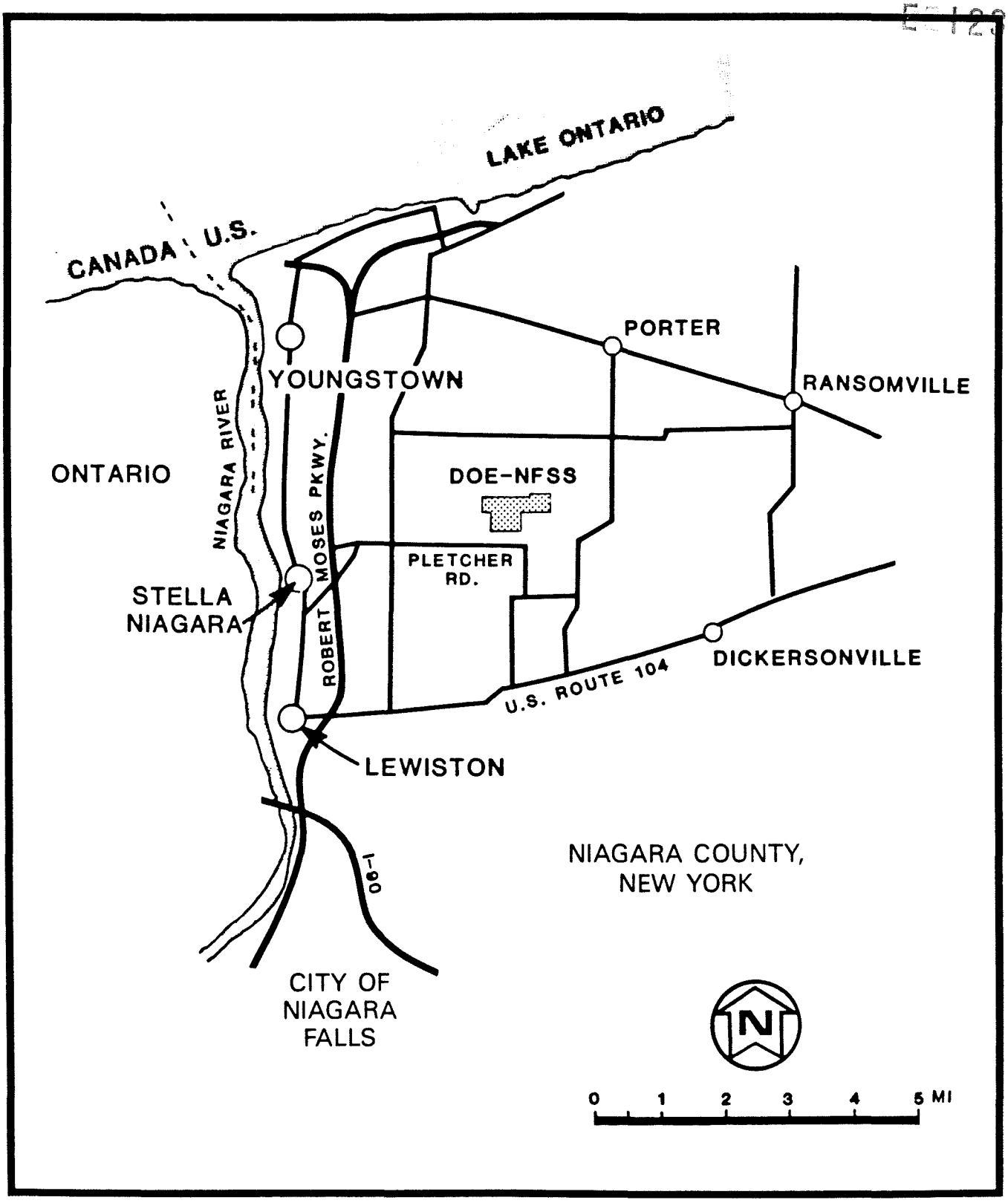

FIGURE 3-1 THE REGIONAL SETTING OF THE NIAGARA FALLS STORAGE SITE (NFSS)

original 7,500-acre LOOW tract was used for TNT production early in World War II. When these operations ceased, the Department of Army assigned the site to the War Assets Administration. The War Assets Administration transferred a portion of the property to the MED, which in 1947 became the Atomic Energy Commission (AEC). The AEC-owned property then totaled approximately 1500 acres.

During 1944, the MED began to use the property for the storage of pitchblende (uranium ore) processing residues. The first materials to arrive at the site were low-grade residues and byproducts from the Linde Air Products Division in Tonawanda, New York (the L-30, L-50, and R-10 residues) and from the Middlesex Sampling Plant in Middlesex, New Jersey (the F-32 residues). The L-30 and L-50 residues were stored in Buildings 411, 413, and 414, while the F-32 residues were stored in a recarbonation pit directly west of Building 411. (These buildings and other features of the NFSS prior to interim remedial actions are illustrated in Figure 3-2.) The R-10 residues, as well as associated R-10 iron cake, were stored in an open area north of Building 411. [redacted]

The Middlesex Sands were obtained from decontamination activities conducted at the Middlesex Sampling Plant (and thus are not a uranium processing residue). They were stored in Building 410.

Shortly after World War II, radioactively contaminated processing equipment from Linde, and contaminated metal, concrete, ceramics, and lumber from decommissioning activities conducted at other facilities used for similar operations during the war were placed on the site.

In 1949, pitchblende residues (the K-65 residues) resulting from uranium extraction conducted at a St. Louis plant were transported to the LOOW in drums. Some of these were stored outdoors along

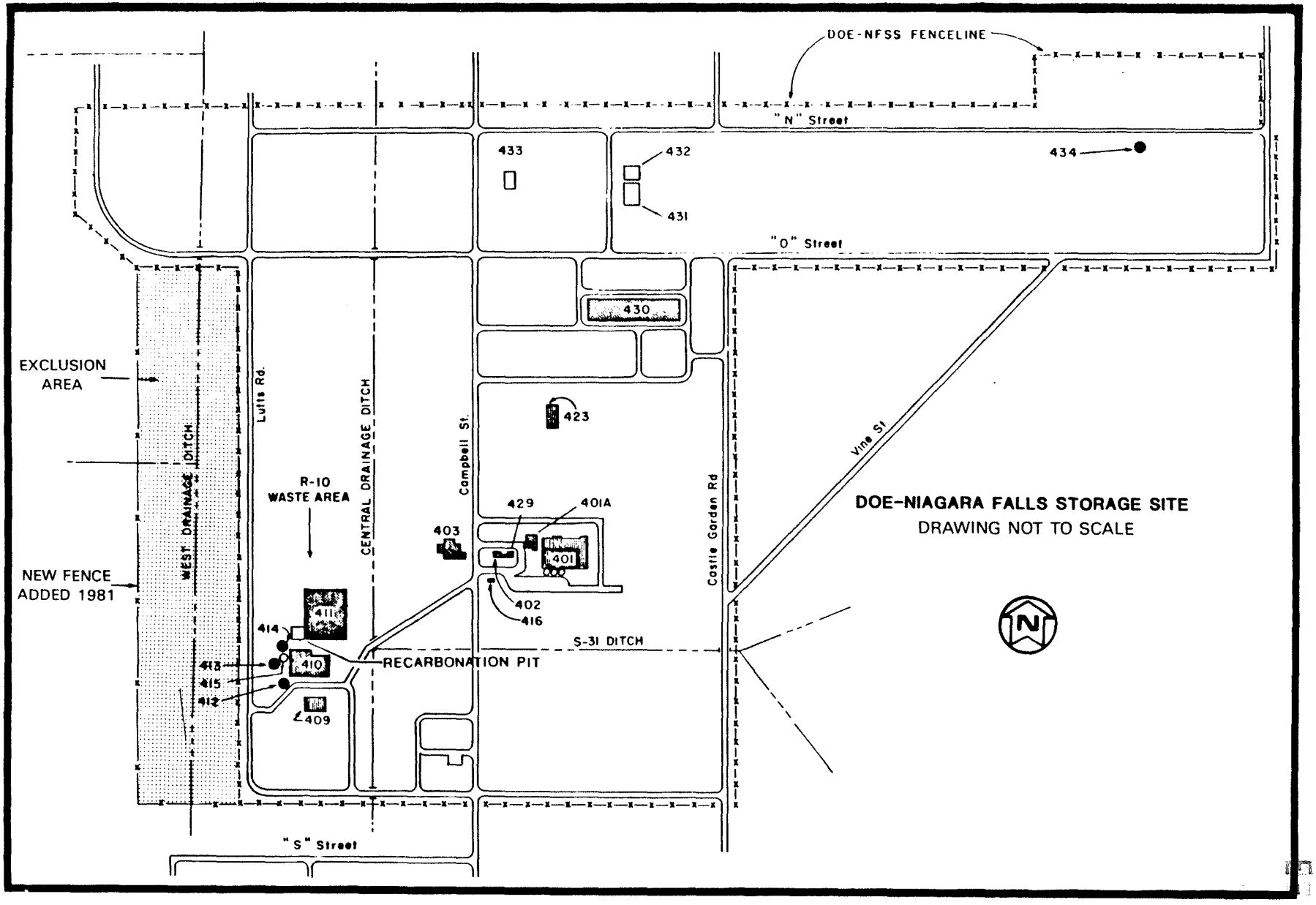

FIGURE 3-2 DIAGRAM OF THE NFSS SHOWING STRUCTURES AND FEATURES OF THE SITE PRIOR TO INTERIM REMEDIAL ACTION

existing roads and rail lines; others were stored in Building 410. From 1950 to 1952, the K-65 residues were transferred to Building 434, a renovated concrete water tower.

Between 1949 and 1952, the AEC property was used as a temporary storage location for uranium- and thorium-containing materials that were processed by various facilities located in New York State. In addition, radioactive materials from the Knolls Atomic Power Laboratory (KAPL), the University of Rochester, and the Electro-Metallurgical company were received at the site. The KAPL wastes consisted of combustible materials stored in wooden crates and processing wastes stored in drums. These materials were later transferred to an AEC burial ground at Oak Ridge, Tennessee. The University of Rochester waste included carcasses and associated laboratory animal waste and miscellaneous material containing strontium-90 and cesium-137. The Electro-Metallurgical Company material included metal casting equipment that was contaminated with recoverable quantities of uranium. This equipment was shipped to the Oak Ridge Y-12 Plant in the late 1950's.

Building 401, the original on-site steam plant, was modified and used for boron-10 production between 1953 and 1959, and again between 1965 and 1971. During the first period of operation, a major site cleanup occurred that included consolidation and removal of surface debris, packaging of KAPL waste for shipment to Oak Ridge, and sale of bulk metallic scrap. After 1971, the boron production facility was disassembled, and the instrumentation and hardware were disposed as surplus materials. After the boron-10 operations ceased, most of the AEC-owned property was transferred or sold. Only 191 acres remained, comprising the NFSS. Site operations were put on standby in 1971, and National Lead Company of Ohio (NLO) was assigned as caretaker for the site.

In 1971, the AEC Oak Ridge Operations Office, assisted by Oak Ridge National Laboratory (ORNL), performed a preliminary radiological survey of the AEC-owned portion of the LOOW and identified several areas that exceeded then-existing environmental standards. These

areas were excavated and, in 1972, approximately 15,000 yd^3 of contaminated materials were piled over a portion of the R-10 residue storage area, forming the R-10 "spoils pile" (Ref. 1). EE12346

Over the next few years, several other radiological surveys were performed in the area, including aerial surveys and a comprehensive survey performed by Battelle Columbus Laboratories (Ref. 2 and 3). Battelle's findings served as the basis for initial interim remedial action planning at the site. In March 1981, BNI was designated by DOE as the PMC for FUSRAP and in October 1981 for the SFMP portion of the NFSS.

3.3 RADIOLOGICAL DESCRIPTION

The radiological description of the NFSS is presented in two parts: the radiological conditions that existed prior to the beginning of interim remedial actions, and the effects the interim remedial actions have had upon the radiological status of the site.

3.3.1 Radiological Status Prior to Interim Remedial Actions

The radiological status of the NFSS prior to the beginning of interim remedial actions was reported by Battelle in 1981 (Ref. 3). The primary radiological features of the site were: the radioactive residues stored in various locations on the site; the contaminated land areas on the site; [redacted] However, these properties were not characterized by Battelle.) Each of the radiological features is covered in the following subsections.

Residues

The weight, volume, and storage locations of the residues and sands at the NFSS prior to remedial action are given in Table 3-1. Refer to Figure 3-2 for storage locations.

The K-65 residues resulted from the processing of high-grade pitchblende ore (containing 35-60 percent uranium oxide) by a St. Louis processing plant. Based on the best available data, (Ref. 3, Ref. 4) the K-65 residues have a uranium concentration of 1,000 to 2,000 ppm (parts per million) and radium concentrations from 180 to 360 ppb (parts per billion). The K-65 residues have the highest specific activity of the residues at the NFSS.

The L-30 residues resulted from the processing of pitchblende ore (containing about 10 percent uranium oxide) by the Linde Ceramics Plant, Tonawanda, New York from December 1943 through October 1944. Available data suggest uranium concentrations ranging from 400 to 5,000 ppm and radium concentrations from 2 to 12 ppb in the L-30 residues (Ref. 3, Ref. 4).

The L-50 residues resulted from uranium extraction of pitchblende ores containing approximately 7 percent uranium oxide. Extraction was conducted by the Linde Plant. The uranium and radium concentrations in the L-50 residues range from 100 to 4,000 ppm and 7 to 12 ppb, respectively (Ref. 3, Ref 4).

The F-32 residues were the result of a similar uranium extraction process to that which produced the L-30 and L-50 residues. Inventory data indicate that the uranium concentration of the pitchblende ore used by Linde ranged from 4,000 to 6,500 ppm (Ref. 3, Ref. 4). Radium concentration are estimated to be 5 ppb.

The R-10 residues resulted from the processing of ore containing 3.5 percent uranium oxide. The R-10 residues were stored on the soil surface north of Building 411, and the initial residue inventory suggested a uranium concentration of approximately 2,300 ppm. Radium concentrations are estimated to be 3 ppb (Ref. 3, Ref. 4).

TABLE 3-1

AMOUNTS AND STORAGE LOCATIONS OF THE MAJOR PITCHBLENDE RESIDUES AND MIDDLESEX SANDS STORED AT THE NFSS

Residue	Volume (yd^3)	Storage Location	
		Before Interim Remedial Action	After Interim Remedial Action
K-65	3,200	Building 434	Building 411, Bays C and A
L-30	7,960	Building 411	Building 411, Bays B, C, and D
L-50	2,150	Buildings 413 and and 414	Buildings 413 and 414
F-32	440	Building 411, Bay A	Building 411, Bays B, C, and D
R-10	9,400	North of Building 411	Waste Containment Area North of Building 411
Middlesex Sands	229	Building 410	Building 410

The Middlesex sands are the result of decontamination activities (sandblasting) conducted at the Middlesex Sampling Plant, Middlesex, New Jersey. Measurements made during the Battelle site characterization indicated levels of less than 100 ppm uranium and less than 0.01 ppb radium-226 (Ref. 3).

Contaminated Land Areas

From information based on site records and the Battelle characterization (Ref. 3), nine distinct contaminated land areas were identified at the NFSS. These areas are illustrated in Figure 3-3. The R-10 residue storage area (Area 1) was partly overlain by the 15,000 yd^3 of spoils (soils, sediments, and rubble) created during the off-site decontamination activities in 1972. The area covered approximately 37,500 yd^2 and contained an estimated 55,000 yd^3 of contaminated soils and residues. Exposure rates at 1 m above the ground in this area ranged from background to 6 mR/h. [redacted].

The New Naval Waste Area (Area 2) was in the north-central portion of the site. The area derived its name from maps in the site archives that identified it as being contaminated with U.S. Navy wastes. Exposure rates at 1 m above the ground in this area ranged from 0.2 to 4 mR/h. The contaminated area was estimated to cover approximately 50,000 ft^2.

Area 3 was an area of approximately 60,000 ft^2 between West Patrol and Lutts roads slightly south of the north perimeter of the site. Exposure rates at 1 m above the ground were as high as 70 mR/h in very small areas near two small concrete pads.

Area 4 was located south and southeast of Building 409, east of Lutts Road. Contamination included broken crucibles, saw blades, and other metallurgical scrap left on the ground during the 1950's. Exposure rates at 1 m above the ground ranged from 0.1 to 0.65 mR/h. The area covered approximately 3,600 ft^2.

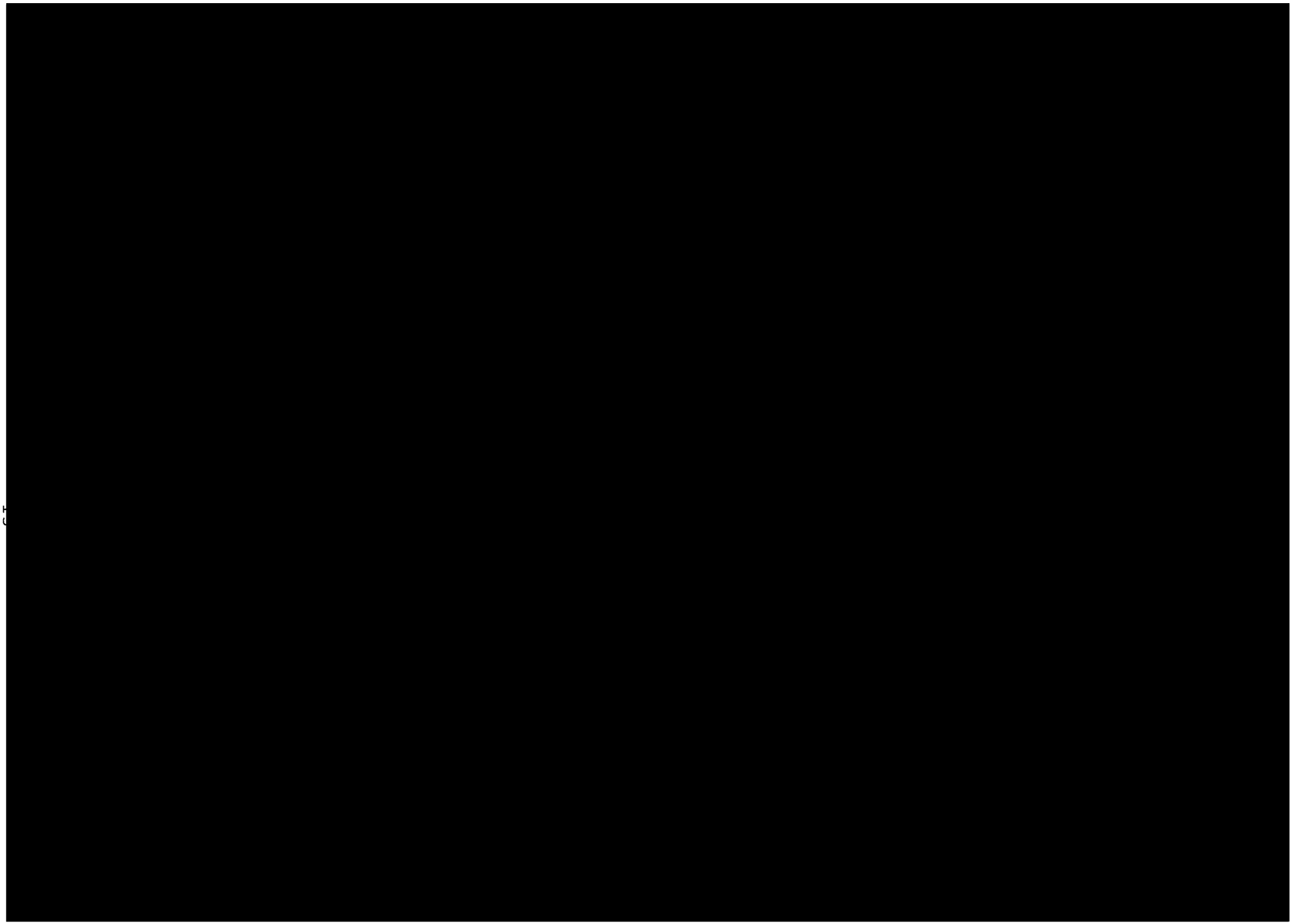

FIGURE 3-3 CONTAMINATED LAND AREAS AT NFSS PRIOR TO INTERIM REMEDIAL ACTION

Area 5 was located east of the Central Drainage Ditch and west of Campbell Street. [redacted]

Area 6 was located south of Building 401. This area was used as a slurry pond during boron-10 isotope separation and was cleaned and filled after operations ceased. Exposure rates at 1 m above the ground ranged from 0.2 to 2 mR/h. The area covered approximately 22,500 ft^2.

Area 7 was in the southwest corner of the intersection of 0 Street and Lutts Road, and covered approximately 2500 ft^2. The original source of contamination is unknown, but could have been caused by bulk storage or from drainage. Gamma exposure rates one meter above the ground ranged to 0.8 mR/h, and beta-gamma dose rates ranged from 0.3 to 2.0 m rad/h at the surface.

The remaining two contaminated areas (Areas 8 and 9) contained non-uniform deposits of radium-226 in a number of small locations, with a total area of about 7500 ft^2. Gamma exposure rates one meter above the ground ranged to 2.0 mR/h and beta-gamma dose rates at the ground surface at corresponding locations ranged to 8.0 m rad/hr.

These approximate surface areas are those reported by Battelle Columbus Laboratories in their 1981 characterization report on the site (Ref. 3).

On-Site and [redacted]

[redacted]

The larger of the ditches is the Central Drainage Ditch, which begins on-site southeast of the R-10 storage area. The Central Drainage Ditch flows north 2650 ft to the site boundary and then continues approximately 3 mi to its confluence with Fourmile Creek northwest of the site. The West Ditch begins at a point west and south of the site and flows northward for approximately 4500 ft to an intersection with the Central Drainage Ditch at a point north of the site.

In the characterizations performed by Battelle, [redacted] The highest concentrations, 1660-1900 pCi/g of radium-226, were found in the on-site section of the Central Drainage Ditch adjacent to Building 411 and the R-10 storage area. In the off-site section of this ditch, Battelle found no contamination in [redacted]

Vicinity Properties

The NFSS covers only 191 acres of the 1511 acres originally utilized for shipment, storage, and burial of radioactive materials and wastes. Therefore, several properties, once part of the federally owned land but now privately owned, were contaminated. Twenty-six vicinity properties, as they are called, were radiologically surveyed by the Radiological Site Assessment Program of Oak Ridge Associated Universities (ORAU) during 1983, and cleanup began in 1984. The cleanup is described briefly in Subsections 3.3.2 and 6.7.1. The locations of the vicinity properties and their radiological status following completion of interim remedial action through 1984 are shown in Figure 3-4.

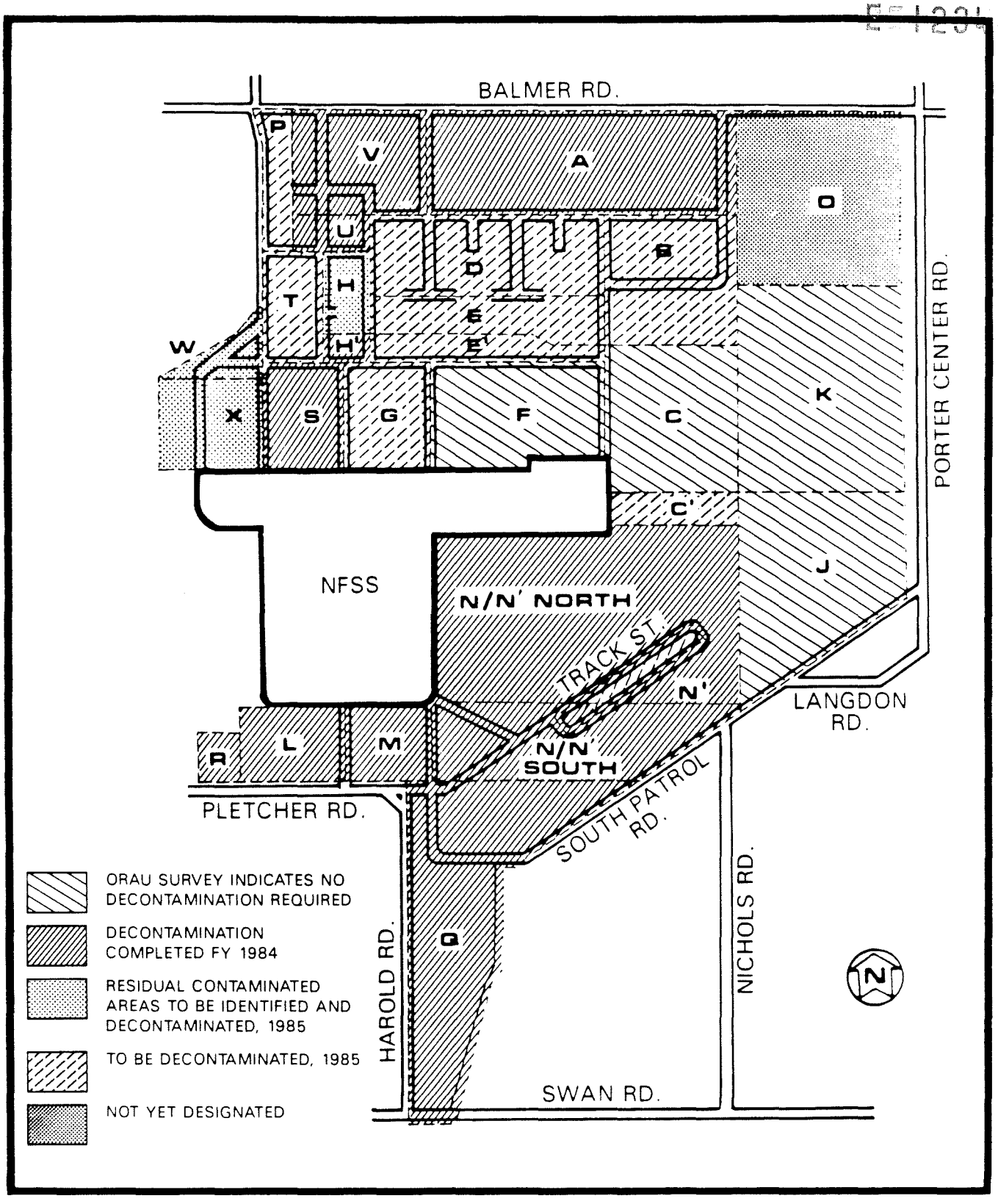

FIGURE 3-4 STATUS OF NFSS VICINITY PROPERTIES AT END OF1984

3.3.2 Radiological Status Following Interim Remedial Actions Through 1984

Since 1980, various steps have been taken at the NFSS to minimize potential radiological risks and prevent migration of residues.

In the fall of 1980, the vent at the top of Building 434 (the former water tower in which the K-65 residues were stored) was capped to reduce radon flux to the environment. In mid-1981, [redacted], the site fence was re-located approximately 500 ft to the west. This effectively reduced radon levels at the site's new boundary to well below applicable guidelines. Also in 1981, remedial action was performed on a triangular-shaped area located just off the NFSS in an area bounded by Vine and O Streets and Castle Garden Road. Approximately 450 yd^3 of contaminated material were excavated from this vicinity property and were returned to the R-10 waste storage area.

To further reduce the levels of radon emanating from the site, in 1982 Buildings 413 and 414 (used for storing the L-50 residues) were upgraded and sealed. Also in 1982, to prevent further migration of residues, contaminated soil near the R-10 pile was moved onto the pile and a dike and cutoff wall were constructed around the R-10 area. The R-10 pile was then covered with an ethylene propylene diene monomer (EPDM) liner to help reduce radon emanation from the R-10 area as well as prevent erosion by the elements.

During 1983, interim remedial actions continued to clean up the on-site contaminated areas and the on-site and [redacted] Excavated contaminated materials were consolidated in the interim Waste Containment Area.

On-site and off-site (Central Drainage Ditch and vicinity properties) excavations continued in FY 1984. Residue transfer and dewatering activities, centering on the use of Building 411 as an interim repository, also progressed. This included the slurry

transfer of approximately 93 percent of the K-65 residues from Building 434 to Building 411. Demolition of Building 410 and a portion of Building 415 was also completed, and the southern portion of the dike/cutoff wall enclosing the Waste Containment Area was completed. Approximately 40 percent of the interim cap also was placed over the Waste Containment Area.

These activities are described in greater detail in Subsection 6.7.1. The condition of the site following the completion of interim remedial actions through 1984 is shown in Figure 3-5.

The storage location of excavated contaminated material is in the Waste Containment Area. One on-site area yet to be characterized and decontaminated surrounds the K-65 Tower. It was not previously characterized or decontaminated due to elevated gamma exposure rates resulting from the presence of the residues and the transfer activity itself, which precluded characterization or cleanup. For more information on this subject, see Subsection 6.2.

3.3.3 Compliance with Environmental Guidelines

All remedial activities performed at the site have conformed to National Environmental Policy Act (NEPA) requirements, and as a result of the interim remedial actions performed to date, the NFSS is in compliance with all applicable DOE environmental protection guidelines. Surface water discharges from the NFSS are regulated by the New York State Department of Environmental Conservation (NYDEC), under the New York State Pollutant Discharge Elimination System (SPDES). Permit No. NY-0110469 was issued May 1, 1983 and is in effect for a period of five years.

During 1984, 2.6 million gallons of site wastewater were released in seven separate discharge events. Discharges consisted of runoff water from the interim Waste Containment Area, wash water from the vehicle decontamination facility, and construction wastewater.

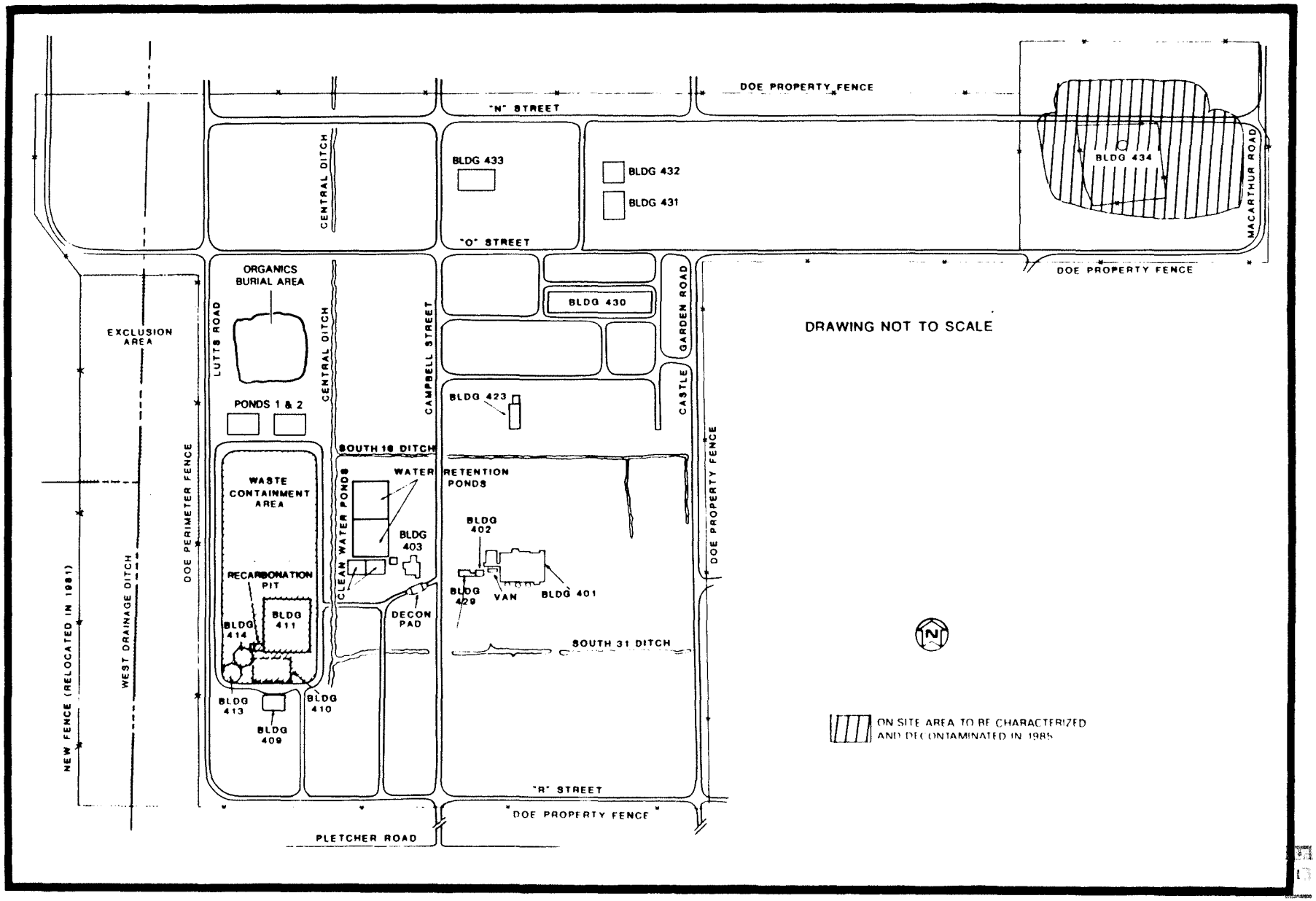

FIGURE 3-5 THE NFSS FOLLOWING INTERIM REMEDIAL ACTION THROUGH 1984

After treatment and testing, water was discharged to the Central Drainage Ditch, which is a tributary of Fourmile Creek. Each discharge request was reviewed and approved by NYDEC.

All water discharged was analyzed before and during release for the applicable permit parameters. For radioactivity, the DOE limits of 600 pCi/l for uranium and 30 pCi/l for radium-226 were applicable. All water released was within SPDES permit parameter limits and DOE Order 5480.1A radioactive release criteria for uncontrolled areas.

NFSS residues and wastes are excluded from regulation under RCRA under the exclusion for "source, special nuclear or by-product material." RCRA EP toxicity testing conducted on the L-30 and K-65 residues in 1984 indicated that maximum concentrations for some heavy metals were exceeded. Long-term management of the residues and wastes by DOE were in substantive compliance with 40 CFR 192 (and therefore, 40 CFR 264) as well as DOE's FUSRAP guidelines for radioactive materials.

4.1 MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

4.1.1 DOE Headquarters

The NFSS project is part of DOE's Surplus Facilities Management Program (SFMP), one of four remedial action programs under the direction of the DOE Assistant Secretary for Nuclear Energy, through the Office of Remedial Action and Waste Technology, to the Division of Facility and Site Decommissioning Projects (DFSDP).

[redacted] The FUSRAP wastes and activities are integrated into the overall NFSS project and management.

DOE Headquarters (DOE-HQ) has the responsibility for the development of overall policy applicable to the NFSS project. DOE-HQ provides broad guidance and establishes the program budget. When necessary, DOE-HQ acts as a liaison with other government agencies to help resolve conflicts or problems that affect the SFMP or FUSRAP or specific projects within the programs.

4.1.2 DOE Richland Operations Office

In 1978, DOE-HQ designated the DOE Field Office in Richland (RL), Washington as the Lead Field Office for the SFMP. The RL Surplus Facilities Management Program Office (SFMPO) manages the program in accordance with established DFSDP policies, applicable DOE orders and directives, and guidance received from DOE-HQ.

SFMPO takes inputs from the various DOE Field Offices that are participants in the program and develops and recommends program activities and budgets to DOE-HQ as required to meet overall SFMP objectives. Authorized funding is distributed to participating Field Offices by SFMPO, and general guidance is issued on the conduct of approved projects in accordance with agreed schedules and at the lowest reasonable cost. SFMPO has assigned the SFMP portion of the NFSS project to the DOE Oak Ridge Operations Office.

4.1.3 DOE Oak Ridge Operations Office

The Oak Ridge Operations Office (OR), Technical Services Division (TSD), provides technical, administrative, and financial management of the NFSS project on a day-to-day basis in compliance with SFMP and FUSRAP policies and all other applicable DOE orders, directives, and specific guidance. In this capacity, OR-TSD oversees the work of the Project Management Contractor chosen to implement project activities.

4.1.4 Project Management Contractor

The Project Management Contractor (PMC), Bechtel National, Inc. (BNI), was selected by DOE-OR to act as its representative in the planning, management, and implementation of the NFSS project. In meeting its responsibilities as PMC, BNI is responsible for analyzing site conditions and evaluating, recommending, planning, and engineering remedial actions for the NFSS. Upon approval from OR-TSD, BNI implements remedial actions as required. BNI administers construction subcontracts, coordinates the sequence of operations, controls the relationships among subcontractors, and ensures completion of the project in accordance with DOE guidance. In implementing approved interim or final remedial actions, BNI focuses on subcontracting in the NFSS region to the extent that it is cost-effective and programmatically expedient.

At NFSS, BNI is responsible for maintaining a program for maintenance and surveillance of the site and defining and

implementing quality assurance procedures and environmental monitoring, health and safety, and radiological protection programs. BNI is also responsible for monitoring and controlling all activities at the site through close cooperation with its radiological support subcontractor, Eberline Analytical Corporation (EAC), and all remedial action subcontractors.

The overall management organization for the NFSS project is shown in Figure 4-1.

4.1.5 NEPA Activities Contractor

Argonne National Laboratory (ANL) is the contractor selected by OR-TSD to be responsible for ensuring NFSS project compliance with the National Environmental Policy Act (NEPA), as outlined in the Council on Environmental Quality guidelines and implementing DOE Orders. Through the NEPA process, DOE advises federal, state, and local agencies and the public of the results of preliminary engineering evaluations, environmental analyses, and conclusions regarding options for disposition of the NFSS. As part of its NEPA responsibilities, ANL performs environmental assessments necessary to support interim activities. Guidance as to the required levels and types of environmental assessments are provided by DOE.

4.2 ADMINISTRATION AND MANAGEMENT OF THE NFSS PROJECT

Figure 4-2 shows the administrative-level organization for the NFSS project, including identification of the NFSS project managers for OR-TSD, BNI, EAC, and ANL. To provide for the effective administration and management of the project, OR-TSD has established certain procedures regarding reports, reviews, and approvals of project activities. These procedures are described in the following sections.

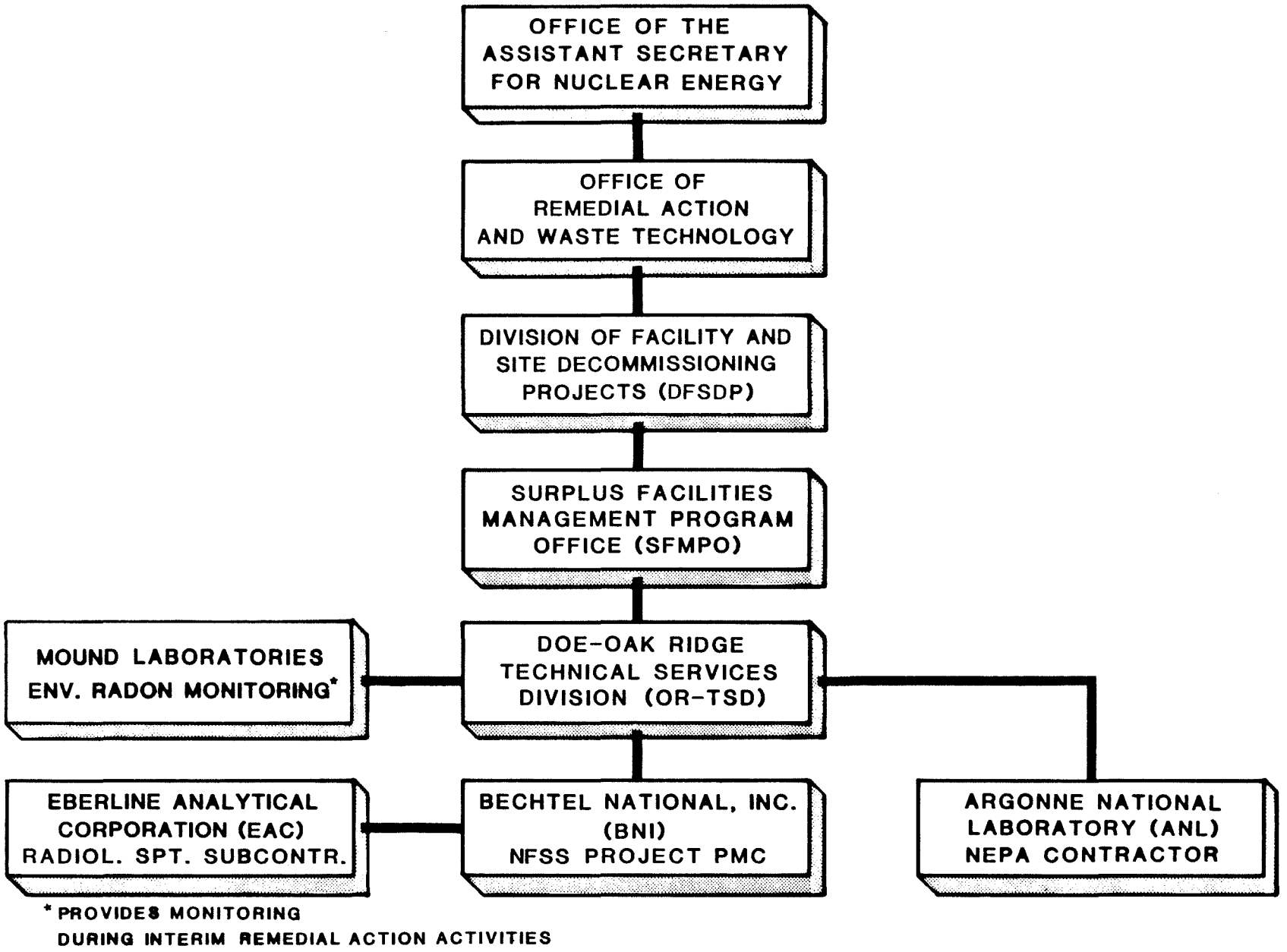

FIGURE 4-1 MANAGEMENT ORGANIZATION AND INTERFACE FOR THE NFSS PROJECT

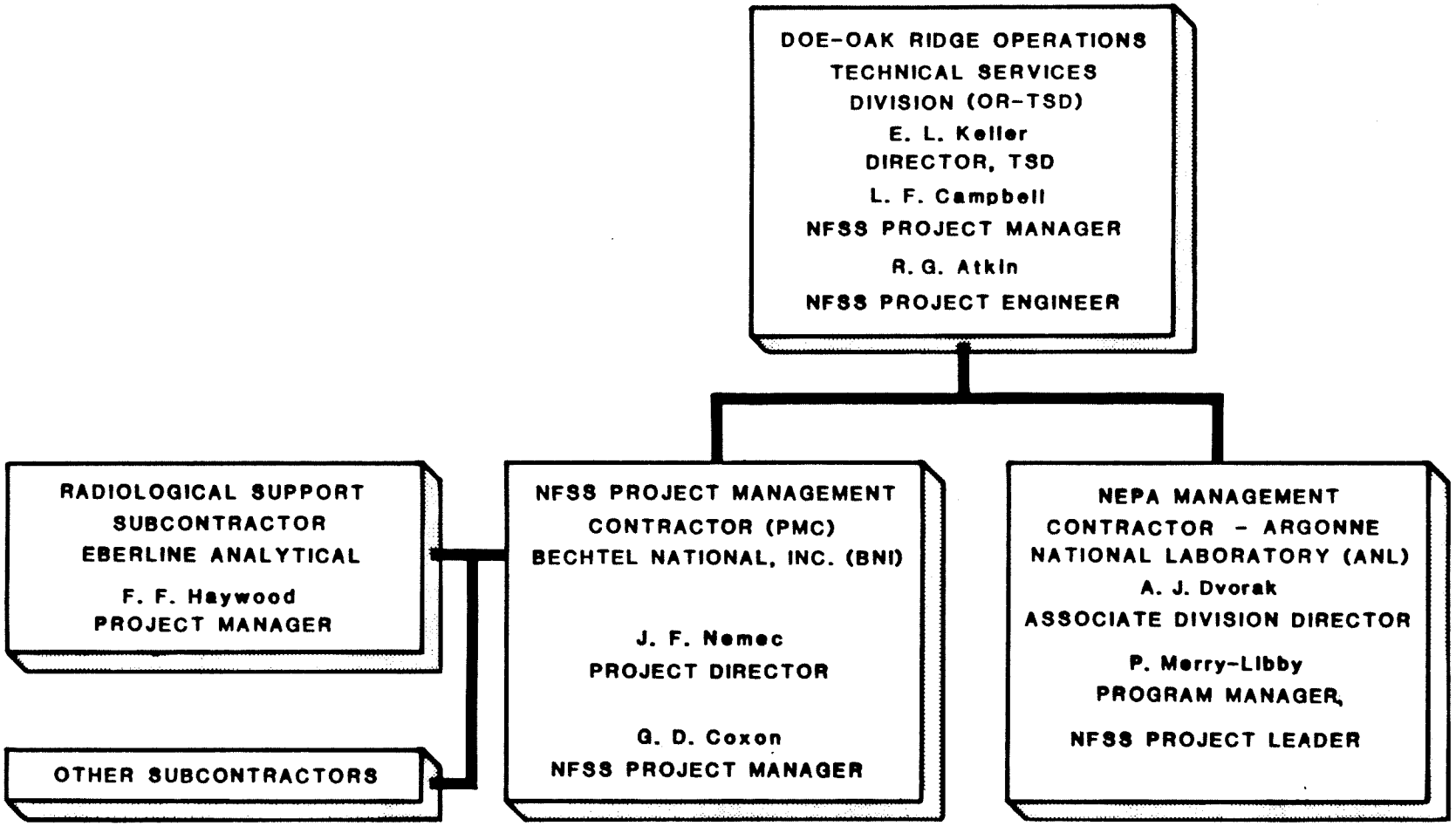

FIGURE 4-2 ADMINISTRATIVE LEVEL ORGANIZATION FOR THE NFSS PROJECT

4.2.1 Project Reports

Project participants prepare major planning documents for the project and provide interim reports and special topical reports as required by OR-TSD. Project participants also are required to make regular reports to OR-TSD on technical progress, costs, schedule status, and milestone achievements of assigned tasks. These reports include weekly activities reports, monthly progress and cost reports, cost trend reports, yearly technical reports on environmental monitoring and construction activities, and reports on completed activities or tasks.

After review and approval of the reports by OR-TSD, some of the input provided is used by OR-TSD to prepare other reports on the NFSS project for information and review by SFMPO and DOE-HQ.

Table 4-1 lists the various types of project reports and shows the responsibilities for report preparation, review, approval, and implementation.

4.2.2 Project Reviews

To allow for monitoring of work performance, documentation of progress, and identification and discussion of problems associated with project activities, OR-TSD and BNI review project status in regular weekly interface meetings. These meetings review the accomplishment of assigned work in accordance with scope and schedule and budget requirements. In addition to these reviews, summary status review meetings are held at appropriate points during each fiscal year, attended by ANL, SFMPO, and DOE-HQ.

4.2.3 Approvals

In addition to approving many of the reports and documents noted in Subsection 4.2.1, OR-TSD approves a wide variety of procedures and actions taken by BNI, ANL, and other project participants. This

TABLE 4-1

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NFSS PROJECT REPORTS

Report/Document	DOE-HQ	SFMPO	OR-TSD	BNI	ANL
Project Planning Documents	R	R	A	P/E	R
Final Project Reports	I	R	A	P	R
Technical Reports	I	I/R*	A/P	P	R
ORO Reports	I	R	A/P	P	R
BNI Reports		I	A/R	P	R
NEPA Documents	A	A/R	A/R	R	P

A = Final Approval
P = Prepare (as appropriate)
E = Implement (as appropriate)
R = Review
I = Information (distribute as appropriate)
* = Design Basis Documents

includes approval of BNI's procedures for subcontracting and procurement activities, review of all subcontract work packages that are prepared for bid, and concurrence with BNI's recommendation for subcontract award. All NEPA-related documents, including Action Description Memoranda, Environmental Assessments, and Environmental Impact Statements, are subject to approval by OR-TSD, SFMPO, and DOE-HQ.

OR-TSD also has approval responsibility for contractor budget submissions, the project baseline and changes thereto, and the project schedule. In addition, BNI internal operational procedures, project documents, project control system, and health and safety and emergency procedures are subject to OR-TSD approvals.

4.2.4 Public Communications Plan

To keep the public informed of activities at the site and the decision making process, a public communications plan for the NFSS project has been prepared by BNI. The plan provides detailed lists of area media and other agencies, groups, or persons to be contacted in the event of significant actions at the NFSS.

BNI also works closely with OR-TSD, SFMPO, and DOE-HQ to prepare special briefings and presentations to the public, civic and special interest groups, and government entities.

4.3 WORK BREAKDOWN STRUCTURE

A Work Breakdown Structure (WBS) is used by all NFSS project participants, providing a method for systematic management and coordination of the project work efforts. The WBS identifies the work elements necessary to accomplish the project objectives, establishing a formal structure for organizing, planning and scheduling work. Under this structure, budget, schedule and technical performance are integrated, allowing reporting and management analyses at various levels of the project.

Level 1 of the WBS comprises SFMP and FUSRAP. Level 2 comprises the NFSS project, identified numerically as 202 for SFMP and 115 for FUSRAP activities. Supplemental funding for the NFSS has been provided under AFRIMET, and work under this funding is identified numerically as WBS 301. Level 3 of the WBS consists of the various work components of the project, such as engineering, remedial action, etc. These components are indicated by an alphanumeric designation (202A, 202B, 115A, 115B, etc.). Level 4 pertains to specific work packages performed as part of a Level 3 component. For example, any specific work package performed under Level 3 component 202G, Remedial Action, would be a Level 4 activity. Table 4-2 illustrates the NFSS WBS through Level 3, and provides a general description of each of the Level 3 components.

TABLE 4-2

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THE WBS AS APPLIED TO THE NFSS PROJECT

SFMP (200) / NFSS (202)	Level 1 / Level 2 / Level 3 Components	FUSRAP (100) / NFSS (115)
202A	Site Characterization is the collection of engineering, radiological, and general data through geological, radiological, and land surveys.	115A
202B	Preliminary Engineering and Environmental Evaluation is the assessment of data gathered through the characterization surveys and development of remedial action options for presentation to DOE.	115B
202C	The NEPA Process is the utilization of Preliminary Engineering and Environmental Evaluation reports to prepare applicable NEPA documentation.	115C
202D	Design Engineering is the development of the work packages for the selected remedial action.	115D
202E	Reserved for future activity.	115E
202F	Site Access Permits or Agreements will be obtained from land owners as required.	115F
202G	Remedial Action Operations is the field work involved in the selected remedial action.	115G
202H	Waste Transportation includes all activities related to waste transportation.	115H
202I	Site Surveillance and Maintenance is an ongoing program to ensure adequate containment of contamination, provide regular sampling and monitoring on-site, and provide physical safety and security controls.	115I

TABLE 4-2

(Continued)

SFMP	Level 3 Components (Continued)	FUSRAP
202J	The Final Report will be prepared documenting the entire remedial action process and the final radiological condition of the site.	115J
202K	General Project Support includes the overall management and administrative functions of the PMC (BNI) acting in direct support of the NFSS project. These functions include project management, technical direction, cost and schedule control, legal affairs, public affairs, procurement and administrative services.	191K
202L	Capital Equipment will be charged to the NFSS project in accordance with criteria contained in DOE-PMR 109-60, Management of Government Property in the Possession of Off-Site Contractors.	115L

NOTE: WBS 301 follows WBS 202 Conventions (i.e., 202A, 202B, etc.).

5.0 TECHNICAL OBJECTIVES

The primary technical objectives for the NFSS project are:

- To continue interim remedial actions to clean up all contaminated areas on-site, [redacted]
- To continue development of the interim Waste Containment Area for containment of residues, contaminated soils, contaminated building rubble, and other materials
- To perform interim remedial action operations as necessary to transfer and stabilize all residues within the interim Waste Containment Area
- To provide engineering support and review as necessary to support the NEPA process as various alternatives are evaluated for the ultimate disposition of the site.

Each of these primary objectives involves several discrete tasks or steps. These tasks are described in Section 6.0, Technical Plan.

In addition, an ongoing technical objective for the NFSS project is the continuation of site maintenance and surveillance activities as necessary to maintain public safety and reduce impacts to the environment and to personnel to as low as reasonably achievable. This objective involves:

- Continuing air and water monitoring and sampling of the site and surrounding areas and reporting the results in an annual Environmental Monitoring Report
- Performing site maintenance as necessary and to maintain the security and safety of the site and its environs.

6.0 TECHNICAL PLAN

E-12346

6.1 INTRODUCTION

Figure 6-1 depicts the NFSS as it will look after interim remedial actions are completed in FY 1986. [redacted] and all residues (except the R-10 residues) will have been dewatered, stabilized and stored in buildings located within the Waste Containment Area. Certain site buildings will have been demolished and the contaminated rubble also placed in the Waste Containment Area, which itself will have been covered with an interim cap.

Thus, at the end of interim remedial actions, all contaminated materials at the NFSS will be placed in an area designed to prevent future recontamination of the site or any migration of radionuclides through groundwater or surface water. Radon emanation will be reduced to background or near background levels by the interim cap. This plan is to be accomplished without precluding or jeopardizing the alternatives for long-term disposition of the site.

To accomplish these objectives, various activities have been under way at the NFSS for several years and will continue through 1986. These activities are described in this section, organized according to WBS categories, such as Site Characterization, Preliminary Engineering, and Remedial Action. Within each WBS category, work is described according to what has already been accomplished, work presently being performed, and work planned for the future. The ongoing site maintenance and surveillance program is also described. A schedule and cost estimate for the site program is presented in Subsection 6.9.

6.2 SITE CHARACTERIZATION

Site characterization activities at the NFSS have been under way for several years in efforts to collect engineering, geophysical, and radiological data necessary to support design for interim remedial

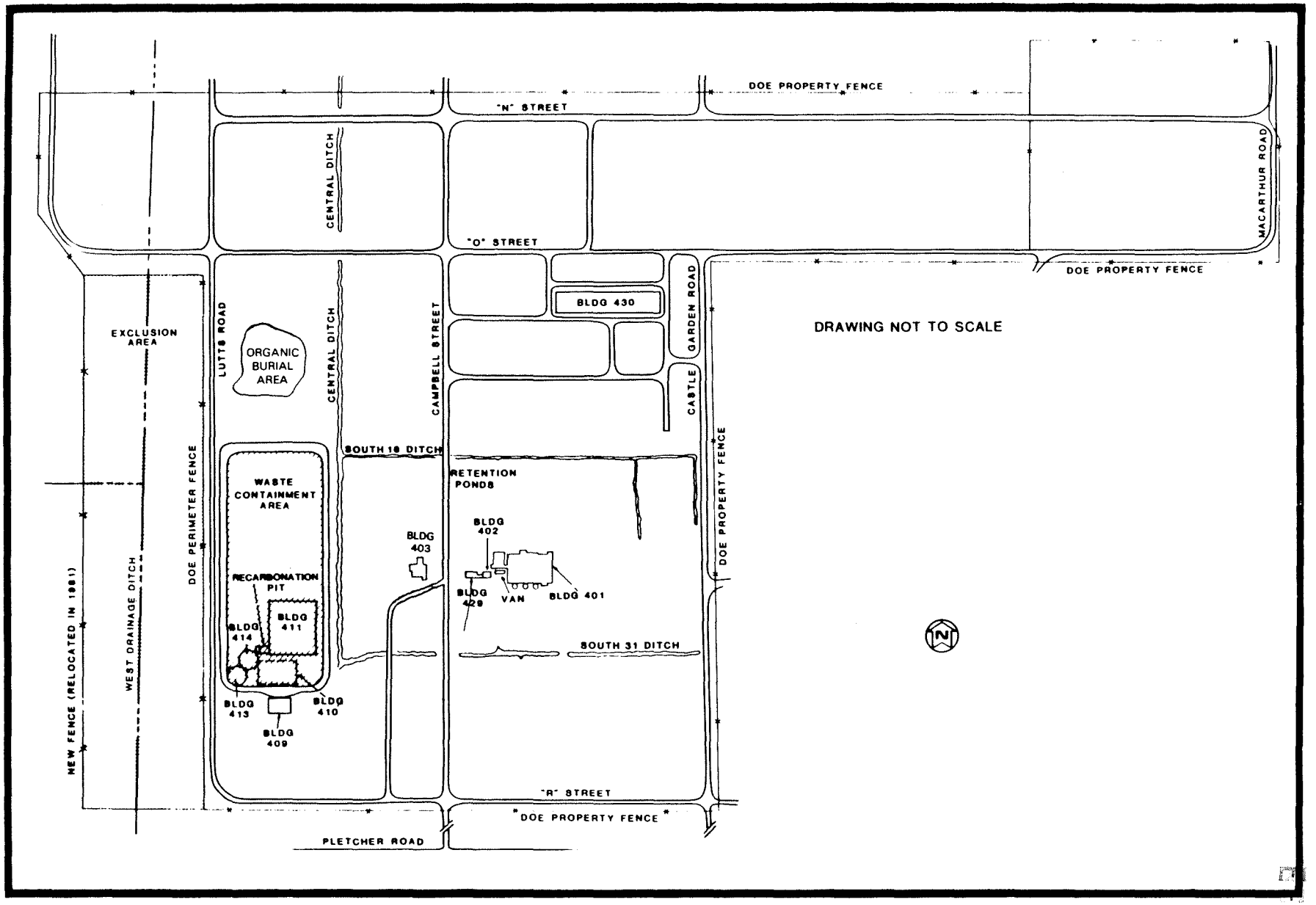

FIGURE 6-1 THE NFSS AFTER COMPLETION OF INTERIM REMEDIAL ACTION

actions. The most extensive site characterization was performed by Battelle, the results of which were published in 1981 (Ref. 3). BNI and its radiological support subcontractor, EAC, have supplemented the Battelle efforts with additional radiological survey borings and drilling necessary to accurately define the limits of excavations required for site cleanup. BNI, with support from subcontractors, have also performed tests on site soils, clays, and other geophysical features of the site. Tests of residues have also been performed to evaluate alternatives for residue dewatering and removal.

Characterization activities completed in 1984 included: on-site areas of localized spotty contamination; [redacted] and the radiological characterization of most of the off-site vicinity properties, performed by Oak Ridge Associated Universities (ORAU), as shown in Figure 3-4.

On-site characterization activities scheduled for 1985 will focus on the area surrounding the K-65 Tower. This area has never been definitively characterized due to the probability of misreadings that would have resulted from the presence of the residues in the Tower. The area to be characterized (shown in Figure 3-5) covers approximately 650 by 1100 ft south of "N" Street and approximately 200 by 900 ft north of "N" Street. In addition, a portion of vicinity property "F", north of the K-65 Tower, will be characterized.

Other off-site characterization has also been conducted on a warehouse on vicinity property "B" and a berm on vicinity property "E". [redacted]

In addition, a mixture of core samples and surface and subsurface soil samples were taken on vicinity properties B, E, E', and G to check for possible chemical cocontamination.

One continuing site characterization effort is the meteorological data collection program begun in 1983 and scheduled to last through 1986. The meteorological information collected will help support the NEPA evaluation.

6.3 PRELIMINARY ENGINEERING

Preliminary engineering for the NFSS also is essentially complete. Information from site characterization activities served as the basis for conceptual engineering designs and estimates of schedule, manpower requirements, occupational radiation exposures, and costs for several alternatives for the disposition of the NFSS. These preliminary engineering results were reported in the Engineering Evaluation of Alternatives for the Disposition of Niagara Falls Storage Site, Its Residues and Wastes (Ref. 1). This document was published in January 1984 and serves as the engineering reference document supporting the NEPA process.

Other preliminary engineering evaluations include a report on the geologic condition of the NFSS, published in June 1984 (Ref. 5), and a report on the design of the interim Waste Containment Area and the conceptual design of a long-term Waste Containment Area, expected to be published in mid-1985.

6.4 NEPA

An Environmental Impact Statement (EIS) is being prepared to examine the environmental aspects of the long-term management of the radioactive wastes and residues now stored at the NFSS. The EIS will evaluate the impacts of the alternatives for the site, provides opportunities for public and other agency comments on those alternatives, and will respond to those comments. Argonne National Laboratory (ANL) is the contractor responsible for the NEPA process.

The EIS process began in early 1983 with public meetings in the NFSS area, and a draft EIS was issued in August 1984. Public review and comments on the draft EIS have led to additional environmental

evaluations to respond to public concerns and suggestions. These additional evaluations will be incorporated into the final EIS for the NFSS, expected to be issued in December 1985. An additional 30-day period for further public review and comment will follow. DOE will then make its decision regarding the final disposition of the site. This record of decision is expected to be made in January 1986.

6.5 DESIGN ENGINEERING

Design engineering for interim remedial actions at the NFSS is prepared in accordance with NEPA requirements and all applicable state, DOE, and other federal regulations. Design engineering provides the basis for detailed cost estimates, working plans, drawings, specifications, and schedules that define the various aspects of interim remedial actions. To allow for review, documentation of progress, and identification and solution of problems, BNI and OR-TSD meet monthly in design review meetings. Progress is also monitored by SFMPO and DOE-HQ.

Design engineering is nearly completed for the interim remedial actions planned for the NFSS during FY 1985. (These actions are described in Subsection 6.7.2, Future Interim Remedial Actions). During FY 1985, design engineering will concentrate on the major work packages described below.

Transfer of Remaining K-65 Residues

The majority of the K-65 residues (approximately 2800 yd^3 of the 3200 yd^3 total) were removed from Building 434 by hydraulic mining and slurry transfer. When this operation ended in early 1985, design began on the operations necessary to remove the residues remaining in the building. Design and award of this subcontract were completed in spring 1985.

[redacted], and the on-site area near Building 434 was also completed by spring 1985, with a subcontract awarded in early May 1985.

Interim Cap

Design on the second phase of the installation of the interim cap was completed in early April 1985. A subcontract for the work was awarded in June 1985.

Miscellaneous Support Work

Design in FY 1985 will also be performed for several subcontracts that will support the major interim remedial action subcontracts. Among these are a subsurface investigations subcontract (for investigations of the vicinity property warehouse described in Subsection 6.2), materials testing, and survey services subcontracts. In addition, design will be performed for a radon abatement system to be added to the Building 411 dewatering system, and for the removal of seven transformers containing PCBs.

Design engineering work to be performed in 1986 will support final interim remedial actions, including final installation of the interim clay cap, installation of topsoil and grass, and site demobilization.

6.6 ACCESS AGREEMENTS

Because the interim remedial actions at the NFSS involves cleanup of some properties not belonging to DOE, it is necessary to obtain agreements with the property owners before cleanup work can proceed. As needs are identified, access agreements are prepared in a cooperative effort with the land owners whose properties may be involved in the interim remedial action. The access agreements

describe the planned actions, the restoration process, and the government's responsibility for any loss or damage to the owner's property. For the remaining off-site interim remedial actions, only four access agreements will be required. Three of these are with private owners of property along the Central Drainage Ditch, while the fourth will be an amended access agreement with Chemical Waste Management.

6.7 INTERIM REMEDIAL ACTIONS

6.7.1 Completed Interim Remedial Actions

Over the past years, various cleanup activities have been conducted at the NFSS. In 1972, [redacted] material were excavate[redacted] pile. During 1981, actions were performed to clean up contaminated materials located [redacted] In 1982 cleanup activities were accelerated and a detailed interim remedial action plan was developed. Many of the steps of this plan have already been accomplished and are described below.

1982

In 1982, BNI and its subcontractors completed work on two major interim remedial actions at the NFSS. These included the R-10 residues stabilization and the upgrading and sealing of Buildings 413 and 414.

The purposes of the R-10 residue stabilization were to control off-site migration of radioactive materials from the R-10 pile and to reduce radon emanation. Stabilization included clearing and grubbing of the surrounding area, moving approximately 15,700 yd^3 of contaminated soil near the R-10 pile onto the cleared pile, and constructing a clay dike and cutoff wall around the R-10 pile. The top of the R-10 pile was graded and covered with an EPDM liner.

The purpose of the actions at Buildings 413 and 414 was to reduce emissions of radon gas from L-50 residues stored in these buildings. Roof materials were removed and the troughs that encircle the inside of the buildings near the top of the residues were filled with concrete. Several layers of materials were placed over the residues: sand, synthetic rubber (Hypalon), clay, EPDM, more clay, another layer of synthetic rubber, and a layer of pea gravel. This sealing technique resulted in the reduction of radon emanations from the buildings to essentially background levels.

During 1982, the site decontamination facility and water treatment facilities were also developed. These facilities have been and will continue to be used throughout interim remedial actions.

1983

During 1983, interim remedial actions consisted of on-site and off-site cleanup and activities to develop the Waste Containment Area. The latter activities included actions to extend the dike and cutoff wall surrounding the R-10 pile southward to enclose Buildings 410, 411, 413 and 414. Work also was performed to prepare for the transfer, dewatering, and consolidation of residues within Building 411.

The 1983 cleanup activities resulted in the decontamination of on-site contaminated areas originally identified by Battelle, the approximately 4,800 ft of the West Ditch, [redacted] In the 1983 cleanup effort, approximately 54,000 yd^3 of contaminated material were excavated and placed in the Waste Containment Area north of Building 411.

Also in 1983, work was completed on the southward extension of the dike/cutoff wall, except for a portion of the west and south walls left open to allow clean water drainage and as possible future access for placing contaminated materials inside the containment

area. The extended dike/cutoff wall, like the previously constructed R-10 dike/cutoff wall, was keyed into underlying clay to prevent any lateral migration of radionuclides.

Inside the southern portion of the Waste Containment Area, work in 1983 concentrated on preparing the area for future storage of contaminated materials. Pipes, culverts, and canals were excavated and/or sealed to close any pathways for possible migration of radionuclides and to prevent future subsidence of compacted wastes.

In addition, work was performed on several of the buildings in the Waste Containment Area. The dilapidated roof of Building 411 was removed and some work was done on the interior of the building to prepare for the residue transfer, dewatering and stabilization. Openings and pipes into Building 410 were also sealed to prepare the building for storage of water during residue transfer operations in Building 411. Building 412 was demolished to permit construction of the new dike/cutoff wall.

1984

During 1984, decontamination was completed on 11 of the vicinity properties and some remaining on-site areas of localized contamination, [redacted]. The contaminated soil from the cleanup of these areas totaled approximately 27,900 yd^3 and all but 3600 yd^3 was placed in the Waste Containment Area. [redacted]

Meanwhile the south dike portion of the Waste Containment Area was completed, forming the final segment of the cut-off wall. Also during 1984, Building 410 and the upper portion of Building 415 were demolished, clearing the way for final development and use of

the southern portion of the Waste Containment Area. The interim cap was placed over the northern portion, or about 40 percent, of the Waste Containment Area.

The other major work in 1984 centered on the activities to turn Building 411 into an interim storage area for the L-30, F-32, and K-65 residues. This work included residue transfer and dewatering activities within Building 411 and the slurry transfer of the K-65 residues from Building 434 to Building 411.

Figure 6-2 shows Building 411 and the Recarbonation Pit, hereafter referred to as Bay A of Building 411. The F-32 residues in Bay A were transferred to Bay D, and an underdrain system consisting of slotted PVC pipe covered with a layer of sand was placed in the bottom of Bay A. Bay A became a receptacle for the excess water covering residues in other bays of Building 411, and, in connection with Building 410, allowed dewatering and treatment of water to occur.

The F-32 and L-30 residues in Bays B and C also were transferred to Bay D. Bays B and C were then cleaned and underdrain systems were installed. Some of the F-32 and L-30 residues were then transferred into Bay B, and some vacuum dewatering was performed as a test (actual dewatering will begin in 1985).

Workers began transferring the K-65 residues from Building 434 to Bay C of Building 411, working first atop the K-65 Tower and later from scaffolding erected along the Tower's side, the subcontractor cut openings into the concrete structure to allow hydraulic mining equipment to be inserted. The residues were hydraulically mined and slurry transferred to Building 411 via a 4-in. steel pipeline. Working through the end of 1984 and into early 1985, approximately 90 percent of the residues were transferred in this manner. The 675 yd^3 of residues and rubble remaining in the building could not be removed by hydraulic mining (see Subsection 6.7.2).

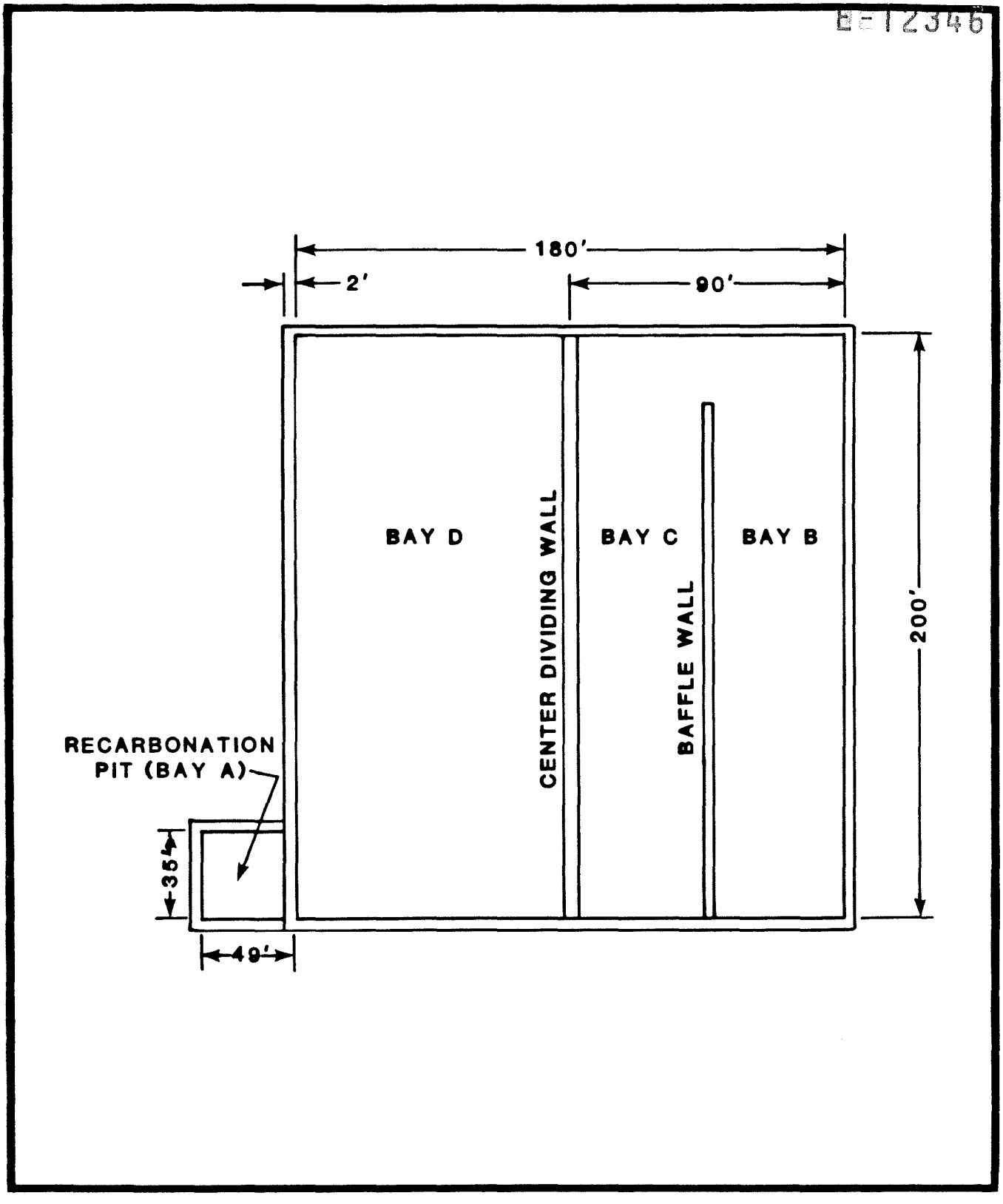

FIGURE 6-2 DIAGRAM OF BUILDING 411

6.7.2 1985-86 Interim Remedial Actions

All contaminated areas on-site and off-site will be cleaned up by the end of 1985, and the contaminated materials will be placed in the Waste Containment Area. The final portion of the interim cap over the Waste Containment Area will be completed in 1986. These and other activities scheduled for 1985-1986 are described below.

On-Site and Off-Site Cleanup

This work began in May and includes excavations on-site in the area around Building 434 and on the remaining vicinity properties. Estimates of the amount of materials to be excavated during the on-site and vicinity properties cleanup are 8300 yd^3 and 1000 yd^3, respectively. [redacted] it was determined that no excavation would be necessary. The holding ponds that have been used for the storage and treatment of construction water will be removed, and the area will be graded to conform to the existing drainage patterns.

Transfer of Remaining K-65 Residues

The 675 yd^3 of K-65 residues and rubble from the outer and inner domes that could not be removed from Building 434 by hydraulic mining are being transferred to Building 411, Bay A, starting in May. The residues remaining in the top of the building first were washed into the bottom of Building 434. After an opening in the base of the building was enlarged, the residues were mechanically removed, loaded into specially constructed metal bins, and hauled by truck to Bay A of Building 411.

The major part of this subcontract to be performed in 1985 will be the demolition of Building 434 and the cleanup of the equipment and support facilities used in the slurry transfer operation. The first step in the demolition was the construction of an earthen berm around the building to contain the spread of contamination during demolition. A standard wrecking ball was used to demolish the building and its foundation.

The rubble from the above-grade and sub-grade portions of Building 434 will be transferred to the Waste Containment Area. Also as part of this activity, water remaining in the K-65 pond will be transferred to Building 411, and the pond EPDM liner and any contaminated soil and sediment will be removed and placed in the containment area. The metal pipeline used in the slurry transfer operation has been cut into sections, placed in a trench dug along the side of Building 411, and buried in fillcrete. The PVC piping used in the slurry transfer operation will be crushed and buried in the containment area.

Two other buildings on-site, Building 409 and 401, will undergo minor decontamination. Building 409 will require decontamination of the basement walls and floor slab, and Building 401 will require decontamination and/or removal of three beams.

It is anticipated that the vicinity property "B" warehouse, which is cocontaminated with PCBs, will also be decontaminated. The contaminated concrete and wood would be disposed of in the Waste Containment Area, and the PCBs would be disposed of by the owner of the property at a licensed chemical waste landfill.

It is also anticipated that limited repairs would be made to roads in the area that were damaged by trucks and other heavy equipment during the cleanup of the vicinity properties.

Residue Transfer and Dewatering

Beginning in early spring, additional L-30 and F-32 residues in Bay D were transferred to Bays B and C to fill them up. This transfer was done in phases, filling the northern portion of the bays and then the southern portions. The L-30 residues placed in Bay C are separated from the K-65 residues by a demarcation layer consisting of strips of synthetic material.

After the residues are placed, vertical drainage wicks will be added and the underdrain dewatering system activated. The wicks will act as conduits for water to reach the underdrain system, thus accelerating the residue dewatering and consolidation.

After residue transfer to Bays B and C has been completed and the wicks have been installed, a vacuum seal will be placed atop the residues. The seal, which will consist of approximately 3 ft of clay, will keep radon emissions under control and act as a surcharge and seal to allow the remaining water covering the residues to be removed. The underdrain dewatering system will then be made operative. As the residues in Bays B and C are dewatered and consolidated, they will be covered with contaminated soil.

Bays B and C are full, and approximately 5 ft of L-30 and F-32 residues remain in Bay D. The residues will be covered with a layer of sand and standpipes will be added to allow for dewatering. Bay D will be filled with contaminated soil to accelerate consolidation.

Figure 6-3 shows a cross section of Building 411 as it will look at the completion of interim remedial actions, including the placement of the interim cap (see following subsection).

Installation of Interim Cap

Approximately 40 percent of the interim cap was installed over the northern portion of the Waste Containment Area in 1984. The remainder of the interim cap will be placed in 1985 and 1986. Work

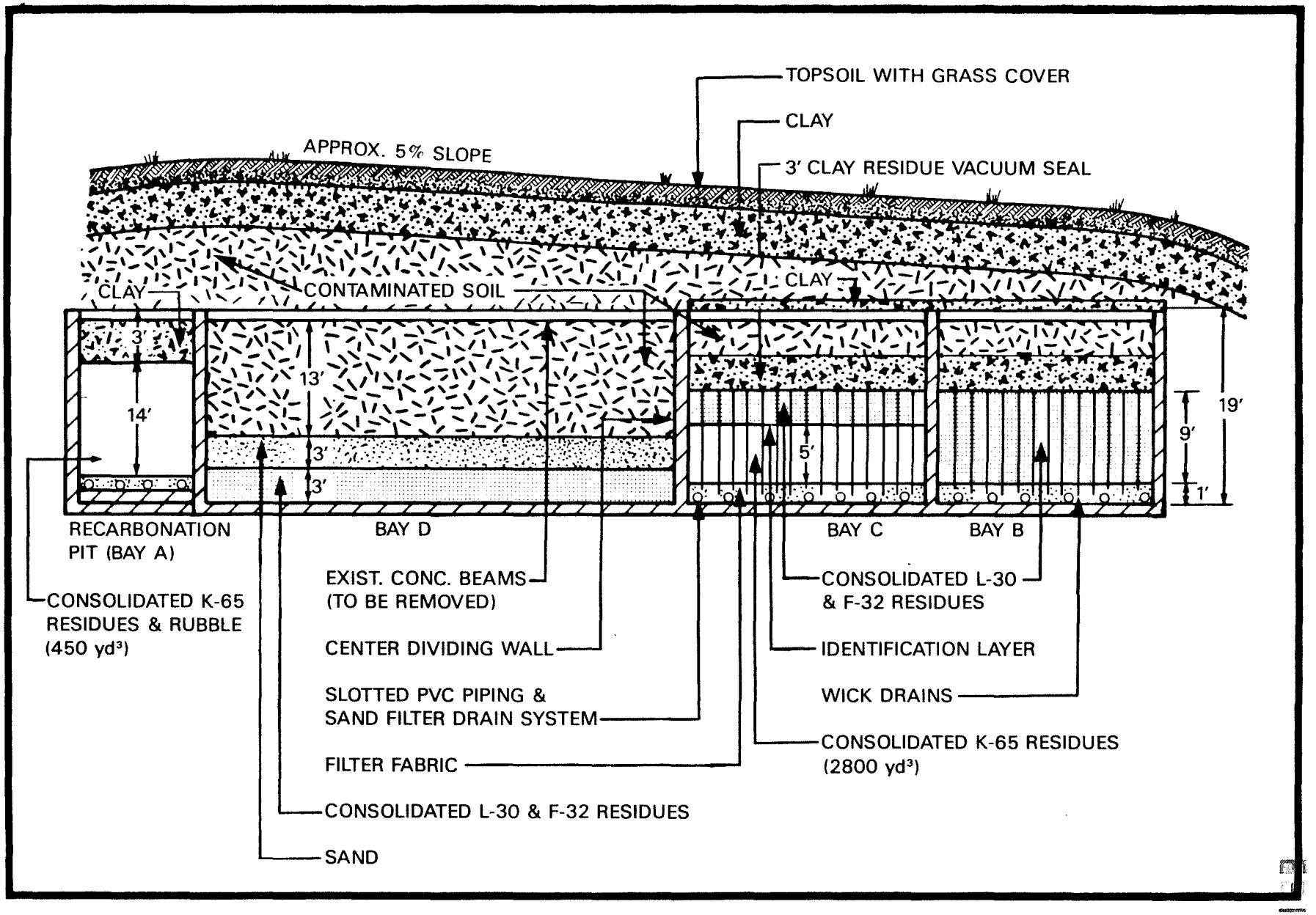

FIGURE 6-3 CROSS SECTION OF BUILDING 411 AT THE COMPLETION OF INTERIM REMEDIAL ACTION

will begin in late summer and should be completed by mid summer 1986.

The interim cap is designed to minimize water infiltration, radon emanation, erosion, and frost heave damage. The lower layer of the cap consists of 3 ft of compacted clay keyed into the dike, sloped to enhance natural drainage away from the storage area. The upper layer is 18 in. of soil and topsoil, and a turf cover designed to minimize erosion and frost heave damage to the underlying clay layer. The upper layer is also graded to promote runoff.

The interim cap will be placed over all remaining portions of the Waste Containment Area, leaving Building 411 until last to allow the residue transfer and dewatering operations to be completed. Only 1 ft of the clay cap material will be placed over Building 411 by the end of FY 1985. The remaining 2 ft of the clay layer, topsoil, surface soil, and vegetative cover will be added in 1986.

Miscellaneous Interim Remedial Actions

In 1985 various other subcontracts will be awarded to support the major subcontracts previously described. These will include the construction of water treatment ponds, water treatment and discharge, water sampling and analysis, surveying, site services, and other support services as required. With the cap closure a moisture detection system will be installed to monitor the cap construction.

Interim remedial actions scheduled for 1986, in addition to the completion of the interim cap, consist of site demobilization activities (such as cleanup of the decontamination facility area) and final placement of some fill, clay cap, topsoil, and grass over Building 411. Water treatment equipment also will be demobilized. Additional monitoring wells will be installed.

6.8 SURVEILLANCE AND MAINTENANCE

To ensure the health and safety of the public and site personnel, and to protect the environment, BNI operates a maintenance and surveillance program at the NFSS. The program is designed to ensure containment of contamination, provide regular monitoring of effluents, surface/subsurface water migrations, and air sampling, and to provide physical safety and security controls. This program includes site patrols, surface and well water monitoring, radon monitoring, grass mowing, fence repair, and brush clearing. The program will continue past the completion of interim remedial actions to ensure that the applicable requirements of the State of New York and Federal regulatory agencies are met.

6.8.1 Environmental Monitoring Program

The NFSS environmental monitoring program is designed to measure radon concentrations in air, radium and uranium concentrations in surface water and groundwater, and the external gamma radiation intensity. Thirty-four monitoring stations located on-site and at site boundaries have both radon and external radiation detectors. Radon levels are measured by Terradex Track-Etch detectors evaluated each month. External radiation levels are measured by LiF thermoluminescent dosimeters (TLDs) on a quarterly basis. Supplemental radon monitoring is performed by Mound Laboratories at 12 locations on the site perimeter, 2 locations in the exclusion area, and 30 off-site locations. Groundwater samples are collected quarterly from 16 locations and annually from three off-site locations. Surface water samples are also collected on-site and off-site. All water samples are analyzed for radium-226 and uranium.

The environmental monitoring program is managed by BNI's Safety and Licensing Department in Oak Ridge. Permanent site personnel are responsible for exchanging radon and TLD detectors, collecting water samples, and shipping samples/detectors for analysis. EAC evaluates the external radiation monitors and performs all analyses of water samples. The Terradex Corporation evaluates the radon monitors.

The BNI Safety and Licensing Staff reviews and summarizes all data and prepares an annual environmental monitoring report issued May 1 of the following year.

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6.8.2 Radiological Protection Program

The radiological protection program for the NFSS was established to provide for the protection of workers and the public living in the vicinity of the site and to ensure compliance with State and Federal regulations. The program is designed around the principle of maintaining radiation exposures as low as reasonably achievable (ALARA). It provides for additional radiation measurements (e.g. dosimeters) during remedial action activities to provide more rapid and frequent health protection data.

The radiation protection program provides guidance and controls designed to assist field personnel in achieving ALARA exposures to radiation.

6.8.3 Safety

BNI corporate and site-specific safety and health programs are in effect at the NFSS and establish responsibility and accountability for safety. Both programs comply with DOE orders and OSHA regulations where applicable. The primary emphasis is to alleviate the possibility of personal injury or illness and property damage or losses.

Procedures have been established with local fire departments, ambulance services, and medical facilities to provide response in the event of an incident. Periodic site familiarization tours are provided for fire and ambulance personnel. Medical facilities are advised of the levels of contamination present, and coordination among agencies is continuously maintained.

6.8.4 Security

The NFSS is fenced and all access is controlled; visitors logs are maintained. The Site Operations Supervisor inspects the perimeter fence regularly for damage or evidence of forced entry. Any damaged section will be temporarily repaired immediately and arrangements made for permanent repairs. All gates are locked at the close of business each day. Keys and their distribution are controlled by the Site Operations Supervisor.

During periods of construction, special procedures have been established to accommodate subcontractors' work and the associated health physics programs. Any emergencies or unusual occurrences will be reported in compliance with DOE orders and established emergency procedures.

6.9 SCHEDULE AND COST

Figure 6-4 summarizes the currently planned schedule for the NFSS project. Total estimated project cost through fiscal year 1987 is $38,370,000. Cost estimates and the schedule beyond fiscal 1987 are dependent on the selected alternative for disposition of the site, and therefore are excluded. Surveillance and maintenance costs, under the SFMP, beyond 1986 are also excluded.

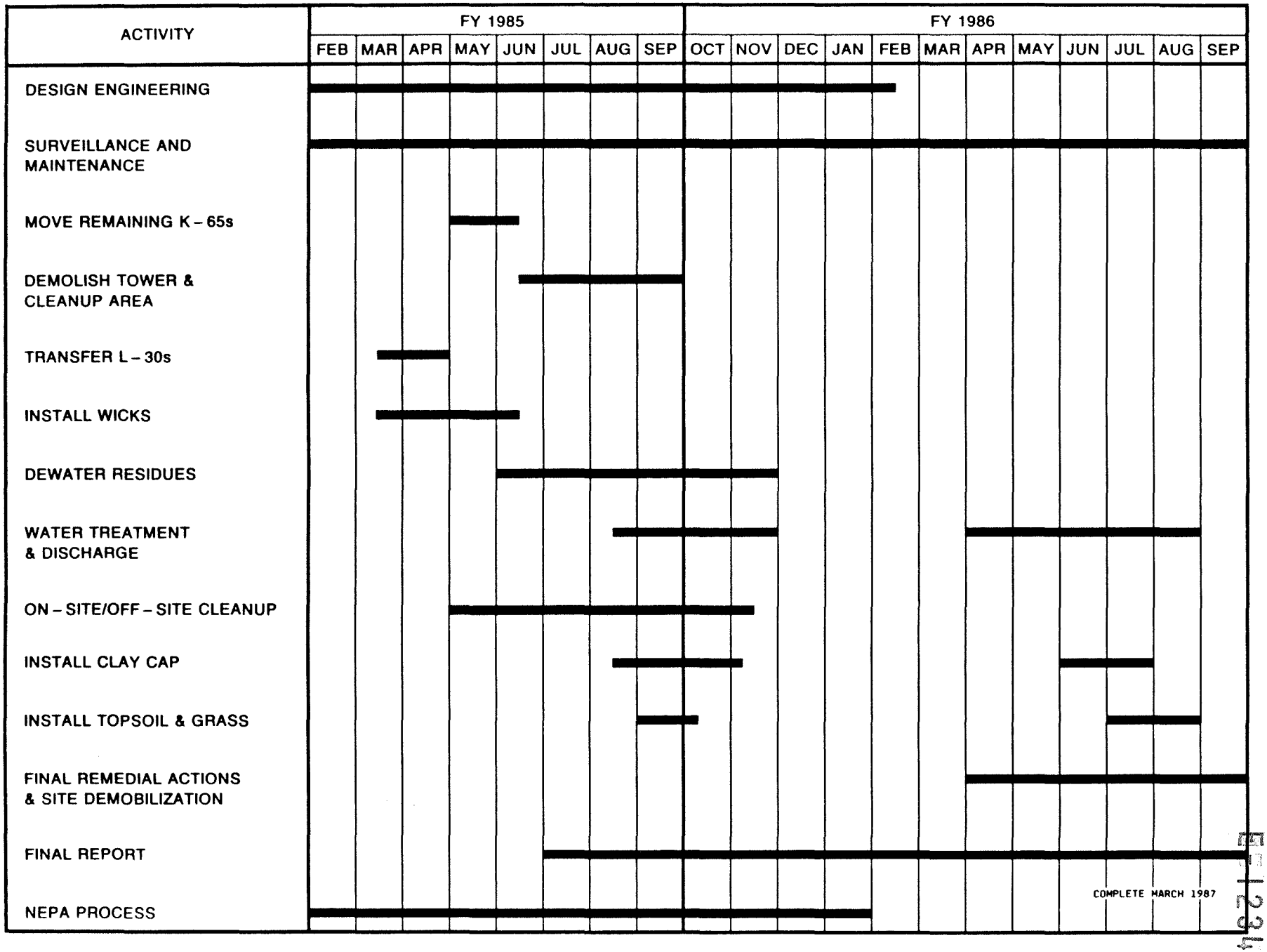

FIGURE 6-4 NFSS PROJECT SCHEDULE

7.0 OCCUPATIONAL EXPOSURE ESTIMATES

Data collected during interim remedial actions at the NFSS have shown that less than 10 percent of the workers have exceeded 100 mrem per year of occupational exposure, compared to the 5,000 mrem/yr limit. To date, none have exceeded 2500 mrem per year.

For interim remedial actions planned in FY 1985-86, the exposure of workers to radiation will occur primarily during removal and transportation of the remaining K-65 residues, and to a lesser extent from operations involving the other residues. Other contaminated materials on-site or off-site will not contribute measurably to the overall occupational radiation exposure.

Occupational exposure to radon is controlled by ventilation and/or directly supplied breathing air, thus reducing the dose to workers. Methodologies for reducing radiation exposure include minimizing direct contact with residues by using remote handling equipment where possible, providing shielding for operators, and placing maintenance items in remote or low exposure areas. The exposure rates from the K-65 residues and the associated problems in handling these materials while maintaining radiation exposures as low as reasonably achievable (ALARA) dictate that direct contact handling be minimized.

During the 1984 transfer of K-65 residues from Building 434 to Building 411, there was an increased risk of exposure to radon for both workers and the environment, and special precautions were taken for the protection of both. Additional radon and external gamma radiation monitoring stations were deployed. Workers' activities were controlled such tnat radiation exposure rates in areas near the top of Building 434 or along the slurry pipeline did not exceed the 50-100 mR/h range, with a maximum exposure rate of 300 mR/h when near large quantities of unshielded residues.

The residues, contaminated soils, and contaminated rubble that have been or will be dealt with during interim remedial actions at the NFSS amount to a total of approximately 156,000 yd^3. This total includes all cleanup activities performed, including the 1972 excavations. The total also includes estimates for the additional on-site cleanup, [redacted].

Table 8-1 presents the volume estimates, broken down into sub-totals for residues, contaminated soils, and contaminated rubble. Estimates shown for 1985 remedial action are based on characterizations performed by Battelle (Ref. 3), ORAU, and ongoing characterizations by BNI and EAC. Estimates are approximate non-compacted volumes and were computed using criteria established by 40 CFR 192. Estimates are subject to change as interim remedial actions proceed.

TABLE 8-1

WASTE VOLUMES FOR NFSS INTERIM REMEDIAL ACTIONS

Waste	Volume (yd^3)
Residues	
Middlesex Sands	230
L-30 Residues	7,960
K-65 Residues	3,200
L-50 Residues	2,150
F-32 Residues	440
R-10 Residues	9,400
Total residues	23,380
Contaminated Soils	
1972 - Remedial Action	15,000
1982 - Remedial Action	15,700
1983 - Remedial Action	[redacted]
On-Site Cleanup - [redacted]	
1984 - Remedial Action	
Off-Site Cleanup - [redacted]	
On-Site Cleanup - [redacted]	
1985 - Remedial Action	
Vicinity Properties - [redacted]	
On-Site Cleanup - 8,300	
Hot Spot - 3,000	
Total Contaminated Soils	
Contaminated Rubble	
Building 410	410
Building 415	100
Building 434	1,400
Thaw House Foundation	220[b]
Total Contaminated Rubble	2,130
TOTAL WASTE VOLUME	150,410[b]

[redacted].

[b]Estimates subject to change as remedial action proceeds.

9.0 QUALITY ASSURANCE

The provisions of the DOE FUSRAP/SFMP Plan for Quality Assurance comply with DOE Order 5700.6, (Ref. 6), and apply to BNI, its radiological subcontractor, architect-engineers, construction, service, and other subcontractors as may be identified.

Quality Assurance requirements apply to all work being performed on the NFSS project. BNI carries out the Project Quality Assurance Program in accordance with the above parameters. Effectiveness of implementation will be appraised by BNI's Quality Assurance organization, and by DOE-OR as it may deem appropriate.

10.0 DECISION PROCESS FOR PERMANENT DISPOSITION OF THE NIAGARA FALLS STORAGE SITE

All work presently being performed or planned for the NFSS is interim work because no decision has been made regarding the ultimate disposition of the site. The final decision will be made by DOE in accordance with the procedures that implement the NEPA process and after all technical, environmental, safety, and other impacts of all reasonable alternatives have been evaluated. The decision-making process provides opportunities for members of the public and local communities to become informed about the alternatives and to make inputs to the decision by DOE. A logic diagram of the decision-making process is presented in Figure 10-1.

The preliminary studies of alternatives under consideration for the site have been presented in the Engineering Evaluation of Alternatives for the Disposition of Niagara Falls Storage Site, Its Residues and Wastes, published in January 1984 (Ref. 1). This document presents alternatives for the long-term disposition and management of the radioactive materials now on the site and vicinity properties. The EEA does not make recommendations, but serves as technical support for the NEPA process.

An Environmental Impact Statement (EIS) is being prepared for the NFSS. The EIS will evaluate the impacts of the alternatives for the site, provide opportunities for public and other agency comments on those alternatives, and respond to those comments. The Draft Environmental Impact Statement was issued in August 1984, and a period of public comment followed. It is expected the Final Environmental Impact Statement (FEIS) will be issued in December 1985. Another 30-day period for public review and comment will follow, and DOE will then make a final decision regarding the NFSS. This Record of Decision is currently targeted for January 1986. A remedial action plan to carry out that decision will then be developed, funded, and implemented.

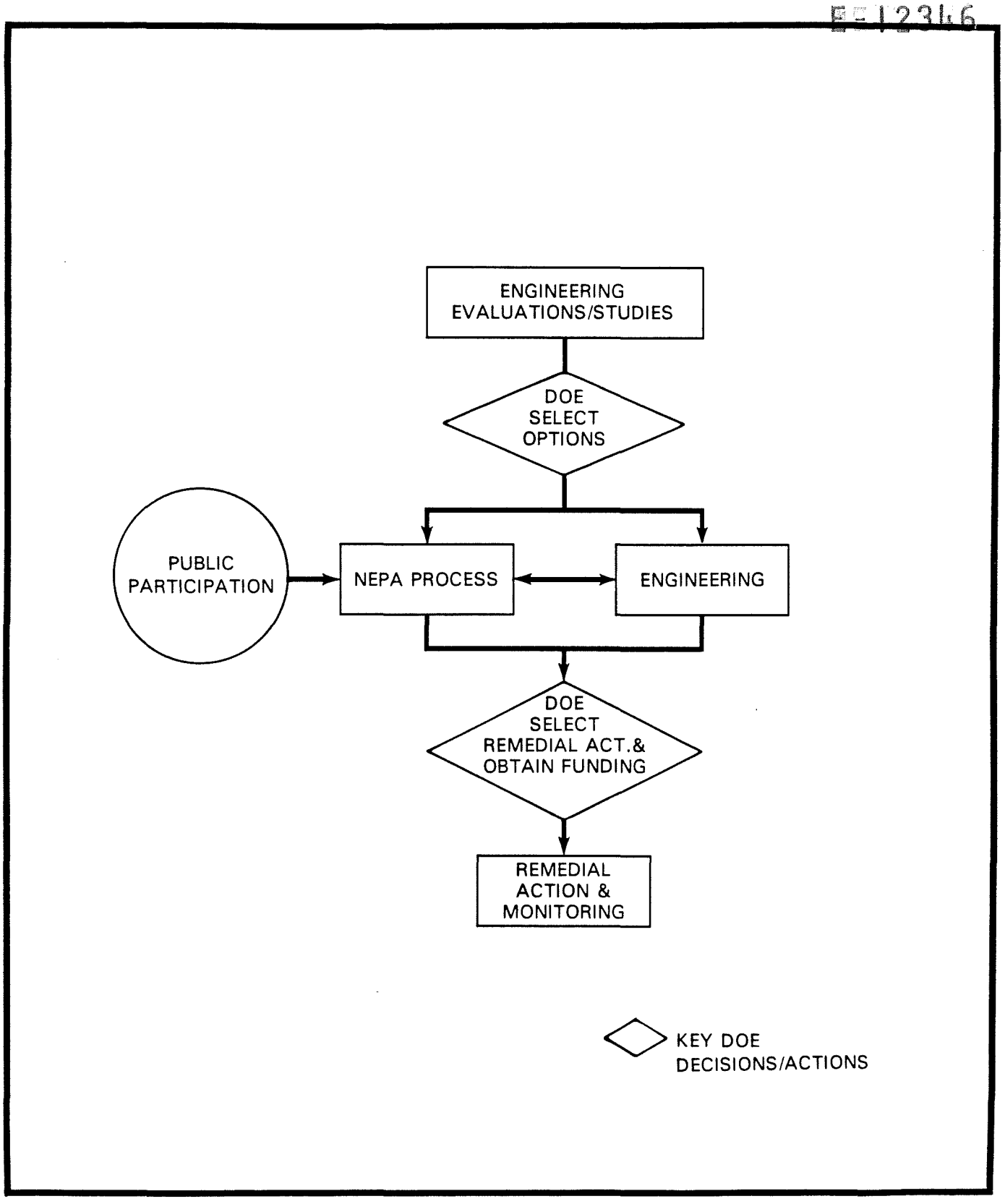

FIGURE 10-1 DECISION PROCESS FOR LONG-TERM DISPOSITION OF NFSS

REFERENCES

1. Bechtel National, Inc. Engineering Evaluation of Alternatives for the Disposition of Niagara Falls Storage Site, Its Residues and Wastes, DOE/OR/20722-1, prepared for U.S. Department of Energy, Oak Ridge Operations, Oak Ridge, TN January 1984.

2. Aerospace Corporation. Background and Resurvey Recommendations for the Atomic Energy Commission Portion of the Lake Ontario Ordinance Works, ATR-82 (7963-04)-1, prepared for U.S. Department of Energy, Washington, DC, 1982.

3. Battelle Columbus Laboratories. A Comprehensive Characterization and Hazard Assessment of the DOE Niagara Falls Storage Site, BMI-2074, Columbus, OH, 1981.

4. Battelle Columbus Laboratories. Preliminary Smelting of Afrimet Residues, Columbus, OH, 1983.

5. Bechtel National, Inc. Geologic Report, Niagara Falls Storage Site, DOE/OR/20722-8, prepared for the U.S. Department of Energy, Oak Ridge, TN, June 1984.

6. U.S. Department of Energy. DOE Order 5700.6, Quality Assurance, "ORO Site Implementation Plan," Oak Ridge, TN, March 3, 1982.