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MEMORANDUM FOR: Ronald B. Eaton, Project Manager
Project Directorate I-III
Division of Reactor Projects

FROM: LeMoine J. Cunningham, Chief
Radiation Protection Branch
Division of Radiation Safety
and Safeguards

SUBJECT: PROPOSED DISPOSAL OF SLIGHTLY CONTAMINATED RADIOACTIVE CONSTRUCTION SOIL ONSITE AT THE PILGRIM NUCLEAR POWER PLANT (TAC NO. M85501)

By letter dated January 15, 1993, the Boston Edison Company (the licensee) submitted a request pursuant to 10 CFR 20.302 for the disposal of slightly contaminated radioactive soil onsite at the Pilgrim Nuclear Power Plant. We have completed our review of the request and find the licensee's procedures, including documented commitments, to be acceptable. This approval is granted provided that the enclosed SER is permanently incorporated into the licensee's Offsite Dose Calculation Manual (ODCM) as an Appendix. Also, future modification of these commitments shall be reported to the NRC.

The SALP is also enclosed. This completes our review of TAC M85501.

Original signed by LeMoine J. Cunningham

LeMoine J. Cunningham, Chief
Radiation Protection Branch
Division of Radiation Safety
and Safeguards

Enclosures: As stated

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SAFETY EVALUATION RELATED
TO THE PILGRIM NUCLEAR POWER PLANT
ONSITE DISPOSAL OF CONTAMINATED RADIOACTIVE
CONSTRUCTION SOIL

1.0 INTRODUCTION

By letter[1] dated January 15, 1993, Boston Edison Company (BECo) requested approval pursuant to Section 20.302 of Title 10 of the Code of Federal Regulation (CFR) for the disposal of licensed material not previously considered in the Pilgrim Final Environmental Statement (FES), dated May 1972. The BECo request contains a detailed description of the licensed material (i.e, backfill construction soil) subject to this 10 CFR 20.302 request, based on traces of residual radioactivity due to natural fallout, plant modification and operational activities. The 79,000 cubic feet (2,238 cubic meter) of construction soil contains a total radionuclides inventory of 0.636 millicuries (mCi) of Cobalt-60 and Cesium-137.

In its submittal, the licensee addressed specific information requested in accordance with 10 CFR 20.302 (a), provided a detailed description of the licensed material, thoroughly analyzed and evaluated the information pertinent to the effects on the environment of the proposed disposal of licensed material, and committed to follow specific procedures to minimize the risk of unexpected exposures.

2.0 DESCRIPTION OF WASTE

The material was contaminated by several events involving releases of radioactivity materials to onsite locations where excavations were subsequently made. These events were reported to and inspected by the staff. Some of events were the Resin Egress Event[2], Radwaste Trucklock Spills[3,4], and the spill from the Condensate Demineralizer Resin Addition Room[5].

The contaminated material for disposal consists of approximately 79,000 cubic feet of controlled backfill grading soil placed during plant construction. The mass of this material has been estimated to be 4.0 million kilograms. Four projects contributed to the majority of the material: (1) installation of a third diesel generator; (2) 10CFR50 Appendix R fire protection modification; (3) excavation of the foundation of the hydrogen water chemistry injection building; and (4) physical security modifications.

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[1] BECo letter from E.T. Boulette to the NRC Document Control Desk, January 15, 1993.

[2] Licensee Event Report 82-19/032.

[3] Licensee Event Report 77-29/1P.

[4] Licensee Event Report 88-026.

[5] NRC Inspection Report 50-293/81-04.

The material contains sand, silt, and rough stone (concrete rubble). There are no hazardous material mixed in the soil.

3.0 PROPOSED DISPOSAL METHOD

BECo plans to dispose of the 79,000 cubic feet of contaminated construction soil onsite pursuant to 10 CFR 20.302. The contaminated material was moved to its current location in August 1988 to locate it further away from the wetland. The disposal of the soil will be land application to an area located onsite 1200 feet south west of the plant, in an area between the Off Gas Stack access road, and the main parking lot access road within the Pilgrim owner controlled area (Figure 1). The proposed storage area is a natural depression in the ground (kettle). After placement and compacting, the material will be covered with topsoil and conservation mix grass seeding to help prevent erosion. Any remaining drainage and surface runoff will be entirely within the BECo owner controlled area. The disposal location is approximately 150 feet from the nearest wetland, shown as W-11 on Figure 1, and approximately 1000 to 1500 feet from Cape Cod Bay.

The area is not available for public use. Upon completing the disposal, no active controls will be employed since the area is within the BECo PNPS owner controlled area.

Table 1 lists the principal nuclides identified in the 4.0 million kilograms of material.

TABLE 1

Nuclide	Total Activity mCi
Cs-137	0.442
Co-60	0.194
Total:	0.636

4.0 RADIOLOGICAL IMPACTS

The licensee has evaluated the following potential exposure pathways to members of the general public from the radionuclides in the soil: (1) external exposure caused by groundshine from the disposal site; (2) internal exposure caused by inhalation of re-suspended radionuclides; and (3) internal exposure from ingesting ground water. The staff has reviewed the licensee's calculational methods and assumptions and finds that they are acceptable. The dose assesments are based on the following:

1. 0.636 mCi of contaminated construction soil distributed over 79,000 square feet.

2. Direct radiation exposure of 2000 hours per year.

3. Inhalation exposure based on 2000 hours per year is minimized due to six-inch layer of gravel (which inhibits wind erosion).

4. Groundwater not considered because there are no domestic wells in the area down-gradient from the plant.

Doses calculated from these pathways are shown in Table 2. The total dose of 0.075 is within the staff's guideline of 1 mrem per year. Such a dose is a small fraction of the 300 mrem received annually by members of the general public from sources of natural background.

TABLE 2

Pathway	Whole Body Dose Received by Maximally Exposed Individual (mrem/yr)
Groundshine	0.025
Inhalation	0.050
Groundwater Ingestion	0.000
Total	0.075

The guidelines used by the NRC staff for onsite disposal of licensed material are presented in Table 3, along with the staff's evaluation of how each guidelines has been satisfied.

The licensee's procedures and commitments as documented in the submittal are acceptable, provided that they are permanently incorporated into the licensee's Offsite Dose Calculation Manual (ODCM) as an Appendix, and that future modifications be reported to NRC in accordance with the applicable ODCM change protocol.

Based on the above findings, the staff finds the licensee's proposal to dispose of the low level radioactive waste soil onsite in the manner described in the BECo letter dated January 15, 1993, to be acceptable.

TABLE 3[6]

20.302 GUIDELINE FOR ONSITE DISPOSAL	STAFF'S EVALUATION
1. The radioactive material should be disposed of in a manner that it is unlikely that the material would be recycled.	1. Due to the nature of the disposed material, recycling to the general public is not considered likely.
2. Doses to the total body and any body organ of a minimally exposed individuals (a member of the general public or a non-occupationally exposed worker) from the probable pathways of exposure to the disposed material should be less than 1 mrem/year.	2. This guideline is addressed in Table 2.
3. Doses to the total body and any body organ of an inadvertent intruder from the probable pathways of exposure should be less than 5 mrem/year.	3. Because the material will be land-spread, the staff considers the maximally exposed individual scenario to also address the intruder scenario.
4. Doses to the total body and any body organ of an individual from assumed recycling of the disposed material at the time the disposal site is released from regulatory control from all likely pathways of exposure should be less than 1 mrem.	4. Even if recycling were to occur after release from regulatory control, the dose to maximally exposed member of the public is not expected to exceed 1 mrem/year, based on exposure scenarios considered in this analysis.

[6] E.F. Branagan Jr. and F.J. Congel, "Disposal of Contaminated Radioactive Wastes from Nuclear Power Plants," presented at the Health Physics Society's Mid-Year Symposium on Health Physics Considerations in Decontamination/Decommissioning, Knoxville, Tennessee, February 1986, (CONF-860203).

SALP INPUT
PILGRIM NUCLEAR POWER STATION

FACILITY NAME: Pilgrim

SUMMARY OF REVIEW /INSPECTION ACTIVITIES:

Boston Edison Company (BECo) submitted, by letter, dated January 15, 1993, a request pursuant to 10 CFR 20.302(a) for the onsite disposal of slightly contaminated construction soil which originated at Pilgrim Nuclear Power Station.

NARRATIVE DISCUSSION OF LICENSEE PERFORMANCE-RADIOLOGICAL CONTROL:

The licensee's submittal was technically sound and responsive to NRC staff concerns to address the criteria of 10 CFR 20.302(a).

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PRPB/DRSS/NRR