

Action Description for  
Remedial Action/Maintenance Activities at the  
Niagara Falls Storage Site, Lewiston, New York

1. Site Description

The 191 acre DOE-owned site at Lewiston, New York (Figure 1) contains four buildings and a concrete silo used to store low-level radioactive pitchblende residues and six other buildings. Some low-level radioactive residues are stored in the open on the ground and are covered with slightly contaminated soil. The stored radioactive wastes are as follows:

K-65\*: 1,757 tons; 10,982 lb. uranium oxide

L-30\*: 8,227 tons; 40,641 lb. uranium oxide

L-50: 1,878 tons; 4,133 lb. uranium oxide

F-32\*: 138 tons; 2,941 lb. uranium oxide

R-10: 8,385 tons; 21,415 lb. uranium oxide

Contaminated, Soils, Sand, Sludge: 20,000 tons

The locations of these residues are shown in Figure 2.

2. Site Status

A radiological survey of the site and the surroundings was completed in December 1980 (reference 1). This survey showed that the buildings and foundations on the site which are not used for residue storage have only small areas of detectable contamination. The residue storage buildings are in need of substantial maintenance, particularly to the roofs to contain the radon emanating from the residues and to reseal connections

\*These residues are African Metals Corporation property stored on the Department of Energy site under lease agreement expiring in July 1983.

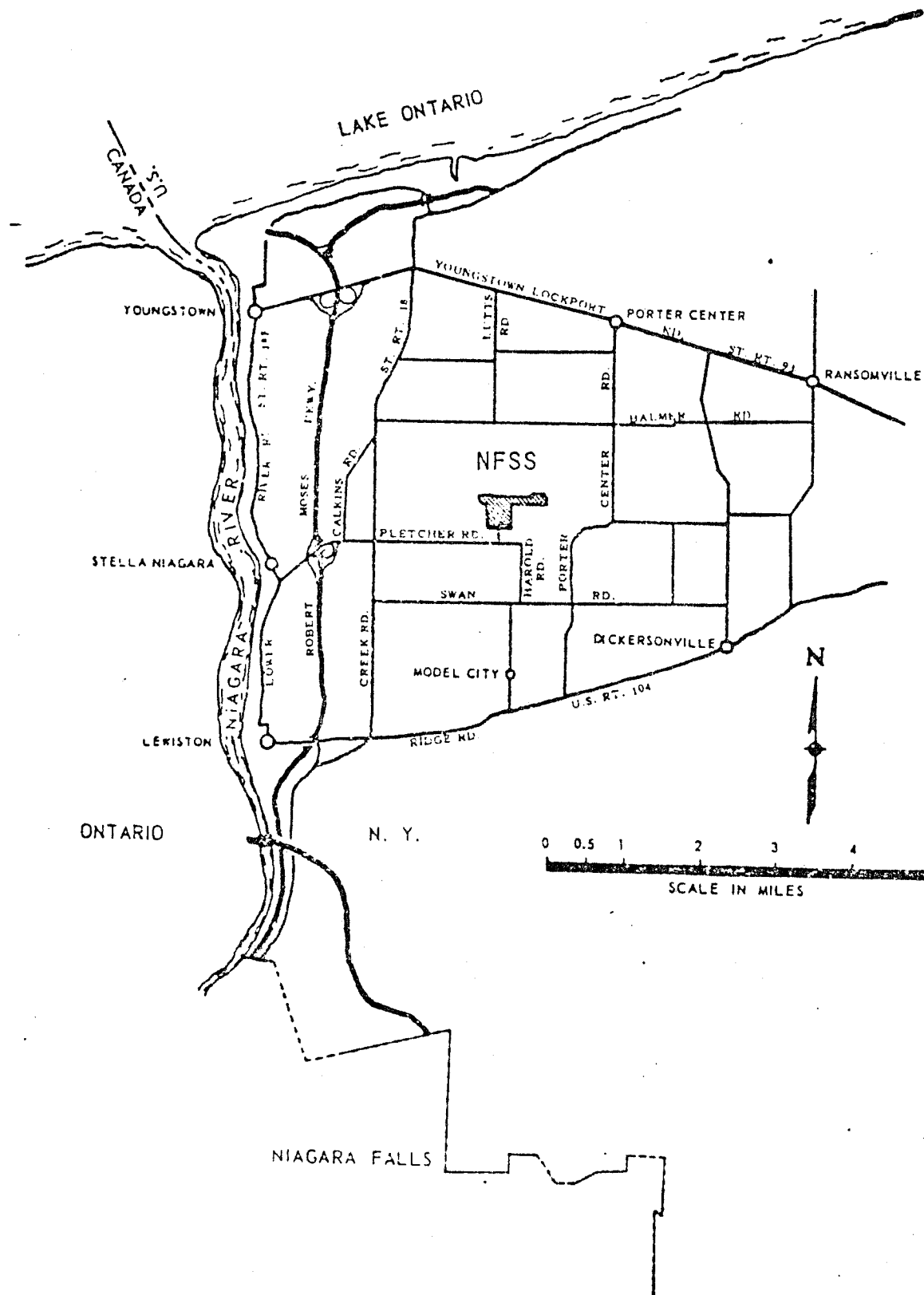
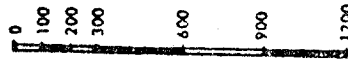
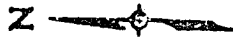


Figure 1 Area Map Of The Niagara Falls Storage Site Showing Relative Locations



Scale in Feet

MACARTHUR STREET

Building Notes:

- 401 - Dismantled Boiler (& Boron) Plant Bldgs.
- 403 - Office and Garage
- 409 - Orig. Fire Reservoir (unused)
- \*410 - F-32 and Middlesex Sand Storage
- \*411 - L-30 Residue Storage
- \*413 - L-50 Residue Storage
- \*414 - L-50 Residue Storage
- 416 - Gate House
- 423 - Motor Vehicle Garage
- 430 - Supplies Warehouse
- \*434 - K-65 Silo and Thaw Bldg.
- ⊗ - approx. location boron vault (empty)

\* Radioactive residues storage

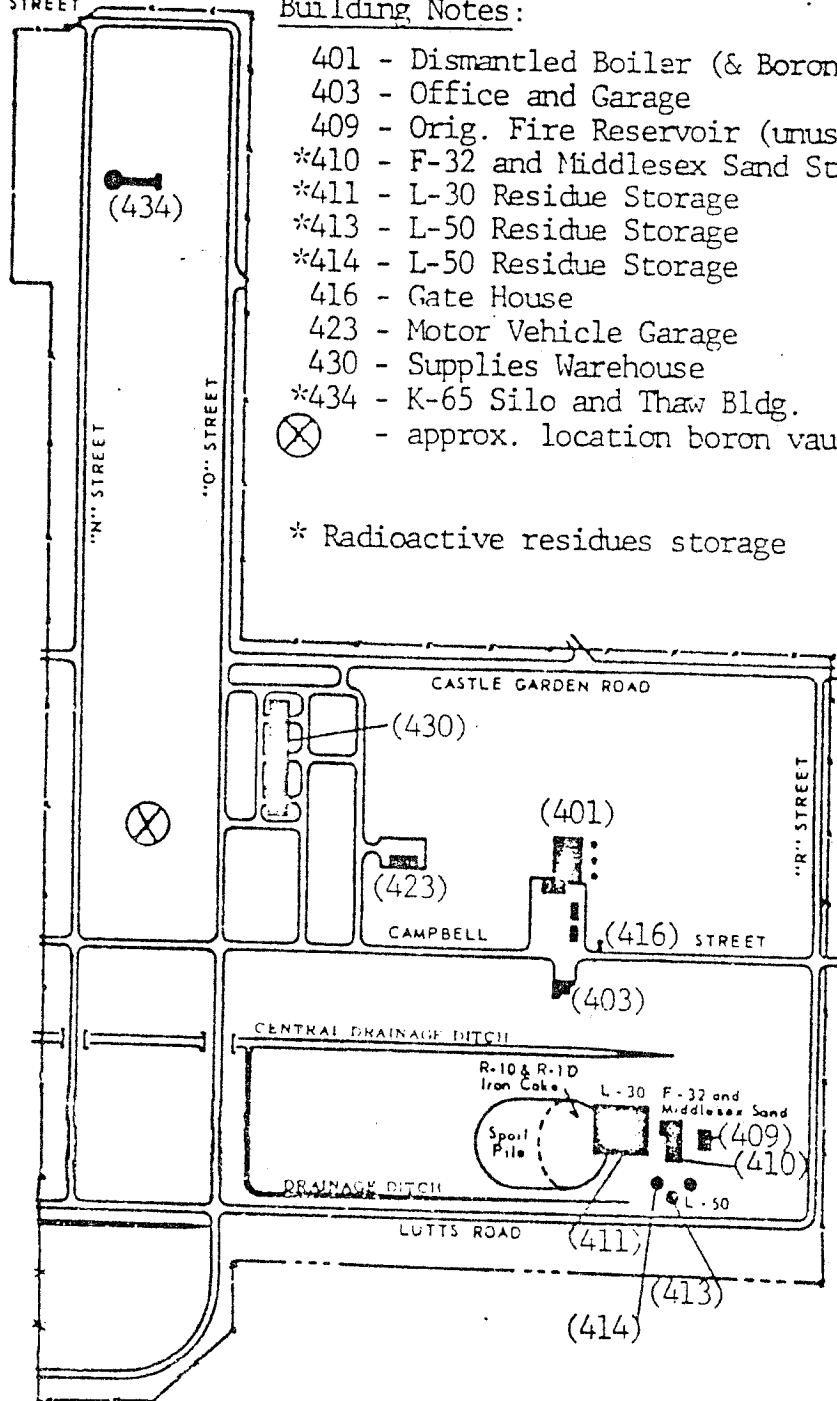


Figure 2- Radioactive Waste Storage Locations. (Present building number designations in parentheses).

to pipes and openings to prevent leaching and further migration of residues from the southwest portion of the site. The concrete silo containing the K-65 residues needs sealing to prevent radon emanation. There is some concern regarding the stability of this 165 foot high silo in an earthquake and it may be necessary to reinforce this structure.

Contamination in the site soil areas resulted from storage of the R-10 pitchblende residues on the surface outside a building, from shallow burials in two small areas in the north part of the site, from spills along old railroad tracks, and from contaminated fill used in an old slurry disposal pond. The contamination is principally from the uranium decay products found in pitchblende residues, and some cesium-137 contamination.

On-site ditches and the West Ditch which originates west of the site and then crosses it in the northwest area contain contaminated sediments. The Central Drainage Ditch sediments contain the greatest contamination and are significantly above guidelines; concentrations decrease as the ditch goes north from the central portion of the site. Contamination in the West Ditch includes radium-226 and cesium-137 significantly above guidelines. Both ditches contain significant concentrations of stable metals and rare earths.

The Central Drainage Ditch drains off-site and leads to Four Mile Creek which eventually flows into the Niagara River. The Central Drainage Ditch is contaminated above the EPA guideline for radium-226 for a

distance of about 2 1/2 miles after leaving the NFSS. The West Drainage Ditch off-site is contaminated in the length opposite the NFSS until it joins the Central Drainage Ditch (Figure 3, areas in pink).

### 3. Description of Proposed Actions

A comprehensive site management program has been planned to provide: adequate containment, regular monitoring and sampling of effluents from the site, and physical safety and security controls (reference 2). The planning will be extended later to provide for the eventual disposal of stored residues and other contaminated material in order to release the site for other uses. This Action Description includes: those relatively short term remedial actions required to cleanup the contamination in the off-site ditches and store the wastes temporarily on-site; the on-site remedial and maintenance actions to adequately contain these residues and the evolved radon, and to prevent spread of contamination off-site. These actions are detailed below and are shown conceptually in Figure 4.

#### 1.) Equipment Decontamination Facility

An impermeable pad and sump and associated wash water treatment system will be designed and built to decontaminate heavy equipment and machinery used to perform project activities. Conventional equipment, materials, and construction methods will be employed. Depending upon location, a small amount of contaminated soil may be excavated, and, therefore, stored on-site. Personnel exposure will be minimal.

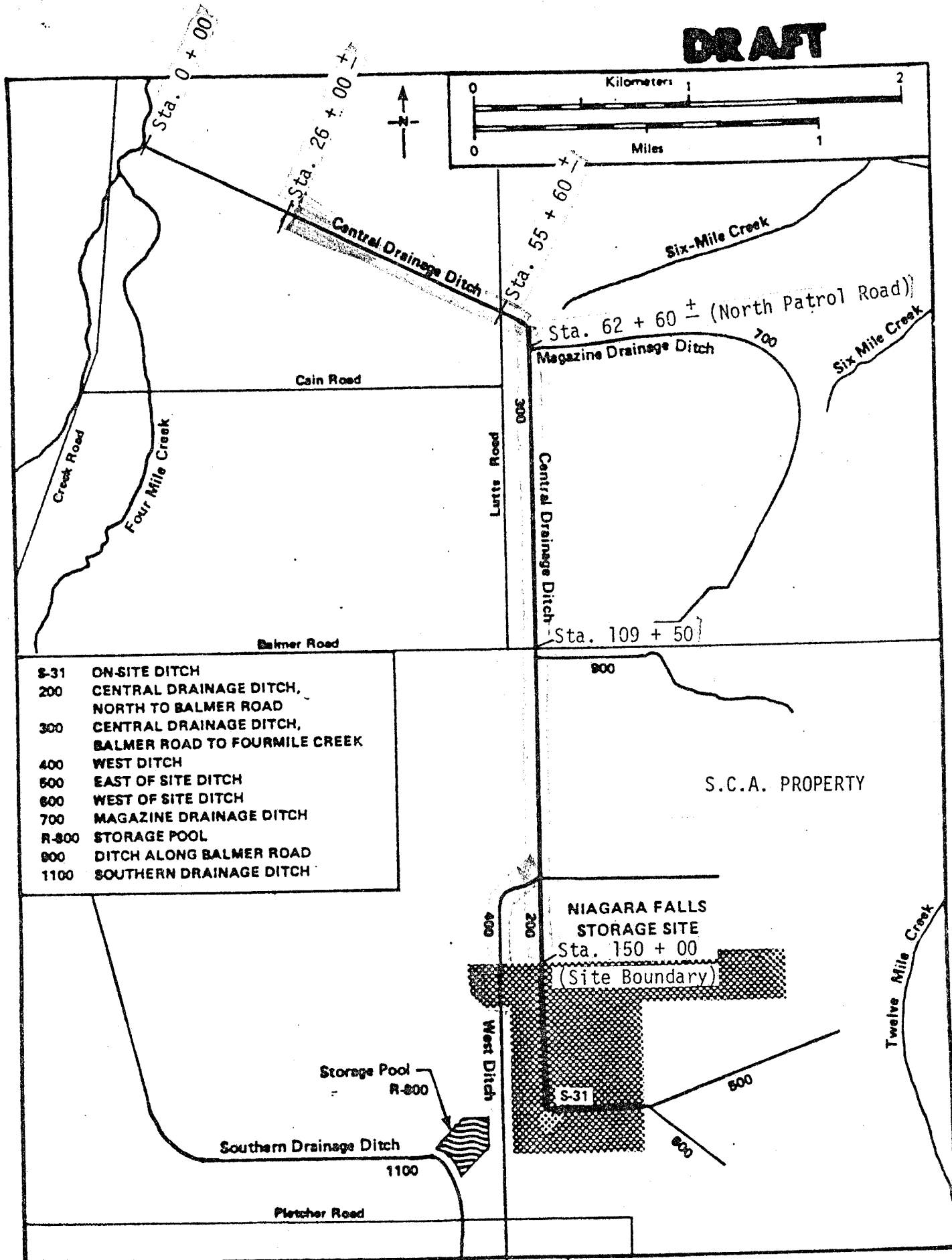


FIGURE 3 DRAINAGES OF THE DOE-NIAGARA FALLS STORAGE SITE

# NFSS Project Plan

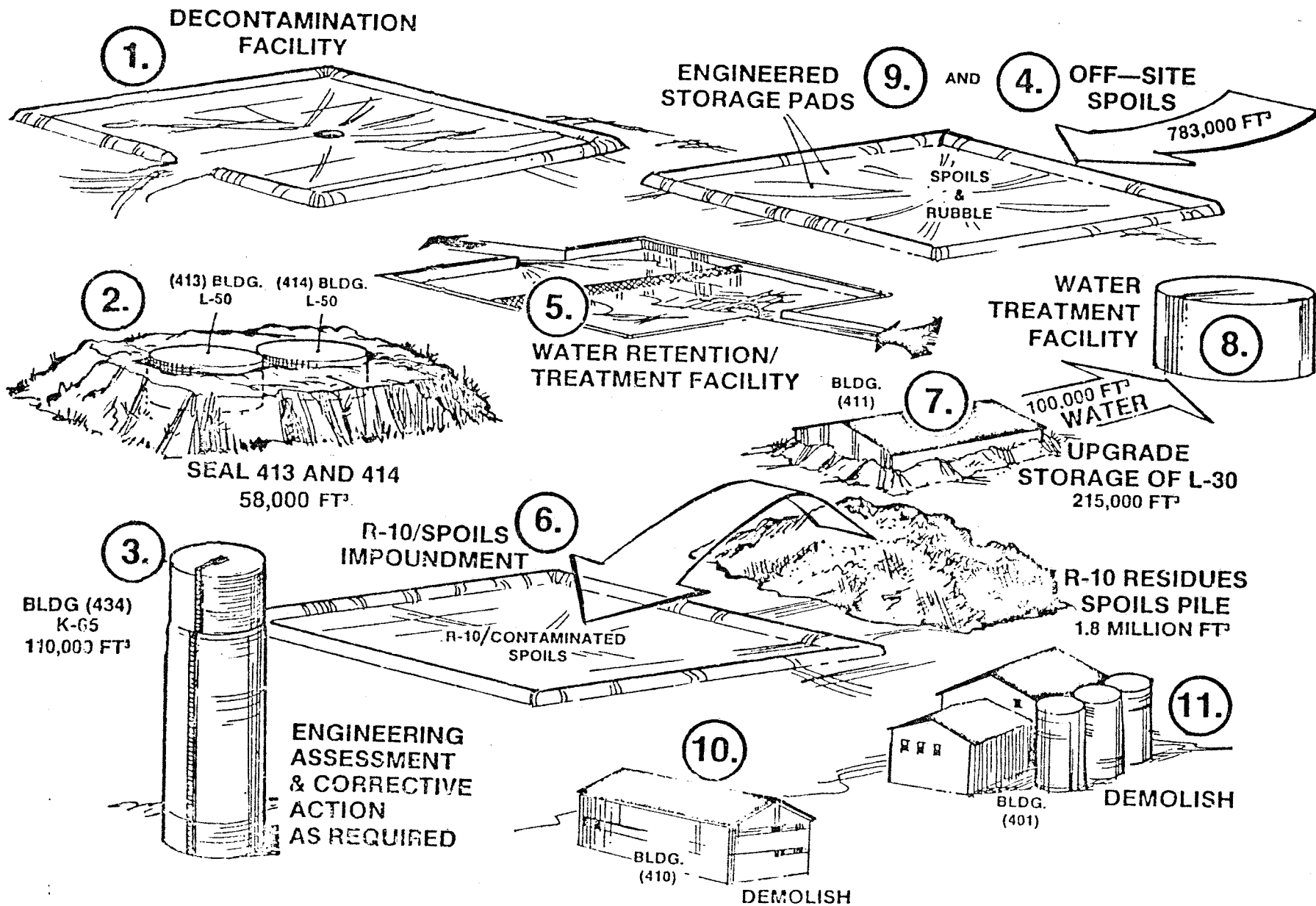


Figure 4 Project Plan

2.) Seal Buildings 413 and 414

The L-50 residue storage buildings must be sealed to reduce radon flux to the levels agreed upon by New York State and the Department of Energy. This activity entails assessment of current radon flux, assessment of options available for reducing the flux, preparation of engineered plans for the chosen option, execution of the plans and, finally, assessment of the resulting flux reduction. Conventional equipment, materials, and construction methods will be employed. Demolition of the existing wooden roof structures may generate a small amount of contaminated rubble. Personnel exposure will require monitoring/control.

3.) Stabilize/Seal Building 434

The K-65 residue storage silo will be assessed for seismic stability, reinforced if necessary, and sealed as required to reduce radon emanation.

The stability assessment will entail gathering data on residue location and density, physical dimensions of the structure, properties of existing construction materials, and local seismic characteristics. Subsequent analysis will indicate whether remedial reinforcement is required. If necessary, reinforcement will be designed and built.

The tasks that may be required to reduce radon emanation are similar to those described in item 2). Structural and radiological assessments, design, and implementation tasks will be coordinated



as practicable. It is anticipated that conventional equipment, materials and construction methods will be employed. Little or no contaminated material will result from this activity. Personnel exposure will require close monitoring/control.

4.) Off-site Ditch Cleanup

This activity entails retrieval of slightly contaminated soil currently in off-site drainage ditches and subsequent impoundment in storage facilities. Impoundment facilities will be designed and built utilizing conventional equipment, materials and construction methods. It is anticipated that retrieval will be accomplished by conventional excavation/hauling equipment. Approximately thirty thousand cubic yards of contaminated soil are involved. Personnel and environmental exposure, while minimal, will require monitoring/control.

5.) Surface Water Retention/Treatment Facility

This facility is required to preclude recontamination of the off-site ditches. This activity entails assessing the physical, chemical and radiological properties of the water, identifying applicable effluent criteria, and establishing appropriate storm flow/frequency protection limits. With these data as inputs, design and then construction will be accomplished. Conventional equipment, materials and construction methods will be employed. Contaminated soil will probably be generated by this activity. Personnel and environmental monitoring/control will be required.

6.) R-10/Spoils Impoundment

This activity entails retrieval of approximately sixty five thousand cubic yards of R-10 residues and associated spoils and subsequent impoundment in appropriate storage facilities. Impoundment facilities will be designed and built utilizing conventional equipment, materials and construction methods. Retrieval of the R-10 residues represents a significantly more complex problem than the ditch cleanup. Retrieval methods will be developed and assessed toward the goal of minimizing occupational and environmental exposure. Due to the depth of excavation and the impacts on groundwater, occupational safety and environmental controls will require special attention. Personnel and environmental monitoring will be required.

7.) Upgrade Building 411

This activity is required to ensure safe storage of the L-30 and F-32 residues currently stored in the building and to reduce radon flux to agreed upon levels. Initial tasks include investigating the current condition of the structure, assessing current radon flux and assessing results of the radon abatement techniques employed on other storage buildings. These data will be used to develop plans for necessary upgrading. It is anticipated that conventional equipment, materials and construction methods will be employed. Demolition of the existing roof, if required, may generate contaminated rubble. Personnel and environmental monitoring/control will be required.

8.) Water Treatment Equipment

Equipment is required to dispose of the contaminated water currently in Building 411. This activity entails characterizing the water, identifying applicable effluent criteria, evaluating the various available treatment systems, application engineering, and subsequently, installation and operation. Installation will be by conventional means. Waste volume will depend upon the equipment utilized.

9.) On-Site Spoils and Rubble Impoundment

Impoundment facilities will be required to store contaminated spoils and rubble generated by the various project activities. Contamination from various locations on-site (NW quadrant, New Navy dump, etc.) will be stored here as required. Design will be based on latest available waste volume estimates. Construction will be by conventional means. Occupational exposure will vary depending upon the contaminated materials handled.

10.) Demolish Building 410

This building will be demolished in order to reduce occupational and radiological hazards at the site. Since portions of the building are contaminated, demolition will be accomplished by conventional, but closely controlled means. Contaminated rubble will be impounded on-site. Personnel and environmental monitoring/control will be required.

11.) Demolish Building 401

This building will be demolished in order to reduce safety hazards and maintenance costs. The building is essentially uncontaminated, and will be demolished by conventional means.

12.) Off-Site Nearby Property Cleanup

Portions of the Modern Disposal property which is planned for use as a landfill, are contaminated from the NFSS. The contaminated soil will be removed by the property owner with Department of Energy overview and will be transported by the owner to the NFSS on-site storage pad for impoundment. The amount of soil is estimated to be less than 100 cubic yards. Personnel and environmental exposure, while minimal, will require monitoring control which will be conducted by the Department of Energy contractor. Other nearby properties which may be determined by the Assistant Secretary for Environmental Protection to need remedial action will be included in this activity.

13.) Perimeter Fence Extension

Additional fence will be added to extend the perimeter of the NFSS to include a portion of the West Drainage Ditch. The fence will be extended from the existing site southern boundary fence westward 150 feet and then to the northward 2300 feet to the existing site boundary fence. This fence extension is expected to reduce the radon concentrations at the site boundary and control public access to areas with elevated radon concentrations. The Niagara Mohawk Power

Company, the property owner, has indicated their permission for the fence erection. Personnel exposure, expected to be minimal, will be monitored and controlled during fence erection.

#### 4. Potential Issues

The potential adverse impacts on the workers and on the off-site environment, principally from the possible mobilization and transport of radioactive and other potentially hazardous sediment constituents (traces of metals and hazardous organic species) as a result of the planned activities, have been given consideration by the ORO Technical Services Division, and the Headquarter Remedial Action Program Office. Based on these considerations, no credible concerns suggesting the need for additional environmental assessment of these actions have been identified.

Some specific factors considered in this analysis are as follows:

- 1.) The storage pads will be constructed on uncontaminated areas on-site and pad foundations will be constructed using uncontaminated materials (e.g., fill dirt, rock, gravel, asphalt, etc.) which obviously would not adversely affect the environment. A radiological/health physics program will be implemented in order to preclude any unnecessary exposure of personnel during construction.
- 2.) Dust control and erosion control procedures, found to be effective in similar work at Middlesex, New Jersey, in 1980, will be implemented in order to preclude any significant worker exposure and

environmental transport of material (both contaminated or non-contaminated) off-site.

- 3.) The decontamination pad and the temporary storage pads will be designed to retain effluents and the stored residues; their effectiveness will be monitored during operation.
- 4.) The sealing of the residues in Buildings 413 and 414 will significantly reduce their contribution to the elevated radon concentrations along the west site perimeter. The off-site transport of mechanically resuspended radioactive materials during these activities will be low due to the asphaltic emulsions presently covering the residues. As the buildings are now ventilating to the atmosphere, demolition of the existing roof structure, if required, should not significantly elevate radon levels at the perimeter of the site. The duration of roof repair and sealing activities will be short and any transient increase of radon levels is expected to be small and to have little significance.
- 5.) No soils, contaminated or clean, will be transported off-site.
- 6.) Access to the site is and will continue to be restricted so that exposures of the workers and site visitors can be controlled and monitored.

5. References

- 1.) A Comprehensive Radiological Survey of the DOE-Niagara Falls Storage Site, B. S. Ausmus et al, BMI-2045, draft report to be released.
- 2.) Project Management Plan for Niagara Falls Storage Site, NLO Inc., prepared under Contract DE-AC05-76OR01156, February 1981.