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Final Environmental Impact Statement

Conversion to Coal
New England Power Company
Salem Harbor Generating Station
Units 1,2 and 3
Salem, Essex County, Massachusetts

October, 1982

U.S. Department of Energy

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U.S. Department of Energy
Economic Regulatory Administration
Office of Fuels Programs
Washington, D.C. 20585

Responsible Agency:	U.S. Department of Energy Economic Regulatory Administration Office of Fuels Programs Fuels Conversion Division
Title of Proposed Action:	Issuance of Final Prohibition Orders to Salem Harbor Generating Station Units 1, 2, and 3, Salem, Massachusetts
Designation:	Final Environmental Impact Statement
Further Information:	Ms. Lynda Nesenholtz Office of Fuels Programs Fuels Conversion Division Economic Regulatory Administration Forrestal Building, Room GA-093, RG-62 1000 Independence Avenue, S.W. Washington, D.C. 20585

Abstract: This Final Environmental Impact Statement (FEIS) responds to comments on the Draft Environmental Impact Statement (DEIS) (DOE/EIS-0086-D, February 1982) and includes any necessary additions and corrections. The supporting information furnished in the DEIS should be reviewed and is incorporated herein by reference. This FEIS assesses the potential impacts associated with the proposed finalization of prohibition orders for Units 1, 2, and 3 of the Salem Harbor Generating Station, located in Salem, Massachusetts. If finalized, the prohibition orders would prohibit the utility from using either natural gas or petroleum products as a primary energy source in the affected units; the utility proposes to conform to the orders by returning Units 1, 2, and 3 to burning low-sulfur coal. The utility has commenced the process of converting to coal, and on March 1, 1982, initiated limited coal burning at the plant under the provisions of a Delayed Compliance Order issued by EPA on February 9, 1982.

Major issues of environmental concern relating to the conversion have been determined through the public scoping process and through discussion with other concerned agencies, and were found to include air and water quality, noise, and waste storage and disposal. These issues, as well as reasonable alternatives in the areas of plant conversion options, fuel type, air and water pollution control, ash disposal, and transportation, are discussed in the DEIS. In an effort to avoid excessive paperwork and costly reproduction, the DEIS text has not been reprinted in the FEIS.

SUMMARY

INTRODUCTION

The Salem Harbor Generating Station is in Salem, Essex County, Massachusetts, about 15 miles northeast of Boston, on a 60-acre site adjacent to Salem Harbor, a branch of Massachusetts Bay. Three of four units at the plant were designed to burn oil or coal as the major energy source; the fourth unit was designed to burn oil only. The units were converted to oil firing exclusively in 1969; they have continued to burn oil since that date except for a short period in 1974-1975 following the oil embargo when they were reconverted to burning coal. The three, Units 1, 2, and 3, are presently fired exclusively on oil. Units 1, 2, and 3 have coal handling and firing equipment in place, except for the oil-only burners on Unit 1 which will be replaced as part of the coal conversion project. A supply of high-ash coal remains on hand from the 1974-1975 coal burn.

On April 3, 1980 (45 FR 22183), the Department of Energy (DOE) published proposed prohibition orders for Units 1, 2, and 3 at the facility under the Powerplant and Industrial Fuel Use Act of 1978 (FUA), as amended. Following enactment of the Omnibus Budget Reconciliation Act of 1981 (OBRA), which amended FUA to allow powerplant owners and operators to certify to FUA's required technical and economic feasibility findings, the utility elected to so certify. DOE then reissued prohibition orders for Units 1, 2, and 3 on December 7, 1981. If the proposed prohibition orders are finalized, they would prohibit the units from using petroleum as their primary energy source. In this event, the New England Power Company, owner of the plant, proposes to return Units 1, 2, and 3 to burning a low-sulfur coal.

A Draft Environmental Impact Statement (DEIS) on the proposed conversion of Salem Harbor was published in February 1982 (DOE/EIS-0086-D). This Final Environmental Impact Statement (FEIS) has been prepared by the Office of Fuels Programs, Fuels Conversion Division of the Economic Regulatory Administration of DOE as part of DOE's responsibility under the National Environmental Policy Act (NEPA). DOE has determined that issuance of the prohibition orders is a major Federal action significantly affecting the quality of the environment, and that an EIS is required.

Major issues relating to reconversion of the plant to coal have been determined through the public scoping process and through discussion with other concerned agencies, especially the U.S. Environmental Protection Agency (EPA), Region I; the Massachusetts Department of Environmental Quality Engineering (DEQE); and the Massachusetts Executive Office of Environmental Affairs. In addition, appropriate comments on the DEIS for Salem Harbor and on the Draft Northeast Regional EIS (NEREIS) were considered. Issues of concern include air quality, water quality, noise, and waste storage and disposal. These issues, as well as reasonable alternatives to the utility's proposed reconversion to a low-sulfur coal as the major energy source, are discussed in the DEIS. No new or substantive issues were raised during the comment period on the DEIS.

PURPOSE OF AND NEED FOR ACTION

The oil embargo of 1973-1974 brought into sharp focus the nation's dependence on imported oil. The Energy Supply and Environmental Coordination Act (ESECA) was passed by Congress in 1974 in response to the embargo. This was superseded by FUA in 1978. One of DOE's responsibilities under FUA is to identify existing powerplants that could most readily convert from use of petroleum products to another fuel. A group of facilities selected included those that had been originally designed to burn coal, but that had subsequently switched to oil or gas. The Salem Harbor Generating Station is one of these powerplants. Return of Units 1, 2, and 3 to coal burning would save about 3.2 million barrels of oil per year over the remaining 15 or so year life of the units, and would contribute to lessening the country's dependence on imported oil.

ALTERNATIVES

As noted in the Council on Environmental Quality's (CEQ) regulations on preparation of environmental impact statements, the analysis of alternatives is the heart of an EIS. This FEIS includes discussions of reasonable alternatives to the proposed action, which is finalization of the proposed prohibition orders. Issues of concern, as identified in the scoping process and in discussions with other agencies, are stressed.

DOE's alternatives under FUA, as amended by OBRA are restricted to two: 1) to issue the Prohibition Orders, or 2) to not issue the orders. Under either of these alternatives, the utility has several options as noted in the following paragraphs and as discussed in the DEIS. The utility's preferred option if the proposed prohibition orders are finalized is to convert the three units at the Salem Harbor Generating Station to burning low-sulfur coal. Unit 4 is not coal-capable and would continue to burn oil.

Alternatives include no action, under which the utility could continue to burn oil; the utility's proposed plan--reconversion to low-sulfur coal; use of alternative fuels; alternative pollution control methods; alternative ash disposal methods; and alternative transportation methods.

No Action

Under the no action alternative, the utility could elect to continue burning oil, could convert to coal without a prohibition order, or could retire the plant.

Proposed Conversion

Under the utility's proposed response to the prohibition orders, the Salem Harbor Generating Station would return to burning a low-sulfur coal (1.5 percent sulfur) in three units. This would require about 870,000 tons of coal per year and would save approximately 3.2 million barrels of oil annually. The coal would be brought to the site by a 36,000-ton collier and would require about 25 unloadings per year.

EPA Region I issued a Final Delayed Compliance Order (DCO) on February 9, 1982, which facilitates the conversion by allowing the station to exceed currently permitted limits for particulate matter (PM) emissions for the period the DCO is in force (not to exceed 46 months from March 1, 1982). These increased emissions would maintain primary National Ambient Air Quality Standards (NAAQS) and would be reduced to within SIP limits as soon as new precipitators could be purchased and installed and a new, approximately 450-foot stack constructed.

A second critical element of the utility's proposed conversion is implementation of an Oil Conservation Adjustment (OCA) to finance the conversion. Under Massachusetts law the OCA permits the utility to establish the cost of oil and the cost of coal on a quarterly basis and to reserve two-thirds of the cost differential for paying the costs of the conversion and taxes. The remaining one-third difference in cost would be passed on to the ratepayer immediately. Once the conversion is paid for, the entire fuel cost savings will accrue to the ratepayers.

Initial construction to commence coal burning requires repair and upgrading of existing coal handling and burning equipment, reshaping of the coal pile, construction of new roadways, and some work in the ash handling areas.

Under the DCO, the present electrostatic precipitators are being refurbished to permit initial coal burning while keeping PM emissions within acceptable limits. When all repairs are made, two of the precipitators should have collection efficiencies of 87.5 percent, and the third an efficiency of 86.1 percent. Flue gas conditioning tests are also being conducted to determine if the addition of chemicals to the system improves efficiency. When the new precipitators are installed, particulate matter emissions will be reduced to within State Implementation Plan (SIP) limits.

Fuels

Other fuels considered as potential major energy sources include high-sulfur coal, coal-oil mix, refuse-derived fuel (RDF), and wood/wood chips. None of these is considered preferable to the proposed conversion. High-sulfur coal would require use of a flue gas desulfurization (FGD) system, which would necessitate additional construction, transportation, and storage acreages, and create additional environmental concerns. Use of a coal-oil mix as tested at the facility reduces oil consumption by only 20 percent. Neither RDF nor wood is available in sufficient quantities to make these reliable energy sources for the plant at this time.

Ash Disposal

Several alternatives for disposal of ash from the facility are being evaluated. If possible, the utility favors marketing the ash commercially; three potential uses are as a landfill cover material, as an ingredient in concrete, and as a construction fill material. For the portion of ash not sold commercially, conventional landfilling would be utilized. Over the short term (3 to 5 years), surplus ash will be disposed of in a commercial landfill at Amesbury, Massachusetts, about 30 miles from the plant, and at other approved disposal sites.

Transportation

Other methods of transportation of coal to the site include rail and coal-slurry pipelines. Since the plant site does not now have rail facilities and reactivation of such rail routes would be difficult, this alternative is not considered viable. No coal-slurry pipelines are available or planned for construction in this area during the life of the plant.

Other Alternatives

Because the plant is an existing electric generating station, and because it was originally designed to burn coal, most facilities are already in place. There are no practical alternatives involving relocation of facilities that would provide an environmental advantage.

ENVIRONMENTAL IMPACTS

As noted previously, major issues of concern are air and water quality, noise and increased traffic, and land use problems due to ash disposal. Impacts to regional or site geology, aquatic or terrestrial biota, housing, labor market, or other socioeconomic factors are expected to be minimal.

Air Quality

Conversion to coal under the DCO will increase PM emissions for up to 46 months, with emissions limits as determined by EPA in the final DCO. Following the DCO period, PM emissions will be within the present SIP limits. SO_2 emissions will be within allowable limits throughout the entire coal-burning period and equivalent to current SO_2 emissions on oil firing. NO_2 emissions are estimated to increase by 180 tons per year. However, DEQE exempts sources if they do not increase NO_x emissions by more than 250 tons per year. Emissions of carbon monoxide, hydrocarbons, and other pollutants will increase slightly under the proposed conversion.

There will be small increases in fugitive dust during construction and after conversion as a result of ash and coal handling activities. Mitigative measures to reduce impacts of increased dust include wetting down of construction areas and the coal pile.

Water Quality

The Salem Harbor Generating Station currently has several waste streams which are discharged under an NPDES permit. These will remain essentially unchanged. Conversion to coal will increase the size of the existing coal pile and, therefore, increase the potential for contamination of groundwater from coal pile runoff.

Ash Disposal

The impacts of additional traffic and noise created by trucking the ash from the plant would be the same for all disposal methods or reuse options. Approximately eight 30-ton truckloads per day would be handled. If landfilling of the ash is ultimately required, landfill capacity would be preempted from other uses, unless ash is used for intermediate landfill cover material as allowed by Masscahusetts Law (Chapter 111, Section 150A).

Noise

Increased noise levels from conversion to coal can be expected as a result of coal delivery, handling, and preparation. There will also be some increased noise as a result of increased truck traffic.

Aesthetics

A new stack will be constructed to replace the three 250-foot stacks currently used for the three units. This stack, approximately 450 feet in height, will stand adjacent to an existing 500-foot stack. The new stack should not significantly alter the appearance of the plant, nor will it block any scenic vistas.

Historic Sites

There is some concern that increased truck traffic required for ash hauling along residential streets may conflict with the historic character of some areas along or near the route. As presently projected, the increase should be about one truck per hour, which is small compared to the present commercial traffic in the plant area.

UNRESOLVED ISSUES

Issues remaining unresolved include 1) final plans for disposal of ash, including disposal methods and capacities, and 2) possible need to take additional precautions such as lining the coal storage area to reduce groundwater infiltration. Neither of these issues is anticipated to be a major deterrant to the continuing conversion of Units 1, 2, and 3 to coal, and there is a continuing dialogue between the utility and the State concerning these issues.

CONCLUSIONS

Conversion of Units 1, 2, and 3 of the Salem Harbor Generating Station to coal burning should not produce long-term impacts to the environment if proposed monitoring programs, sale of fly ash, and other similar mitigative actions are taken.

The cost of the conversion is estimated at $100 million. This cost will be offset by reductions in costs of fuel and resultant lower costs to the ratepayer. The fuel cost reduction is presently estimated at $8 to $12 per equivalent barrel of fuel oil. In addition, the conversion will permit a reduction in oil use of 3.2 million barrels per year, or 48 million barrels over the approximately 15-year remaining life of the plant.

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1.0 PURPOSE OF THIS DOCUMENT

In February 1982, the U.S. Department of Energy (DOE) published and distributed a Draft Environmental Impact Statement (DEIS) on the issuance of Final Prohibition Orders to New England Power Company (NEP) for Units 1, 2, and 3 of its Salem Harbor Generating Station in Salem, Massachusetts (DOE/EIS-0086-D). The DEIS was written pursuant to the National Environmental Policy Act (NEPA) of 1969. NEP proposes to respond to the orders by returning Units 1, 2, and 3 to burning low-sulfur coal and has commenced the conversion process. On March 1, 1982, NEP initiated limited coal burning at the plant under the provisions of a Delayed Compliance Order (DCO) issued by the U.S. Environmental Protection Agency (EPA) on February 9, 1982.

A Massachusetts Draft Environmental Impact Report (DEIR) pursuant to the Massachusetts Environmental Policy Act (MEPA) was filed with the Massachusetts office of Environmental Affairs in January 1982. Availability of the Massachusetts FEIR was announced in the Massachusetts Environmental Monitor on March 22, 1982.

This Final Environmental Impact Statement (FEIS) has been prepared to conform with the Council on Environmental Quality (CEQ) regulations (40 CFR Part 6) for implementing NEPA. The essence of the NEPA decision process is contained in the Abstract Sheet for the FEIS; it describes the proposed prohibition orders, summarizes alternatives--including mitigative measures--and their impacts, and identifies and evaluates major concerns and issues of the proposal. In an effort to avoid excessive paperwork and costly reproduction, the DEIS text has not been reprinted in the FEIS. The supporting information furnished in the DEIS should be reviewed and is incorporated herein by reference.

Section 2.0 contains additions and corrections to the DEIS. Areas of special concern covered in that section include air quality, coal combustion waste handling and disposal, coal storage, community resources, and floodplain assessment. An errata section is also included.

Section 3.0 contains the results of public participation in the EIS process. Included are copies of written communications submitted to DOE in response to the DEIS and Massachusetts DEIR, followed by DOE's responses to each individual comment. As NEP was the project proponent for the State FEIR, they prepared responses to comments on the DEIR submitted by DOE. This FEIS responds to comments on both the DEIS and Massachusetts DEIR, and utilizes many of the responses prepared by NEP.

Section 4.0 of the FEIS lists the individuals involved in its preparation. Section 5.0 lists the agencies and groups from whom comments were requested on the DEIS. Supplementary material is provided in Section 6.0.

2.0 ADDITIONS AND CORRECTIONS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Comments on the DEIS by agencies and the public expressed concern regarding several aspects of the proposed conversion. While specific comments are responded to in Section 3.0, it was decided to gather the response material in several areas into the text that follows. The areas of special concern covered in this section include air quality, coal combustion waste handling and disposal, coal storage, community resources, and floodplain assessment; a list of errata is also included. Four figures from the DEIS have been repeated for reader convenience as Figures 2.0-1 through 2.0-4.

2.1 AIR QUALITY

2.1.1 General

The purpose of this section is to incorporate into this FEIS those regulatory changes associated with Salem Harbor Station's conversion to coal that have occurred since the DEIS was published. At the time DEIS was published, EPA was in the process of evaluating public comments on a proposed Delayed Compliance Order (DCO) issued for New England Power Company's Salem Harbor Generating Station (46 FR 39175). Since that time, however, EPA has issued a final DCO (47 FR 5893, February 9, 1982) which, in some areas, differs significantly from the proposed DCO upon which the DEIS was based.

2.1.2 Requirements of the Delayed Compliance Order

The most significant change to the DCO originally proposed by EPA is related to the Best Practical System of Emission Reduction (BPSER) for particulate matter (PM) emissions during the period in which the DCO will be in effect. EPA's proposed DCO specified a BPSER emission rate of 0.60 lb PM/MMBtu heat input for the first 4 months of new coal burning (this period is referred to as DCO-2 in the DEIS) and a rate of 0.35 lb PM/MMBtu heat input for the remainder of the DCO period (referred to as DCO-3 in the DEIS). Following the DCO period, the Salem Harbor Station must meet the requirements of the current SIP, namely 0.12 lb PM/MMBtu heat input. On the basis of comments received on the proposed DCO, EPA has revised the emission limitations during the DCO period to be 0.60 lb PM/MMBtu heat input for the first 6 months of new coal burning (DCO-2) and 0.45 lb PM/MMBtu heat input for the remainder of the DCO period (DCO-3).

The revisions described above have resulted in changes to the DEIS, the details of which are discussed below. Although EPA made other changes to the conditions of the DCO, none would require revisions to the air quality sections of the EIS. A copy of the Final DCO, which includes a complete discussion of the changes made by EPA, is contained as Section 6.1 of this FEIS.

2.1.3 Operational Impacts--DCO Period

2.1.3.1 Summary of Emissions

Table 2.1-1 contains the estimated 100 percent load emission rates for the criteria pollutants that will be emitted in significant quantities from Units 1, 2, and 3 at the Salem Harbor Station. The emissions from Unit 4 will be unaffected by the conversion and are not included in this table. Table 2.1-1 supersedes Table 4.2-2 in the DEIS and reflects the conditions set forth by EPA in the final DCO as issued for Salem Harbor. The only emissions that have changed from those given in the DEIS are the PM emissions for DCO period 3 (DCO-3). The table summarizes emissions of criteria pollutant emissions (i.e., those pollutants for which EPA has established a national ambient air quality standard) for SO_2, PM, NO_2, CO, and HC for each of six fuel option alternatives, as follows:

- No action
- Proposed coal conversion
- High-sulfur coal plus SO_2 scrubbing
- Coal-oil mixture (30 perent coal)
- Coal conversion with RDF supplement (15 percent RDF)
- Wood/wood chips as primary fuel.

The table gives PM emissions for DCO periods 2 and 3, as well as the post-DCO period of permanent station operation. DCO period 1 (DCO-1 in the DEIS) emissions are not included in the table, since there is no fixed emission limitation for the first 2 months of coal burning at the station. The conditions of the final DCO, however, are such that old coal can be burned for 2 months in either Unit 2 or Unit 3, but not in both units simultaneously, thus limiting PM emissions during DCO Period 1 to less than during DCO Period 2. The DCO does not set a numerical emission limit, but rather limits power generation in Units 2 and 3 to 64 and 100 MW, respectively. This, together with other specifications on precipitator performance, should limit particulate emissions to approximately 1.0 lb/MMBtu in Units 2 and 3, based on estimates made by NEP. The emissions in the other fuel-burning units would be a maximum of 0.12 lb/MMBtu, as specified in the current SIP. The estimated PM emissions for DCO-1 would be 140.0 grams/second if Unit 2 burns old coal, and 205.7 grams/second if Unit 3 burns old coal for the proposed coal conversion fuel option alternative. Both of these possible emission rates are less than the DCO-2 and DCO-3 emissions for the same fuel option alternative.

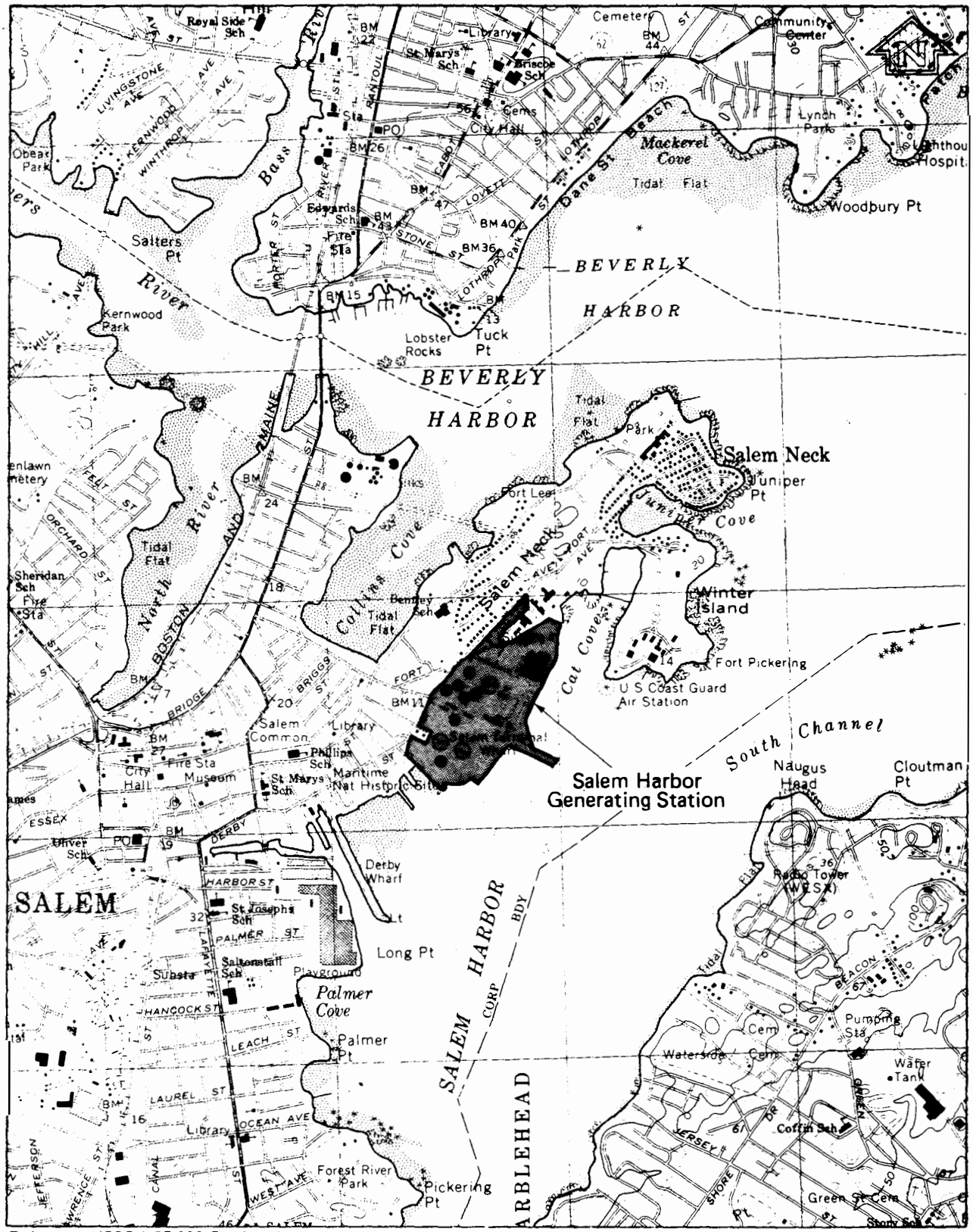


FIGURE 2.0-1
LOCATION MAP-SALEM HARBOR GENERATING STATION

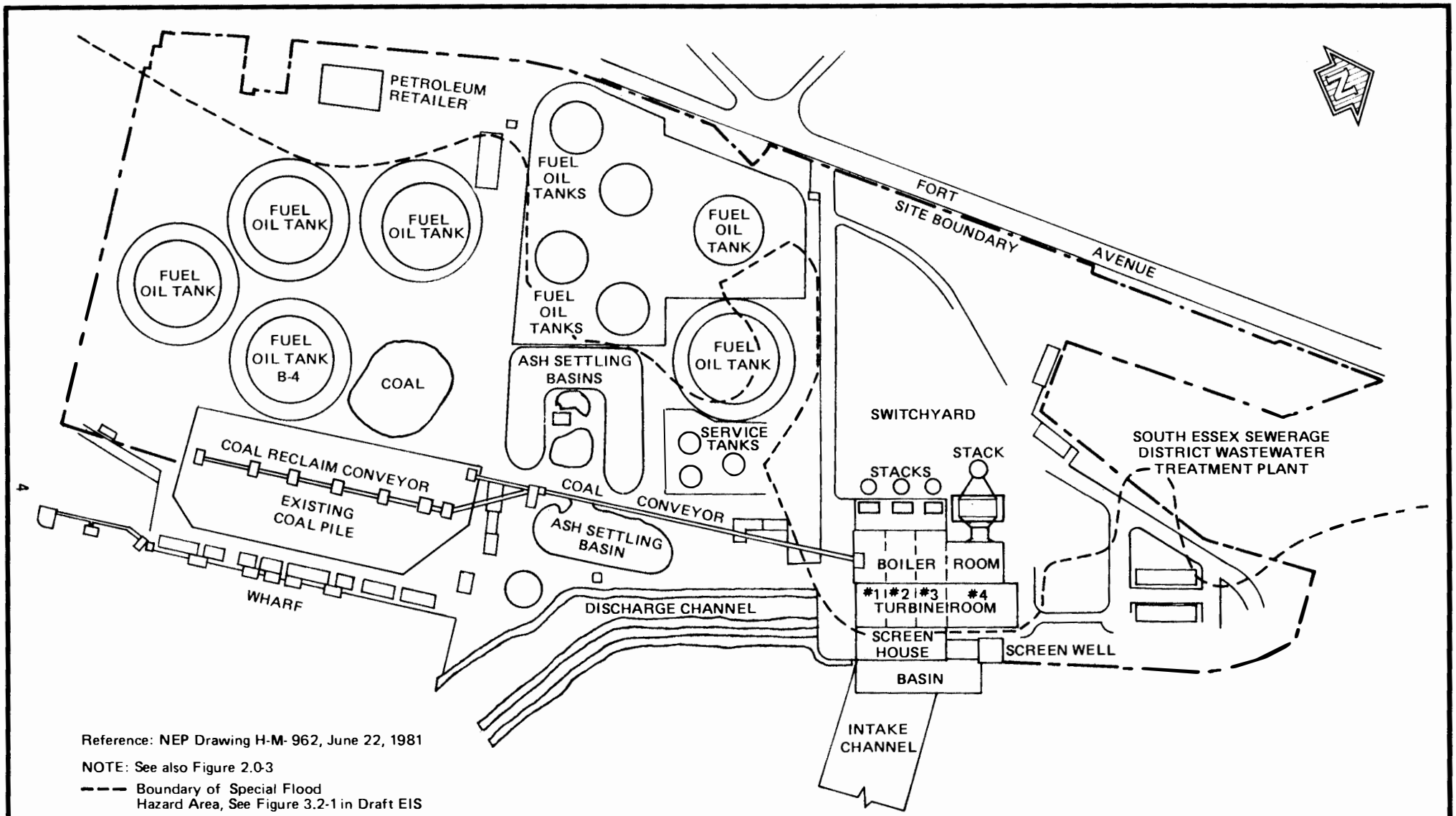


FIGURE 2.0-2
EXISTING SITE LAYOUT

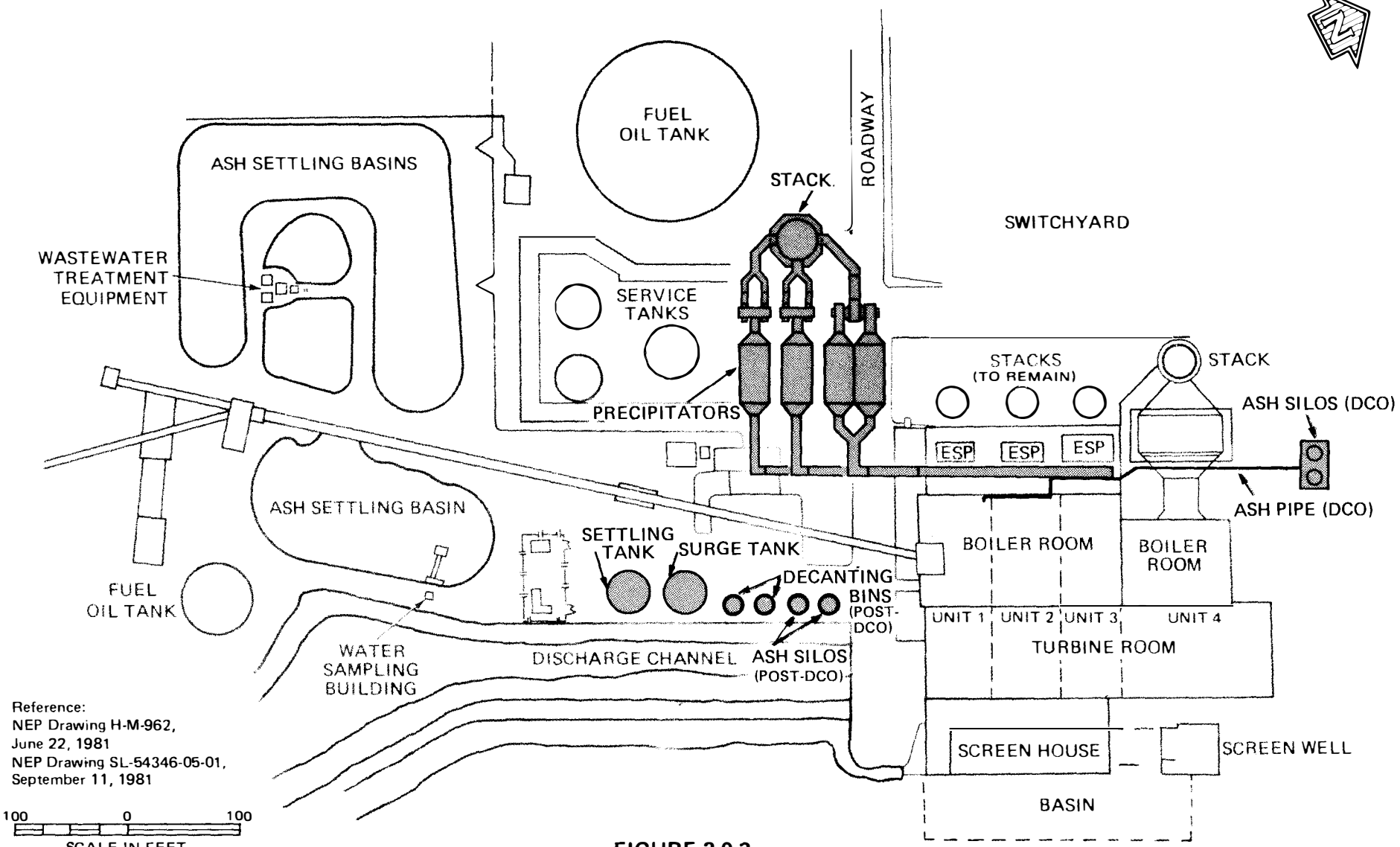
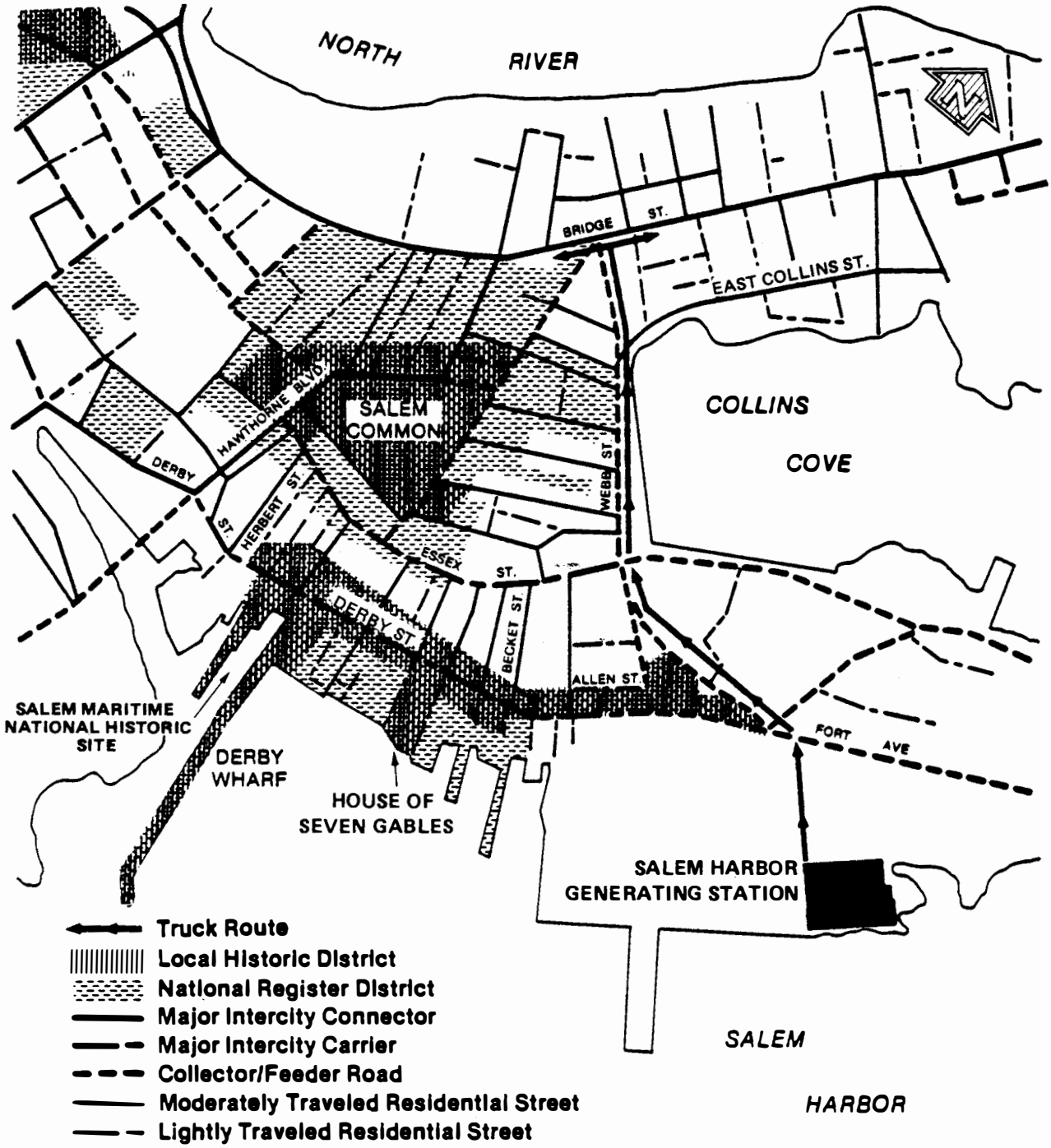


FIGURE 2.0-3
PROPOSED PLANT MODIFICATIONS (DESIGNATED BY SHADED AREAS)



SOURCE: Radian, 1981

FIGURE 2.0-4
TRUCK TRANSPORTATION ROUTE NEAR
SALEM HARBOR SITE AND APPROXIMATE BOUNDARY OF
DERBY STREET HISTORIC DISTRICT

Table 2.1-1 Salem Harbor Generating Station Stack Emissions of Major Pollutants from Units 1-3 at 100 Percent Load
(emissions in grams/second)

Pollutant	Fuel Option Alternative					
	No Action	Proposed Coal Conversion	Coal-Oil Mixture (30 percent Coal)	High-Sulfur Coal Plus SO_2 Scrubbing	Coal Conversion with RDF Supplement (15 percent RDF)	Wood as Primary Fuel
SO_2[a]	950.0[b] --	950.0 (30-day) 1813.0 (24-hr)	950.0 (30-day) 1813.0 (24-hr)	950.0 (30-day) 1813.0 (24-hr)	775.0 (30-day) 1465.0 (24-hr)	39.93[b] --
PM[c]	47.9[b] -- --	239.6 (DCO-2) 176.9 (DCO-3) 47.9 (Post-DCO)	105.4 (DCO-2) 96.2 (DCO-3) 47.9 (Post-DCO)	239.6 (DCO-2) 176.9 (DCO-3) 47.9 (Post-DCO)	239.6 (DCO-2) 176.9 (DCO-3) 47.9 (Post-DCO)	47.9[b] -- --
NO_2[d]	282.4	287.6	284.0	287.6	262.3	266.2
CO[d]	13.4	16.0	14.2	16.0	223.2	53.2
HC[d]	2.7	4.8	3.3	4.8	13.1	53.2

[a]30-day figure represents emissions based on 30-day rolling average sulfur limitations (1.21 lb S/10^6 Btu); 24-hr figure represents emissions based on maximum 24-hr sulfur limitations (2.31 lb S/10^6 Btu).

[b]Based on current SIP emission limits.

[c]DCO-2 refers to PM emission limitation during first 6 months of new coal burning (0.6 lb/10^6 Btu). DCO-3 refers to PM emission limitation effective 8 months after initial coal burning (0.45 lb/10^6 Btu). Post-DCO refers to PM emission limitation after DCO period (0.12 lb/10^6 Btu).

[d]Based on AP-42 emission factors.

2.1.3.2 Effects of Salem Harbor Station Operation

The assessment of the impact on ambient air quality resulting from the operation of the Salem Harbor Station during the period of the DCO was originally based on extensive dispersion modeling analyses and is discussed in detail in the DEIS. The results of these dispersion modeling analyses have been summarized in Table 2.1-2 and reflect the conditions set forth by EPA in the final DCO issued for Salem Harbor. The results contained in this table supersede those presented in Table 4.2-3 in the DEIS.

The results in the table indicate that the highest total calculated 24-hour ambient PM concentration during DCO Period 2 (first 6 months of new coal burning) is shown to be 244 $\mu g/m^3$, which is 8 percent less than the primary 24-hour standard of 260 $\mu g/m^3$. As discussed in the previous section, PM emissions during DCO Period 1 will be less than DCO Period 2, and the resulting ground-level concentrations will also be less than those shown in Table 2.1-2. During DCO Period 3 (beginning 8 months after the initial burning of any coal), the highest total calculated 24-hour ambient PM concentration is predicted to be 212 $\mu g/m^3$, which is 27 percent less than the primary standard. Because of the conservative way in which the calculated estimate was obtained (as explained in the DEIS text), the tabulated value should be considered an upper boundary to possible concentrations. Also, higher 24-hour PM concentrations have been recorded at some of the other monitors, but the locations of those monitors are such that they are not representative of ambient PM concentrations in the area around the station, where high concentrations attributable to station emissions can be expected to occur.

Table 2.1-2 Calculated Air Quality Effects for Particulate Matter Emissions (100 Percent Load) During the DCO Period
(concentrations in $\mu g/m^3$)

Pollutant	DCO[a] Period	Averaging Period	Predicted Highest Second-Highest Salem Harbor Station Impact (Units 1-3)					Monitored Background (Congress St. Monitor) 1978		Total 1978 Calculated Ambient Concentration	Primary NAAQS
			1974	1975	1976	1977	1978	Highest[b] Modeling Day	Whole[c] Year		
PM	2	24-hr	<120[d]	150	144	129	127	72	117	199[e](244)[f]	260
	2	Annual	17.1	12	13	9	10	N/A	48[g]	58[h]	75
PM	3	24-hr	<90[d]	112	108	96	95	72	117	167[e](212)[f]	260
	3	Annual	8	9	9	6	8	N/A	48[g]	56[h]	75

(Footnotes for this table appear on the following page.)

[a]DCO period refers to the emission limitations specified in EPA's Delayed Compliance Order.
Period 1: First 2 months of coal burning (old coal only). See text for explanation.
Period 2: First 6 months of burning new coal.
Period 3: Begins 8 months after burning any coal and continues to end of DCO period.

[b]Represents ambient concentration at Congress Street monitor on day of highest second-highest predicted concentration in 1978.

[c]Highest second-highest 24-hour concentration observed at Congress Street monitor in 1978.

[d]All predicted values were less than the values indicated.

[e]Obtained by adding highest second-highest predicted impact to highest modeling day background concentration.

[f]Obtained by adding highest second-highest predicted impact to highest second-highest monitored concentration at Congress Street monitor in 1978.

[g]Geometric mean for 1978.

[h]Obtained by adding 1978 geometric mean to predicted annual average for 1978.

2.2 COAL COMBUSTION WASTE HANDLING AND DISPOSAL

2.2.1 Wastewater Treatment

Discharges from the Salem Harbor Generating Station are regulated under a National Pollutant Discharge Elimination System (NPDES) permit dated February 21, 1980, which has been renewed yearly. Under that permit the station has seven discharges as follows:

Outfall No.	Operations Contributing Flow	Average Flow (MGD)
001	Condenser Cooling Water	633.6
	Non-Contact Cooling Water	32.1
	Units 3 and 4 Screenwash	0.2
	Blowdown & Turbine Hall Drains	0.1
	Total	666.0
005	Unit #1 Screenwash	0.2
007	Unit #2 Screenwash	0.2
006	Wastewater Treatment System Discharge	1.0
008	Stormwater Runoff	0.024
010	Stormwater Runoff	0.037
014	Condenser Cooling Water Intermittent Heat Recycle	-

The above discharges are monitored in accordance with the provisions of the NPDES permit, and the results of long-term monitoring are submitted to EPA in conjunction with permit renewal applications. Table 2.2-1 compares the long-term average values for several discharge parameters with the NPDES permit limitations. Operational restrictions historically have not been required to achieve these limitations.

NEP's NPDES permit contains a compliance schedule for monitoring effluent streams after the plant starts burning coal. This schedule is detailed in Permit Modification No. 2 (included as Section 6.2), and requires any additional wastewater treatment found to be necessary to be operational within 18 months of the initiation of coal burning. The principal change to the discharge limits established by the permit modification allows an increase in suspended solids at Discharge Outfall No. 006 (see Table 2.2-1), from the present level of 30 parts per million (ppm) to 300 ppm as a daily average and 100 to 500 ppm as a daily maximum for the 18-month period, to accommodate the increased usage of the settling bosins during that time. Construction of the temporary dry fly ash handling facilities is expected to provide the means of reducing suspended solids levels to the 30 ppm limit. Iron limits are also increased by the modification, from 1 ppm to 3 ppm daily average, and from 1 to 5 ppm daily maximum.

The wastewater treatment system at the Salem Harbor station (for location, see Figure 2.0-3) is designed to remove dissolved and suspended pollutants which are present in plant wastewater as a result of contact with coal and oil ash, boiler cleaning wastes, and general plant drains, including site runoff. The treatment process is based on lime precipitation. Wastes are first pumped into an equalization basin for flow control and pH damping. From there, they

Table 2.2-1 Water Quality Analysis and Discharge Limitations at the Salem Harbor Generating Station

Outfall No.		001		005 & 007		006		008		010		014	
		Long-Term Average Value	Discharge Limits	Long-Term Average Value	Discharge Limits	Long-Term Average Value	Discharge Limits	Long-Term Average Value	Discharge Limits	Long-Term Average Value	Discharge Limits	Long-Term Average Value	Discharge Limits
Flow	(MGD)	666[a]	670(670)[b]	0.21 each	6.5(6.5)[b]	0.19	3.0(3.5)[b]	0.024(8.6)[c]		0.037(13)[c]		28.8[d]	(19.2)
Temperature (winter)	(°F)	54.7	25(90)[e]	36.5								115	115[f]
Temperature (summer)	(°F)	75.9	25(90)[e]	59.9								115	115[f]
pH	(standard units)	8.2(8.3)[a]	6.0(8.5)[g]	7.8(7.8)[j]	6.0(8.5)[g]	8.2(8.3)[a]	6.0(9.0)[g]	8.0(-)[h]	6.0(8.5)[g]	7.8(-)[h]	6.0(8.5)[g]	7.2(8.5)[g]	6.0(8.5)[g]
Oil & Grease	(mg/l)					6.3	15.0(15.0)[b]	5.8	(15.0)[b]	5.8	-(15.0)[b]		
Iron	(mg/l)					0.11	1.0(1.0)[b,i]						
Copper	(mg/l)					<0.1	1.0(1.0)[b]						
Nickel	(mg/l)					0.17	1.0(1.0)[b]						
Zinc	(mg/l)					<0.1	1.0(1.0)[b]						
Residual Chlorine	(mg/l)	<0.1	0.1(0.1)										
Turbidity	(JTU)					3.8[k]	25(50)[b]						
Total Suspended Solids	(mg/l)					6.4	30(100)[b,k]	17.1	30(100)[b]	9.6	30(100)[b]		

[a] 30-day values.

[b] Daily average (daily maximum).

[c] Smaller value is long-term average flow based on an annual rainfall of 43 inches. Larger value is calculated for a 10-year, 24-hour rainfall event.

[d] Intermittent flow, normally 0.

[e] Temperature rise not to exceed 25°F, maximum temperature not to exceed 90°F.

[f] Maximum temperature not to exceed 115°F.

[g] Not less than 6.0 nor more than 8.5 or 9.0.

[h] Daily values.

[i] Increases to 3.0 (5.0) during first 18 months of coal burning.

[j] Average value for Oct.-Dec. 1980 from NEP, 1980.

[k] Increases to 300 (500) during first 18 months of coal burning.

Notes: Long-term average values (NEP, 1981d).
Discharge limits (USEPA, 1980).

flow through a mixing chamber where lime slurry is added to raise the pH and cause the dissolved metals to precipitate as metal hydroxides. The water then flows through a series of three settling basins in which the metal hydroxides and other suspended solids are precipitated before the treated water is discharged to Salem Harbor. The treatment system has a capacity of 3.5 MGD, which is adequate to handle wastewater streams (NEP, Response to Comments on Massachusetts DEIR, Attachment C, March 1982).

Sludge is periodically removed from the basins and allowed to air dry before being trucked offsite for disposal. As part of the hazardous waste notification screening procedures under the Federal Resource Conservation and Recovery Act (RCRA), two samples of sludge from the Salem Harbor wastewater treatment system were tested in 1980 using the toxicant extraction procedure test. The results of the tests were as follows:

Metals	Sample #1 (mg/l)	Sample #2 (mg/l)	EPA Limits (mg/l)
Arsenic	0.018	0.017	5.0
Barium	1.0	1.0	100.0
Cadmium	0.1	0.1	1.0
Chromium	0.1	0.1	5.0
Lead	0.01	0.01	5.0
Mercury	0.0067	0.0002	0.2
Selenium	0.004	0.009	1.0
Silver	0.1	0.1	5.0

Sludge from the treatment system was found to be not hazardous and this is not expected to change.

As part of the coal conversion, a coal pile runoff collection system will be installed, as discussed in Section 2.3.1. Coal pile runoff will be pumped from a lined holding basin to the wastewater treatment system. The treatment system, as presently operated, can adequately handle the flow rate and characteristics of coal pile runoff.

During the first 6 months of the DCO coal burn, a wet fly ash system will sluice fly ash to the treatment system. Throughout the DCO, bottom ash will be sluiced to the system. Other facilities to be installed with coal conversion include a recirculating bottom ash system. Bottom ash will be sluiced to dewatering bins which remove most of the ash. The water will flow to two new lined settling basins for removal of smaller particles and then will be recycled to the station for reuse. This system will also accommodate boiler seal water and equipment washwater from the coal-fired units. Same small amount of overflow from the system to the wastewater treatment system will probably be required. The total flow to the wastewater treatment system, including coal pile runoff following coal conversion, will be less than during oil burning.

2.2.2 Ash Characteristics and Disposal

At the time of the preparation of the DEIS, coal burning had not been initiated at Salem Harbor. Several commentors on the DEIS requested additional information on the characteristics of ash from Salem Harbor and on the safety of its disposal. NEP has since provided data from recent samples at Salem Harbor during the DCO coal burn, together with other data from its Brayton Point experience. This additional information is presented in Section 6.6.

Coal burned at Salem Harbor will be very similar to that burned at Brayton Point, and the boilers are also sufficiently similar to conclude that NEP's experience at Brayton Point is generally applicable to Salem Harbor. NEP conducted a test program at Brayton Point soon after coal conversion. This study was designed to evaluate potential changes in wastewater discharges at the station that might occur as a result of long-term coal conversion. Samples were obtained from the coal deliveries, fly ash and bottom ash, and liquid waste streams during the 1980 DCO. Test results from this study are shown as NEP's Attachment G in Section 6.6.

Two other characteristics of coal combustion ash which bear on its suitability for land disposal are permeability and toxicity. NEP also supplied data on these two factors, as Attachments D, E, and F in Section 6.6. Ash is a relatively impermeable material as indicated by the test results in Attachment D. Its low permeability inhibits water from entering the material and forming leachates. In a landfill, this characteristic is desirable, to prevent rainfall from reaching the solid waste. When used as cover material, ash can replace other, sometimes scarce, soil materials and doesn't consume landfill capacity. This course--using ash for landfill cover--is the principal one now being pursued by NEP for Salem Harbor's ash.

For ash to replace other materials, such as clay or sand, as landfill cover, it must be non-toxic. Attachments E and F include the results of a toxicant extraction procedure conducted for NEP on ash samples from Brayton Point and Salem Harbor, respectively. The results are well below the levels established by EPA to define a hazardous waste.

Two studies for using ash as landfill cover were supplied by NEP as their Attachments B and C. The work was conducted between 1976 and 1978 in two southeast Massachusetts communities and included evaluation of ash handling characteristics and the installation of observation wells to monitor groundwater. Subsequent to the submittal of these reports, ash was approved in Massachusetts for use as intermediate landfill cover. The towns of Hamilton and Danvers have also given NEP approval for use of ash as cover in their respective landfills.

One of the issues raised in the DEIS and by several commentors was whether NEP has sufficient ash disposal capacity for the remaining life of the plant units. Clearly, the Amesbury site is inadequate for the entire period unless a major expansion is undertaken. NEP indicated at that time that negotiations were underway with several municipalities/ landfill operators regarding either outright disposal or use as intermediate cover. As noted above, two towns have since approved its use for landfill cover. Discussions are continuing with operators of other disposal sites, including the owner of a large, worked-out quarry. NEP also continues to pursue other constructive uses for the material, as described in detail in the DEIS. It now appears that NEP can provide sufficient disposal capacity and contingencies for ash from the remaining life of Salem Harbor.

2.3 COAL STORAGE

2.3.1 Coal Pile Configuration

Coal has been stored at and adjacent to the Salem Harbor site since the late 1800's: originally when the property was used as a coal handling facility by local coal retailers, and later when coal was burned at the powerplant. The present coal pile rests on land that was reclaimed from the harbor in 1922 by constructing granite seawalls on the south and east sides and then filling in the interior. Available materials were used for the fill, including sand, gravel, clay, and organic silt (dredge spoil).

The coal-capable units at the plant were completed in 1952 through 1958, and were fired with coal until 1969. The units burned coal again briefly in 1974 and 1975. Over the years, a significant layer of coal fines has been built up in the pile area. Presently, there is also a supply of coal in the pile remaining from the 1974-1975 burn. Of the approximately 70,000 tons remaining, about 30,000 tons has been recently burned as part of the present conversion. The portion not burned will be spread out over the coal pile area and will form the base for the new pile.

NEP plans to store approximately 190,000 tons of coal at the plant as an operating reserve (see Comment NEP-26 in Section 3.0). The existing pile, shown on Figure 2.0-2, will be enlarged slightly from its present 2.5 acres to accommodate the additional coal. The entire pile area will be enclosed within berms which will act both to collect pile runoff and protect from flooding during severe storms. Coal pile runoff will be collected in a lined ditch and directed to a lined holding basin. The basin will serve to prevent shock-loading of the treatment system. The runoff will then be pumped (at about 100 gpm) to the water treatment system described in Section 2.2.1.

Flooding of the coal pile area during severe storms will be prevented by the perimeter berms. Although the exact location and elevation of the berms will not be established until designs are finalized, it is anticipated that the berms will approximately follow the pile perimeter shown on Figure 2.0-2, and will have sufficient freeboard above the design storm surge for the area which is elevation 15.5 feet MLW.

2.3.2 Seepage Effects on Surface Water and Groundwater

The existing coal pile at the Salem Harbor Station does not have a seepage liner beneath the pile. NEP has indicated that, as part of the conversion, it will construct a runoff collection system as described above. On the basis of its analysis, NEP believes that lining the coal pile is not necessary for the protection of groundwater or surface water. To support this position, NEP has performed additional field studies and analyses since publication of the DEIS. NEP's summary of these studies is presented in Section 6.4 of this FEIS.

Both rainfall and water sprays used for dust control will result in runoff and percolation from the coal pile. With the addition of a runoff collection system as part of the conversion, the only pathway by which water from the coal pile area can reach Salem Harbor will be percolation through the groundwater underlying the site. Data provided by NEP indicate that, while the coal pile is underlain by a variety of materials, the net effect of the combination is relatively impervious and will retard percolation. Seepage will be further retained by the old granite seawall and the sheet pile wall at the site perimeter, both of which appear from the data to have become sealed with silt.

Field studies were conducted by NEP in March 1982 to provide additional data on percolation rates and existing groundwater quality beneath the coal pile. These studies are summarized in Section 6.4. A total of five observation wells were installed--two in the coal pile area, two between the coal pile and the dock, and one control well about 340 feet west of the pile. In addition, two test pits were excavated in the coal pile area in order to evaluate the permeability of the material at the base of the pile. Analysis of groundwater sampled from the five wells shows that the water is alkaline and slightly brackish, indicating influence from the seawater adjacent to the site. Only a modest influence of the coal pile is indicated by the metals analysis. Percolation rates are expected to also be low, as indicated by a series of water level readings in the test pits. Water introduced into the pits percolated very slowly into the base of the pile. Seepage through the coal fines was near zero during the test period, and only slightly greater in the underlying fill soils.

Marine resources in Salem Harbor have been the subject of several investigations between 1971 and 1979, including two periods (January-May 1974 and April-June 1975) when coal was burned and the coal pile was active. As detailed in Section 6.4, these studies were designed to examine the overall effect of electric power generation on the marine life and water quality of Salem Harbor, and not the specific effects of coal pile leachate. The results do, however, indicate that the overall effect of the plant, including the pile, has not had adverse effects on the harbor.

Parallels can reasonably be drawn between effects from the coal pile at the Salem Harbor Station and those at the Brayton Point Station, also operated by NEP and converted to coal in 1980. Both will use coal purchased according to the same specifications, and both coal piles are built on filled land adjacent to saline water. NEP initiated a monitoring program at the time of the Brayton Point conversion to measure the accumulation of metals in the sediments and shellfish of Mount Hope Bay. To date, there have been no unusual concentrations of heavy metals in the monitored shellfish near the Brayton Point coal pile. Details of the study are presented in Section 6.4.

2.3.3 Rationale for Further Evaluation

Available data suggest that the resumption of coal handling and storage at Salem Harbor will not adversely affect the marine resources or water quality of Salem Harbor. NEP will, as part of the conversion to coal, redirect all surface runoff from the coal pile to its onsite treatment plant, thereby eliminating this source of pollution. Percolation of pile leachate through the underlying soils to the groundwater and subsequently the harbor is expected to be at a slow rate due to the relative impermeability of the natural and fill soils at the site. Dilution and flushing in the harbor would be expected to further reduce the potential for harmful effects on marine resources. The addition of a liner would not at this time appear to be necessary to further mitigate coal pile effects.

Nevertheless, although the NEP data are convincing, they are not conclusive. The parallel between site conditions at Brayton Point and Salem Harbor is important, and offers evidence that similar circumstances do not induce adverse effects. As a basis for State decisions site-specific data for Salem Harbor would be required of NEP to demonstrate that favorable results experienced at Brayton Point can be repeated at Salem Harbor.

The need for additional confirming data has been recognized by the reviewing agencies and NEP. In response to a comment by the Massachusetts Division of Marine Fisheries on the Massachusetts DEIR for the State MEPA process, NEP proposed to implement a monitoring program which will measure the accumulation of metals in sediment and shellfish in areas adjacent to and remote from the coal pile. Baseline sampling would be performed in spring/summer 1982 and repeated at yearly intervals. Although not proposed by NEP, further evaluation of groundwater under the site could also be accomplished through continued sampling of the recently installed monitoring wells. The reliability of the single sampling event in March 1982 would be confirmed by additional data. In combination, this additional monitoring would provide reassurance of the environmental acceptability of continuing the present unlined pile. In the event that elevated metals levels are experienced in the future, other protective measures such as a liner could be employed.

2.4 COMMUNITY RESOURCES

Comments on the DEIS indicate concern that adequate provisions be included in the proposed conversion plans to minimize disruptive effects on the local population and tourists as well as potential adverse effects on Salem's historic resources. Activities connected with plant conversion to and subsequent operation using coal that could be detrimental to these resources include:

- Direct effects of construction
- Construction dust and noise
- Traffic volume and vibration
- Fugitive dust from transportation of ash
- Coal handling and storage.

The following paragraphs provide discussions of each of these activities, the planned procedures for reducing their effects, and other mitigation measures that could be employed. The concurrence of the Massachusetts Historical Commission on the project has been requested and received. Correspondence with the Historical Commission is presented in Section 6.3 of this FEIS. Copies of the correspondence were also sent to the Advisory Council on Historic Preservation.

2.4.1 Direct Construction Effects

Conversion of three units of the generating station to coal burning will affect only areas within the existing plant perimeter. The plant area has been an industrial site for many years and has been extensively reworked during previous construction. The southern portion of the plant site is covered by hydraulic fill from dredging operations and dumped cinder fill.

As noted in the DEIS, no sites of archaeological significance are known or suspected within the plant area. This has been confirmed by the State Archaeologist (see letter from the State Archaeologist in Section 6.3).

2.4.2 Traffic

2.4.2.1 Construction Period. Worker traffic on city streets will increase during construction. NEP has provided a revised estimate that the peak construction labor force will be in the range of 350 persons (see Comment NEP-47 in Section 3.0). Parking for the estimated 233 cars (at 1.5 workers per car) will be provided on the plant site. While these workers will begin their work day at an early hour, the mid- to late-afternoon release of the work force could cause traffic congestion near the site. There is the potential that some visitors to Salem's historic sites, particularly the Salem Maritime National Historic Site and the House of Seven Gables, could experience slight inconvenience. While some conflict between tourist and construction traffic is inevitable, it is expected that neither the number of visits to the

historic site nor the quality of the visitor experiences will be adversely affected (personal communication, City of Salem Planning Department, May 19, 1982).

Several factors will contribute to the lessening of potential impacts. These include traffic patterns in the area, the likelihood that some visitors will park in a municipal or nonmunicipal lot and walk to the historic sites, and the fact that peak tourist traffic is on weekends when few, if any, construction workers will be at the generating station.

The likely traffic flow patterns and parking facilities for the historic site visitors are not in the immediate vicinity of the powerplant. Derby Street, which runs in front of the Salem Maritime National Historic Site and the House of Seven Gables, becomes a one-way street near the powerplant. Traffic leaving the powerplant is prohibited from travelling west on this street. Worker traffic will generally leave the plant site along Webb Street which does not go through the historic district. Additionally, the powerplant site is beyond the historic district and it is unlikely that most tourists will travel past the plant.

Small parking lots adjacent to the Salem Maritime National Historic Site and the House of Seven Gables accommodate visitors. Other areas are within a short walking distance. These include the privately owned parking facilities for the wharf areas, accessed from Congress Street, and the municipal lots in the center of the historic area. Neither the municipal lot nor the private parking lots is near the powerplant; traffic from these facilities is unlikely to conflict with powerplant traffic. If tourists leave their cars in these parking lots and visit the sites on foot, they will reduce the volume of tourist traffic that could be affected by any construction-related traffic congestion.

The peak time for tourists in Salem is the weekend, particularly in the summer (personal communication, City of Salem Planning Department, May 19, 1982). Construction activities at the plant will occur on weekdays and will thus avoid any conflicts during these peak periods.

In the event that construction-related traffic does result in significant traffic problems, particularly at the end of the work day when workers are leaving the plant, two forms of mitigation could be considered. First the utility's contractor could stagger the dismissal times for workers by 10 or 15 minutes in order to spread out the traffic leaving the plant. Secondly, the utility could arrange to have a traffic policeman at the exit to the plant directing traffic. Once the workers leave the immediate vicinity of the plant, the traffic will disperse, reducing congestion problems. Furthermore, this potential traffic congestion will extend only through the construction period. Planned increases in the operational workforce at the plant are minimal and should not significantly increase traffic volumes.

Construction traffic will consist of a combination of automobiles, other light-duty vehicles, and heavy trucks transporting construction materials. Vibration effects from automobiles used by construction workers will be negligible. It is anticipated that heavy trucks will avoid the downtown area of Salem and most would access the site via the truck routes shown on Figure 2.0-4. The construction contractor and subcontractors will be required to restrict their access to the direct route into the site as a condition of the contract. At present, both Webb Street and Bridge Street are travelled by trucks similar to those expected to be used during plant construction.

While the construction work is anticipated to increase the frequency of truck traffic, it will not be substantially changed from present conditions. No extended periods of concentrated truck traffic are anticipated. The vibration resulting from project traffic will be in character with that previously experienced by the historic buildings in the area, and no specific mitigation is expected to be required.

2.4.2.2 Operation Period. During plant operation, combustion ash from Salem Harbor Units 1, 2, and 3 will be transported by truck, either to a disposal site or to a location where it will be reused. NEP proposes to store ash onsite overnight and during weekends and transport ash only on weekdays. At the anticipated rate of ash production, this will require eight to ten round trips each weekday, or about one truck per hour leaving the plant.

Permanent employment at the plant after full conversion is expected to increase by 30 to 35 employees. Neither worker traffic nor ash transport is anticipated to contribute significantly to local traffic during plant operation.

2.4.3 Ash Transportation

The type of truck used for ash transport will depend on the end use intended for the ash. Fly ash used in building materials or sold in other commercial markets must be supplied to users in a dry state. For these markets, the dry ash from the boilers will be handled at the plant in a closed system and transported in closed hopper trucks. These trucks are similar to those used for transporting cement, flour, and other dry materials.

Ash used in landfill or for construction fill will be moistened prior to its transport by tarpaulin-covered trailer dump trucks. Moistening of the ash will effectively prevent escape of fugitive dust during loading, transport, and unloading/spreading operations. No increase in fugitive dust is expected along the truck route for either dry or moistened ash.

2.4.4 Construction Dust and Noise

Massachusetts air quality regulations (310 CMR 7.90 and 7.10) apply to control of construction dust and noise during the plant conversion. No specific standards are given for fugitive dust, except that it should not cause a nuisance condition. Noise levels are limited to no more than a 10-decibel increase at the property line.

NEP has included procedures for minimizing impacts during (and after) construction as design requirements in the architect-engineer contract for the conversion (NEP, Response to Comments on Massachusetts DEIR, Attachment C, March 1982). The contract requirements address noise, dust, traffic control, and parking. During construction, NEP will endeavor to ensure that nuisances (dust and noise) will be minimized, including complying with the DEQE guideline. Noise level compliance will be based on a survey of baseline noise measurements at the property line.

2.4.5 Coal Handling and Storage

Coal will be transported to the Salem Harbor Station by sea, using barges or a self-unloading collier now being constructed for New England Power Company. The collier, scheduled for completion in 1983, will be visually similar to the tankers now unloading at the NEP dock.

The coal pile at the plant will remain in its present location. As the quantity of coal stored will be greater than during previous coal burns, the pile area will be enlarged and the elevation increased. Visually, the effect will not be significantly changed. NEP has also committed itself to controls to prevent the escape of fugitve dust from the coal pile (see Section 6.5), including water sprays, compaction of inactive areas, and, if necessary, use of dust control agents.

2.5 FLOODPLAIN ASSESSMENT

2.5.1 Preliminary Floodplain Statement of Findings

The dock and tank farm portions of the generating station are within the 100-year floodplain as delineated on the HUD floodplain map for the City of Salem (see Figure 2.0-2 of this FEIS and Section 3.2 and Figure 3.2.1 in the DEIS). Some construction activities proposed in conjunction with conversion to coal will occur in these areas. In compliance with Executive Order 11988, "Floodplain Management," Water Resources Council's "Floodplain Management Guidelines," and Department of Energy regulations "Compliance with Floodplain/Wetlands Environmental Review Requirements" (10 CFR 1022), alternatives have been identified and their environmental impacts evaluated. The evaluation included public comments made during the review period for the DEIS. A preliminary conclusion has been made by the Department of Energy that no practicable alternative exists to locating the project in floodplains and that the proposed action is designed to minimize potential harm to or within the floodplain. Before action is taken on this project, the Secretary of Energy will reach a final conclusion on these matters. A Final Statement of Findings containing this conclusion will be published in the Federal Register with the Record of Decision on the project.

2.5.2 Alternative Sites

The only alternatives available to the DOE concerning this proposed action are issuance and non-issuance of the Final Prohibition Orders for Salem Harbor Generating Station. Therefore, alternate sites are not relevant to the DOE decision. For a discussion of the process through which Salem Harbor was chosen as a candidate for a Prohibition Order, see Section 1.3 of the DEIS and the Draft NEREIS.

2.5.3 Alternatives at Proposed Site

Several of the modifications to the facility necessary to allow conversion to coal involve structures which are built in the 100-year floodplain, including the coal pile and settling basins. Since these structures cannot be relocated within the generating station site boundary, there are no alternatives to locating these modifications within the floodplain.

2.5.4 No Action Alternative

The no action alternative to the proposed action would involve non-issuance of the Final Prohibition Orders by DOE. The utility could voluntarily convert to coal, retire Units 1, 2, and 3 early, or continue to operate with oil.

Voluntary conversion to coal would involve the same floodplain impacts as the proposed action. Early retirement and continued burning of oil would involve no action in the floodplain. Early retirement would require NEP eventually to provide substitution for the 310 MWe now supplied by Units 1, 2, and 3. Continued burning of oil would not satisfy the purpose and goal of FUA and would perpetuate the dependence of NEP, and, to a lesser extent, the United States, on imported petroleum fuels.

2.5.5 Mitigation Measures

The proposed activities will be small in scale and will occur in an already industrialized area. These activities will neither change the existing character of the floodplain nor alter the risk of losses due to flooding of adjacent property. Facilities constructed in the floodplain, particularly those in the V3 zone that are subject to hurricane storm waves, will be floodproofed to withstand wave forces and inundation. Floodproofing will include such items as diking and reinforcement to reduce storm damage. Further details concerning mitigation of floodplain impacts are contained in Sections 3.2.1 and 4.2.2 of the DEIS and the response to Comment 1-6 in the FEIS.

2.5.6 Conclusion

Based on the above analysis, DOE has made a preliminary conclusion that no practicable alternatives exist to locating the proposed action in the floodplain and that the proposed action has been designed to minimize potential harm

to or within the floodplain. Before action is taken on this project, the Secretary of Energy will make a final conclusion on these matters. A Final Statement of Findings containing this conclusion will be published in the Federal Register with the Record of Decision on the project.

2.6 DRAFT ENVIRONMENTAL IMPACT STATEMENT ERRATA

SECTION Page	Location (paragraph, including fragments, and line in paragraph)
SUMMARY	
iii	1st paragraph, 8th line: CHANGE SENTENCE TO READ: The three, Units 1, 2, and 3, are presently fired exclusively on oil. DELETE REST OF SENTENCE; ADD SENTENCE: All three units have coal-handling and -firing equipment in place except for the burners on Unit No. 1, which now has oil-only burners.
iii	1st paragraph, 9th line: CHANGE SENTENCE TO READ: A supply of high-ash coal remains on hand from the 1974-1975 coal burn.
v	5th paragraph, 6th line: CHANGE SENTENCE TO READ: When the new precipitators are installed, particulate matter emissions will be reduced to within State Implementation (SIP) limits.
CHAPTER 1.0	
1-2	5th paragraph, 5th line: CHANGE SENTENCE TO READ: The station is owned by New England Power Company, a subsidiary of New England Electric System (NEES), a public utility holding company.
1-10	2nd paragraph, 2nd line: CHANGE: 792 megawatts TO: 754 megawatts. 2nd paragraph, 3rd line: CHANGE: 482 MWe TO: 444 MWe.
1-13	2nd paragraph, 1st line: CHANGE SENTENCE TO READ: Currently about 70,000 tons of high ash coal are stored at the site.
CHAPTER 2.0	
2-4	3rd paragraph, 2nd line: CHANGE: 150,000 tons TO: 190,000 tons.
2-5	Figure 2.3-1 was partially obliterated in the DEIS; it has been properly reproduced in this volume, as Figure 2.0-3.
2-6	1st paragraph, 4th line: CHANGE: The low-grade coal . . . TO: Part of the coal. . . 4th paragraph, 2nd line: CHANGE SENTENCE TO READ: One or more of the relatively small service tanks. . . .
2-7	1st paragraph, 12th line: CHANGE: . . . silos and trucks, . . . TO: . . . silos and covered trucks, . . .
2-8	5th paragraph, 12th line: DELETE LAST SENTENCE IN PARAGRAPH.
2-10	3rd paragraph, last line: CHANGE: 43 months TO: 43 to 46 months . . .
2-11	1st paragraph, 3rd line: CHANGE: . . . will be housed . . . TO: . . . are currently housed . . .
2-12	1st paragraph, 1st line: CHANGE: Acoustical silencers . . . TO: Provisions for acoustical silencers . . . 1st paragraph, 3rd line: CHANGE: . . . pneumatic electrode-cleaning or rapping systems TO: . . . rapping devices . . . 1st paragraph, 4th line: AFTER: enclosures, ADD: if necessary, where rappers are exposed at the top of the precipitators. 1st paragraph, 6th line: CHANGE: dust emissions TO: emissions. 3rd paragraph, 6th line: CHANGE THIRD ITEM AFTER: The principal new sources of wastewater will include: FROM: . . . equipment washwaters and boiler seal water, . . . TO: . . . equipment and truck washwaters, . . . 3rd paragraph, 14th line: CHANGE: . . . concrete . . . TO: . . . paved.
2-13	1st paragraph, 7th line: CHANGE SENTENCE TO: Ash sluicewater discharge from the coal-fired units will be reduced substantially during . . . 3rd paragraph, 3rd line: DELETE: . . . continuous . . .
2-14	1st paragraph, 2nd line: CHANGE SENTENCE TO: During the first 30 weeks of the DCO, the settling basins shown in Figure 2.3-1 will be operated in series with more or less continuous dredging of ash. ADD SENTENCE: The ash will be windrowed on land for partial dewatering prior to offsite disposal. 3rd paragraph, 6th line: CHANGE: . . . six to seven . . . TO: . . . eight to ten . . .

SECTION Page	Location (paragraph, including fragments, and line in paragraph)
2-15	7th paragraph, 2nd line: CHANGE: 50 to 100 . . . TO: . . . 350 . . .
2-18	2nd paragraph, 1st line: CHANGE: . . . 445 feet . . . TO: . . . approximately 450 feet . . .
2-19	1st paragraph, 2nd line: CHANGE: . . . concrete trench . . . TO: . . . paved channel . . .
2-26	4th paragraph, 3rd line: CHANGE: . . . 5 MGD, . . . TO: . . . 3.5 MGD, . . .
2-27	1st paragraph, 3rd line: CHANGE: . . . 60,000 tons of ash . . . TO: . . . 75,000 tons of ash . . . 4th paragraph, 7th line: CHANGE: . . . 247,000 tons of fly ash . . . TO: . . . 225,000 tons of fly ash . . .
2-28	3rd paragraph, 6th line: CHANGE: . . . 15 years . . . TO: . . . 5 years . . .
CHAPTER 3.0	
3-4	2nd paragraph, 1st line: CHANGE SENTENCE TO: The City of Salem participates in the National Flood Insurance Program administered by the Federal Insurance Administration of the Federal Emergency Management Agency (FEMA).
3-20	Table 3.3-2, 4th Station Name: CHANGE: Jacob Ave. TO: Jacobs Ave.
3-22	Table 3.3-3, 3rd Monitor Station: CHANGE: Jacob Ave. TO: Jacobs Ave.
3-23	Table 3.3-4, 3rd Monitor Station: CHANGE: Jacob Ave. TO: Jacobs Ave. Table 3.3-4, Source line: CHANGE: NEPCO, 1980. TO: NEP, 1981c.
3-26	Table 3.3-5, Source line: DELETE: . . . and NEPCO, 1980.
3-30	3rd paragraph, 2nd line: CHANGE: . . . standards . . . TO: . . . regulations . . .
3-31	3rd paragraph, 13th line: CORRECT SPELLING: practicable.
CHAPTER 4.0	
4-3	4th paragraph, 2nd line: CHANGE: Units 2 and 3 TO: Unit 3 4th paragraph, 3rd line: CHANGE: in Unit 1 within 2 months . . . TO: in Units 1 and 2 within 4 months . . .
4-4	Figure 4.1-1: CHANGE 1ST LINE TO: Initiate Unit 3 Coal Burning. CHANGE 2ND LINE TO: Initiate Unit 1 Coal Burning AND MOVE DOT SYMBOL 1 MONTH TO RIGHT. CHANGE 3RD LINE TO: Initiate Unit 2 Coal Burning. IN 5TH LINE (Start New Construction), MOVE DOT SYMBOL TO MONTH 4.
4-5	2nd paragraph, 2nd line: DELETE: . . . 43-month . . .
4-7	2nd paragraph, 1st line: CHANGE PHRASE: . . . a work force of from 50 to 100 persons . . . TO: . . . a peak work force of 350 persons . . .
4-9	3rd paragraph, 9th line: CHANGE SENTENCE TO: Total discharge from the wastewater treatment system could approach the permit limit of 3.5 MGD. 3rd paragraph, 17th line: CHANGE PHRASE: . . . for the first 18 months . . . TO: . . . for up to the first 18 months . . .
4-15	3rd paragraph, 6th line: CHANGE: . . . 445-foot, . . . TO: . . . approximately 450-foot, . . .
4-24	4th paragraph, 10th line: CHANGE: . . . 1981a TO: 1981c.
4-28	4th paragraph, 5th line: CHANGE: . . . identical . . TO: . . . similar . . . 4th paragraph, 6th line: DELETE: . . . is from the same mine and . . .
4-44	5th paragraph, 2nd line: CHANGE: . . . 445-ft-high . . . TO: . . . approximately 450-foot-high . . .
4-45	8th paragraph, 2nd line: DELETE SENTENCE: For instance, . . . draft fans. 8th paragraph, 4th line: CHANGE SENTENCE TO: The new precipitators will be provided with sound-deadening enclosures, where necessary, for the rappers.

SECTION Page	Location (paragraph, including fragments, and line in paragraph)
4-46	1st paragraph, 1st line: CHANGE: . . . hoppers . . . TO: . . . hopper areas . . .
4-46	4th paragraph, 1st line: CHANGE: . . . 6 to 8 30-ton, 10-wheel, . . . TO: . . . eight to ten 30-ton, 18-wheel, . . .
	4th paragraph, 3rd line: DELETE LAST SENTENCE IN PARAGRAPH.
4-57	3rd paragraph, 1st line: CHANGE: . . . new 445-foot . . . TO: . . . new, approximately 450-foot.
REFERENCES	
R-4	7th reference: ADD: . . . , and as amended June 3, 1981.

3.0 PUBLIC AND AGENCY PARTICIPATION

The Draft Environmental Impact Statement (DEIS) was published in February 1982 and made available to the U.S. Environmental Protection Agency and the public. The Federal Register (47 FR 8402) dated February 26, 1982, announced the availability of the DEIS and the proposed issuance of Final Prohibition Orders for the Salem Harbor Station. The DEIS was provided to numerous Federal, State, and local agencies, as well as concerned individuals, interest groups, and public officials.

The comment period on the DEIS remained open through April 12, 1982. Letters received during the comment period are included in this section of this Final EIS. The designations in the right hand margin of the 13 letters received identify those specific comments for which responses have been developed. Responses are provided adjacent to each letter. As NEP was the project proponent for the Massachusetts FEIR, they prepared responses to comments on the DEIR submitted by DOE. This FEIS responds to comments on both the DEIS and DEIR, and utilizes many of the responses prepared by NEP.

DOE has not held public hearings for the proposed conversion since the public scoping meeting held in Salem on February 10, 1981. EPA, however, convened a public hearing on NEP's DCO application on September 2, 1981, at which time the public participated in discussion of the major issues related to the conversion. Background material on EPA's DCO hearings is provided in Section 6.1.

Comments were received from the following agencies, groups and individuals:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J. F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

April 9, 1982

Mr. Steve Ferguson
Acting Chief, Analysis Branch
Office of Fuels Programs
Economic Regulatory Administration
Department of Energy
2000 M Street, N.W.
Washington, DC 20461

Dear Mr. Ferguson:

Enclosed are EPA's comments on the Draft Environmental Impact Statement (EIS) for the Salem Harbor Coal Conversion. In general, we found the EIS to be an adequate overview of the variety of environmental questions raised by the conversion. There were areas in which we felt better technical information should be presented, and these are discussed in the enclosure.

In accordance with our EIS rating system (explanation enclosed) we have rated this EIS as LO-2. Please call Tom D'Avanzo of my staff at (617) 223-0400, if you have further questions.

Sincerely,

Lester A. Sutton, P.E.
Regional Administrator

Enclosures

EPA COMMENTS ON SALEM HARBOR
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Air Quality

Emission Limits

The Final EIS should incorporate the emission limits required in the final, not the draft, DCO (attachment 1). These have changed to .60 pounds of TSP per million BTU for the first 4 months of new coal burning, and .45 pounds thereafter. Other conditions of the order have also changed and are discussed in the preamble. E-1

The EIS states an inaccurate SO_2 emission limit of 2.31 #S/MMBTU (section 4.2.3.2). Salem's SO_2 emission limit is 2.42 #S/MMBTU. Also, the emission data shown in Table 4.2-5 are unclear. Are these actual or expected emissions? Are they averages or maximums? Why do Unit's 1 and 2 have different PM emission rates when they are the same size and will be meeting the same standards? The derivation of these numbers should be shown. E-2

Modeling Results

NEPCO's modeling submitted in support of their DCO application adequately demonstrates that all applicable NAAQS will be maintained during the DCO period. Dames and Moore's modeling as presented in the EIS is not, however, technically adequate. For example, the use of monitoring data to substitute for interactive modeling is not an acceptable technique. The EIS should have used the same background scheme as NEPCO's. In general, there is a lack of detail on such subjects as models used or receptor networks. Such information should be presented in a technical appendix to the Final. E-3

U.S. Environmental Protection Agency

E-1 According to EPA's final Delayed Compliance Order (DCO) issued February 9, 1982, for the Salem Harbor Station as specified in 47 FR 5893, the emission limits for total suspended particulates (TSP) or particulate matter (PM) have been set at 0.60 pounds of PM per million Btu (lb PM/MMBtu) for the first 6 months of new coal burning, and 0.45 lb PM/MMBtu for the remainder of the DCO period. These emission limits differ from those originally proposed by EPA (46 FR 39175) in that the emission limit of 0.60 lb PM/MMBtu has been extended from the first 4 to the first 6 months of new coal burning. For the remainder of the DCO period, the PM emission limit has been increased from 0.35 to 0.45 lb/MMBtu. These changes have been incorporated into Section 2.1 of the Final EIS. This Section 2.1 of the Final EIS discusses only those aspects of the DEIS that were affected by the revisions to the DCO.

E-2 The SO_2 emission limits given in Section 4.2.3.2 of the DEIS for the 30-day and the 24-hour averaging period are incorrectly given to be 1.21 and 2.31 lb S/MMBtu heat input. The correct emission limits for SO_2 would be twice these amounts (i.e., the molecular weight of SO_2 is twice that of S), or 2.42 and 4.62 lb SO_2/MMBtu heat input. The figures given in the text are correct but refer to the emission limitations of sulfur rather than SO_2. Accordingly, footnote (a) in Table 4.2-2 in the DEIS should be modified to reflect this change. (Note that the modified Table 4.2-2 has been included in this Final EIS as Table 2.1-1.)

The emission data shown in Table 4.2-5 represent maximum allowable emissions and have been revised as shown in the new version below. These emissions are based on the historical operating characteristics of each unit (obtained from FPC Form 67 which was filed by NEP for the year 1978), assuming 100 percent load for each unit. Although Units 1 and 2 are both rated at 81 MW, their historical fuel usage indicates that their fuel requirements differ somewhat for the same power generation in each unit, hence the slightly different emission rates for Units 1 and 2. The bases for these emission rates are shown in the table.

E-3 The dispersion modeling analyses as presented and utilized in the DEIS were performed primarily by New England Power (NEP) as a condition to receive a Delayed Compliance Order (DCO) from EPA for the proposed coal conversion at Salem Harbor. These analyses were submitted to EPA on April 15, 1981. In the development of the DEIS these dispersion modeling analyses, as well as correspondence between EPA Region I, Department of Environmental Quality Engineering (DEQE), and NEP, were reviewed in detail prior to their use in the DEIS. In addition to this review, a limited-scope independent dispersion modeling analysis was performed in order to assess the adequacy of the NEP modeling analyses for use in the DEIS. On the basis of this review and the additional modeling analysis, the NEP modeling results were judged to be adequate to meet the assessment requirements of the DEIS. The details of these modeling analyses, including information on the models used and the receptor networks, are discussed in the NEP modeling reports which have been submitted to EPA Region I and are part of the public record. These reports were referenced in the DEIS.

Table 4.2-5 Summary of Emissions and Emission Characteristics for Salem Harbor Generating Station Units 1-4 for the Post-DCO Operating Period

	Emissions (g/s)[a]				
Pollutant	Unit 1	Unit 2	Unit 3	Unit 4	Total Units 1-4
SO_2[b]	256.0	262.0	430.0	1,439.0	2,389.0
PM[c]	12.7	13.0	21.7	72.0	120.2
NO_2[d]	74.8	76.7	127.6	424.0	705.8
CO[d]	3.6	3.7	6.1	20.2	33.7
HC[d]	0.7	0.7	1.2	4.0	6.6

[a]Emissions are based on 100 percent load.

[b]Based on emission limit of 2.42 lb SO_2/MMBtu heat input (30-day average limit).

[c]Based on emission limit of 0.12 lb PM/MMBtu heat input.

[d]Based on EPA AP-42 emission factors.

	Unit Characteristics			
	Unit 1[e]	Unit 2[e]	Unit 3[e]	Unit 4
Stack height (m)	135.6	135.6	135.6	152.0
Stack diameter (m)	2.6	2.6	3.35	5.64
Stack exit vel. (m)	30.0	30.0	30.0	35.9
Stack temperature (°K)	416.0	416.0	416.0	455.0
Heat input at 100 percent load (MMBtu)	839.0	860.0	1,409.0	4,716.0

[e]Units 1-3 will share a common 3-flue stack.

Regarding the acceptability of the method used in the DEIS to assess compliance with the National Ambient Air Quality Standards (NAAQS), the approach used in the NEP analysis for the post-DCO configuration (submitted by NEP to EPA Region I on December 1, 1981) does not differ substantially from that used in the DEIS. Both methods utilize the results of monitoring data to determine background SO_2 levels, and both methods give very similar results. The principal difference in the two approaches is that in the NEP analysis, the modeled impact of the Salem Harbor Station and all other emission sources within 12 kilometers of the station are added to an assumed ambient background concentration derived from the ambient air quality monitoring network surrounding the station. In the DEIS, the modeled impact of the station alone is added to an assumed ambient background concentration, which was also derived from the ambient monitoring network.

A comparison of the results obtained from each analysis is presented in the new Table E-3.1, below. With the exception of the annual averages, the results of each analysis are seen to compare reasonably well with each other. The 3-hour and 24-hour total concentrations differ by only 12 and 3 percent, respectively. The NEP annual average total concentration is 40 percent greater than that given in the DEIS, a result which is attributable to a "double counting" of emission sources in the area. This double counting of emission impacts is expected to be more predominant for the annual averaging period since a given monitor will record the impact of a greater number of sources over a large area for longer averaging periods. In this case the assumed background concentration used by NEP would be overly conservative if used in the annual average calculation since it almost certainly contains contributions by many or all of the sources used in the interactive modeling analysis. For the 24-hour and 3-hour averaging periods, however, one would not observe the contributions from as many sources due to the direction-specific nature of the 24-hour and 3-hour observations.

Table E-3.1 Comparison of Two Dispersion Modeling Analyses Used to Assess Compliance with the NAAQS at Salem Harbor During the Post-DCO Period

(Concentrations in $\mu g/m^3$)

	Averaging Period		
	Annual	24-Hour	3-Hour
NAAQS	80	365	1,300
EIS Analysis			
Assumed background concentration[a]	34	178	465
Station impact[b]	8	160	806
Total concentration	42	338	1,271
NEP Analysis			
Assumed background concentration[c]	42	205	411
Interactive source impact[b,d]	17	144	720
Total concentration	59	349	1,131

[a] Highest second highest observation excluding Marblehead monitoring results for the period 1978-1980.

[b] Salem Harbor station emissions based on 24-hour maximum emission limit of 2.31 lb S/MMBtu.

[c] Highest concentrations recorded during the period 1978-1980 that do not include a substantial impact by the Salem Harbor station.

[d] All emission sources within 12 km of Salem Harbor station.

Ambient Monitoring

The ambient monitoring section tends to overstate the amount of current information available and to downplay high SO_2 measurements in Marblehead as "a local anomaly" (p. 3-25). Given the short data record for the Green Street site, it is not clear what information was used to conclude that the SO_2 levels measured there in 1980 were a rare occurance. The Draft presents no facts to show that this maximum value is unrepresentative, but instead states only that these high values "may not be truly representative of typical maximum conditions." The Final EIS should either provide information to show why the maximum value is unrepresentative, or revise the conclusion to indicate that the value is reasonable given the data available at this time.

E-4

E-4 The ambient air quality monitoring data presented in the DEIS were used to estimate the background level of air quality in the vicinity of the station (i.e., a level of air quality attributable to sources of emissions other than the Salem Harbor Station), and to use this information to assess compliance with the applicable air quality standards for the period of permanent station operation following the DCO. Inasmuch as the monitoring network in the Salem Harbor area is fairly comprehensive (i.e., seven continuously operating monitoring stations virtually surround the Salem Harbor Station), it is desirable to use these data to the extent possible in order to obtain the most accurate representation of the existing and projected air quality in the area. The alternative to this approach would be to use dispersion modeling methods (which are generally known to be conservative in nature) to determine the impact of all existing and proposed emissions in the area. Given the data available to us, however, this seems unnecessary and is believed to be an unduly conservative approach.

With regard to the "short data record" at the Green Street ambient air quality monitoring station in Marblehead, this station has been operating continuously since the beginning of 1978 for a period of record which exceeds 4 years. This station has provided ambient measurements of PM and SO_2 with a very high percentage of data recovery throughout the period of record. The implication in the text of the DEIS that the high observations at the Green Street monitor could be a "local anomaly" was intended to suggest that the high readings could be attributable to one of three possible scenarios:

- Unusual meteorological conditions conducive to high ground-level concentrations
- The emissions from a nearby facility other than the Salem Harbor Station
- The emissions from the Salem Harbor Station.

The only "anomaly" in this situation is that elevated SO_2 levels have only occurred several times each year. During the entire period of record, SO_2 levels were observed to be higher than 50 percent of the ambient 24-hour standard of 365 $\mu g/m^3$ only four times in 1980 and only once in 1981. More importantly, there has never been a violation of the daily ambient air quality standard for SO_2 at this or any other monitor in the network.

Since the DEIS was published, additional information on the Green Street monitoring results has been obtained from NEP and reviewed in order to shed additional light on the situation. The following table lists the two highest observed 24-hour monitored concentrations at the Green Street monitor for 1978 and 1979, and the six highest observed concentrations in 1980 and 1981.

Concentration Rank	Year (Concentrations in $\mu g/m^3$) 1978	1979	1980	1981
1	162	138	371	211
2	112	118	287	180
3	--	--	253	180
4	--	--	222	167
5	--	--	175	154
6	--	--	175	143

Conversations with NEP personnel have indicated that the 3-hour observations display a very similar pattern. For illustration purposes, however, only the more restrictive 24-hour results are being shown here. NEP's review of the on-site meteorological data record for each of the days on which the highest concentrations listed above were observed revealed that all six of the highest concentrations for 1980 and 1981 were apparently heavily influenced by the Salem Harbor Station. The meteorological data record for each of these days (particularly the four highest observations) contained multiple hours of very persistent northwesterly winds indicating that the emissions from the Salem Harbor Station were contributing significantly to the observations.

In order to use the observations from the air quality monitoring network for ambient background SO_2 levels, it would be necessary to discount from those observations values which are known to be heavily influenced by the Salem Harbor Station. The Green Street SO_2 data were not used for background levels because these data have been shown to be heavily influenced by the emissions from the Salem Harbor Station and the objective in using the results of monitoring was to include the effects of all sources of SO_2 other than the Salem Harbor Station. In the DEIS, the maximum projected ambient SO_2 concentrations under the new GEP stack configuration (post-DCO) were determined by adding the highest predicted Salem Harbor Station impact (using 5 years of meteorological data) to the monitored background concentration. It would be incorrect to double-count the impact of the Salem Harbor Station by considering its known historical impact at the Green Street monitor as background. It should be noted that, although the highest observations for 1980 at the Green Street monitor were not used for background purposes, the results as presented in the DEIS are still considered to be conservatively high since:

- Background levels and station impacts were added directly without regard for physical location of impact
- The 24-hour and 3-hour levels did not take into account temporal or meteorological coincidence
- The impact from the station used in the summation was based on a 24-hour maximum emission limitation of 4.62 lb SO_2/MMBtu. In reality, the emission from the station would most likely be closer to the 30-day rolling average emission limit of 2.42 lb SO_2/MMBtu.

Other Issues

Ash

The discussion of ash disposal alternatives provides a good overview of the subject. It would be enhanced, however, by including information on the chemical constituents of the ash Salem is generating, especially metal concentrations. This information should be available from NEPCO and would be useful data for an evaluation of environmental impacts of alternative disposal methods.

E-5

Water Impacts

Table 3.2-3 should be updated to include effluent limits imposed by modification #2 to Salem's NPDES permit (see attachment 2). Two changes have been made to accommodate coal burning: an increase in TSS from 30 to 300 mg/l as a daily average and 100 to 500 mg/l daily maximum. Iron limits have also been increased from 1.0 mg/l to 3.0 mg/l daily average and 5.0 mg/l daily maximum.

E-6

Attachments

E-5 Additional information on the chemical and other characteristics to be expected of coal combustion ash from Salem Harbor included by NEP in the Massachusetts FEIR on the conversion. This material has been incorporated into Sections 2.2.2 and 6.6 of this Final EIS.

E-6 Table 3.2-3 in the DEIS presents the effluent limitations at Salem Harbor when the plant is burning oil. As the comment notes, the allowable limits for total suspended solids (TSS) and iron increase for coal burning. These latter limits are reflected in Table 2.2-1 in the expanded wastewater treatment discussion in Section 2.2.1.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 82/373

APR 13 1982

Ms. Lynda H. Nesenholtz
Division of Fuels Conversion (RG-62)
Economic Regulatory Administration
U.S. Department of Energy
Washington, D.C. 20461

Dear Ms. Nesenholtz:

We have reviewed the draft environmental impact statement for conversion to coal, New England Power Company, Salem Harbor Generating Station, Units 1, 2, and 3, Salem, Essex County, Massachusetts and hove the following comments.

Community Resources

There may well be adverse impacts upon the resources and public enjoyment of Salem Maritime National Historic Site due to implementation of this project. The principal impacts to the site would be due to traffic during construction. Section 4.1.3 indicates that there may be a noticeable increase in worker traffic on city streets during construction. The level of coincidence of construction traffic and peak visitation to Salem Maritime National Historic Site should be carefully evaluated, and measures to minimize conflicts should be made a part of the proposal. Mitigation measures should also be taken to minimize structural damage caused by vibrations to historic buildings in the area, particularly along traffic routes used. The final statement should discuss these mitigation measures and more thoroughly discuss the potential damage to historic buildings due to vibration. The National Park Service would like to be apprised of the volume and time of day the Department of Energy anticipates this increased traffic flow and if possible, work with the applicant to mitigate potential problems. I-1

The National Park Service is concerned that sufficient precautions would be taken during the transport of fly ash from the generating station to the disposal site so as nat to increase fugitive dust emissions which may degrade the quality and appearance of the many historic sites in the area. An increase in fugitive dust along the truck route may require more frequent painting and maintenance by the National Park Service. The final environmental impact statement should discuss mitigation measures to prevent this type of damage. I-2

In section 3.5.6 the authors state, "No sites of archaeological significance are either known or suspected in the area of the generating station." This should be substantiated by the Massachusetts State Historic Preservation Office. The applicant should contact Valerie Talmage, State Archaeologist, Massachusetts Historical Commission, 294 Washington Street, Boston, Massachusetts 02108. I-3

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U.S. Department of the Interior

I-1 Worker traffic on city streets will increase during construction (DEIS Section 4.1.3). NEP has provided a revised estimate that the peak construction labor force will be in the range of 350 persons. Parking for the estimated 233 cars (at 1.5 workers per car) will be provided on the plant site. While these workers will begin their workday at an early hour, the mid-to-late afternoon release of the workforce could cause conflicts with visitors to the Salem Maritime National Historic Site. The potential for conflict and possible mitigation are evaluated in Section 2.4.2.1. While some conflict is unavoidable, it is not expected that the number of visits to the historic site and visitor experiences will be adversely affected.

Construction traffic will consist of automobiles, other light-duty vehicles, and heavy trucks transporting construction materials. Due to their light weight and soft suspensions, vibration effects from automobiles used by construction workers will be negligible. It is anticipated that heavy trucks will avoid the downtown area of Salem and most would access the site via the truck routes shown on Figure 2.0-4. Both Webb Street and Bridge Street are presently travelled by trucks similar to those expected to be used during plant construction.

Although construction is anticipated to increase the frequency of truck traffic, present conditions will not be substantially changed. No extended periods of concentrated truck traffic are anticipated. The vibration resulting from project traffic will be similar to that previously experienced by the historic buildings in the area, and no specific mitigation is expected to be required.

I-2 Combustion ash from Salem Harbor will be transported by truck, either to a disposal site or to a location where it will be reused. NEP proposes to store ash onsite overnight and during weekends, and to transport ash only on weekdays. At the anticipated rate of ash production, this will require 8 to 10 round trips each weekday, or about one truck per hour leaving the plant (DEIS, Section 2.3.4.4).

The type of truck used will depend on the end use intended for the ash. Ash used in building materials or other commercial markets must be supplied to users in a dry state. For these markets, the dry ash from the boilers will be handled at the plant in a closed system and transported in closed hopper trucks. These trucks are similar to those used for transporting cement, flour, and other dry materials.

Ash used in landfill or for construction will be moistened prior to transport by tarpaulin-covered trailer dump trucks. Moistening the ash will effectively prevent escape of fugitive dust during the loading, transport, and unloading/spreading operations. No increase in fugitive dust is expected along the truck route for either dry or moistened ash.

I-3 Conversion of three units of the generating station to coal burning will affect only areas within the existing plant perimeter. The plant area has been an industrial site for many years and has been extensively reworked

The authors state in the last paragraph of section 3.5.5, "There are no national parks or forests within a 10-mile radius of the plant." It should be noted in the final environmental impact statement that Salem Maritime National Historic Site is an operating unit of the National Park System and is located approximately .5 mile from the generating station.

I-4

Future coordination about additional mitigation measures should be directed to the Superintendent, Salem Maritime National Historic Site, Custom House, Derby Street, Salem, Massachusetts 01970 (telephone: FTS 223-2100).

Coal Pile Area

We recommend that the suggestion for the addition of an impermeable liner beneath the coal pile should be adopted to minimize contamination of migrating ground water that may receive coal-pile leachate.

I-5

Existing and proposed coal pile areas are located in the Flood Hazard Areas designated by the Federal Emergency Management Agency. The EIS mentions that berms will be constructed for spill containment and runoff collection. The final EIS should include a drawing showing the location and elevation of any berms constructed for flood protection.

I-6

We hope these comments will be helpful to you in the preparation of a final statement.

Sincerely,

Bruce Blanchard, Director
Environmental Project Review

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during previous construction. The southern portion of the plant site consists of hydraulic fill from dredging operations and dumped cinder fill.

As noted in the DEIS, no sites of archaeological significance are known or suspected within the plant area. This has been confirmed by the State Archaeologist (see letter in Section 6.3).

I-4 The existence and location of the Salem Maritime National Historic Site are acknowledged and addressed in the DEIS on Figure 1.5-1, in the last paragraph on page 3-48, and in Table 3.5-3. The paragraph should note that, other than the Salem Maritime National Historic Site, which is located approximately 0.5 mile from the generating station, there are no other national parks or forests within a 10-mile radius of the plant.

I-5 This comment is acknowledged; the issue is addressed in detail in Section 2.3.2.

I-6 The potential for shallow (less than 1 foot) flooding of the coal pile area during severe storms is discussed in Sections 3.2.1 and 4.2.2 in the DEIS.

The coal pile area will be enclosed within berms which act both to collect pile runoff and protect from flooding. It is expected that the berms will be placed around the perimeter of the pile shown on Figure 1.5-2 in the DEIS, and would have a crest elevation higher than 15.5 feet mean low water (MLW). The location and crest elevation of the berms will be further defined during design studies for the conversion.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the Secretary

Washington, D.C. 2020

March 5, 1982

Lynda Nesenholtz
Office of Fuels Programs
Fuels Conversion Division
Economic Regulatory Administration
2000 M Street, N. W. - Room 6128 0
Washington, D. C. 20461

Dear Ms. Nesenholtz:

We have reviewed the Draft Environmental Impact Statement, Conversion to Coal, Salem Harbor Generating Station; Department of Energy. The impacts within the scope of our review are not affected. H-1

Sincerely,

Franz W. Krebs, AIA
Office of Architecture
Office of Facilities Engineering

U.S. Department of Health and Human Services

H-1 No response required.

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:
NEDPL-I

25 March 1982

Ms. Lydia Nesenholtz
Office of Fuels Programs
Fuels Conversion Division (R6-62)
Economic Regulatory Administration
U.S. Department of Energy
Washington, DC 20461

Dear Ms. Nesenholtz:

We have reviewed the Draft Environmental Impact Statement concerning the Conversion to Coal by the New England Power Company of their Units 1, 2 and 3 at the Salem Harbor Generating Station in Salem, Massachusetts.

Salem Harbor is a navigable water of the United States. The data submitted does not clearly indicate what work, if any, will be done in the river and/or wetlands. A Corps of Engineers permit is required for all work beyond mean high water in navigable waters of the United States under Section 10 of the River and Harbor Act of 1899. In New England, for purposes of Section 10, navigable waters of the United States are those subject to the ebb and flow of the tide and rivers, lakes and other waters that are used to transport interstate or foreign commerce. Permits are also required under Section 404 of the Clean Water Act for those activities involving the discharge of dredged or fill material in all waters of the United States, including not only navigable waters of the United States, but also inland rivers, lakes, streams and their adjacent wetlands. On the coastline our jurisdiction under the Clean Water Act extends landward to the extreme high tide line or to the landward limit of any wetlands.

Your agency should be advised to contact our Regulatory Office early in the planning process to avoid any delays since it normally takes 3 to 6 months to process a permit application.

Thank you for the opportunity to comment and we look forward to continued coordination. Should you have any questions, please contact Mr. Carl P. Melberg of my staff at (617) 894-2400, extension 518 or Mr. Vacirca of our Regulatory Branch, extension 372 for regulatory matters.

Sincerely,

for Lawrence J. Bogan
JOSEPH L. IGNAZIO
Chief, Planning Division

DA-1

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U.S. Department of the Army

DA-1 The need for Corps of Engineers' approval of all work in navigable waterways and/or wetlands is addressed in Section 1.6 and Table 1.6-1 of the DEIS. In Section 2.3.3 (the last paragraph on page 2-8) the DEIS states, based on information from NEP, that "no dredging or other work requiring a permit from the U.S. Army Corps of Engineers is expected."

Two activities related to coal conversion at the Salem Harbor plant that could require a Corps' Section 10 permit are dock construction and dredging. During the past 3 years, NEP has made considerable repairs to the existing pier, including sheet piling of the entire length, constructing four new dolphins, and installing two new oil unloading arms. This work has been performed to upgrade the multi-use dock facilities in general, has received all appropriate permits, and is not attributable to coal conversion. NEP maintains a 600-foot-long access channel to the Federal navigation channel in Salem Harbor. As detailed below in response to Comment P-2, no improvement dredging will be required as a result of coal conversion.

Some construction activities proposed by NEP in conjunction with coal conversion will occur in areas within the regulatory (100-year) floodplain (DEIS, Section 4.1.3). This construction at the plant will be entirely within the present plant boundaries. As noted in the DEIS Section 3.4.3 (on page 3-47), however, there are no wetlands or other unique or critical habitats on or adjacent to the Salem Harbor site.

Advisory Council On Historic Preservation

1522 K Street, NW
Washington, DC 20005

March 30, 1982

Ms. Lynda H. Nesenholtz
Division of Fuels Conversion (RG-62)
Economic Regulatory Administration
Department of Energy
Washington, DC 20461

Dear Ms. Nesenholtz:

The Council has reviewed your draft environmental impact statement for proposed fuel conversion of the New England Power Company's Salem Harbor Generating Station in Salem, Massachusetts, circulated for comment pursuant to Section 102(2)(C) of the National Environmental Policy Act. We note that the undertaking will affect the Derby Street Historic District, a property included in the National Register of Historic Places, and may affect other resources potentially eligible for the National Register. We are particularly disturbed by the issue of coal storage and disposal, which may adversely affect historic resources. The Council recommends early agency contact with the Massachusetts State Historic Preservation Officer to initiate discussion of means to avoid or mitigate any adverse effects.

Circulation of a draft environmental impact statement does not fulfill your responsibilites under Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. Sec. 470f).

Prior to the approval of the expenditure of any Federal funds or prior to the granting of any license, permit, or other approval for an undertaking, Federal agencies must afford the Council an opportunity to comment on the effect of the undertaking on properties included in or eligible for inclusion in the National Register of Historic Places in accordance with the Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800). Until these requirements are met, the Council considers the draft environmental statement incomplete in its treatment of historical, archeological, architectural, and cultural resources. You should obtain the Council's substantive comments through the process outlined in 36 CFR Sec. 800.9. These comments should then be incorporated into any

A-1

A-2

Advisory Council on Historic Preservation

A-1 Coal will be transported to the Salem Harbor Station by sea, using barges or a self-unloading collier now being constructed for New England Power Company (DEIR, Section 2.3.3). The collier, scheduled for completion in 1983, will look similar to the tankers now unloading at the NEP dock.

The coal pile at the plant will remain in its present location. As the quantity of coal stored will be greater than during previous coal burns, the pile area will be enlarged and the elevation increased (Section 2.3.1). Visually, the effect will not be significantly changed. NEP has also committed itself to controls to prevent the escape of fugitive dust from the coal pile (Section 2.3.4.1), including water sprays, compaction of inactive areas, and, if necessary, use of dust control agents.

Disposal of ash from coal combustion has raised questions regarding traffic congestion, vibration from trucks, and fugitive dust, and their effects on historic resources. Responses I-1 and I-2 to previous comments by the U.S. Department of the Interior address these issues. No "adverse effects," as defined in 36 CFR 800.3 (b), are expected from these activities. Section 2.4 of this FEIS presents additional discussion of construction period impacts.

A-2 This information is acknowledged. The Advisory Council on Historic Preservation (ACHP) has been contacted. Based on conversations with ACHP the appropriate state agency was contacted and the resulting correspondence is presented in Section 6.3 of this FEIS.

subsequent documents prepared to meet requirements under the National Environmental Policy Act. Kate M. Perry may be contacted at 254-3495 for further assistance.

Sincerely,

Jordan E. Tannenbaum

Jordan E. Tannenbaum
Chief, Eastern Division
of Project Review

EDWARD J. KING
GOVERNOR
JOHN A. BEWICK
SECRETARY

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFA

ON

DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	Salem Harbor Coal Conversion
PROJECT LOCATION:	Salem
EOEA NUMBER:	03994
PROJECT PROPONENT:	New England Power Company
DATE NOTICED IN MONITOR:	January 29, 1982

The Secretary of Environmental Affairs herein issues a statement that the Draft Environmental Impact Report submitted on the above referenced project does adequately and properly comply with Massachusetts General Laws, Chapter 30, Section 62-62H inclusive, and the regulations implementing MEPA.

Although the Draft EIR was prepared for the Department of Energy, the Final EIR is expected to be prepared and submitted by NEP. This is consonant with the ENF reviewed by this office, with section 62G of MEPA, and with 301 CMR 10.12 and 10.13. The fact that the Draft EIR was prepared without the continual involvement of NEP means that NEP's position on certain issues first appears in the comment NEP filed on the Draft EIR. This places a special burden on NEP, in achieving a Final EIR which is in all respects adequate. In addition, NEP's non-involvement in preparation of the EIR has resulted in a document which we find deficient in detailed assessment of impacts and development of mitigating strategies. M-1

The Final EIR shall be a complete document, not a supplement to the Draft EIR (which in other instances might suffice). M-2

FORM D

Massachusetts Executive Offices of Environmental Affairs

M-1 The comment primarily relates to a review of the proposed conversion by the Massachusetts Executive Office of Environmental Affairs (EOEA) as part of the State MEPA process. This process has since been completed and no response is necessary. EOEA's concerns regarding deficiencies in the DEIS were expressed in their specific comments and are addressed below.

M-2 This comment relates to the State MEPA process. No response is necessary.

Air Quality

The Draft EIR is silent as to the particulate matter emission limitation to be met during "DCO-1", the 2 months during which old coal will be burned. Only in the NEP comment does it appear that emissions will be limited to 1.0 lb./mm BTU. Pursuant to FUA and the DCO, burning of this coal commenced at the beginning of March. M-3

The Final EIR should discuss DCO-1 PM emission limitations, discuss total particulate emissions emitted per day during that time (reflecting the load reduction mandated), and compare that figure with total PM emissions during DCO-2, DCO-3 and post-conversion. It should also present and discuss actual TSP levels and opacity recorded during that period of DCO-1 which precedes filing of the Final EIR.

The Final EIR should also devote more attention to airborne dust from operations at the coal pile, and discuss ways to minimize emissions. M-4

In our view, Appendix A of the Draft EIR (which should also be included in the Final EIR) demonstrates abundantly the importance of continuing vigilance over PM emission levels. M-5

M-3 The Delayed Compliance Order (DCO) issued by EPA permits only Unit No. 2 or Unit No. 3 to burn old coal, but not both units at the same time. The DCO did not set a numerical emission limit (such as 1.0 lb/MMBtu), but does require that net generation be limited to 64 MW for Unit No. 2 and 100 MW for Unit No. 3. Additionally, the unit burning old coal must have its electrostatic precipitator in proper operating condition as specified in the DCO. These conditions should insure that the unit burning old coal would not have a particulate emission rate exceeding 1.0 lb/MMBtu, and that the total PM emissions from the three units during DCO Period 1 would be less than DCO Period 2 and DCO Period 3, as shown in the table on the next page. Therefore, by addressing the emissions rates and ground-level effects during DCO Period 2 and DCO Period 3, the worst-case conditions have been evaluated in this FEIS.

Attachment No. 5 to NEP's June 3, 1981, DCO application addendum provided emission rates in grams per second for NEP's proposed old and new coal lb/MMBtu limits. The new coal emission rates can be determined by ratio, reflecting the lb/MMBtu limits specified in the final DCO. Post-conversion rates would be approximately the same as on oil. The emission limits from Attachment No. 5 are tabulated on the next page.

Actual TSP levels and opacity will be subject to periodic reports and records furnished or available to EPA and DEQE under the terms of the DCO. Coal has been burned at Salem Harbor only since March of 1982. The first series of TSP filters are still in the process of being analyzed, and opacity measurements may not be indicative of the entire old-coal burning period.

M-4 The DCO requires, and NEP has filed with EPA, a detailed program for minimizing fugitive particulate emissions from coal and coal ash handling. The proposed plan as submitted to EPA is included in Section 6.5.

After completing the conversion, NEP will fallow DEQE standard operating procedures. These procedures will include fugitive particulate emission control techniques.

M-5 By the incorporation of the DEIS by reference, Appendix A is included in this FEIS.

Calculated Particulate Emissions at
Allowable Limits and Full or Allowable Capacity*

		Capacity (MW)	Particulate Emission Limit (lb/MMBtu)	Particulate Emission Rate (g/sec)	Particulate Emission Rate (lb/day)
DCO-1 (old coal in Unit No. 3)					
Unit No.	1 (oil)	81	0.12	12.7	2,417
	2 (oil)	81	0.12	13.0	2,474
	3	100	1.00	180.0	34,255
				205.7	39,146
DCO-1 (old coal in Unit No. 2)					
Unit No.	1 (oil)	81	0.12	12.7	2,417
	2	64	1.00	106.0	20,173
	3 (oil)	148	0.12	21.3	4,053
				140.0	26,643
DCO-2 (new coal--0.6 lb/MMBtu limit)					
Unit No.	1	81	0.60	63.7	12,123
	2	81	0.60	63.7	12,123
	3	148	0.60	119.4	22,723
				246.8	46,969
DCO-3 (new coal--0.45 lb/MMBtu limit)					
Unit No.	1	81	0.45	47.7	9,078
	2	81	0.45	47.7	9,078
	3	148	0.45	81.1	15,434
				176.5	33,590
Post-conversion (0.12 lb/MMBtu limit)					
Unit No.	1	81	0.12	12.7	2,417
	2	81	0.12	13.0	2,474
	3	148	0.12	21.3	4,053
				47.0	8,944

*This table is referenced in Comment M-3.

Source: Tables I and XX in Attachment No. 5, DCO Application of July 3, 1981, Addendum.

How was 180 tons/year of NO_2 arrived? M-6

Water Quality

The Draft EIR adverted to the possible lining of the coal pile. Lining of the coal pile was an essential mitigating measure in the coal conversion of the Mt. Tom power plant, EOEA No. 4152. It was not required for the Brayton Point coal conversion, which did not receive MEPA review (with the exception of the ash landfill, EOEA 03198). Thus far, the EIR contains no discussion of potential groundwater pollution transport mechanisms in a coastal environment and no information to show that lining of the coal pile should not be required. M-7

NEP contends, in discussion with this office that studies done at both Salem Harbour and Brayton Point demonstrate that there is no need to line the coal pile. Those studies should be presented and discussed in the Final EIR. M-7a

If the proponent contends that Brayton Point studies should be dispositive as to Salem Harbour, it should establish that the background environments, particularly as to marine resources, are equivalent. The potential role of pyrites, as well as heavy metals, in groundwater pollution shall be evaluated. The Final EIR should present the results of testing of groundwater and soils from around the perimeter of the present coal pile, and from beneath portions of the pile (as they are cleared away). Since the current pile has been in place and sealed for years, any contamination levels found will represent a minimum level of contamination. Contamination to be expected from continued deposition of new coal, before it weathers, would certainly be higher. What contamination levels are present in harbour sediments near the plant? M-7b M-7c

The Division of Marine Fisheries comment on the need for lining is ambivalent (compare paras. 2 and 3). Although current contamination levels of harbor sediments and shellfish should be reported, they will not be controlling, in view of the disuse and sealing of the pile. M-7d

The Final EIR should discuss whether a DEQE permit for discharge to ground will be necessary for (i) an unlined coal storage pile and (ii) any portion of the waste water treatment plant (for which we believe an unlined holding pool will be employed, prior to completion of the dry ash system).

The workings of the waste water treatment plant should be discussed in detail. What will be the characteristics and disposition of (i) sludge and (ii) scrapings or dust from settling basins? Will they be classed as hazardous waste? M-8

M-6 From Table 4.2-2, NO_2 emissions (assuming all NO_x as NO_2) would be 282.4 grams per second on oil and 287.6 grams per second on coal. The increase on coal, therefore, would be 5.2 grams per second. The 5.2 grams per second is equivalent to 180 tons per year, assuming full capacity and continuous operation for an entire year.

The coal and oil emissions were derived from AP-42 (compilation of Air Pollutant Emission Factors, Second Ed., U.S. EPA, 1973) emission factors and other assumptions as follows:

Subject	Oil	Coal
AP-42 Emission Factor	$\frac{105 \text{ lb } NO_2}{1000 \text{ gal}}$	$\frac{18 \text{ lb } NO_2}{\text{ton of coal}}$
Heat Content of Fuel	148,500 Btu/gal	12,500 Btu/lb
Heat Input Rate of Units No. 1-3 combined	3,167 MMBtu/hr	Same
Resulting Calculated NO_2 Emissions	282.4 gram/sec	287.6 gram/sec

M-7 All analyses to date have shown that lining the coal pile may not be necessary for the protection of groundwater or surface water. In this FEIS, Section 2.3.2 discusses the need for a coal pile lining at greater length than the DEIS. Please refer to this section which presents a rationale, supported by additional field data, for not lining the coal pile. The four distinct issues raised in this comment (keyed M-7a through M-7d) are also addressed in Section 2.3.2.

M-8 The existing wastewater treatment system at the Salem Harbor Station has a National Pollutant Discharge Elimination System (NPDES) permit issued jointly by U.S. EPA and Massachusetts Division of Water Pollution Control (DWPC) (Federal Permit No. MA0005096; State Permit No. 20). The treatment system is designed to remove dissolved and suspended pollutants present in plant wastewater as a result of contact with coal and oil ash, fireside and boiler tube boiler cleaning wastes, and general plant drains, including site runoff. The treatment process is based on lime precipitation. All wastes are pumped to an equalization basin, which serves to dampen wide swings in pH. From there, they flow through a mixing chamber where lime slurry is added and mixed. This raises the pH of the wastewater and causes dissolved metals to precipitate as metal hydroxides. The water then flows through three settling basins in series in which the precipitated metal hydroxides and other suspended solids settle before the treated water is discharged to Salem Harbor.

During the first 6 months of the DCO coal burn, a wet fly ash system will sluice fly ash to the treatment system. Throughout the DCO, bottom ash will be sluiced to the system. The treatment system can adequately handle these wastewater streams without modification to the system itself or the

NPDES permit governing its operation. No specific permit modification will be required for discharge of water, if any, from the basins to the groundwater.

Sludge (there is no dust in the basins) is periodically removed from the basins and allowed to air-dry before being trucked offsite for disposal. As part of the hazardous waste notification screening procedures under the Federal Resource Conservation and Recovery Act (RCRA), two samples of sludge from the Salem Harbor wastewater treatment system were tested in 1980 using the toxicant extraction procedure test.

The results of the tests were as follows:

Metals	Sample #1 mg/l	Sample #2 mg/l	U.S. EPA Limits mg/l
Arsenic	0.018	0.017	5.0
Barium	1.0	1.0	100.0
Cadmium	0.1	0.1	1.0
Chromium	0.1	0.1	5.0
Lead	0.01	0.01	5.0
Mercury	0.0067	0.0002	0.2
Selenium	0.004	0.009	1.0
Silver	0.1	0.1	5.0

Sludge from the treatment system was found to be not hazardous and this is not expected to change.

As part of the coal conversion, a coal pile runoff collection system will be installed. Coal pile runoff will be pumped from a lined holding basin to the wastewater treatment system. The treatment system, as presently operated, can adequately handle the flow rate and characteristics of coal pile runoff.

Other facilities to be installed with coal conversion include a recirculating bottom ash system. Bottom ash will be sluiced to dewatering bins which remove most of the ash. The water will flow to two new, lined settling basins for removal of smaller particles and then will be recycled to the station for reuse. This system will also accommodate boiler seal water and equipment washwater from the coal-fired units. Some small amount of overflow from the system to the wastewater treatment system will probably be required.

Both the installation of the coal pile runoff collection system and the closed loop bottom ash system will require approval of plans by the DWPC. The total flow to the wastewater treatment system, including coal pile runoff following coal conversion, will be less than during oil burning.

It is expected that no modification to the NPDES permit will be required as a result of coal conversion other than normal permit renewal. No specific permit beyond approval of plans will be required for discharge to groundwater, if any, from the new facilities to be installed with coal conversion.

Finally, the Final EIR shall discuss the physical feasibility of lining the pile (i) during April, 1982 and (ii) after April, 1982 and identify potential liner materials.

M-9

Solid Waste

The Draft EIR assumes, without showing, that burial of ash presents no threat to groundwater. Data which support such a contention have never been presented for MEPA review. NEP is now the largest generator of coal ash in New England, and its output is expected to increase by 145 tpd when this project is in operation. The Final EIR should discuss all studies known to NEP in Massachusetts, and the leading studies elsewhere in this country, which address groundwater impacts of coal ash disposal or re-use. A compendium of such studies should be filed in the MEPA office as an Appendix to the Final EIR to be available for all reviewers.

M-10

M-9 During part of the first 2 months of the DCO coal burn, when old coal is being burned, the existing coal pile will be reduced to approximately 40,000 tons, which will leave a base of coal about 10 feet thick. Delivery of new coal will then begin and the inventory will eventually increase to about 190,000 tons. It would be difficult and expensive to move the coal pile at any time for lining, if coal burning is to be continued uninterrupted. Technically, the lining could be accomplished at any time if required. An appropriate liner material would be one that is flexible enough to accommodate changes in loading and thick enough to withstand mechanical damage from coal handling equipment. Fly ash would be a good choice because it is available onsite and is nearly as impermeable as clay when compacted. Clay would also be an acceptable material. Rigid materials, such as asphalt, or thin materials, such as coatings or synthetic membranes, would probably break up over time.

M-10 As noted in the EIS, between 1976 and 1978, NEP conducted experiments in two southeast Massachusetts communities to demonstrate the effectiveness and safety of using ash for landfill cover. The tests included evaluation of ash handling characteristics and the installation of observation wells to monitor groundwater. (The results of the test work are presented in Section 2.2.2 of this document.) Ash was approved for use as intermediate landfill cover based on this research.

The Massachusetts Department of Public Works (DPW) has evaluated ash for its permeability. As shown in Section 6.6, Attachment D, its permeability is low to very low. For this reason, it is superior to common borrow material because it will prevent rainfall from entering a landfill and generating leachate. The leachability of ash itself is very low. Attachments E and F include the results of a toxicant extraction procedure conducted on ash samples from Brayton Point and Salem Harbor. The results are well below the levels established by EPA to define a hazardous waste.

In 1976, an EIR was prepared and submitted to DEQE and MEPA by the Thompson and Lichtner Company for the disposal of coal ash from Brayton Point Station at a landfill in Freetown, Massachusetts. (Final Limited Environmental Impact Report, Proposed Fly Ash Landfill, Freetown, Massachusetts, March 5, 1976.) The report concluded that:

> There will be no degradation of inland ground or surface waters by siltation or by percolation of leachates, because of the low permeability of compacted fly ash. The low permeability lessens the probability of extensive groundwater percolation and consequent damage of soluble materials being leached out of the landfill.

Several studies are now under way elsewhere in this country, including a major study of coal ash disposal techniques by U.S. EPA as required by the RCRA of 1980. These studies, which relate directly to burial of nominally dry ash in the ground, are still underway and are not yet available for public review. Another study, now in the third year of a 5-year life and mentioned in the DEIS, involves the use of ash as a roadbase material in highway construction and is being sponsored by NEP and the Massachusetts

Construction Impacts

The Final EIR should either demonstrate that there will be sufficient on-site parking for all construction workers, or should discuss adequate provision for satellite parking, with busing of construction workers. M-11

In addition, the EIR should discuss whether designated construction truck routing will be necessary, to enforce avoidance of the more sensitive parts of Salem. M-12

March 8, 1982
DATE

Samuel G. Mygatt, Ca
JOHN A. BEWICK, SECRETARY

DPW. An aspect of that study is to evaluate the environmental effects of such a reuse option.

M-11 Construction will include development of a parcel of land on the north end of NEP property for employee parking. This land improvement will free existing parking spaces for the anticipated maximum 350 construction workers employed during a period in 1985. Readjustment of internal yard fencing will make space for about 300 cars which, in view of the predominantly local hiring of workers, may be in excess of need. Conventional construction planning with local hiring calls for 1.5 workers per car (233 car spaces).

Offsite parking with busing to work is not anticipated. If some unusual conditions should require it, the need would not arise until late 1984 and 1985, when maximum worker loading should occur.

M-12 In the DEIS, Section 4.2.5.5, Transportation (page 4-46), discusses the limited access to Salem Harbor Station with regard to truck travel for ash disposal. The NEP contract with Fluor Power Service, Inc., for the conversion construction work has called specific attention to the location of the station, including its bordering population areas and the requirement to minimize the increase in offsite noise level caused by construction. Fluor specifies, as a condition in its subcontracts, the requirements of a specific truck routing into the site and for use of barge transport to the site pier facilities.

Measures to minimize the impact of noise will include use of electric motor-driven welding machines and air compressors, and specification of other equipment with modern noise abatement controls. Where possible, construction activities with higher noise levels will be scheduled for less sensitive periods of the day.

Review Comments.
Staff Report
Ashvin Patel

EOEA # 03994; DEIS, Salem Harbor Generating Station.

1. FEIR must contain copies of - ENF, the scope and the comments on the DEIS.

2. Although it is stated in the report that no dredging will take place, in their comments the NEP have stated otherwise. FEIR should be more specific on this subject - total volume to be dredged, quality of dredged material and area of disposal.

3. The report does not present measures that will be implemented to minimize impact during the construction - noise, dust, traffic and parking. How will complaints be handle during this period? (Ref. to 10/20/81 letter from Mr. Mygatt to Ms. Nessenholtz).

4. The company also has indicated that no upgrading is anticipated of spray towers. - In the past dust from the coal pile caused a nuisance. This was one of the major concerns expressed during the MEPA scoping meeting. The best available control methods should be discussed in the FEIR and upgrading of the existing 15 year old system should be considered.

5. Use of chemicals to enhance ash collection efficiency is considered in the report. What type of chemicals will be used, if any, and at what rate will it be injected to the flue gases?

MEPA Staff Report Comments

P-1 The Massachusetts FEIR filed with the Commonwealth of Massachusetts includes the ENF filed January 22, 1981, and the Scope dated February 20, 1981. The Massachusetts FEIR includes Appendices B and C, Comments Received on the Massachusetts DEIR and Response to Comments.

P-2 NEP maintains a 600-foot-long access channel to the Federal navigation channel in Salem Harbor leading to its berth at the Salem Harbor Station. No improvement dredging will be required as a result of coal conversion. The present channel and berth are deep enough to accommodate vessels delivering coal and oil to the plant, including the self-discharging collier to be put in service in 1983. As is the case with any channel, periodic maintenance dredging is necessary to keep the channel at its approved depth. Although no maintenance dredging is now planned, some may be required during the nearly 4 years of coal conversion construction. No dredging is anticipated for the coal conversion construction per se. Maintenance dredging was last done in 1972 and normally will be repeated at 10- to 15-year intervals. No estimates of volume have been determined, nor have disposal sites been designated.

P-3 Measures to reduce construction impacts are detailed in Section 2.4, with information on dust control in Section 6.5.

NEP maintains an office in Salem and its staff is responsible for responding to any customer or neighborhood concerns:

Manager of Community Relations--David J. Beattie

Address:

209 Washington Street
Salem, Massachusetts 01970
927-3000, ext. 352

P-4 The existing spray tower system for control of coal pile fugitive dust will not be upgraded because it is considered the best available control method. NEP has acquired 12 new portable sprays to supplement the existing system. It is anticipated that these will be used on the east side of the pile. Currently, 10 fixed spray towers are on the west side. The portable sprays will be used during coal unloading. These portable sprays add the virtue of flexibility to dust control, as they can be applied at specific points of dust escape. Inasmuch as long-term coal unloading will shift from crane-lifted buckets to the self-unloading coal ship, flexibility is necessary.

It appears that NEP has taken proper precautions to minimize fugitive dust and does not believe it prudent to redesign its system prior to gaining more experience. Also, washed coal will be delivered in a damp state, which will minimize fugitive dust during initial handling.

P-5 The DCO requires an extensive program to evaluate the effectiveness of flue gas conditioning. At least two different types of flue gas conditioning must be installed and compared. NEP must submit a preliminary and a

6. FEIR should present chemical characteristics of
   i) Coal
   ii) fly ash and bottom ash
   iii) leachate from coal pile, bottom ash.

7. Approximately 22% increase in HC emission cannot be viewed as not significant (p. 4-18). FEIS should further evaluate this pollutant.

8. Detail regarding existing NPDES permit should be presented in the FEIR. Will treatment of coal pile runoff require revision of this permit? How will be shock loading of wastewater treatment plant be prevented during high runoff situation? Where will be sludge disposed of?

P-6

final plan to optimize particulate emission reduction via flue gas conditioning. In addition, particulate emission testing with and without the flue gas conditioning in operation must be performed to evaluate the conditioning's effectiveness.

P-7

P-6 In 1980, NEP conducted a Coal Conversion Test Program under the guidance of EPA and the DWPC. The objective of the program was to identify potential changes in wastewater treatment, including the treatment of coal pile runoff, that might be needed as a result of coal conversion. This was conducted at Brayton Point Station, while new source coal, of the type to be used at Salem Harbor, was being burned. A report of the Test Program was submitted to EPA and DWPC on November 17, 1980. The test included analyses of coal, fly ash, bottom ash, and coal pile runoff. Ash leachate was not directly measured, but may be inferred from the analyses of fly ash and sluicewater and bottom ash sluicewater that are included in the report. Results of this work are presented in Section 6.6 of this FEIS, Attachments D, E, F, and G.

P-8

P-7 The 22 percent increase is based on AP-42 hydrocarbon (HC) emissions estimates for oil and coal combustion. The AP-42 estimates are 0.3 lb HC per ton of coal and 1.0 lb HC per 1,000 gallons of oil. A January 23, 1978, EPA memorandum from its Office of Air Quality Planning and Standards provides an estimate of 0.01 lb HC per ton of coal, but this is probably most applicable to new generating units.

EPA has stated that a soon-to-be-released revision to AP-42 will have emission factors of 0.07 lb HC per ton of coal and a 0.8 lb HC per 1,000 gallons of oil, both applicable to existing units. With these rates, hydrocarbon emissions would decrease by 35 tons per year by using coal instead of oil.

The January 23, 1978, and soon to be released AP-42 EPA estimates are probably better used to judge the impact on air quality because they deal with non-methane hydrocarbons. The ozone section on Page 4-19 of the DEIS discusses the fact that non-methane hydrocarbons are those that contribute to ozone formation. That same section points out that oil or coal combustion at Salem Harbor Station contributes insignificantly to area ozone in comparison to automobile traffic.

P-8 Section 2.2.1 in this FEIS contains information on the plant wastewater treatment system. The text of the NPDES Permit is reproduced as Section 6.2.

Shock loading of the treatment system will be avoided by providing a lined collection basin for coal pile runoff. From the collection basin, the runoff will be pumped to the treatment system at a rate of approximately 100 gallons per minute. The transfer can be accomplished at a time which will avoid overloading the system. In any case, the treatment system can accommodate an inflow of 1,500 gallons per minute, so the flow of coal pile runoff will not adversely affect treatment.

Sludge for the treatment system will be partially dried in a lined area adjacent to the treatment system and trucked offsite for landfill disposal.

9. Will there be any permits required for discharge to the ground? please detail the information.

10. In its comments, NEP has stated that there is no need, nor any plans to line the coal pile. However no data is presented to substantiate this claim. The FEIR should therefore present a) soil study b) impact on the marine environment and water quality.

P-9

P-10

P-9 Massachusetts and Federal regulations require a combination of Approval of Plans for wastewater treatment facilities and NPDES permits for discharges from those facilities. The existing wastewater treatment facility is fully licensed, including Approvals of Plans and NPDES permit. New treatment facilities will be lined, and thus have no discharge to the ground.

P-10 Section 2.3.2 of this FEIS presents a detailed discussion of this issue, including presentation of data on soil under the coal pile, groundwater characteristics, and an assessment of the potential impact on the marine environment and water quality.

ANTHONY D. CORTESE, Sc. D.
Commissioner

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
One Winter Street, Boston 02108

COMMENTS ON "DRAFT ENVIRONMENTAL IMPACT REPORT

for

SALEM HARBOR GENERATING STATION," SALEM MASSACHUSETTS

Solid Waste

The proposed reconversion to coal will increase the amount of ash requiring disposal by a large amount. The discussion of the solid waste disposal impacts of the coal conversion has been improved over the earlier draft of this document, but there is still additional information which should be provided. There is no discussion of the specific constituents of the fly ash and bottom ash, despite the fact that the coal will be nearly identical to that already in use at Brayton Point and the Company should have that information available. The FEIR should discuss questions such as: Could harmful constituents of disposed ash present a leachate problem? Will flyash impact groundwater more than usual municipal refuse? Are there different impacts of using ash as a cover material instead of burying it? Somewhat the same point applies to the use of ash for ice control. Considerably more analysis of the environmental impacts would be required if that alternative is pursued. There is no direct discussion of what will happen once the capacity of the Amesbury landfill is exhausted. Q-1

Department of Environmental Quality Engineering

Q-1 Analyses of coal, fly ash, and bottom ash are included in Section 6.6 of this FEIS and discussed in Section 2.2.2. The coal used for the Brayton Point analysis was a composite of coal burned during the 1980 DCO. Ash tests at Salem Harbor are from the DCO coal burn now in progress.

Ash has been permanently exempted from Federal hazardous waste criteria (40 CFR 261.4(b)(4)). Tests performed on ash samples from both Brayton Point and Salem Harbor (and discussed in Section 6.6) confirm that these ashes have elutriate concentrations that are less than levels which characterize hazardous waste. On this basis, it can be concluded that disposed ash can be treated like other non-hazardous wastes and that disposal criteria for conventional landfills provide sufficient protection.

Outright disposal of ash in landfills would displace other landfilled materials, such as municipal trash. If NEP's primary disposal site, the Amesbury landfill, were to accept all of the ash from Salem Harbor, the rate of waste disposal at the landfill would increase about 25 percent. In practice, the ash would likely be blended with the trash, although some operators might segregate the ash in separate areas. The trash-ash mixture would be covered daily to prevent blowing debris and to control pests. Depending on the intermediate cover material used at the end of each day, rainfall would enter the landfilled material, forming leachates from the constituents of both the municipal trash and ash. Studies by NEP (Section 6.6) showed the resultant combined leachate to be principally controlled by the trash constituents.

Ash used as an intermediate landfill cover would be relatively impervious (see test results in Section 6.6), and would inhibit rainfall from entering the landfilled material and forming leachates. Runoff from ash cover would, however, tend to transport some ash as sediment and would contain some of the same constituents as ash leachate.

On a long-term basis, once a landfill is capped with impervious material, contamination from both leachate and runoff would be reduced. Outright disposal of ash would therefore be expected to have somewhat greater groundwater effects during landfill operation than use of ash as intermediate cover, which would primarily have surface water effects. Actual rates and concentrations would be highly site-specific for either type of ash application; however, neither application would be expected to result in quantities or concentrations which would preclude its use. Following closure of the landfill, effects would be expected to diminish in either case.

The use of bottom ash for ice control is not an accepted practice in Massachusetts at this time, although it is widely used in other states. Before it can be used on Massachusetts roads, both the DEQE and the DPW will have an opportunity to thoroughly evaluate the practice and address the concerns identified.

Ash disposal from Salem Harbor Station is not contingent upon the use of the Amesbury landfill. To date, the towns of Hamilton and Danvers have

Finally, there is no list of references used to evaluate the impact of the solid waste disposal problem. This is a serious oversight. Q-2

Air Quality

Massachusetts air quality regulations (310 CMR 7.09 and 7.10) apply to dust and noise in quantities which could cause a nuisance condition. These sections will continue to apply even during the Delayed Compliance Order. The DEIR indicates that considerable quantities of both dust and noise will be generated, but does not state whether noise levels will comply with the DEQE guideline of no more than a 10 decibel increase at the property line. Q-3

Trace Element Emissions

The topic of toxic trace element emissions and deposition of toxic trace elements originating from the Salem facility is treated in a cursory manner. More information should be presented relative to toxic trace element emissions, dispersion of toxic trace elements, deposition of toxic trace elements, and potential or existing impacts on public health and the natural environment. Q-4

Water Quality Impacts

The DEIR states on p. 4-10 that placing an impermeable liner beneath the coal pile is both possible and technically feasible. However, there is little discussion of the magnitude of any adverse impacts upon ground and surface water quality which might be caused by leachate from the coal pile with or without a liner. Most importantly, there is no statement of what course of action the Company proposes to follow: to line or not to line.

This deficiency may be due to the fact that the Company is relying for its MEPA submission upon the federal submission for NEPA purposes done by the U. S. Department of Energy. Regardless, however, it is important that the FEIR state the Company's position on lining the coal pile, the environmental impacts of that preference, and any mitigating measures available. The decision on whether to line the coal pile should be made only after careful consideration of the pros and cons, and those pros and cons should be set out clearly in the FEIR. We suggest that a conclusion not to line the coal pile should be accompanied by a plan of continuing environmental monitoring during the life of the powerplant. If, after a specified period of time (for example, one year) the monitored levels show adverse effects, lining of the coal pile should be undertaken. Q-5

The Company should have first hand information about the potential problem of leachate from a coal pile, based upon its experience with coal conversion at the Brayton Point station. Any such available information should be included in the FEIR. Q-6

An engineering report and final plans must be submitted for any major alterations to the existing wastewater treatment facilities. If new unlined treatment basins are to be used, then a demonstration similar to the one called for above would be required.

approved the use of ash for landfill cover. Other disposal sites have been offered for use by NEP. As noted in the DEIS, the fully licensed Freetown site could accept the equivalent of 24 years of ash from Salem Harbor. That site is underutilized now due to the successful ash reuse program from Brayton Point ash.

Q-2 Several studies on ash disposal problems are identified in response to comment M-10 above.

Q-3 NEP's architect-engineer for the long-term conversion project will take baseline noise measurements at the property line, prior to initiation of ansite construction. A design requirement for the project will be that, when the project is complete, there will be no degradation (increase) in noise levels attributable to the station. During the construction phase, NEP will endeavor to insure that nuisances (dust and noise) will be minimized, including complying with the DEQE guidelines. Additional information on construction impacts and this mitigation is presented in Section 2.4.

Q-4 Appendix A to the DEIS--a reproduction of Appendix E to the U.S. Department of Energy's Draft Northeast Regional EIS--provides additional information on this topic. Section 4.3, Troce Elements (pages 4-33 through 4-68), of the Northeast Regional Environmental Impact Study: Reference Document for the Health Effects of Air Pollution (DOE Document No. ANL/ES-121 dated November 1981) provides additional information. In addition the Final NEREIS, (DOE/EIS-0083-F) which incorporates the Draft by reference contains an addendum to the health affects study.

Q-5 NEP has provided information to demonstrate that a liner under the coal pile may not be needed. Section 2.3.2 of this FEIS contains detailed discussion of this issue.

Q-6 New lined basins will be installed for coal conversion. NEP will submit plans for these facilities and the coal pile runoff collection system to the DWPC for review and approval prior to installation.

PHILIP G. COATES
DIRECTOR

The Commonwealth of Massachusetts
Division of Marine Fisheries
Lowell Tallonstall State Office Building
100 Cambridge Street
Boston, Massachusetts 02202

727-3193

March 5, 1982

Ashvin M. Patel, Associate Planner
MEPA Office
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202

Dear Mr. Patel:

At your request, the Division has reviewed the information which you provided on the Salem Power Plant Coal Reconversion Environmental Impact Report.

Basically, the information is insufficient to make a judgment on whether a liner may be required on the basis of any fishery impacts. I have taken the liberty of contacting New England Power Company for information on heavy metals in shellfish relative to the Brayton Point Power Station coal yard. I am enclosing a copy of that report. Basically, the information indicates that there is no problem with shellfish at that station.

At this time we cannot recommend a liner at Salem Power Station based on existing information; however, we would recommend that shellfish be sampled in the vicinity of the water discharge as well as at a location in Salem Harbor distant from the Power Plant to compare the respective heavy metal burdens. This should be done as a minimum precaution before any decision is made relative to the liner on the basis of fishery impacts.

If you have any questions, please contact me.

Sincerely yours,

W. Leigh Bridges
Assistant Director

WLB/le...

cc: Charles Anderson, DMF
Barry Ketschke, NEPCo

44

MF-1

Division of Marine Fisheries

MF-1 NEP expects to be required by DEQE or DMF to implement a monitoring program to measure the accumulation of metals in sediment and shellfish in areas adjacent to and remote from the coal pile, comparing their respective heavy metal burdens. Further discussions of the issue of coal pile lining and associated impacts to aquatic resources are presented in Section 2.3 of this FEIS.

mapc Metropolitan Area Planning Council 110 Tremont St., Boston, MA 02108 617/451-2770

February 24, 1982

The Honorable John A. Bewick
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202
Attn: MEPA Unit

RE: Proposal to Convert Salem Harbor Electric Generating Station to Coal (MAPC #EIR-82-10, received February 3, 1982) EOEA # 03994 comments due March 1, 1982

Dear Secretary Bewick:

In accordance with the provisions of Chapter 30, Section 62 of the Massachusetts General Laws, the Metropolitan Area Planning Council has reviewed the above-referenced Draft Environmental Impact Report (DEIR).

This DEIR describes the effects of converting New England Power Company's Salem Harbor Generating Station Units 1-3 from oil to coal. The action was initiated by a proposed prohibition order from the US Department of Energy. The proposal calls for three units originally designed to use coal to burn low-sulfur coal, without additional pollution-control equipment for the first 44 months, and with new electrostatic precipitators (ESPs) thereafter.

The Council finds the DEIR to be an excellent and honest description of the effects of converting the Salem plant to coal. The report addresses many of the concerns raised in public meetings and by concerned citizens. It is clear that the coal conversion will cause environmental degradation to the immediate area. Given that the benefits of the conversion outweigh the problems, the Council urges that everything feasible be done to mitigate the effects of the conversion.

Therefore our comments are limited to the following:

(1) Clarify the retirement dates of Units 1, 2, and 3 once the conversions have been completed. The report states that Unit 1 is to be retired in 1986, Unit 2 in 1987, and Unit 3 in 1992. It is not clear how these retirement dates are affected by the conversion. C-1

(2) The relationship of Salem Harbor's role as a base-load plant to the ability to pursue the "no action" alternative is not clear. What would happen if Units 1, 2, and 3 were to be retired early? Is there anything available to take their place? While this alternative seems infeasible, the DEIR devoted too little to the justification for converting those units to coal rather than retiring them. Clarifying the base-load situation in the final EIR should help to inform the public and justify the potential environmental degradation. C-2

Metropolitan Area Planning Council

C-1 The DEIS referred to retirement dates without conversion of 1986, 1987, and 1992 for Salem Harbor Units No. 1, 2 and 3, respectively. The plant modifications associated with coal conversion will help extend their remaining useful life, although additional capital investments may be required to achieve a useful life to the year 2000. In a DOE study of generating unit retirements conducted by Brookhaven National Laboratories, 15 years were added to the useful life of most oil-fired plants after coal conversion.

C-2 NEP does not consider early retirement for Salem Harbor Units No. 1, 2, and 3 to be a feasible alternative. These units operate as base-load while burning oil and will continue to do so following coal conversion. Although they are not new units, they are relatively efficient and reliable units; any generating capacity that would be run in their place would be more costly to the consumer. Also, NEP claims that these units are needed for stability of the electric power grid in the region. The Massachusetts North Shore is an area of high demand without much capacity. Transmission facilities into the area are not sufficient to carry the load without Units No. 1, 2, and 3 at the Salem Harbor Station.

(3) Would the owners of the Amesbury landfill (SCA) be willing to accept the ash that is such a staggering proportion of their total refuse? If not, are there any clearer options?

(4) Because of the concerns associated with the health effects of fine particulates and because of the density of the population, why were baghouses not considered further? Recent studies show them to be better than ESPs at removing fine (inhalable) particulates.

(5) Because the plant is counting on low-sulfur coal (rather than scrubbers) to maintain low sulfur dioxide emissions, the final EIR may wish to comment on the recent studies showing that low-sulfur coal creates ash of high resistivity that lowers the performance of ESPs. Has the Brayton Point conversion generated any recent data to this effect?

(6) The correct 1980 population for the region is 2.9 million (page 3-49).

(7) The waste ash should not be trucked out during peak hours and "sensitive" times, such as evening, night, and early morning hours. Consult the City of Salem to schedule truck trips to minimize the effects of this travel.

Thank you for the opportunity to comment on this DEIR. The comments of MAPC representative for Marblehead are enclosed.

Very truly yours,

Donald E. Megathlin, Jr.
Executive Director

DEM:lpb
Enclosure
cc: Mr. W. Gregory Senko
MAPC Representative, Salem
Mr. James Bishop
MAPC Representative, Marblehead
Senator John G. King
Rep. J. Michael Ruane
Rep. Lawrence R. Alexander
Senator Walter J. Boverini
Ms. Lynda Nesenholtz
Department of Energy
Ms. Karen Pierson
MAPC Staff
Mr. Denny Lawton
MAPC Staff

C-3 NEP has a contract to dispose of coal ash at the Amesbury landfill. The landfill is licensed to accept 1,200 tons of refuse per day and the estimated ash disposal requirement from Salem Harbor Station is 230 tons per day, or 20 percent of capacity. If the landfill operators choose to use ash as intermediate cover material, with the approval of the Amesbury Board of Health, the ash can replace other cover material and not increase the total amount of material entering the landfill.

C-4 To meet the regulatory particulate emission rate limit of 0.12 pounds per million Btu, precipitators are generally accepted as the most cost-effective control device. The combination of the new precipitators and the new Good Engineering Practice (GEP) height stack should ensure that the ambient particulate matter impact, including fine particulates, will be significantly lower than it was during oil burns. NEP space limitations at the site preclude the use of baghouses.

C-5 New England Power states that the new electrostatic precipitators will be designed to meet the regulatory particulate emission limit over the expected range of sulfur content in the coal. The Brayton Point Station precipitators were designed to use coal with a sulfur content as low as 0.8 percent, even though the majority of the time the actual sulfur content is in the 1.0 percent to 1.5 percent range. Post-coal conversion compliance tests conducted on Units 1 and 2 at Brayton Point have demonstrated that emission limits can be met while burning low sulfur coal with properly designed electrostatic precipitators. The design of the Salem Harbor precipitators will also take into account the sulfur variability factor, as well as the range of other factors affecting precipitator performance.

C-6 The correct 1980 population has been incorporated into the Errata (Section 2.5).

C-7 The City of Salem (Zoning Board of Appeals) has required that ash be trucked from the site only on weekdays during normal working hours. NEP has stated that it will adhere to this requirement.

ENVIRONMENTAL REVIEW REQUEST

Metropolitan Area Planning Council 110 Tremont St., Boston, MA 02108
Tel. 451-2770

DATE: February 3, 1982

I.D. #: EIR-82-10

TO: James Bishop

COMMUNITY: Marblehead

Enclosed is a description of the project referenced below.

The Council requests that you consider whether this report adequately describes the project's impact upon your community and addresses significant environmental benefits and potential damages.

PROJECT TITLE: Salem Harbor Coal Conversion

THE COUNCIL HAS ONLY 15 CALENDAR DAYS TO FILE COMMENTS WITH E.O.E.A. TO MEET THIS DEADLINE, YOUR COMMENTS MUST BE RECEIVED AT THE MAPC BY February 26, 1982

- ☒ ADEQUATELY DESCRIBES ENVIRONMENTAL IMPACTS
- ☐ MERITS FURTHER ENVIRONMENTAL STUDY
- ☐ NEED MORE INFORMATION

EXPLANATORY COMMENTS:

Excellent report. Clearly describes environmental impacts and the surrounding circumstances in this community. [illegible]

SIGNATURE: [signature]

DATE: [illegible]

marblehead conservation commission

February 19, 1982

Ms. Lynda Nesenholtz
Office of Fuels Program
Fuels Conversion Division
Economic Regulatory Administration
2000 M. Street N.W., Room 61280
Washington, D. C. 20461

Dear Ms. Nesenholtz:

This letter is written in response to the Draft Environmental Impact Report (DEIR) for the Salem Harbor Generating Station of Salem, Mass. issued and revised by DOE on January 11, 1982.

There are some serious deficiencies in the proposed plan to convert the Salem Power Station units 1 - 3 from oil to coal which are evident in the DEIR. I would like to address a few of these in this letter.

Marblehead is located 1½ miles southeast (downwind) of the power plant stacks. Air quality measurements at the Green Street station in Marblehead exhibited the highest SO_2 values of all the monitoring stations. At the present time the particulate matter levels measured in Marblehead exceed State and Federal secondary air quality standards. The proposed changes will only cause additional degradation of air quality over Marblehead. MCC-1

In the DEIR, the very high SO_2 levels at Marblehead are dismissed as "could be a local anomaly" (p.3-25) and the data are not even used in the air quality modelling (table 4.2-4). MCC-2

The amount of acid rain which will be contributed to Marblehead from the existing 250' stacks and from the proposed 445' MCC-3

10 school st · marblehead, massachusetts 01945

Marblehead Conservation Commission

MCC-1 The following response (MCC-2) addresses the sulfur dioxide question. With regard to particulate matter levels, the high levels were recorded at the Green Street monitor in the 1976-1977 period. At that time, trucking and dumping activity nearby was the principal cause for the elevated levels, activities not related to the Salem Harbor Station. The monitor was removed in April 1977 because it was not considered to indicate representative particulate levels in Marblehead. Particulate monitoring at Green Street has resumed, as a DCO requirement.

The use of coal, both under a DCO (with existing stacks) and on a long-term basis (with a new stack), is not expected to significantly impact Marblehead.

MCC-2 The text of the FEIS has been revised to clarify that the elevated SO_2 levels recorded in the past at the Green Street monitor were heavily influenced by Salem Harbor Station. The only "anomaly" is that elevated SO_2 levels (exceeding 50 percent of the daily standard) have only occurred several times each year. More importantly, there never has been a violation of the daily ambient air quality standard for SO_2. (Also see Response E-4.)

The Green Street SO_2 data were not used for background levels because background is meant to include effects of all other sources of SO_2. Total ambient concentrations under the new GEP stack configuration were determined by adding the modeled station impact to the monitored background concentration. It would be incorrect to double-count the station impact by considering its historical impact at Green Street as background.

When the new GEP stack is constructed, the impact of the Salem Harbor Station on ground-level SO_2 concentrations at Green Street and all of Marblehead should be significantly lower.

MCC-3 There is no consensus on the relationship between powerplant emissions and acid rain. However, those who support the thesis that powerplant emissions contribute to acid rain generally believe that significant transport time is required for atmospheric chemical reactions to occur leading to rain acid. The transport times (distances) are on the order of hundreds of miles. The proximity of Marblehead to the Salem Harbor site simply does not provide the transport time for any appreciable chemical reactions to occur. The origin of "acid rain" is the subject of numerous studies, none of which is conclusive at this time.

NEP claims that the new stack will lower local (including Marblehead) elevated ambient SO_2 concentrations caused by the building downwash effect with the existing stacks. Coal burning at Brayton Point Station, which has the same sulfur-in-fuel regulations as Salem Harbor Station, has resulted to date in approximately a 20 percent lower SO_2 emission rate than with oil burning, and NEP expects to observe a reduction of similar magnitude at the Salem Harbor Station.

stacks needs to be determined. Marblehead, not "just the ocean", is downwind of the plant stacks and this fact must be taken into consideration in this proposed conversion plan.

Considerable quantities of fugitive dust will be emitted from the coal and ash handling operations. A portion of these increased emissions will be rained on Marblehead and its waters. The significance of these additional pollutants must be determined. MCC-4

Contaminants from the ash storage ponds and coal pile leachate and runoff will cause additional increments of pollution to Salem Harbor. Is this proposed conversion compatible with the maintenance and protection of Salem Harbor's important commercial lobster fishery and recreational fishery? MCC-5

The DEIR raises a lot more questions than it answers, at least when dealing with issues of concern to Marblehead. We will need to see a much more thorough impact assessment of this proposed facility, before we can lend our support to this project.

Sincerely,

Frederick Sullivan, Chairman
Marblehead Conservation Commission

FS/hs

cc: Mr. Samual Mygatt, Director
Massachusetts Environmental Policy Office

Mr. Wallace Stickney, Director
Environmental Assessment Office

Cong. Nicholas Mavroules

Rep. Lawrence Alexander

Sen. Edward Kennedy

Marblehead Board of Selectmen

MCC-4 The NEP plans for minimizing fugitive particulate emissions are presented in Section 6.5 of this FEIS. The Delayed Compliance Order includes the requirement that the company submit a detailed description of its fugitive emission control program. NEP must also submit and receive State approval of its Standard Operating Procedures for control of fugitive particulate emissions.

Experimental observations of the distribution of fugitive dust originating from active and inactive coal piles have shown that the majority of the coal pile emissions will be deposited at ground level within a few hundred meters of the pile. Since Marblehead is located approximately 1,500 to 2,000 meters from the station, fugitive emissions are not expected to travel the distance from the station to Marblehead.

MCC-5 A dry ash system will be installed for fly ash collection as part of coal conversion. The bottom ash system will be a wet recirculating type using hydrobins and lined basins for removal of ash from the sluicewater, which will then be recycled. There should be no contamination from ash storage basins to pollute Salem Harbor. Coal pile runoff will be collected and treated prior to discharge to Salem Harbor. As a result of coal conversion, NEP states that flow to the existing wastewater treatment system will be significantly reduced from that experienced during oil-firing. Additional details of the plant wastewater treatment system are provided in Section 2.2.1 of this FEIS. The environmental problems related to coal storage at the Salem Harbor Station, and plans for mitigating them, are discussed in detail in Section 2.3 of this FEIS.

CLF

COMMENTS OF THE

CONSERVATION LAW FOUNDATION OF NEW ENGLAND, INC.

ON THE

DRAFT ENVIRONMENTAL IMPACT REPORT

FOR THE

SALEM HARBOR GENERATING STATION

50

February 26, 1982

Conservation Law Foundation of New England, Inc., 3 Joy Street, Boston, Massachusetts 02108 (617) 742-2540

The draft Environmental Impact Report on the Salem Harbor coal conversion is generally very well done. A number of data omissions and inconsistencies must be addressed in the final report. Only two areas, however, require significant revision: alternatives to conversion and solid waste disposal. With changes made as suggested below, the final EIR will be an extremely useful planning document.

ALTERNATIVES

The draft EIR briefly mentions conservation as an alternative to the conversion, and finds that there is no apparent fatal flaw to the proposal although it is not likely to offset load demand (p. 2-35). This conclusion is based only on cursory, non-specific data, however. The final EIR must give more detailed consideration to implementation of conservation projects and development of nonconventional energy sources as an alternative to coal conversion.

The draft EIR cites a study on conservation in Utah and Nevada even though information specific to New England, Massachusetts, and the New England Power Company (NEPCo) is readily available. The final EIR should make use of such recent assessments as Energy in New England: Transition to the '80's (New England Congressional Institute, June 1981) and New England Can Reduce Its Oil Dependence Through Conservation and Renewable Resource Development (General Accounting Office, June 1981). The analysis of conservation should consider it in conjunction with other alternatives such as early retirement or conversion of only one or two of the units to coal instead of all three.

The analysis should not consider only the conservation and nonconventional generation which is expected to develop, but that which can be induced by spending the $100 million which would otherwise be spent on the conversion. The capital cost

Conservation Law Foundation, Inc.

CLF-1 DOE recognizes that the national objective of minimizing the overall consumption of oil and natural gas cannot be achieved by the implementation of FUA alone. The limited authority of the Act to encourage the use of alternate energy sources in utility boilers means that there is a potential role for actions outside of the authority of FUA (alternative technologies and conservation) to contribute to reaching the goal of reducing reliance on oil and natural gas for generating electricity. In order to assess the potential for alternative technologies and conservation within the Northeast Region, a detailed analysis was performed as part of DOE's Draft NEREIS (DOE/EIS-0083-F, October 1981).

In that study, conservation and six energy alternatives to the proposed coal conversion of the units at 42 sites were examined for their potential to displace future oil consumption. In addition to conservation, the following alternatives were considered: solar, wind, small-scale hydroelectricity, coal cogeneration, wood, and geothermal energy. Estimates of the potential of each of the alternatives were introduced into a model to simulate power pool operation for the year 1990. (The three power pools which serve the Northeast Region are the New England Power Pool (NEPOOL), the New York Power Pool (NYPP), and the Pennsylvania-New Jersey-Maryland Interconnection (PJM).) The model was used to analyze impacts on electricity generation of potential coal conversions in the region and that of the energy alternatives. The results in each power pool indicated that by 1990 solar, wind, small-scale hydroelectricity, coal cogeneration, and wood resources combined could not achieve an oil savings comparable to that of the potential conversions. Significant additional contributions from conservation, above those indicated by the power pools, would be unlikely. In NEPOOL, it was found that it would be effective to convert all of the potential units to coal and use all of the potential alternatives. As New England is heavily oil-dependent, sufficient benefits would be obtained from both coal conversion and conservation. Additional information and documentation is provided in Section 3.3, Appendix A of the Draft NEREIS, and Appendix D of the Final NEREIS.

CLF-1

alone is $322.50/kw, or about 2.2 cents/kwh (if the plant operates at 60% of capacity). Many conservation measures could be promoted or taken by the utility for that price or less.

SOLID WASTE DISPOSAL

As the EIR notes, final plans for disposal of ash is one of the major unresolved issues of the conversion. More information on both land and ocean disposal should be included in the final EIR to aid in the resolution of this critical issue.

The anticipated environmental impacts of disposal at alternative landfill sites must be discussed in the final EIR. Specific information on the Freetown and Amesbury sites should be readily available. In both cases, the incremental effects on land, water, and air of disposing of a greater volume of ash should be assessed.

The draft claims that other potential disposal sites have not been identified (p. 4-42). Earlier, however, the report notes that, in addition to the Amesbury and Freetown sites, NEPCo "has been offered enough ash disposal capacity at commercial landfills to take care of 28 years of production" (p. 2-29). These sites should be listed and briefly evaluated in the final EIR.

Another disposal alternative is ocean dumping. According to the draft, NEPCo had a consultant study the environmental impacts of dumping ash at a site 30 miles south of Martha's Vineyard (p. 2-28). A more detailed summary of this study should be included in the final EIR.

CLF-2

CLF-3

CLF-2 Both the Amesbury and Freetown sites are fully licensed disposal facilities that have been through the required environmental reviews, including assignment and Approval of Plans. The Amesbury site is a commercial facility operated by SCA Services, which handled the permitting process. The Freetown site was licensed in 1976 for the exclusive use of ash disposal by NEP. An EIR was prepared as part of the licensing process and submitted to DEQE and MEPA in March 1976. Because this site has been underutilized due to NEP's ash reuse program, it has the capacity to accept ash from Salem Harbor Station as well as Brayton Point Station. A more detailed discussion of the environmental effects of ash reuse and disposal is presented in Section 2.2.

Since the DEIS was prepared, the towns of Hamilton and Danvers have approved the use of ash for intermediate landfill cover. In addition, NEP has reached agreement with Trimount Bituminous Products Company in Saugus, Massachusetts, to use an exhausted section of rock quarry for ash reuse and disposal. A hydrogeologic evaluation of the site has been conducted and was submitted to DEQE in January 1982. A copy of the report was submitted to MEPA for public review. At this time, NEP has indicated that it would be imprudent for them to identify other sites for which disposal and reuse negotiations are ongoing. All such sites will be subject to local and State environmental review prior to approval.

CLF-3 NEP does not now propose ocean dumping for ash disposal. An environmental assessment and application for ocean dumping was prepared and submitted to EPA in 1974 because no approved land disposal sites were then available and beneficial reuse techniques had not been developed. Since that time, land disposal and reuse have become more attractive and are the only options being pursued.

OTHER ISSUES

Some basic information about assumptions used in the draft EIR was not included in the report. For example, what, if any, figures were used for unit heat rates on coal and oil and for pre- and post-conversion capacity factors? Similarly, the report never states the dollar amounts of the wide, middle, and narrow price differentials used in calculating Oil Conservation Adjustment cost recovery (pp. 4-50 to 4-52).

Three inconsistencies should be resolved in the final EIR. Will the coal pile be lined? The draft simply states that the utility has not indicated its plans (p. 2-19), although it notes that such a liner could mitigate the water resources impacts of the coal pile (p. 4-10). Will the conversion shift the planned retirement dates for the units? The draft states that the modifications will extend the useful life to about the year 2000 (p. 4-49) but calculates a savings from reduced oil use "over the 15-year life of the plant" (p. viii). Finally,

CLF-4

CLF-5

CLF-6

CLF-7

CLF-4 According to NEP, for the past 3 years, the average capacity factors and heat rates for Salem Harbor Units No. 1, 2, and 3, burning oil, have been as follows:

	Capacity Factor (%)	Heat Rate (Btu/kWh)
Unit No. 1	67	10,732
Unit No. 2	56	10,884
Unit No. 3	70	9,994

With coal conversion, the capacity factors will remain roughly the same or increase slightly, especially for Units 1 and 2. Heat rates on coal-firing should not change substantially and will be affected primarily by the additional unit output required to power the new precipitators and associated ash system equipment. Until the final engineering design and procurement of the new equipment is completed, the specific energy requirements and impact on heat rate are not available.

CLF-5 Exact predictions of the differentials between coal and oil costs are not possible due to uncertainties, particularly in future oil prices. Experts generally agree that oil prices will increase substantially in the long run. Prices in the market in the near future and the rate of future price growth are uncertain; the world market now has an oil surplus and prices have declined recently.

The rates of growth in oil demand and oil prices depend on such factors as economic growth, conservation, and fuel switching, and success of efforts to increase domestic oil production. The future supply situation will depend heavily on the effectiveness of the OPEC nations in controlling oil production and prices, and the ever-present potential for hostilities in the Mideast that could interrupt oil production or exports.

Coal costs are expected to grow roughly with inflation, except for rail freight costs, which are increasing much faster. Recognizing the uncertainties, New England Power Company estimates for the mid- to long-term, that the differential between oil and coal costs will be in the range of $8 to $12 per barrel of oil equivalent.

Tables 4.2-6, 4.2-7 and 4.2-8 in the DEIS are no longer applicable because the tax laws have changed and the Massachusetts Department of Public Utilities (DPU) has modified its Oil Conservation Adjustment (OCA) regulations. Similarly, Table 4.2-9 has been modified to reflect the estimated OCA fuel adjustment savings for the months of March-June 1982 as shown here:

CLF-6 NEP has stated that it does not plan to line the coal pile. This issue is discussed in detail in Section 2.3.2 of this FEIS.

CLF-7 See the response to comment C-1 of the Metropolitan Area Planning Council above. The plant modifications associated with coal conversion should extend the remaining useful life of the plants, but NEP has not stated its projected postconversion retirement dates.

are increased emissions of nitrogen oxides an important concern? The regional analysis concludes that further investigation is needed because of current high levels and a trend toward increased emissions (p. 2-45). The site-specific discussion says emissions will be practically unchanged and have no impact (p. 4-17), although local ambient levels are unknown (p. 4-34).

CLF-8

CLF-8 The Salem Harbor DEIS simply reiterates several statements from the Draft Northeast Regional Environmental Impact Statement (DNEREIS). The Draft NEREIS calls for further investigation of the impact of incremental nitrogen oxide emissions. These investigations were made and the results are reported in the Final NEREIS. The DEIS investigated the impacts on a site specific basis.

Regarding local ambient effects, Table 4.2-2 in the DEIS indicates that converting from oil to coal would increase the NO_2 emission rate from 282.4 grams per second to 287.6 grams per second, about a 1.8 percent increase. However, dispersion modeling conducted by NEP for the DCO application showed that, for a given emission rate, the maximum annual impact with the new Good Engineering Practice (GEP) height stack to be built would decrease by about 96 percent, as follows:

- Existing stacks: 23 $\mu g/m^3$ with approximately 0.8 lb/MMBtu emission rate (equivalent to 70 $\mu g/m^3$ based on 30-day rolling average emissions).
- GEP height stack: 2.9 $\mu g/m^3$ based on 30-day rolling average emissions.
- Decrease: existing vs. GEP stacks (with same emission rates):
  - Existing - 70 $\mu g/m^3$
  - GEP - 2.9 $\mu g/m^3$
  - Decrease with GEP stack - 96 percent.

The net effect of an emission increase of 1.8 percent and an ambient impact decrease of 96 percent would still yield about a 96 percent ambient impact decrease.

The concern about current high levels of NO_2 addressed in the Draft NEREIS also does not apply in this instance. The current modeled annual station NO_x impact while using oil (0.7 lb/MMBtu emissions assumed) would be about 20 $\mu g/m^3$, even with 100 percent NO_x to NO_2 conversion. This is only 20 percent of the NAAQS for NO_2. Therefore, no current high levels of NO_2 attributable to the station would be expected. While the Draft NEREIS raises concerns that could apply to some coal conversions, they do not necessarily apply to the Salem Harbor conversion.

Table 4.2-9 New England Power Company Fuel Adjustment Factors
(March 1, 1982, through June 30, 1982)

	Coal-Oil Savings Adjustment Factor Full Flow Through ($/kWh)	Coal-Oil Savings Adjustment Factor for OCA Charge ($/kWh)
March	0.0046127	0.0030751
April	0.0070734	0.0042157
May	0.0030852	0.0020568
June	0.0081678	0.0054452

Source: NEP 1982.

GEORGE F. JULEY. P.E.
CONSULTING ENGINEERS

March 31, 1982

Ms. Lynda Nesenholtz
Office of Fuels Programs
2000 M. St, N.W., Rm. 6128
Washington, D.C. 20461

Dear Ms. Nesenholtz:

Units # 1, 2, and 3 to use low burning sulfur coal. What do you people and the Salem Harbor Generating Station call low burning sulfur coal? J-1

I was in contact withWilliam Cadigan, and his way of taking care of the coal is wrong. I checked with my engineering crew and they all agreed with me. J-2 J-3

May I ask what you and GE call sulfur? J-3

Please advice me on this situation. I look forward to hearing from you soon.

Any help you can give me will be greatly appreciated.

Sincerely,

George F. Juley

George F. Juley, P.E.

GFJ/sh

George F. Juley, P.E., Consulting Engineers

J-1 In Section 2.3.1 of the DEIS (pp. 2-6 and 2-7), the low sulfur coal planned for use in the Salem Harbor Generating Station Units 1, 2, and 3 after conversion is identified and described. On these pages, it is stated that New England Power plans to burn coal with an average sulfur content less than 1.21 pounds of sulfur per million British thermal units (Btu) heat input. The utility plans to achieve this standard by specifying in purchase contracts that the coal will have a minimum heating value of 13,000 Btu/lb and a maximum sulfur content of 1.5 percent. Results of a laboratory analysis of the coal which could be used after conversion are presented in Section 6.6 of this FEIS.

J-2 Information on the coal handling and storage procedures to be followed at the Salem Harbor Generating Station are presented in Sections 2.3.1, 2.3.2, and 2.3.3 of the DEIS (pp. 2-4 through 2-8), with additional information on coal handling provided on pages 2-10 and 2-11. These issues are discussed in this FEIS in Section 2.3. No information presented to date indicates that New England Power's planned procedures for handling coal are other than acceptable engineering practices.

J-3 It is not clear what an acceptable response to this comment would contain.

New England Power

New England Power Company
20 Turnpike Road
Westborough, Massachusetts 01581
Tel. (617) 366-9011

April 9, 1982

Ms. Lynda Nesenholtz
Office of Fuels Programs
Fuels Conversion Division
Economic Regulatory Administration
2000 M Street, N.W., Room 6128 O
Washington, D.C. 20461

Dear Ms. Nesenholtz:

We have reviewed the Department of Energy's (DOE) Draft Environmental Impact Statement (DEIS), Conversion to Coal, New England Power Company, Salem Harbor Generating Station Units No. 1, 2 and 3, Salem, Essex County, Massachusetts, dated February 1982. This document was submitted earlier to the Massachusetts Secretary of Environmental Affairs as a Draft Environmental Impact Report (DEIR) as part of the Massachusetts Environmental Policy Act (MEPA) review process. We submitted our comments to the report on February 22, 1982 and enclose a copy with this letter for your review.

Several commenters in the MEPA review expressed concern over the issue of coal pile lining. In response to those comments, we have prepared a new Section 4.4.2.1, Need for Coal Pile Lining, to be included in the MEPA Final EIR beginning at Page 4-50. A copy of this material is also attached for your review.

We have responded to other comments received through the MEPA process and we offer to assist DOE in responding to comments received on the Federal Draft EIS.

Very truly yours,

Andrew H. Aitken
Director of Environmental Affairs

AHA:gv

Enclosures

57

NEP-1

New England Power Company

NEP-1 The information contained in New England Power Company's Section 4.4.2.1 has been analyzed and adapted where appropriate for use in Section 2.3 of this FEIS.

New England Power Company Comments 4/9/82
Draft EIS Conversion to Coal
Salem Harbor Generating Station

SUMMARY

Page iii, First Paragraph

Units No. 1, 2 and 3 have coal handling and firing equipment in place except for the burners on Unit No. 1 which now has oil-only burners that will be replaced as part of the coal conversion project. The existing coal is high ash, but not low grade.

Page iv, First Paragraph

Salem Harbor Units No. 1, 2 and 3 have an indefinite life of 15 or so years.

Page v, Second Paragraph

The Delayed Compliance Order (DCO) for Salem Harbor Station was made final on February 9, 1982. It will remain in force until not later than December 31, 1985, or a period of 46 months from March 1, 1982. The new stack will be approximately 450 feet tall. The 445-ft. reference also appears on Pages viii, 2-18, 4-15, 4-44, 4-57.

Page v, Third Paragraph

The OCA provision permits the utility to establish the cost of oil and coal on a quarterly basis and to reserve two thirds of the cost differential for paying the costs of conversion and taxes.

Page v, Fourth Paragraph

Rewrite the last sentence as follows: When the new precipitators are installed, particulate emissions will be reduced to within State Implementation (SIP) limits.

Page vi, Second Paragraph

Ash will be disposed of at Amesbury and other approved disposal sites.

Page vii, Second Paragraph

PM emissions will increase for up to 46 months.

Rewrite the second sentence as follows: SO_2 emissions will be within allowable limits throughout the entire coal burning period and equivalent to current SO_2 emissions on oil firing.

Page vii, Fourth Paragraph

Add the sentence: However, coal has been stored at the site and adjacent to the site for all but the last few years since the late 1800's with no adverse impact on surface waters or groundwaters.

NEP-2
NEP-3
NEP-4
NEP-5
NEP-6
NEP-7
NEP-8
NEP-9
NEP-10

NEP-2 These two errors of fact have been corrected in Section 2.6 (Errata) of this FEIS.

NEP-3 Information available to the Department of Energy indicates that 15 years is a reasonable estimate of the remaining useful life of generating units that have been converted to coal burning. See also the response to Comment C-1 above.

NEP-4 The Delayed Compliance Order was issued after the DEIS had been submitted for publication. These finalized dates are noted. It is also noted that NEP would prefer "approximately 450 feet" be used instead of 445 feet in describing the proposed height of the stack.

NEP-5 It is noted that recent changes in the Oil Conservation Adjustment (OCA) procedures now permit NEP to establish costs of oil and coal on a quarterly basis. It is also noted that, of the two-thirds of the cost differential retained by NEP, about one-half of the funds retained would be used to pay taxes. See also NEP Comments NEP-101 through NEP-106.

NEP-6 This comment is reflected in the Errata listing (Section 2.6).

NEP-7 NEP's current plans for ash disposal are detailed in Section 2.2.2 of this FEIS.

NEP-8 This change is reflected in the Errata listing (Section 2.6).

NEP-9 This information is acknowledged.

NEP-10 This judgment is acknowledged; the topic is addressed elsewhere in this FEIS (Section 2.3).

Page vii, Fifth Paragraph

Rewrite the last sentence as follows: Landfill capacity will be preempted from other uses unless ash is used for intermediate cover material as allowed by Massachusetts law, (Chapter 111, Section 150A). NEP-11

Page viii, Third Paragraph

Remove unresolved issue #2 because the coal pile will not be lined. In spite of the long history of coal storage at the site, a study of Salem Harbor by the Massachusetts Division of Marine Fisheries from 1971 to 1976, which included samples and analysis of 14 benthos stations, showed no adverse impact on benthic species diversity or abundance. NEP-12

CHAPTER 1.0 - PURPOSE OF AND NEED FOR ACTION

Pages 1-2, Last Paragraph

The Station is owned by New England Power Company (NEP), a subsidiary of New England Electric System (NEES), a public utility holding company. NEP-13

Pages 1-10, Second Paragraph

The net generating capacities of Salem Harbor Units No. 1, 2, 3 and 4 are 81, 81, 148 and 444 MW, respectively, for a total of 754 MW. NEP-14

Pages 1-10, Last Paragraph

Fuel oil burned at Salem Harbor has a sulfur content of not greater than 2.2 percent which gives SO_2 emissions of not greater than 2.42 lbs./MMBtu. Storage capacity on-site is approximately 1.6 million barrels. Coal/oil mixture is no longer stored at the Station. NEP-15

Pages 1-13, Second Paragraph

Existing coal is high ash, but not low grade. NEP-16

Pages 1-13, Fifth Paragraph

Cooling water is chlorinated daily when the intake temperature is above 40°F, which is roughly April through December. NEP-17

Pages 1-17, First Paragraph

The Department of Environmental Quality Engineering (DEQE) will be preempted from enforcing only TSP emission limits during the DCO period. NEP-18

Pages 1-18 through 1-21, Table 1.6-1

Waste Disposal

Ocean dumping permits will be required only if dredge material or coal ash are to be dumped at sea which is unlikely. NEP-19

RCRA and State permits for treatment, storage and disposal of hazardous wastes will not be required for coal conversion. Ash is temporarily exempt from Federal hazardous waste criteria, and Massachusetts law (Section 150A of Chapter 111) treats ash as a non-waste when it is reused or stored for reuse. NEP-20

NEP-11 This topic is addressed elsewhere in this FEIS (Section 2.2.2).

NEP-12 These issues are addressed in Sections 2.3.2 and 2.3.3.

NEP-13 The ownership status is corrected in the Errata listing (Section 2.6). The replacement of the abbreviation NEPCO with the term NEP is noted at the beginning of this FEIS.

NEP-14 These facts are noted in the Errata listing (Section 2.6).

NEP-15 This information is acknowledged.

NEP-16 This change is reflected in the Errata listing (Section 2.6).

NEP-17 This information is acknowledged; the issue is addressed in Section 2.2.1.

NEP-18 This clorification is acknowledged. TSP is the only emission limit affected by the DCO.

NEP-19 This information is acknowledged.

NEP-20 This information is acknowledged. Although this comment accurately states the State law on waste disposal, ash from Salem Harbor may be sent to disposal rather than reused or stored for reuse. In that case, the ash would not be excepted from compliance with the State law. It should also be noted that 40 CFR 261.4(b)(4) exempts ash temporarily from Federal hazardous waste criteria. The issue is discussed in Section 2.2.2 of this FEIS.

Transportation

Federal Section 10 and Section 404, and Massachusetts Division of Waterways permits will be needed only if dredging in the existing berth and channel is required.

CHAPTER 2.0 - ALTERNATIVES

Page 2-2, Second Paragraph

Rewrite first sentence as follows: Under this option, the plant would continue to burn residual fuel over its remaining life. Delete the second sentence.

Present oil and coal prices are $24.50 per bbl. and $69 per ton. Rewrite beginning at third sentence as follows: It would, however, require the use of about 30 MMB of oil over the next 10 years. At the present price of $24.50 per barrel, this represents an expenditure of about $735 million in 1982 dollars. Coal of the type to be burned costs about $69 per ton or $476 million for the 10-year period.

Pages 2-3, Third Paragraph

Early retirement would require NEP to eventually provide substitution for 310 MW.

Pages 2-4, First Paragraph

With OCA, savings are shared between financing the conversion and the consumer.

Pages 2-2, Last Paragraph

NEP plans to store 190,000 tons of coal at the site.

Pages 2-6, Third Paragraph

Coal will be carried by existing covered conveyors to the powerhouse.

Pages 2-6, Fourth Paragraph

Change second sentence to read: One or more of the service tanks, etc.

Pages 2-6, Fifth Paragraph

The coal used will have an average sulfur content of 1.21 lbs./MMBtu or less.

Pages 2-7, First Paragraph

Rewrite second sentence as follows: Coal shipped to Brayton Point during 1980 and 1981 contained sulfur and ash levels of 1.15 percent and 8 percent, respectively, which were well below the design specifications.

Particulate emissions will be reduced to no greater than 0.12 lb./MMBtu. Ash in dry form will be stored and handled in enclosed silos and covered trucks, etc.

NEP-21 NEP-22 NEP-23 NEP-24 NEP-25 NEP-26 NEP-27 NEP-28 NEP-29 NEP-30 NEP-31 NEP-32

NEP-21 This information is acknowledged.

NEP-22 The question of generating unit retirement is addressed in the response to comment C-1 above.

NEP-23 These changes in prices are acknowledged. The information in the revised Table 4.2-9, presented above in response to comment CLF-5, reflects these changes. It is noted that these figures provided by NEP are on the extreme limits of the price range and may not be representative of subsequent time periods.

NEP-24 This correction is noted in the Errata listing (Section 2.6).

NEP-25 This clarification is acknowledged.

NEP-26 This correction is noted in the Errata listing (Section 2.6).

NEP-27 This clarification is noted.

NEP-28 This additional information is noted in the Errata listing (Section 2.6).

NEP-29 This clarification is noted in the Errata listing (Section 2.6).

NEP-30 The restatement is noted.

NEP-31 This clarification is noted.

NEP-32 This clarification is noted in the Errata listing (Section 2.6).

Pages 2-8, Third Paragraph

Coal will be shipped to ports at Lamberts Point, Virginia, via the Norfolk and Western Railroad, Curtis Bay in Baltimore, Maryland, via the Baltimore and Ohio Railroad, Canton Pier in Baltimore, Maryland, via Conrail and Newport News, Virginia, via the Chesapeake and Ohio Railroad.

NEP will use its self-unloading collier, when available, and other vessels or barges to transport coal. Prior to 1983, barges and other colliers will deliver coal to Salem Harbor Station.

Pages 2-8, Last Paragraph

Some dredging in the berth or channel may be required, so delete the last sentence.

Pages 2-10, Third Paragraph

New precipitators will be operational within 43-46 months of initial coal burn.

Pages 2-10, Last Paragraph

Fugitive dust will be controlled from active portions of the coal pile with the existing system of spray towers; no upgrading is anticipated.

Pages 2-11, First Paragraph

Coal conveyors are currently housed or enclosed to control the escape of dust.

Pages 2-12, First Paragraph

Provisions for accoustical silencers will be installed in the duct work. Each of the new precipitators will use rapping devices which will be provided with sound-deadening enclosures if necessary where rappers are exposed at the top of the precipitators. Each of the new precipitator hopper areas will be enclosed to reduce both noise and fugitive emissions.

Pages 2-12, Third Paragraph

New sources of wastewater will include an increased solids content in equipment and truck washwater. Boiler seal water will be diverted to the bottom ash system, rather than the wastewater treatment system. The coal pile runoff trench will be paved, rather than concrete.

Pages 2-13, First Paragraph

Rewrite last sentence as follows: Ash sluicewater discharge from the coal-fired units will reduce substantially during the DCO period, etc.

Pages 2-13, Second Paragraph

Add to the last sentence: An amount equivalent to ash generated during the 1950's and 1960's.

Pages 2-13, Third Paragraph

The dry fly ash system will not necessarily be continuous, so delete that word.

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NEP-37
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NEP-41
NEP-42
NEP-43

NEP-33 This information is noted.

NEP-34 These clarifications are noted.

NEP-35 This deletion is noted in the Errata listing (Section 2.6). See also response to Comment P-2.

NEP-36 This change is noted in the Errata listing (Section 2.6).

NEP-37 This statement is noted; the issue is addressed in Section 6.5.

NEP-38 This change is noted in the Errata listing (Section 2.6).

NEP-39 These changes and clarifications are noted in the Errata listing (Section 2.6).

NEP-40 This clarification is noted in the Errata listing (Section 2.6).

NEP-41 This clarification is noted in the Errata listing (Section 2.6).

NEP-42 This information is acknowledged.

NEP-43 This deletion is noted in the Errata listing (Section 2.6).

Pages 2-14, First Paragraph

During the first 30 weeks of the DCO, the settling basins will be operated in series with more or less continuous dredging of ash. The ash will be windrowed on land for partial dewatering prior to offsite disposal.

Page 2-14, Last Paragraph

Transporting of ash will require eight to ten round trips each week day.

Page 2-15, Sixth Paragraph

There will not be a measurable increase of suspended solids in the water volume during construction because TSS in construction area runoff will be controlled.

Page 2-15, Last Paragraph

The peak construction labor force will be in the range of 350 persons. This comment also applies to Page 4-7.

Page 2-16, Third Paragraph

Add the sentence: A fugitive emission control program will be implemented as part of the DCO.

Page 2-16, Last Paragraph

In the third sentence, delete the words by approximately 20 percent.

Page 2-17, Third Paragraph

Add the sentence: By contrast, once the self-unloading collier is in service, coal spills are far less likely than oil spills with current exposure.

Page 2-19, First Paragraph

Coal pile runoff will be collected in a paved channel. Delete the second and third sentences because there is no need, nor any plans to line the coal pile.

Page 2-19, Third Paragraph

Delete the last sentence since there are no plans to dispose of coal ash at sea.

Page 2-19, Fourth Paragraph

Add the sentence: The estimated eight to ten trucks per day carrying ash is a small percentage of the present truck traffic in the area.

Page 2-23, Last Paragraph

Add the sentence: Wood transportation would substantially increase truck traffic to the Station.

Page 2-26, Third Paragraph

Add to the last sentence: and would result in a more expensive and less operable system.

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NEP-45
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NEP-54
NEP-55

NEP-44 This change is noted in the Errata listing (Section 2.6).

NEP-45 This correction is noted in the Errata listing (Section 2.6).

NEP-46 This judgment is acknowledged; however, some modest increase in TSP in the water column is likely to be unavoidable.

NEP-47 These corrections are noted in the Errata listing (Section 2.6).

NEP-48 This information is noted. The emission control program is described in Section 6.5.

NEP-49 This deletion is noted.

NEP-50 This statement is noted.

NEP-51 The change from "concrete" to paved has been noted above (response to comment NEP-40). The issue of lining the coal pile is addressed in Section 2.3.2 of this FEIS.

NEP-52 This statement is noted. The response to comment CLF-3 above addresses this issue.

NEP-53 This statement is noted.

NEP-54 This statement is noted.

NEP-55 This statement is noted.

Page 2-26, Fourth Paragraph

The NPDES permit limits the present wastewater treatment system to a capacity of 3.5 MGD.

Page 2-27, First Paragraph

The expected rate of ash generated after the DCO period is 75,000 tons per year.

Page 2-27, Last Paragraph

The annual production of fly ash at Brayton Point is approximately 225,000 tons.

Page 2-28, Second Paragraph

Ocean disposal, while an option on an emergency basis, is not a likely means of ash disposal.

Page 2-28, Third Paragraph

The exhausted section of quarry has an estimated capacity of five years.

Page 2-29, First Paragraph

Disposal areas presently available and fully licensed are shown on Figure 2.4-1. If ash is used as intermediate cover material at the Amesbury site as provided by law, there would be no increase in the rate of waste disposal.

Page 2-29, Second Paragraph

NEP has been able to reuse 100% of the ash from Brayton Point through 1981.

Page 2-33, Third Paragraph

Voluntary conversion would proceed at the same rate as under the issuance of a prohibition order because of site limitations, so delete the fourth sentence.

Page 3-19, Second Paragraph

Delete everything after the sentence: A summary of the highest SO_2 concentrations recorded at these monitors is contained in Table 3.3-4. Running averages as discussed in this section have no basis for comparison with standards.

Page 3-22, Table 3.3-3

Jacob Avenue should read Jacobs Avenue. This comment also applies to Pages 3-23 & 3-24.

Page 3-23, Table 3.3-4

The source reference should be NEP, 1981c, rather than NEP, 1980.

Page 3-24, First Paragraph

Rewrite the first sentence as follows: With the exception of Green Street (Marblehead), SO_2 concentrations, the ambient PM and SO_2 data presented in Tables 3.3-3 and 3.3-4 should be fairly representative of background levels, etc.

NEP-56 NEP-57 NEP-58 NEP-59 NEP-60 NEP-61 NEP-62 NEP-63 NEP-64 NEP-65 NEP-66 NEP-67

NEP-56 This clarification is noted in the Errata listing (Section 2.6).

NEP-57 This correction is noted in the Errata listing (Section 2.6).

NEP-58 This correction is noted in the Errata listing (Section 2.6).

NEP-59 This statement is noted; the issue is addressed above in the response to comment CLF-3.

NEP-60 This correction is noted in the Errata listing (Section 2.6).

NEP-61 This information is noted. The issue is addressed in Section 2.2.2 of this FEIS.

NEP-62 This rewording is noted.

NEP-63 This rewording is noted; however, use of coal would be at a later date than if the conversion were undertaken as a result of prohibition orders.

NEP-64 This statement is noted.

NEP-65 These corrections are noted in the Errata listing (Section 2.6).

NEP-66 This correction is noted in the Errata listing (Section 2.6).

NEP-67 This statement is noted; the issue is addressed in Responses E-1 through E-4.

Page 3-24, Second Paragraph

Rewrite the sixth sentence as follows: Each of those two monitors is situated in the vicinity of a local industrial facility and it is possible that observations of each monitor are heavily influenced by operation of the nearby facility. NEP-68

Page 3-25, First Paragraph

Rewrite the last sentence as follows: Inasmuch as these relatively high observations are probably influenced by Salem Harbor Station, they are not representative of typical background concentrations in the area and should be used with care. NEP-69

Page 3-26, Table 3.3-5

Delete the source reference, NEP, 1980. NEP-70

Page 3-30, Third Paragraph

Coal conversion will necessarily involve changes in air pollution regulations applicable to the Station. NEP-71

Page 3-30, Last Paragraph

Rewrite as follows: On February 9, 1982, the Environmental Protection Agency (EPA) published a final DCO (47 FR 5896) for NEP's Salem Harbor Generating Station. Specific emission limits that will apply to the Salem Harbor Station during these two periods are discuased below. NEP-72

Page 3-31, First Paragraph

The DCO period will extend for 44-47 months from date of authorization. The period during which the PM emissions are limited to 0.60 lbs./MMBtu will last for six months of burning new coal. Thereafter, for the remainder of the DCO period (approximately 38 months), the limit on PM emissions will be 0.45 lb./MMBtu. NEP-73

Page 3-31, Last Paragraph

The word practicable is misspelled. NEP-74

Page 3-32, Last Paragraph

Rewrite second sentence as follows: Inasmuch as there will not be an increase in allowable emissions associated with the conversion to coal, PSD increments for SO_2 will not be consumed. NEP-75

CHAPTER 4.0 - ENVIRONMENTAL CONSEQUENCES

Page 4-3, Second Paragraph

Phase II of the coal conversion project will be completed in 43-46 months after initial coal burn. NEP-76

Page 4-3, Third Paragraph

Add the sentence: The dates shown may be modified somewhat as the coal conversion project proceeds, but in no case will the final completion date extend beyond December 31, 1985. NEP-77

NEP-68 This rewording is noted.

NEP-69 This restatement is noted; the issue is addressed in Responses E-1 through E-4 of this FEIS.

NEP-70 This correction is noted in the Errata listing (Section 2.6).

NEP-71 This correction is noted in the Errata listing (Section 2.6).

NEP-72 The text of the Delayed Compliance Order is reproduced in this FEIS as Section 6.1.

NEP-73 These changes, as a result of the publication of the DCO, are discussed in Section 2.1.

NEP-74 This correction is noted in the Errata listing (Section 2.6).

NEP-75 This judgment is noted; however, it is not conclusive that SO_2 emissions will not be reduced by the conversion.

NEP-76 This change in the timetable, as a result of DCO publication, is noted.

NEP-77 This statement is noted.

Page 4-3, Fourth Paragraph

Rewrite the first sentence as follows: The conversion schedule presented in Figure 4.1-1 indicates that the Station will begin burning coal in Unit No. 3 within one month after the DCO is received and in Units No. 1 and 2 within four months of receipt of the order.

NEP-78

Page 4-4, Figure 4.1-1

Show start new construction at four months from receipt of DCO.

NEP-79

Page 4-5, Second Paragraph

Delete 43-month from first sentence.

NEP-80

Page 4-9 Third Paragraph

Total discharge from the wastewater treatment system could approach the permit limit of 3.5 MGD. The elevated levels of suspended solids will occur for up to the first 18 months of coal burning.

NEP-81

Page 4-10, First Paragraph

After the first 30 weeks of the DCO period, the total wastewater discharge from all sources will drop to about 1.5 MGD. Delete the second sentence of the paragraph because the TSS of the effluent may not drop to 30 ppm until 18 months as the NPDES permit allows. At the end of the DCO period wastewater discharge from coal ash handling will drop to near zero.

NEP-82

Page 4-10, Second Paragraph

Assuming that one-half the annual precipitation runs off and is collected, a portion of the remainder, about 3.4 million gallons annually, or 9,400 gallons per day, could find its way into the waters of Salem Harbor. Actually, much of the water which doesn't run off will evaporate or be brought into the power plant with the coal. The maximum seepage would be about 0.0002 percent of the tidal exchange.

NEP-83

Page 4-10, Last Paragraph

Delete the reference to the placement of an impermeable liner because it will not be installed. The wastewater treatment system is limited by the NPDES permit to a capacity of 3.5 MGD.

NEP-84

Page 4-12, Second Paragraph

Add the sentence: The DCO requires that NEP submit to EPA prior to the burning of any coal a detailed program for minimizing fugitive particulate emissions from coal and coal ash handling.

NEP-85

Page 4-14, Third Paragraph

Rewrite as follows: During the first 30 weeks of the DCO portion of the coal conversion, both bottom ash and captured fly ash will be sluiced wet to settling ponds on-site. After 30 weeks, a temporary dry fly ash system will be constructed for use during the remainder of the DCO period and only bottom ash will be sluiced to the settling ponds. The ash ponds will be dredged regularly, etc.

NEP-86

NEP-78 This change is noted in the Errata listing (Section 2.6).

NEP-79 This change is noted in the Errata listing (Section 2.6).

NEP-80 This deletion is noted in the Errata listing (Section 2.6).

NEP-81 These corrections are noted in the Errata listing (Section 2.6).

NEP-82 These changes are noted; the issue is addressed in Section 2.2.1 of this FEIS.

NEP-83 This information is noted; the issue is addressed in Section 2.3.2 of this FEIS.

NEP-84 The issue of the coal pile lining is addressed in Section 2.3.2 of this FEIS. The wastewater plant capacity is limited by permit conditions to 3.5 mgd.

NEP-85 This information is noted. The DCO text is reproduced as Section 6.1 of this FEIS; the details on the control program are described in Section 6.5.

NEP-86 This change is noted.

Page 4-16, Last Paragraph

Additionally, NEP has approximately 70,000 tons of high ash (17%) coal on site some of which it will burn to make room for new cleaner coal.

The DCO will restrict the burning of old coal, etc.

Delete the sentence: No new coal will be burned during the 2-month period.

EPA's final DCO (47 FR 5897, February 9, 1982) will also limit PM emissions to 0.45 lb./MMBtu effective eight months from initial old coal burning (six months after burning of new coal) for the duration of the DCO.

Page 4-23, Table 4.2-2

In the table under the columns headed: Coal-oil mixture, high sulfur coal plus SO_2 scrubbing, and coal conversion with RDF supplement, delete the reference to DCO-2 and DCO-3 for PM emissions. NEP has not proposed these alternatives for the DCO period.

Correct DCO-3 period to reflect final DCO conditions of 0.45 lb. particulate per MMBtu effective eight months after initial coal burning.

Page 4-24, Third Paragraph

Rewrite as follows: The approach used in the analysis to assess the impact on ambient air quality was to use the predicted impact of plant itself, the predicated impact of other major sources in the area, and the results of ambient monitoring in the area. Delete the remainder of this paragraph because interactive modeling was performed.

Page 4-24, Fourth Paragraph

Rewrite the third sentence as follows: In order to meet these requirements, NEP has performed extensive atmospheric dispersion modeling analyses for particulate matter in order to assess the effects of the proposed coal conversion on these pollutants, and submitted these analyses to EPA Region I on June 3, 1981.

The correct reference for NEP's original modeling analysis is (NEP, 1981c).

Page 4-25, Paragraph 2 through 4-27, Paragraph 2

Delete all material beginning with the third sentence, Page 4-25, paragraph 2, through Page 4-27, Paragraph 2, including Table 4.2-3, and replace with the following discussion.

One of the requirements for a DCO is that the applicant demonstrate that the burning of coal would not result in emissions which cause or contribute to ambient concentrations which would violate national primary ambient air quality standards (for the pollutant for which the DCO was sought).

In its DCO application (NEP, 1981b), particulate emission limits of 0.77 lb./MMBtu for Units No. 1 and 2, and 0.85 lb./MMBtu were requested. NEP further agreed to limit the generation of Units No. 1 and 2 to 76 MW, with corresponding emission limits of 0.67 lb./MMBtu for each unit, when all three units were burning coal simultaneously. For the brief period when old coal was being burned, NEP agreed to use old coal in only Unit No. 2 or Unit No. 3, and to restrict generation to 64 MW or 100 MW, respectively; these load levels corresponded to an emission rate of 1.0 lb./MMBtu. NEP further evaluated background PM levels (based on monitored data) and the impact of local major sources.

NEP-87

NEP-88

NEP-89

NEP-90

NEP-91

NEP-92

NEP-93

NEP-87 These changes, resulting from the DCO, are noted and are addressed in Section 2.1.

NEP-88 Although NEP has not proposed these alternatives for the DCO period, they were included in Table 4.2-2 to ensure full consideration of available alternatives.

NEP-89 This change, resulting from the DCO, is noted and is addressed in Section 2.1.

NEP-90 This change is noted.

NEP-91 The additional modeling analyses performed by NEP and submitted on June 3, 1981, as an amendment to the DCO application are acknowledged.

NEP-92 This correction is noted in the Errata listing (Section 2.6).

NEP-93 EPA issued the Final DCO for Salem Harbor (47 FR 5893, February 9, 1982) subsequent to NEP's comment. The terms of NEP's original DCO proposal are not now relevant to the FEIS.

NEP concluded, and EPA agreed, in the proposed DCO, that the above emissions limits would not cause or contribute to violations of the primary NAAQS for PM. The highest second-high total PM concentration for the five meteorological years modeled was 259 ug/m^3, composed of a Station impact of 177 ug/m^3, and a background concentration of 82 ug/m^3. The highest annual total PM concentration was 74 ug/m^3, composed of a Station impact of 23 ug/m^3 and a background concentration of 51 ug/m^3.

The final DCO issued by EPA requires emission limits for new coal of 0.60 lb./MMBtu initially and 0.45 lb./MMBtu ultimately. These limits are substantially lower than the ones proposed by NEP and, therefore, should provide substantial additional protection of the primary NAAQS for particulates.

Page 4-28, Last Paragraph

Salem Harbor coal will be similar to that burned at Brayton Point. Delete the parenthetical expression because the coal will not necessarily be from the same mine. NEP-94

Page 4-29, First Paragraph

Actual average sulfur (and hence SO_2) emissions from coal burning units of Salem Harbor can be expected to be less than would be observed under the present oil-burning configuration. NEP-95

Page 4-29, Last Paragraph

Rewrite second sentence as follows: NEP has agreed with DEQE to reduce SO_2 emissions by switching to a lower sulfur fuel and/or taking one or more units off-line during periods when high ambient SO_2 concentrations are observed in the area. NEP-96

Begin the fourth sentence with the words, Emission reduction will occur, etc.

Modify the seventh sentence as follows:...NEP will reduce SO_2 emissions by switching to 1% sulfur oil and/or taking units off-line.

Rewrite the last two sentences as follows: If either of the two outlying monitors indicates that such a condition exists, NEP will also switch Unit No. 4 to low sulfur oil. NEP has indicated that such actions can occur in less than 3 hours.

Page 4-33, Last Paragraph

Rewrite the last part of the paragraph as follows: The 1980 highest second-highest observations are shown in the table, but were not used in the calculation since these observations already include a significant impact by Salem Harbor Station. Delete the remainder of the paragraph. NEP-97

NEP-94 This clarification is noted; however, the coals are expected similar as they will be purchased according to the same specif

NEP-95 This clarification is noted. While experience to date hc reduction of 20-25 percent in sulfur emissions at Brayt specific levels of reduction cannot be predicted in advance Harbor. A reduction of the same magnitude is expected, howe

NEP-96 This clarification is noted; the agreement with DEQE is to r emissions. This may be accomplished in several ways, switching to lower sulfur fuel or by taking units off line.

NEP-97 This change is noted. The issue is addressed in Section 2.1 of t

Page 4-45, Last Paragraph

Two types of noise mitigation techniques are proposed by NEP to ensure that noise levels following coal conversion are no higher than at present. Delete the sentence which refers to accoustical silencers in the duct work. Precipitators will be provided with sound deadening enclosures, where necessary, for the rappers. NEP-98

Page 4-46, First Paragraph

The new precipitator hopper areas will be enclosed. NEP-99

Page 4-46, Fourth Paragraph

NEP projects that it will use 8-10 30-ton 18 wheel, covered trailer dump trucks to transport ash. Delete the reference to ash density (1 ton/yd.^{3}) because this is not correct for dry ash. NEP-100

Page 4-49 through 4-54, Section 4.2.7.1, Cost of Conversion

This section is now out of date and inaccurate because tax laws have changed, the Massachusetts Department of Public Utilities has modified the Oil Conservation Adjustment (OCA) procedures and the project did not begin in June 1981 as originally projected. Revised figures are not now available to modify the text. NEP-101

Rewrite this section as follows: NEP has proposed that the costs of conversion be financed as they occur through the use of an OCA, rather than through long-term debt and equity funds.

It is estimated that the capital cost of converting Salem Harbor Units No 1, 2 and 3 will be about $100 million. This estimate is preliminary in nature since the facility has not undergone detailed engineering design.

Page 4-54, Second Paragraph

Rewrite second sentence as follows: NEP has received FERC permission to use the OCA.

Rewrite the last two sentences as follows: The revenues generated through the use of the OCA would be distributed as follows - one-third to the utility to pay capital and O&M costs at the facility, one-third to the government to pay taxes on the revenue based on current IRS requirements, and one-third to the consumer. The revenues generated by the OCA and accruing to the customer could vary depending on the ratio of costs of oil consumption to the costs of coal consumption. NEP-102

Page 4-54, Third Paragraph

Rewrite as follows: Once the conveaion costs have been recovered, the full saving from burning coal would go to the customer. The period of time for OCA to recover conversion costs could vary depending on the coal-oil price differential. Based on estimates NEP prepared as part of its filing with FERC to obtain approval of the OCA, the conversion costs would be recovered in a period of from 4 to 14 years. NEP-103

Page 4-54, Third Paragraph

Delete the word, possible in the first bullet.

Rewrite third bullet as follows: To the extent collected through the OCA mechanism, etc. NEP-104

NEP-98 These clarifications are noted.

NEP-99 This clarification is noted.

NEP-100 This information is noted. NEP projections are f than used for the DEIS.

NEP-101 These changes in the applicable laws and regulat result, information presented in the DEIS is supers in NEP comments NEP-101 through NEP-106.

NEP-102 through 106 This information is noted. See NEP-101, above.

Page 4-55, Second Paragraph

Rewrite the first three sentences as follows: Shown on Table 4.2-9 are the estimated fuel adjustment factors for the period March 1, 1982 through June 30, 1982. The first column illustrates the coal-oil savings portion of the adjustment factor if fuel benefits of the coal burn were passed through. The second column illustrates the coal-oil saving portion of the adjustment factor for the OCA charge. NEP-105

Page 4-56, Table 4.2-9

Revise as follows: NEP-106

Month	Coal-Oil Savings Adjustment Factor Full Flow Through ($/kWh)	Coal-Oil Savings Adjustment Factor for OCA Charge ($/kWh)
March 1982	0.0046127	0.0030751
April	0.0070734	0.0042157
May	0.0030852	0.0020568
June	0.0081678	0.0054452

Source: NEP 1982

Page R-4, Second NEP Reference NEP-107

Add to this reference:, and as amended June 3, 1981.

General NEP-108

NEP is prohibited by law from using the abbreviation NEPCo. Wherever that abbreviation is used in the report, change it to NEP.

NEP-107 This correction is noted in the Errata listing (Section 2.6).

NEP-108 This clarification is noted. The abbreviation NEP has been used for New England Power Company in this FEIS.

4.0 LIST OF PREPARERS

U.S. DEPARTMENT OF ENERGY
ECONOMIC REGULATORY ADMINISTRATION
OFFICE OF FUELS PROGRAMS
FUELS CONVERSION DIVISION

Name	Education	Expertise	Contribution to EIS
Steven E. Ferguson	B.S./M.E., J.D.	Chief of Environmental Branch, DOE Program Manager; direction and management of environmental evaluation of conversions	Director of DOE environmental staff and environmental contractor
Lynda H. Nesenholtz	B.J./J.D.	Section Chief, Environmental Branch	Salem Harbor Project Director

DAMES & MOORE, CONSULTING ENGINEERS, WASHINGTON, D.C.
PRIME CONTRACTOR TO DOE

Name	Education	Expertise	Contribution to EIS
Ronald E. Kear	B.S., P.E.	Dames & Moore Partner; management of multidiscipline environmental studies	Program Director
John C. Kittridge	M.S., P.E.	Environmental engineering, project management	Project Manager
Stephanie F. Morrow	M.R.P.	Planning, land use, socioeconomics; report coordination	Assistant Project Manager, Community Resources
Leonard Breitstein	Ph.D	Energy and environmental systems	Plant Engineering and Alternatives Definition
George C. Howroyd	Ph.D	Air quality, ambient air monitoring, dispersion modeling	Air Quality
William M. Levitan	M.S.	Aquatic ecology	Ecology
Carey A. Sumner	B.S.	Environmental science, water resources	Water Resources

5.0 COORDINATION LIST

The following Federal, State, and local agencies, public officials, organizations, and interest groups have been requested to comment on this impact statement.

FEDERAL AGENCIES

Environmental Protection Agency
Department of Interior
Department of Commerce
Department of State
Department of Agriculture
Department of Defense
Department of the Army
Department of Housing and Urban Development
Department of Justice
Department of Labor
Department of Health and Human Services
Department of Transportation
Federal Energy Regulatory Commission
Occupational Safety and Health Administration
Office of Management and Budget
Nuclear Regulatory Commission
Department of Energy
National Science Foundation
Advisory Council on Historic Preservation

STATE AGENCIES

Massachusetts Department of Environmental Quality Engineering
Massachusetts Executive Office of Environmental Affairs
Massachusetts Office of Energy Resources
Massachusetts Department of Environmental Management
Massachusetts Department of Public Utilities
Connecticut Department of Environmental Protection

In addition, the Governor of Massachusetts, the State A-95 Clearinghouse, and elected officials at the Federal, State, and local levels were included in the Draft EIS distribution.

Private citizens, local and regional agencies and organizations, and all others who requested copies of the EIS were also included in the Draft EIS distribution.

6.0 SUPPLEMENTAL INFORMATION

6.1 STATE AND FEDERAL ADMINISTRATIVE ENFORCEMENT OF IMPLEMENTATION PLAN REQUIREMENTS AFTER STATUTORY DEADLINES; DELAYED COMPLIANCE ORDER FOR NEW ENGLAND POWER COMPANY'S SALEM HARBOR GENERATING STATION (FEDERAL REGISTER VOL. 47, NO. 27; TUESDAY, FEBRUARY 9, 1982)

The following Federal Register entry was provided by EPA Region I as Attachment I to their letter of April 9, 1982, which transmitted EPA's comments on the Draft EIS.

40 CFR Part 55

[A-1-FRL-2026-4]

State and Federal Administrative Enforcement of Implementation Plan Requirements After Statutory Deadlines; Delayed Compliance Order for New England Power Company's Salem Harbor Generating Station

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) announces the issuance of an administrative order called a Delayed Compliance Order (DCO) to New England Power Company (NEPCO), allowing generating units 1, 2, and 3 of its Salem Harbor Generating Station, located in Salem, Massachusetts to convert from burning oil to burning coal. The increased particulate emissions caused by coal burning will mean that NEPCO will be unable to comply with certain provisions of the Massachusetts

State Implementation Plan (SIP) until December 31, 1985. Between now and December 31, 1985, NEPCO will be allowed to burn coal despite this noncompliance. During this interim period, however, NEPCO must install the pollution control equipment necessary to achieve final compliance with the Masssachusetts SIP. This DCO sets forth a compliance schedule, emissions limitations, and other requirements of Section 113(d)(5) of the Clean Air Act.

EFFECTIVE DATE: February 9, 1982.

ADDRESSES: Copies of all comments received and EPA's responses to these comments are available for public inspection during normal business hours at the Environmental Protection Agency, Region I, JFK Federal Building, Room 1903, Boston, Massachusetts; and at the Salem Planning Department, One Salem Green, Church Street, Salem, Massachusetts. All reports required under the DCO also will be available for public inspection at EPA Region I.

FOR FURTHER INFORMATION CONTACT: Brian Hennessey at the U.S. Environmental Protection Agency, Region I, JFK Federal Building, Room 1903, Boston, Massachusetts 02203 or telephone (617) 223-4448.

SUPPLEMENTARY INFORMATION: On April 15, 1981, NEPCO requested a DCO under Section 113(d)(5) of the Clean Air Act, 42 U.S.C. 7413(d)(5), to enable it to burn coal in generating units 1, 2, and 3 of its Salem Harbor plant in Salem, Massachusetts. These units have a net power output generating capacity of approximately 81, 81, and 148 megawatts respectively when burning coal. NEPCO proposed an immediate conversion from oil to coal burning and stated that this would cause temporary noncompliance at Salem Harbor with the following regulations contained in the EPA-approved Massachusetts SIP:

310 CMR 7.02(8)—limiting particulate emissions to 0.12 pounds per million Btu heat input;

310 CMR 7.05(4)—limiting the ash content of fossil fuels to 9% dry weight (interpreted by the state as measured on a cargo received basis); and

310 CMR 7.06(1)—limiting visible emissions to 20 percent opacity, except up to 40 percent for no more than 6 minutes in any hour.

On July 31, 1981, EPA proposed (46 FR 39175) to issue a DCO to NEPCO, deferring the particulate and VE emission requirements for 43 months after initial burning of coal (or December 31, 1985, whichever is earlier), and the ash content regulation for two months after initial burning of coal (or July 31, 1982, whichever is earlier). EPA's proposal also contained interim pollution control requirements and emission limitations, as well as emissions, ambient air monitoring and reporting requirements. These requirements, as well as EPA's findings on Salem Harbor's eligibility for a DCO, are explained in detail in EPA's proposed rulemaking notice and will not be repeated here.

The comment period on EPA's proposal ran from July 31 to September 24, 1981. A public hearing was held in Salem, Massachusetts on September 2, 1981. Forty-two people testified at the public hearing and/or submitted written comments during the comment period. Of these forty-two commenters, five opposed the proposed DCO, five were neutral, twenty-six favored the proposed DCO, and six favored the DCO but also expressed other concerns. As previously stated, EPA's responses to all the comments submitted are contained in documents which are available for public inspection. Only those comments which address questions posed in EPA's proposed rulemaking notice or which have resulted in substantive changes in EPA's proposal will be discussed in today's notice.

1. *Best Practicable System of Emission Reduction (BPSER)*—NEPCO's original request contained commitments to implement certain upgrading measures and maintenance procedures on the existing electrostatic precipitators (ESPs), coal handling equipment and ash removal system, as well as to evaluate the effectiveness of flue gas conditioning (FGC) on one unit for possible application on all units. NEPCO predicted that these measures would result in emission rates varying from 0.67 to 0.85 pounds per million Btu heat input.

EPA's proposal specified a BPSER emission rate of 0.60 pounds per million Btu heat input for the first four months of burning conforming ash ("new") coal, and a rate thereafter of 0.35 pounds per million Btu heat input. These emission rates were based on projected emissions resulting principally from restoring the ESPs to design condition, installing and operating FGC systems, and installing additional transformer-rectifier (T-R) sets on all three units. However, EPA's proposal did not require the installation and operation of specific controls; rather, EPA proposed to allow NEPCO to select controls to meet the BPSER emission rates, and to submit their selection to EPA for approval prior to coal burning.

One commenter opposed EPA's proposed limits as being too lenient, especially with respect to fine particulates. Another commenter requested that EPA either specify the installation and operation of FGC systems and T-R sets in the Order, or release NEPCO's plan for 30 day public comment prior to any EPA action on the plan. A third commenter, NEPCO, opposed EPA's BPSER limits as being too stringent. During the comment period, NEPCO presented additional data pertaining to the effectiveness of the existing ESPs for controlling particulate emissions resulting from burning the quality coal intended for use at Salem Harbor. NEPCO did not revise its particulate emission estimates. Based on this new information, EPA has revised its estimate of BPSER emission rates of 0.60 and 0.35 pounds per million Btu. Therefore, the emission rates required by the order are 0.60 and 0.45 pounds per million Btu heat input. EPA believes this revision to the proposed limits is reasonable given the uncertainties inherent in this type of engineering estimate of predicting the efficiency of restored ESPs and in estimating the emission benefits of the modifications NEPCO will make to the ESPs.

NEPCO also presented new proposals for BPSER which included installation of FGC on all units, ESP resectionalization, additional upgrading measures on the existing ESPs, performance of ESP gas flow distribution tests, installation of a dry flyash hopper evacuation system, and installation of four new T-R sets with provision for additional T-R installations if FGS proves to be effective. These proposals correspond closely to the control equipment selection upon which EPA based its proposed BPSER emission rates. However, as previously stated, NEPCO did not predict an improvement in particulate control from implementation of these measures: NEPCO prefers to establish a final particulate emission limit after each unit is tested.

Upon consideration of public comment and review of NEPCO's new BPSER proposals, EPA has concluded that the new proposals should be incorporated in the Order. EPA continues to believe that the emission rates contained in the Order are achievable, but that NEPCO is the best judge of the most cost-effective way to achieve these rates. EPA has, therefore, accepted NEPCO's revised plan as described above with two minor modifications. In its revised plan, NEPCO agreed to install FGC systems on all three units. FGC systems from several vendors are available for use at Salem Harbor; FGC effectiveness may vary among the units and systems used. In order to ensure that installation of

FGC has a maximum effect on reducing emissions, EPA is requiring NEPCO to experiment with FGC systems from two vendors and to select, install and operate the more effective system within 6 months of coal burning. In its revised BPSER plan, NEPCO also agreed to perform gas flow distribution tests on two units. The Order requires NEPCO to implement improvements if the tests show that gas flow distribution significantly decreases ESP effectiveness.

2. *Plantwide Emissions Cap or "Bubble"*—EPA's proposal solicited comments on NEPCO's request that EPA impose a total plantwide emission rate as an alternative to specific emission rates for each unit. EPA's proposal further solicited comments on NEPCO's request that such plantwide emission rates be specified in terms of weight of particulates per unit time, and on how such a plantwide emissions cap could be enforced. In addition to NEPCO, four commenters addressed these questions. Two of these commenters supported the concept of a plantwide emissions cap and two opposed it.

NEPCO's comments suggested that EPA implement the plantwide emissions cap by first determining an emission rate in pounds per million Btu's for each unit, then coverting each emission rate to a pounds per hour emission rate assuming full load operation, and finally summing the pounds per hour emission rates for the three units to determine a single pounds per hour plantwide emission rate.

NEPCO suggested that EPA enforce the plantwide emissions cap by first requiring stack tests to determine emission rates as a function of various loads for each unit, next requiring NEPCO to plot graphs of emission rates (expressed in pounds per hour) versus power output (expressed in megawatts) for each unit, then requiring NEPCO to operate the plant such that the sum of the emissions from all units at any given time is less than the plantwide emissions cap, and finally requiring NEPCO to track and record hourly power output correlated with total emissions.

The effect of the plantwide emissions cap as expressed in terms of pounds per hour is to allow pollution credit for reduced load operation. EPA has determined that a plantwide emissions cap is legally permissible in this case. EPA will consider an emissions cap in this case provided the source installs and operates pollution control equipment which satisfies the requirements in the Act for use of the best practicable system of emission reduction. However, at this time, EPA believes that the Salem Harbor units individually are capable of meeting the emission rates contained in today's Order. Therefore, no final action is being taken today on NEPCO's proposal for a plantwide emissions cap. At a future date, EPA may supplement the Order to include such a cap in the event that any of the units fails to demonstrate compliance with the DCO's final emission rates after NEPCO has made all reasonable efforts to comply. Such data will be available for public inspection at the addresses listed above. Currently, EPA is refining the procedures to implement a plantwide emissions cap.

3. *Primary NAAQS for Sulfur Dioxide (SO_2)*—EPA's proposal discussed the potential for violations of the primary NAAQS for SO_2 during the DCO resulting from plume downwash from the three short stacks presently serving units 1, 2, and 3. EPA believes that if an SO_2 problem does presently exist at Salem Harbor, it will be resolved by the end of the DCO period. The permanent coal conversion includes the replacement of the three short stacks with a single taller stack representing good engineering practice, thus eliminating downwash. However, since at the time of proposing the DCO EPA had not required NEPCO to model SO_2 emissions under the tall stack configuration, EPA had no data that would demonstrate NAAQS attainment. One commenter argued persuasively that the public had a right to such a demonstration. EPA therefore required NEPCO to provide this modeling, which NEPCO submitted on December 2, 1981. EPA has reviewed this submission and has performed additional analyses of its own, and has concluded that Salem Harbor will not cause or contribute to a violation of any NAAQS for SO_2 when the tall stack is completed. This modeling, as well as EPA's review, is also available for public inspection.

Additionally, the Massachusetts Department of Environmental Quality Engineering (DEQE), as a condition of their permit to NEPCO allowing the Salem Harbor Plant to burn fuel with a sulfur content up to 1.21 pounds per million Btu heat release potential, has required NEPCO to maintain a supply of low (1%) sulfur oil on site. The DEQE has further required NEPCO to install a telemetry system within the plant to record the ambient SO_2 levels measured at the monitors around the plant. These monitors are required as part of the DCO. If these monitors measure SO_2 concentrations which approach the NAAQS, the DEQE will required NEPCO to convert one or more of its coal burning units to the low sulfur oil until the elevated levels decrease.

4. *Ash Content in Fuel*—NEPCO requested that EPA delay compliance with the Massachusetts 9% (dry weight) coal ash limitation in order to accommodate NEPCO's current contract for coal which specifies a 10% (as received) ash content. NEPCO's experience with this contract shows that occasionaly the coal it receives exceeds 9% ash by dry weight. NEPCO's submissions however show that most of the contracted coal complies with the state's ash regulation. In discussions with NEPCO, EPA had suggested that NEPCO monitor the ash content of coal shipments before delivery, so that lower ash shipments may be sent to Salem Harbor and higher ash shipments to another NEPCO plant. While monitoring and shipping arrangements to accomplish this may pose problems, NEPCO has not shown that these problems are insurmountable. More importantly, NEPCO has not documented that it cannot obtain coal elsewhere which complies with the state regulation.

NEPCO will be permitted to burn the high ash coal currently on-site, but only for a 60 day period. Due to severe space limitations this on-site coal must be disposed of before complying coal can be stored. All coal burned after this 60 day period must conform to the state regulation.

5. *Miscellaneous Testing and Reporting Requirements*—Based on comments received pertaining to the frequency, nature and timeliness of proposed data reporting requirements, EPA has revised its proposal in the following areas:

(a) increased the number of particulate stack tests,

(b) decreased the number of correlations of stack opacity with observations of visible emissions,

(c) accelerated the operation of the ambient monitoring network,

(d) reduced the sampling frequency of certain TSP monitors,

(e) changed the range of operation of the SO_2 monitors,

(f) added a provision for potential future analysis of TSP filters for fine particulates,

(g) extended the ambient data reporting deadlines,

(h) increased the availability of ambient data records to the public,

(i) extended the time for stack testing and installing opactiy monitors.

In addition, EPA made other minor administrative changes to its proposal. These changes are discussed more fully in EPA's responses to public comments.

Therefore, after considering all comments received, the DCO request by the New England Power Company, EPA's findings, and the written concurrence from the Governor of the Commonwealth of Massachusetts, this Order is hereby issued. In addition, this Order is being made effective February 9, 1982.

(42 U.S.C. 7413(d))

Dated: February 2, 1982.

Anne M. Gorsuch,

Administrator, Environmental Protection Agency.

Before the United States Environmental Protection Agency Region I, John F. Kennedy Federal Building, Boston, MA 02203.

Statutory Authority

This Order is issued under sections 113(d)(5) and 114 of the Clean Air Act [the Act], as amended, 42 U.S.C. 7413(d)(5) and 7414. This Order contains a compliance schedule, interim requirements, monitoring and reporting requirements and other requirements which satisfy the terms of these Sections of the Act. Public notice has been provided under section 113(d)(1) of the Act, 42 U.S.C. 7413(d)(1). The Governor of the Commonwealth of Massachusetts has concurred with issuance of this Order.

In consideration of the foregoing, 40 CFR Part 55 is amended as follows:

PART 55—FEDERAL ADMINISTRATIVE ORDERS ISSUED UNDER SECTION 113(d)(5) OF THE CLEAN AIR ACT

Subpart W—Massachusetts

1. By adding § 55.472 to read as follows:

§ 55.472 Federal administrative orders issued under Section 113(d)(5) of the Act.

Findings

The Administrator of EPA (Administrator) makes the following findings:

1. New England Power Company (NEPCO) owns and operates the Salem Harbor Generating Station (Salem Harbor) located in Salem, Massachusetts.

2. Salem Harbor is a major stationary source, having the potential to emit more than 100 tons per year of particulates and sulfur dioxide (SO_2) while using pollution control equipment.

3. Currently, units 1, 2 and 3 at Salem Harbor burn residual oil.

4. On April 3, 1980, the U.S. Department of Energy (DOE) published a proposed order under the Powerplant and Industrial Fuel Use Act (FUA), 42 U.S.C. 8301 *et seq.*, which would prohibit units 1, 2 and 3 from burning oil. On June 10, 1981, DOE published a Notice of Intent to Proceed on the Salem Harbor Prohibition Order (46 FR 30682).

5. A state implementation plan (SIP) to regulate air pollution in Massachusetts has been approved by the Administrator of EPA under Section 110 of the Act, 42 U.S.C. 7410.

6. 310 CMR 7.02(8), which concerns emission limitations, is part of the applicable SIP within the meaning of Section 113(d)(5) of the Act and reads in pertinent part as follows:

> No person owning, leasing, or controlling the operation of any fossil fuel utilization facility shall cause, suffer, allow, or permit emissions therefrom in excess of those emission limitations set forth in the following tables * * * [0.12 lbs. of particulate per million Btu heat input].

7. 310 CMR 7.05(4), which concerns ash content of fuels, is part of the applicable SIP within the meaning of section 113(d)(5) of the Act and reads in pertinent part as follows:

> (b) No person shall cause, suffer, allow or permit the burning in the District [Boston Metropolitan] of any fossil fuel containing an ash content in excess of nine per cent (9%) by dry weight.

8. 310 CMR 7.06(1), which concerns visible emissions, is part of the applicable SIP within the meaning of section 113(d)(5) of the Act and reads in part as follows:

> (a) No person shall cause, suffer, allow, or permit the emission of smoke which has a shade, density, or appearance equal to or greater than No. 1 of the Chart [20%] for a period, or aggregate period of time in excess of six minutes during any one hour, provided that at no time during the said six minutes shall the shade, density, or appearance be equal to or greater than No. 2 of the Chart. [40%].

9. EPA has determined that units 1, 2 and 3 will be unable to meet the requirements of 310 CMR 7.02(8), 7.05(4) and 7.06(1) if the units convert to coal burning.

10. Salem Harbor is located in the Metropolitan Boston Air Quality Control Region (AQCR). The city of Salem is located within this AQCR and EPA has designated Salem as an area which is attaining the primary national ambient air quality standard (NAAQS) for total suspended particulates (TSP).

11. The Administrator has determined that the emission limits, requirements respecting pollution characteristics of coal and other enforceable measures contained in the following Order are sufficient to assure that the burning of coal at Salem Harbor will not result in emissions which cause or contribute to concentrations of any air pollutant in excess of any primary NAAQS for such pollutant.

12. The Administrator also has determined that the compliance schedule in the following Order requires compliance with 310 CMR 7.02(8), 7.05(4) and 7.06(1) as expeditiously as practicable and before December 31, 1985.

13. Furthermore, the Administrator has determined that the interim requirements of the following Order require the best practicable systems of emission reduction (BPSER) to protect the public health and minimize noncompliance with 310 CMR 7.02(8), 7.05(4) and 7.06(1).

Based on the foregoing findings, it is hereby ordered:

I. SIP Limitation

As specified in this Order, units 1, 2 and 3 of the Salem Harbor Generating Station owned by NEPCO shall comply with the interim limitations, compliance schedules, and other enforceable requirements set forth in this Order. The emission limits contained in this Order are authorized only until NEPCO can install the pollution control equipment necessary to achieve compliance with Sections 310 CMR 7.02(8), 7.05(4), and 7.06(1) of the Massachusetts SIP while burning coal at Salem Harbor. These regulations govern particulate emissions, coal ash content and visible emissions, respectively.

As used in this Order, the term "old coal" means the high ash (over 17%) coal on site at Salem Harbor before April 15, 1981, when NEPCO petitioned EPA to allow coal burning at the plant. "New coal" as used in this Order, refers to coal which complies with the 9% ash limit of 310 CMR 7.05(4) (interpreted by the state as measured on a cargo received basis).

II. Interim Requirements

EPA has determined that the following interim requirements ensure that the burning of old or new coal in units 1, 2 and 3 will not cause or contribute to violations of the primary NAAQS for TSP.

A. Preliminary and General Measures

1. Prior to the burning of any coal at Salem Harbor, NEPCO shall submit to EPA a detailed program for minimizing fugitive particulate emissions from coal and coal ash handling. Upon approval by EPA, this program shall become enforceable under this Order.

2. (a) Prior to the burning of old coal in any unit Salem Harbor, NEPCO shall install a flue gas conditioning system in that unit to enhance the collection efficiency of its electrostatic precipitator. This flue gas conditioning system shall remain in operation when the unit converts to burning new coal.

(b) Prior to the burning of new coal in a second unit at Salem Harbor, NEPCO shall install another flue gas conditioning system in that unit. This second flue gas conditioning system shall be supplied by a different vendor than the one that supplied the system required by (a) above.

(c) Prior to the burning of new coal in the third unit at Salem Harbor, NEPCO shall install a flue gas conditioning system in that unit. This third flue gas conditioning system may be supplied by any vendor.

(d) Within 180 days after initial burning of old coal at Salem Harbor, NEPCO shall evaluate the effectiveness of the flue gas conditioning systems, shall select the more effective system, and shall install the more effective system on all three units. In the event that the systems are ineffective, EPA may eliminate the requirement for installation and operation of the system.

(e) For the duration of this Order, the selected flue gas conditioning systems shall be operated in a manner recommended by the supplier of the conditioning agents.

3. (a) Within 180 days after initial burning of old coal at Salem Harbor, NEPCO shall complete implementation of all measures identified as best practical system of emission reduction of NEPCO's September 24, 1981 submittal to EPA, summarized as

items 1–10 in Figure 12 of the testimony of G. P. Sasdi.

(b) Within 210 days after initial burning of old coal at Salem Harbor, NEPCO shall submit to EPA for approval a plan which details any corrective measures NEPCO intends to implement as a result of gas flow distribution tests (Item 7 in Figure 12). NEPCO shall be required to implement corrective measures if tests show that the existing gas flow distribution significantly decreases the effectiveness of the electrostatic precipitators. Upon approval by EPA, the terms of the above plan shall become enforceable under this Order.

4. (a) Within 30 days after initial burning of old coal at Salem Harbor, NEPCO shall submit to EPA a preliminary plan to optimize particulate emission reduction from operating the flue gas conditioning system or systems.

(b) In addition, NEPCO shall submit to EPA monthly status reports on the implementation of this plan.

(c) Within 210 days after initial burning of old coal at Salem Harbor, NEPCO shall conduct particulate emission tests on each unit to demonstrate optimization of the flue gas conditioning systems.

(d) Within 210 days after initial burning of old coal at Salem Harbor, NEPCO shall submit to EPA for approval a plan for installing any additional new transformer-rectifier sets. NEPCO shall be required to install additional new transformer-rectifier sets if flue gas conditioning optimization tests show that flue gas conditioning significantly enhances the effectiveness of the electrostatic precipitators. Upon approval by EPA, the terms of the above plan shall become enforceable under this Order.

(e) Within 240 days after initial burning of old coal, NEPCO shall submit to EPA a final plan to optimize particulate emission reduction from operating the flue gas conditioning system. Upon approval by EPA, this final plan shall become enforceable under this Order.

B. Old Coal Burn

1. Not later than 14 days before burning old coal in any unit, NEPCO shall submit to EPA written notice of the date it intends to start burning old coal in that unit.

2. (a) NEPCO shall be authorized to burn old coal for no more than 60 actual days of coal burning following the effective date of this Order, and not later than July 31, 1982.

(b) NEPCO shall burn old coal during this period only in either unit 2 or unit 3, but not in both units at the same time.

(c) During this time, unit 1 shall not burn any coal.

3. For the 60 days of burning of old coal under this Order, net electric power generation from coal burning shall not exceed the following rates:

(a) Unit 2: 64 MW

(b) Unit 3: 100 MW

Compliance with this limitation shall be based upon the monitoring and reporting required by IV(B)(5) of this Order.

4. For the 60 days of burning of old coal under this order, no unit shall burn coal at any time unless all fields of its electrostatic precipitator are fully energized and operating properly. Compliance with this requirement shall be verified by electrostatic precipitator records kept as required by IV(A)(6) of this order.

C. New Coal Burn

1. Not later than 14 days before burning new coal in any unit, NEPCO shall submit to EPA written notice of the date it intends to start burning new coal in that unit.

2. (a) Upon initial burning of new coal in any unit, particulate emissions from that unit shall not exceed 0.60 pounds per million Btu gross heat input.

(b) Within 60 days of initial burning of new coal in any unit and not later than 150 days from the initial burning of any coal at Salem Harbor, NEPCO shall conduct particulate emission tests on that unit to demonstrate compliance with this emission limit.

3. (a) Within 240 days of initial burning of any coal at Salem Harbor under this Order, particulate emissions from each unit shall not exceed 0.45 pounds per million Btu gross heat input.

(b) Within 240 days of initial burning of any coal at Salem Harbor, NEPCO shall conduct a particulate emission test on each unit to demonstrate compliance with this emission limit.

(c) Eighteen months after completing (b) above, NEPCO shall conduct an additional particulate test on each unit to demonstrate continued compliance with the emission rate.

4. Within 30 days of completing each set of particulate emission tests required by II(C)(3), NEPCO shall submit to EPA a report which correlates visible emissions from each unit as determined by EPA Method 9 (40 CFR Part 60, Appendix A) as a function of particulate emissions from coal burning.

(a) Each report shall propose an enforceable visible emissions opacity limit for each unit covered by this Order.

(b) EPA shall set an opacity limit for enforcement under this Order within 30 days of receipt of each report.

(c) Each report also shall propose an opacity monitor reading which correlates with particulate emissions from coal burning.

(d) Within 30 days of receipt of each report, EPA shall set an opacity monitor reading which will be used as an indicator of continuous compliance with the emission limits of this Order.

(e) EPA may require NEPCO to submit additional visible emission analyses under IV(A)(5) of this Order, and may use the additional data to revise opacity limits applicable to coal burning under this Order.

III. Compliance Schedule

Before commencing the burning of old coal under this Order, NEPCO shall continue to comply at all times with 310 CMR 7.02(8), 7.05(4), and 7.06(1). Once the burning of old coal has commenced, NEPCO shall proceed as expeditiously as practicable to achieve compliance with 310 CMR 7.02(8), 7.05(4), and 7.06(1).

A. Increments of Progress

NEPCO shall achieve the following increments of progress towards final compliance no later than the earlier of the times specified in the following compliance schedule:

Compliance Schedule and Increment of Progress

1. Prior to the initial burning of old coal in any unit, or May 31, 1982—Hire an architect/engineer for coal conversion project design and engineering.
2. 2 months after initial burning of old coal in any unit, or July 31, 1982—Attain compliance with 310 CMR 7.05(4). (Compliance shall be determined from reports and fuel analyses required under IV)(B) of this Order.)
3. 9 months after initial burning of old coal in any unit, or February 28, 1983—Enter contracts or place purchase orders for all major equipment including electrostatic precipitators, and ductwork, necessary for final compliance with 310 CMR 7.02(8) and 7.06(1).
4. 21 months after initial burning of old coal in any unit, or February 28, 1984—Initiate on-site construction or installation of electrostatic precipitators and ductwork.
5. (a) 31 months after initial burning of old coal in any unit, or December 31, 1984—Tie unit 1 into its completed electrostatic precipitator and ductwork.

(b) 35 months after initial burning of old coal in any unit, or April 30, 1985—Tie unit 2 into its completed electrostatic precipitator and ductwork.

(c) 39 months after initial burning of old coal in any unit, or August 31, 1985—Tie unit 3 into its completed electrostatic precipitator and ductwork.

6. (a) 34 months after initial burning of old coal in any unit, or March 31, 1985—Perform an emission test demonstrating compliance of unit 1 with 310 CMR 7.02(8) and 7.06(1).

(b) 38 months after initial burning of old coal in any unit, or July 31, 1985—Perform an emission test demonstrating compliance of unit 2 with 310 CMR 7.02(8) and 7.06(1).

(c) 43 months after initial burning of old coal in any unit, or December 31, 1985—Perform an emission test demonstrating compliance of unit 3 with 310 CMR 7.02(8) and 7.06(1).

B. Force Majeure

In the event NEPCO is unable to comply with any of the schedule increments established in III(A) above, and such failure is due to an act of God, war, strike, or other causes beyond its control, NEPCO may petition EPA to extend the time for compliance with such schedule increment and all subsequent schedule increments by a period equal to the delay caused by such circumstances. NEPCO shall bear the burden of proving that a delay is caused by circumstances clearly beyond its control. Any delay caused by such circumstances shall not be deemed a violation of this Order. In no event, however, shall final compliance be achieved later than December 31, 1985.

C. Compliance Reporting Requirements

1. NEPCO shall submit written notice of its compliance status with each of the above listed compliance milestones within 10 calendar days after the date for achieving such milestones.

2. If noncompliance is reported, notification should include the following information:

(a) A description of the noncompliance;
(b) A description of any actions taken or proposed by NEPCO to comply with the elapsed schedule requirements;
(c) A description of any factors which tend to explain or mitigate the noncompliance;
(d) An approximate date by which NEPCO will perform the required action.

3. Furthermore, NEPCO shall submit calendar quarterly construction progress reports to EPA for the duration of this Order.

IV. Monitoring and Reporting Requirements

A. Emissions Monitoring and Reporting Requirements

1. All particulate emission testing shall be conducted in accordance with Reference Method 5, 40 CFR Part 60, Appendix A, under operating conditions approved by EPA and in the presence of EPA personnel or EPA representatives.
(a) NEPCO shall provide safe access to safe sampling platforms on all units to be tested.
(b) For the purposes of this Order, a particulate emission test shall consist of four Method 5 sampling runs. If NEPCO chooses to sootblow its boilers continuously as its normal mode of boiler operation, then each sampling run shall be conducted under continuous sootblow. If NEPCO chooses not to sootblow continuously, however, then one of the four sampling runs shall be conducted during the normal boiler sootblowing cycle, and three runs shall be conducted without sootblowing.
(c) The average emission rate for a particulate emission test shall consist of the arithmetic average of the three non-sootblow runs prorated in a manner specified by EPA to account for the change in emissions encountered during the sootblow run.

2. For all particulate emission tests required by II(A)(4)(c) of this Order, the following additional requirements shall apply:
(a) Two sets of tests shall be performed on each unit: one set while the flue gas conditioning system is operating, and one set while it is not operating.
(b) The same type of coal shall be burned during both sets of tests.
(c) The boiler load, sootblowing operations and the amount of excess air shall be the same for both sets of tests.
(d) Both sets of tests shall be made while the unit and its electrostatic precipitator are operating under normal operating conditions.
(e) The tests with conditioning agents shall be preceded by at lesst 10 days of operation with conditioning agents to allow the precipitator to stabilize. Similarly, the tests without conditioning agents shall be preceded by a period of precipitator operation without conditioning agents, as specified by EPA.
(f) After the flue gas conditioning systems have been optimized on new coal, if the approximate composition or usage rate of the conditioning agent changes at any time during the life of this Order, NEPCO shall notify EPA in writing within 15 days of the change. If such change occurs after NEPCO has performed the testing detailed above, EPA may require additional tests. If EPA decides to require additional tests, NEPCO shall be notified in writing. NEPCO shall perform the additional tests within 30 days of receipt of the written notice.

3. For any emission or performance specification testing under this Order:
(a) NEPCO shall submit a pretest report to EPA at least 30 days before the proposed test date for any unit.
(b) No fewer than 5 days before NEPCO conducts any such test, appropriate NEPCO personnel and any representatives of the contractor responsible for the performance of the tests shall meet with EPA to discuss and finalize the testing protocol.
(c) NEPCO shall submit a written emission test report to EPA within 30 days of completing any EPA required emission testing.
(d) Pretest reports and emission test reports shall contain information as required by EPA and shall be presented in a format specified by EPA.

4. NEPCO shall install and operate continuous opacity monitoring equipment on each unit before burning new coal in that unit.
(a) NEPCO shall demonstrate that each opacity monitor complies with performance specifications within 30 days after coal is burned in the unit on which the monitor is installed. NEPCO shall comply with the provisions of 40 CFR Part 51, Appendix P, and the performance specification test requirements cross-referenced under 40 CFR Part 60, Appendix B. If two or more opacity monitors are used to report opacity from any single boiler, NEPCO shall submit to EPA prior to conducting performance specifications tests for the monitors, an approvable method for correlating each monitor to the total opacity at the stack outlet at any time after the effective date of this Order. NEPCO shall notify EPA 10 days before removing any monitor from its location. This notification also shall include data which demonstrates that the new location for the monitor or its replacement meets the requirements of 40 CFR Part 60, Appendix B. Additionally, the monitor or its replacement shall be completely recertified according to 40 CFR Part 60, Appendix B before it is reinstalled. Data demonstrating recertification shall be provided to EPA upon request.
(b) Not later than 30 days prior to initial start-up of the continuous opacity monitoring equipment, NEPCO shall submit to EPA an approvable quality assurance program for the monitoring system.
(c) NEPCO shall report to EPA on a monthly basis all hourly average opacity readings for each opacity monitor which exceed the limits specified by EPA under II(c)(4) of this Order. These summary reports shall be submitted to EPA within 15 days of the end of each month; records of all hourly average opacity readings shall be retained at Salem Harbor for inspection for the duration of this Order.

5. NEPCO shall perform any additional testing required by EPA within 30 days of receipt of written notification of such requirement. Among other things, additional testing may be required to quantify changes in emissions due to such factors as changes in coal characteristics or changes in boiler or precipitator operations. Additional tests also may be required to quantify suspected changes in emissions indicated by frequent opacity exceedences. Any proposal made by NEPCO to limit total station emissions by derating one or more generating units may result in additional testing requirements for that unit or units at any proposed generation levels.

6. NEPCO shall maintain a logbook available for EPA inspection containing the following data for each electrostatic precipitator serving a unit burning old or new coal under this Order.
(a) NEPCO shall log secondary voltage, secondary current, and spark rate for each transformer-rectifier set every 4 hours while the unit is burning old or new coal.
(b) NEPCO shall log voltage current relationships across each transformer-rectifier set's operating range every 15 days for the first 60 days after initial burning of old coal. Thereafter the data shall be logged every 30 days for the duration of this Order.

B. Coal Monitoring and Reporting Requirements

Within 30 days of the effective date of this Order, NEPCO shall submit an approvable fuel monitoring plan to EPA. As a minimum, such plan shall include a commitment on the part of NEPCO to do the following:

1. NEPCO shall perform proximate analyses of all coal cargoes off-loaded at the Salem Harbor Generating Station.
(a) ASTM D 3172 shall be used for the performance of the proximate analyses.
(b) ASTM D 2234, with systematic spacing shall be used for sample increment collection.
(c) Paragraph 7.1.3.2 and Table 2 of ASTM D 2234 shall be used to determine the number and weight of increments required per gross sample.
(d) One gross sample shall be collected for each shipment or for each 10,000 tons of coal, whichever is less.

2. NEPCO shall perform daily coal sampling and analyses for sulfur content, ash content and gross calorific value for coal burned at the station under this Order.
(a) ASTM D 2234, with systematic spacing shall be used for sample increment collection.
(b) As a minimum, one increment shall be collected from each coal conveyor during each hour that an individual conveyor is in operation. Such increments from all conveyors are to be composited for analysis on a daily basis.
(c) Table 2 of ASTM D 2234 shall be used to determine the weight of each increment.

(d) ASTM D 2013 shall be used for sample preparation.

(e) ASTM D 3177 or an equivalent method approved by EPA shall be used for sulfur analysis.

(f) ASTM D 3174 shall be used for ash analysis.

(g) ASTM D 2015 or ASTM D 3286 shall be used for gross calorific value determinations.

3. NEPCO shall participate in the EPA coal analysis methods audit program conducted by the Quality Assurance Division, Environmental Monitoring Systems Laboratory in Research Triangle Park, North Carolina. Coal audit samples shall be analyzed according to ASTM procedures for percent sulfur, moisture, ash content and gross calorific value and will be provided by EPA on a periodic basis.

4. Monthly reports containing coal cargo shipment sizes, coal analyses, cargo and daily coal analyses shall be submitted to EPA within 15 days of the close of each month in a format approved by EPA.

(a) Such reports also shall contain 30-day "rolling average" sulfur content values for the coal burned, calculated for each day of the month.

(b) The results of any audit coal sample analyses performed during that month also shall be included.

(c) All coal analysis data shall be presented on a dry basis.

5. NEPCO shall submit to EPA on a monthly basis, hourly average net megawatts generated by each unit. Monthly data shall be reported within 15 days of the end of each month in a format approved by EPA.

C. Ambient Monitoring and Reporting Requirements

1. (a) Within 60 days of the effective date of this Order but in no case later than the start of coal burning and subject to the provisions of IV(C)(5) of the order, NEPCO shall install and operate a network of ambient monitors to measure SO_2 concentration on a continuous basis, and TSP concentration on a frequency as specified in IV(C)(2) below.

(b) As a minimum, NEPCO shall place both TSP and SO_2 monitors near each of the following locations:

(i) Water Tower, Green Street, Marblehead

(ii) Winter Island Dam, Salem

(iii) NEPCO right-of-way, north of Fort Avenue, Salem

(iv) NEPCO property outheast of Derby and English Streets

(v) Beverly north of Mackerel Cove

(c) The burning of coal at Salem Harbor under this order constitutes acceptance by NEPCO that ambient monitoring data collected on its property is representative of ambient air quality levels in the surrounding area. EPA may use this data as such for any purpose appropriate under the Act.

2. The sampling frequency at the Green Street, Marblehead and Beverly TSP sites shall be once every three days unless an exceedence of the secondary NAAQS for TSP is measured. In this event, daily sampling is required. The sampling frequency at all the remaining TSP sites shall be daily; however, the sampling frequency at any TSP monitoring site may be reduced to once every three days if the following conditions are met at such site during any continuous 365 day period after new coal has been burned at all three units:

(a) Every 24-hour TSP concentration measured at the site must be less than 200 micrograms per cubic meter and;

(b) The annual geometric mean for TSP measured at the site must be less then 60 micrograms per cubic meter.

3. All ambient monitoring locations and equipment installations must be approved by EPA prior to operation and must meet 40 CFR Part 58, Appendix B (Quality Assurance), Appendix C (Ambient Air Quality Monitoring Methodology), and Appendix E (Probe Siting Criteria).

(a) All SO_2 analyzers are to be operated on the 0.5 ppm or 1.0 ppm ranges unless ambient air quality levels exceed this concentration. If this case occurs, then any such instrument must be operated on the appropriate higher range.

(b) Within 30 days of the effective date of this Order, NEPCO shall submit in writing to EPA an approvable quality control program.

(c) EPA will accept performance audits by the Massachusetts Department of Environmental Quality Engineering (DEQE) to satisfy the requirements for the quarterly accuracy audit (40 CFR Part 58, Appendix B, Section 3), but it will be NEPCO's responsibility to provide independent performance audits for any calendar quarter not audited by DEQE.

4. Within 60 days of the effective date of this Order, NEPCO shall construct a meteorological tower at a location near the company right of way north of Fort Avenue.

(a) NEPCO shall operate continuous monitoring instruments on this tower to measure and record wind speed and direction.

(b) The exact location and height of the tower shall be selected by NEPCO and approved by EPA in writing before the tower is constructed.

(c) All meteorological instrumentation shall comply with EPA requirements as specified in EPA Guideline 450/4-80-012.

(d) All meteorological monitoring procedures must be submitted to EPA for approval at least 30 days before they are implemented.

5. NEPCO shall obtain all the necessary permits, easements or permissions necessary to locate the monitors and meteorological towers required by IV(C)(1) and (4) of this Order. EPA may grant time extensions for monitor siting, select alternative sites, or eliminate sites altogether, but NEPCO shall bear the burden of establishing that a change is necessary.

6. NEPCO shall receive permission in writing from EPA prior to conducting any further analysis of the TSP filters. NEPCO must keep all TSP filters in a suitable condition for further analysis for a period of 12 months after termination of this order. NEPCO must supply any of these filters to EPA upon request for further analysis. If the Federal Reference method for total suspended particulates is modified or replaced during the period of this Order, EPA reserves the right to require NEPCO to modify or replace any or all existing particulate monitors.

7. All monitoring and meteorological data shall be submitted to DEQE within 30 days of the close of each month in machine-readable SAROAD format.

(a) The data reported to DEQE shall be for individual hourly observations of SO_2, wind speed, and direction, as well as daily averages for TSP.

(b) NEPCO shall insure that EPA receives the above information within 90 days of the end of each calendar quarter.

(c) NEPCO shall notify EPA of any exceedence of any primary NAAQS for SO_2, within 72 hours of its occurrence. NEPCO shall notify EPA of any exceedence to any primary NAAQS for TSP within 15 days of its occurrence.

(d) Within 30 days of the close of each month, NEPCO shall submit to both EPA and the DEQE, Northeast Regional Office, Woburn, one paper copy of all monitoring and meteorological data. This data will be maintained for public inspection at the EPA Regional Office, Boston, and the DEQE Regional Office, Woburn, during normal working hours.

(e) EPA may grant time extensions to these reporting requirements for this Section, but NEPCO shall bear the burden of establishing that extensions are necessary.

8. Within 30 days of the occurrence of any violation of the primary NAAQS for TSP, NEPCO shall submit to EPA all relevant data under Section 113(d)(5)(D)(i) through (iii) of the Act.

V. General Requirements

A. This Order shall not be effective during any interval after EPA finds, and notifies NEPCO, that (1) a primary NAAQS for TSP is being exceeded in the Metropolitan Boston AQCR (Section 113(d)(5)(D)), and (2) NEPCO has failed to prove that the requirements of Sections 113(d)(5)(D)(i) through (iii) of the Act have been satisfied. During any such intervals, NEPCO shall comply with 310 CMR 7.02(8), 7.05(4) and 7.06(1). If NEPO violates these regulations, it shall be subject to enforcement action under any and all authorities of the Act.

B. Nothing herein shall affect the responsibility of NEPCO to comply with any applicable local, state or federal regulations except as specified in this Order.

C. NEPCO shall submit a copy of all correspondence and reports required under this Order to the Director, Air and Waste Management Division, EPA, Region I, JFK Federal Building, Boston, MA 02203.

NEPCO may assert a business confidentiality claim covering part or all of the information requested by this Order, in the manner described by 40 CFR 2.203(b). Information covered by such a claim will be disclosed by EPA only as set forth in 40 CFR Part 2, Subpart B. If no such claim accompanies the information when it is received by EPA, it may be made available to the public by EPA without further notice to NEPCO. Certain categories of information are not properly the subject of such a claim. For example, the Act provides that emission data

shall in all cases be made available to the public. See 42 U.S.C. 7414(c).

D. NEPCO is hereby notified that its failure to achieve final compliance at its Salem Harbor Station with 310 CMR 7.02(8), 7.05(4) and 7.06(1) by the compliance date specified in III(A)(6) of this Order may result in an assessment of a noncompliance penalty under section 120 of the Act, 42 U.S.C. 7240. This penalty may be imposed at an earlier date, as provided under section 113(d) and section 120 of the Act, in the event that this Order is terminated or violated as provided in V(E) and (F) below. In either event, NEPCO will be formally notified of its noncompliance, under section 120(b)(3) of the Act or any regulations promulgated thereunder.

E. This Order shall be terminated in accordance with section 113(d)(8) of the Act if the Administrator determines, on the record, after notice and opportunity for hearing, that the inability of NEPCO to comply with 310 CMR 7.02(8), 7.05(4), and 7.06(1) as approved by EPA, no longer exists with respect to its Salem Harbor Station. Additionally, if NEPCO demonstrates compliance with 310 CMR 7.02(8), 7.05(4), and 7.06(1) prior to the applicable compliance dates specified in III(A)(2) and (6) of this Order, then this Order shall be terminated at that earlier date.

F. Under section 113 (d)(9) of the Act, 42 USC 7413(d)(9), violation of any requirement of this Order shall result in one or more of the following actions:

1. Enforcement of such requirement under section 113(a), (b), or (c) of the Act, 42 U.S.C. 7413(a), (b), or (c);
2. Revocation of this Order, after notice and opportunity for a public hearing;
3. Notification of noncompliance and assessment of a noncompliance penalty under section 120 of the Act.

G. This order is effective upon publication in the Federal Register and after having received concurrence from the Governor of the Commonwealth of Massachusetts.

Dated: February 2, 1982.

Anne M. Gorsuch,

Administrator, Environmental Protection Agency.

[FR Doc. 82-3435 Filed 2-8-82; 8:45 am]
BILLING CODE 6560-38-M

6.2 AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (FEDERAL PERMIT NO. MA0005096, MODIFICATION NO. 2)

The following NPDES permit was provided by EPA Region I as Attachment 2 to their letter of April 9, 1982, which transmitted EPA's comments on the Draft EIS.

ATTACHMENT 2

Federal Permit No. MA0005096
State Permit No. 20
State Application No. 78
Modification No. 2

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251, et seq. the "Act"). and the Massachusetts Clean Waters Act, as amended, (M.G.L.,C.21, §§ 26-53),

New England Power Company
Salem Harbor Station

T. E. LANDRY

FEB 18 1982

is authorized to discharge from a facility located at

24 Fort Avenue
Salem, Massachusetts

to receiving waters named

Salem Harbor

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective 45 days after date of signature.

This permit and the authorization to discharge shall expire at midnight, May 31, 1981.

Signed this 21 day of February, 1982.

Leslie Carothers, Director
Enforcement Division
Environmental Protection Agency

Thomas C. McMahon, Director
Division of Water Pollution Control
Commonwealth of Massachusetts

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Except as specified in this paragraph and in paragraphs 2 thru 5 below, the permittee is not authorized to discharge to Salem Harbor a final effluent to which it has added any pollutants.

   a. It has been determined based on engineering judgment that the circulating water intake structure presently employs the best technology available for minimizing adverse environmental impact. Any change in the location, design or capacity of the present structure shall be approved by the Administrator and the Director. The present design shall be reviewed for conformity to regulations pursuant to Section 316(b) of the Act when such are promulgated.

   b. The temperature differential between the point of discharge and the intake structure shall not change more than (a) 12°F during any one-hour period from the first day of April to the first day of November, and (b) 9°F during any one-hour period from the first day of November to the first day of April except during periods of station emergency. The temperature measurement shall be taken at corresponding points in the water column 8 ft. below the surface of mean low tide on the intake water and 2 ft. below the surface for the discharge water.

   c. Chlorine may be used as a biocide in circulating water systems. Total residual chlorine in the discharge shall not exceed 1/10 of a part per million at any time. Prior to the use of another type of biocide, permission must be received from EPA and the Division. The company shall perform research satisfactory to EPA and the Division in order to find alternatives to non-selective biocidal cleaning of cooling water apparatus and, upon discovery of an alternative satisfactory to EPA and the Division, institute it into all units. Within 90 days from the effective date of this permit, the permittee shall present to EPA and the Division for review the results from previous research studies and submit for approval a proposed plan for continued biocidal research.

   d. The discharge shall not interfere with any Class SB use of Salem Harbor and shall not violate applicable water quality standards. Pollutants not subject to limitation in this permit, but which have been specifically identified in the application, may be discharged at the frequency and level identified in the application, provided that such discharge does not violate Section 307 or 311 of the Act or applicable water quality standards.

e. The term "Regional Administrator" means the Regional Administrator of Region I of the U.S. Environmental Protection Agency; the term "Enforcement Director" means the Director of the Enforcement Division of Region I of the U.S. Environmental Protection Agency; and the term "Director" means the Director of the Division of Water Pollution Control of the Massachusetts Water Resources Commission.

f. Coal Conversion

(1) The permittee shall submit to the Enforcement Director and the Director a test program for evaluating the chemical composition of the following liquid and solid streams after conversion to coal as a fuel:

(a) Coal as received.
(b) Botton Ash.
(c) Fly Ash.
(d) Bottom Ash Sluice Water.
(e) Fly Ash Sluice Water.
(f) Fresh Water used for Sluicing.
(g) Salt Water used for Sluicing.
(h) Coal Pile Runoff during and after a rain storm.
(i) Ash Pile Runoff during and after a rain storm.
(j) Waste Water Treatment System discharge.

(2) The streams (subparagraph (1) above) shall be sampled twice simultaneously by grab samples on two different days when Units 2 and 3 are all burning the new source coal. The stream analysis shall include the following parameters where applicable but are not to be limited to:

(a) Flow rate (gpd or lbs/day)
(b) Total suspended solids
(c) Total dissolved solids
(d) pH
(e) BOD
(f) COD
(g) TOC
(h) Antimony (total)
(i) Arsenic (total)
(j) Beryllium (total)
(k) Cadmium (total)
(l) Chromium (total)
(m) Copper (total)
(n) Lead (total)
(o) Mercury (total)
(p) Nickel (total)
(q) Selenium (total)
(r) Silver (total)
(s) Thallium (total)
(t) Zinc (total)
(u) Iron (total)
(v) Manganese (total)
(w) Nitrate
(x) Sulfate

(3) The metals shall be reported both as stream concentration and the pounds per day in that stream. The analytical procedures for each parameter shall be identified in the test plan for approval by the Enforcement Director and the Director.

(4) The test program must be submitted within 30 days after the effective date of the permit modification. The samples are to be taken within 5 days after the facility (Units 2 and 3) are in stable operation using only the new source coal.

(5) The technique for mitigating the coal pile runoff impact upon Salem Harbor shall be presented to the Enforcement Director and the Director for approval 30 days after completion of the laboratory tests.

(6) The permittee shall provide in the test program the anticipated coal procurement plans with coal sources, if known, and the plans for utilizing the existing coal.

(7) The permittee may submit analytical data obtained at another power plant if it can be shown that the same coal source was used and that the coal was burned under similiar operating conditions. This justification shall be included in the test program to be submitted 30 days after this permit modification (subparagraph (4) above .

3. During the period beginning effective date and lasting Operational Date ***
the permittee is authorized to discharge from outfall(s) serial numbers(s) 006 WWTS **
shall not exceed the following conditions.

a. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations kg/day(lbs/day)		Other Units(Specify)		Monitoring Requirements	
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement Frequency	Sample Type
Flow - (MGD)	-	-	3.0	3.5	continuously	daily average and range
Total Suspended Solids			300.0 mg/l	500.0 mg/l	weekly*	24-hr. composite
Oil and Grease			15.0 mg/l	15.0 mg/l	weekly*	grab
Turbidity			25 JU	50 JU	weekly*	24-hr. compos
Metals						
Zinc			1.0 mg/l	1.0 mg/l	weekly*	24-hr. composite
Nickel			1.0 mg/l	1.0 mg/l	weekly*	24-hr. composite
Iron			3.0 mg/l	5.0 mg/l	weekly*	24-hr. composite
Copper			1.0 mg/l	1.0 mg/l	weekly*	24-hr. composite

*daily during cleaning operations

b. The pH shall not be less than 6.0 standard units nor greater than 9.0 standards units and shall be monitored weekly by a grab sample at a representative point prior to discharge into Salem Harbor.

c. There shall be no discharge of floating solids or visible foam in other than trace amounts.

d. Samples taken in compliance with the monitoring requirements specified about shall be taken at any representative point prior to discharge into the condenser cooling water canal.

**W.W.T.S. includes ash settling pond, Units#1 to 4 seal water, floor drains, equipment drains, deminerlizer/regenerator wastes, and equipment wash water streams.

*** Operational date is the date that the construction for the Waste Water Treatment System is completed and operational level is achieved in accordance with Par. I.B.1.d. of this permit.

***

4. During the period beginning operational date/& lasting through May 31, 1981 the permittee is authorized to discharge from outfall(#) serial numbers(#) 006 WWTS ** shall not exceed the following conditions.

a. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations kg/day(lbs/day)		Other Units(Specify)		Monitoring Requirements	
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement Frequency	Sample Type
Flow - (GD)	-	-	3.0	3.5	continuously	daily average and range
Total Suspended Solids			30.0 mg/l	100.0 mg/l	weekly*	24-hr. composite
Oil and Grease			15.0 mg/l	15.0 mg/l	weekly*	grab
Turbidity			25 JU	50 JU	weekly*	24-hr. composite
Metals						
Zinc			1.0 mg/l	1.0 mg/l	weekly*	24-hr. composite
Nickel			1.0 mg/l	1.0 mg/l	weekly*	24-hr. composite
Iron			1.0 mg/l	1.0 mg/l	weekly*	24-hr. composite
Copper			1.0 mg/l	1.0 mg/l	weekly*	24-hr. composite

*daily during cleaning operations

b. The pH shall not be less than 6.0 standard units nor greater than 9.0 standards units and shall be monitored weekly by a grab sample at a representative point prior to discharge into Salem Harbor.

c. There shall be no discharge of floating solids or visible foam in other than trace amounts.

d. Samples taken in compliance with the monitoring requirements specified about shall be taken at any representative point prior to discharge into the condenser cooling water canal.

**W.W.T.S. includes ash settling pond, Units#1 to 4 seal water, floor drains, equipment drains, demineralizer/regenerator wastes, and equipment wash water streams.

*** Operational date is the date that the construction for the Waste Water Treatment System is completed and operational level is achieved in accordance with Par. I.B.1.d. of this permit.

7. Biological Monitoring

The permittee shall conduct the following programs of sampling and analysis:

a. Monthly, for a 24-hour period, the screen washwater from Units 1, 2, 3 and 4 will be sampled for finfish. All fish collected will be identified to the lowest taxon possible and measured for length. Live/dead determinations are to be based upon the presence or absence of opercular beats.

b. Monthly, at two stations, Stations 12 and 14 on Figure 1, finfish will be sampled by means of a 30-foot shrimp trawl. Single tows will be made. All fish will be identified to the lowest taxon possible and measured for length.

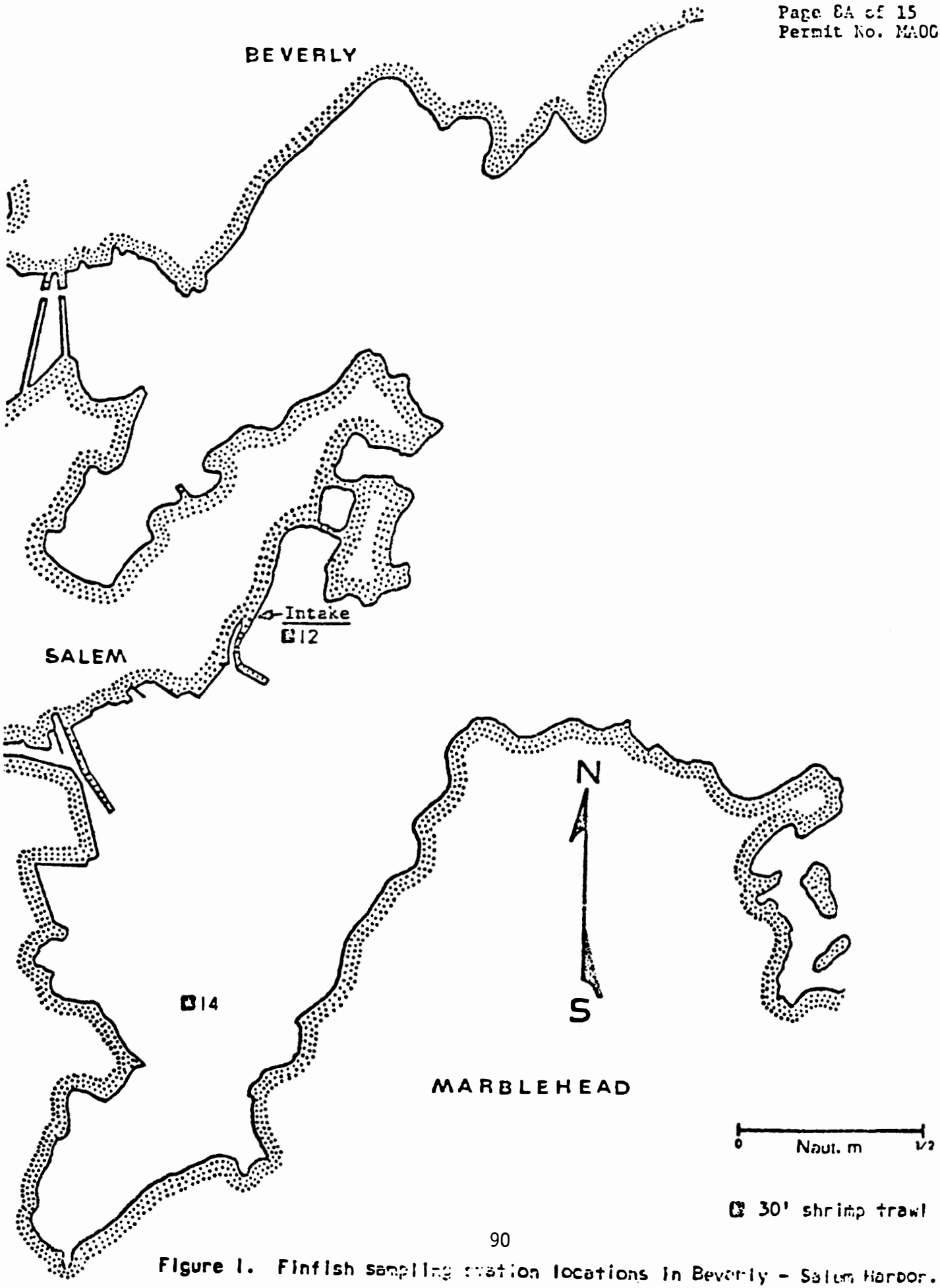


Figure 1. Finfish sampling station locations in Beverly - Salem Harbor.

B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

a.	Evaluate the treatment required for Waste Water Treatment System discharge	6 months after start of coal use
b.	Submit Preliminary Plans for proposed facilities	8 months after start of coal use
c.	Submit Final Plans for proposed facilities	9 months after start of coal use
d.	Complete Construction	18 months after start of coal use
e.	Determine if the coal pile runoff and the ash pile runoff will require treatment to meet Federal and State requirements	6 months after start of coal use
f.	If required, design and construction schedule for "e" above same as for the modification of the Waste Water Treatment System schedule above ("b", "c", and "d" above).	

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

6.3 CORRESPONDENCE WITH ADVISORY COUNCIL ON HISTORIC PRESERVATION AND MASSACHUSETTS STATE ARCHAEOLOGIST

Department of Energy
Washington, D.C. 20585

MAY 5 1982

Ms. Patricia Weslowski
State Archaeologist
Massachusetts Historical Commission
294 Washington Street
Boston, Massachusetts 02108

Dear Ms. Weslowski:

The Department of Energy's Division of Fuels Conversion is preparing an Environmental Impact Statement on the proposed conversion to coal of New England Power Company's Salem Harbor generating station at Salem, Massachusetts. The EIS discusses the environmental impacts of burning coal at Units 1, 2, and 3 pursuant to the Powerplant and Industrial Fuel Use Act of 1978, as amended by the Omnibus Budget Reconciliation Act of 1981.

Normally, the Department contacts the appropriate State Historic Preservation Officer early in the EIS process to determine whether its proposed action will affect resources currently included in, or eligible for inclusion in, the National Register of Historic Places. Unfortunately, due to staff oversight, this coordination did not take place in the case of Salem Harbor before the EIS was published in draft form. Therefore, at this time I am sending you the Draft EIS for Salem Harbor and requesting your identification of current or proposed National Register sites which may be affected by this conversion.

I note that, in his March 30, 1982, letter commenting on the Salem Draft EIS, Jordan E. Tannenbaum of the Advisory Council on Historic Preservation expressed particular concern that adequate mitigation measures be included in the proposed conversion plans to minimize potential adverse effects on Salem's historic resources. Possible activities that could be detrimental to these resources include coal handling and storage, construction, traffic volume and vibration, and transportation of fly ash.

We have reviewed each of these concerns with respect to the level of treatment in the draft EIS, the availability of appropriate mitigation measures, and the extent to which the utility has committed itself to specific mitigation procedures. Although some analysis remains to address some of the specific issues raised, we feel that the overall evaluation of the project, as presented in the draft EIS, is substantially accurate. That is, the conversion of the Salem Harbor will have an effect on historic

resources, as defined in 36 CFR 800.3(a), but not an adverse effect as defined in 36 CFR 800.3(b). In addition, the effect on the City of Salem's historic resources will be temporary, extending only through the construction period. The following paragraphs provide a preliminary description of the mitigation for each of the issues raised; a more detailed discussion will be presented in the final EIS.

Coal will be transported to the Salem Harbor Station by sea, using barges or a self-unloading collier now being constructed for New England Power Company (draft EIR, Section 2.3.3). The collier, scheduled for completion in 1983, will be visually similar to the tankers now unloading at New England Power Company's dock.

The coal pile at the plant will remain in its present location. Because the quantity of coal stored will be greater than during previous coal burns, the pile area will be enlarged and the elevation increased (Section 2.3.1). Visually, the effect will not be significantly changed. New England Power has also committed itself to controls to prevent the escape of fugitive dust from the coal pile (Section 2.3.4.1), including water sprays, compaction of inactive areas, and, if necessary, use of dust control agents.

Worker traffic on city streets will increase during construction (Section 4.1.3). New England Power has provided a revised estimate that the peak construction labor force will be in the range of 350 persons. Parking for the estimated 233 cars (at 1.5 workers per car) will be provided on the plant site. While these workers will begin their workdays at an early hour, the mid-to-late-afternoon release of the workforce could cause conflicts with visitors to the Salem Maritime National Historic Site, particularly during peak visiting periods. While some conflict is unavoidable, however, it is not expected that visits to the historic site will be adversely affected.

Construction traffic will consist of a combination of automobiles, other light-duty vehicles, and heavy trucks transporting construction materials. Due to their light weight and soft suspensions, vibration effects from automobiles used by construction workers will be negligible. It is anticipated what heavy trucks will avoid the downtown area of Salem and that most would access the site via the truck routes shown on Figure 4.2.1. Both Webb Street and Bridge Street are presently traveled by trucks similar to those expected to be used during plant construction.

While construction traffic is anticipated to increase the frequency of truck traffic, it will not be substantially changed from present conditions. No extended periods of concentrated truck traffice are anticipated, and vibration resulting from project traffic will be in character with that previously experienced by the historic buildings in the area.

I look forward to receiving your comments and recommendations on the proposed Salem Harbor conversion. Should you have any questions or require further information, please contact me at (202)252-2461.

Sincerely,

Lynda H. Nesenholtz

Lynda H. Nesenholtz
Office of Fuels Programs
Division of Fuels Conversion
Economic Regulatory Administration

Enclosure

cc: Jordan E. Tannenbaum, ACHP

Dames & Moore

7101 Wisconsin Avenue, Suite 700
Washington, D.C. 20014
(301) 652-2215
TWX: 710-824-9613 Cable address: DAMEMORE

May 12, 1982

Ms. Valerie Talmage
State Archaeologist
Massachusetts Historical Commission
294 Washington Street
Boston, MA 02108

Re: Preparation of Federal EIS
Conversion of Units 1, 2, and 3 to Coal
Salem Harbor Generating Station
Salem, Massachusetts

Dear Ms. Talmage:

As we discussed by telephone this morning, Dames & Moore is assisting DOE in preparing the EIS for the Salem Harbor conversion. To date, we have prepared a draft EIS and received comments. As noted by one commentor, the U.S. Department of the Interior (letter attached), your office should be contacted on the potential archaeological signifance of the plant site or ash disposal site(s). By this letter, we request that you review the enclosed project documents and your files for potential effects of the conversion on archaeological resources.

Enclosed are a copy of the draft EIS, and a map of the Amesbury disposal site. No maps are available (to us) of the other potential disposal sites. New England Power Company is proposing to do all of its onsite construction within the present plant boundary, as shown on Figures 1.5-2 and 2.3-1 and described in Section 2.3

Disposal of ash from Salem Harbor is discussed in Section 2.4.3.3. NEP is pursuing commercial markets but is presently planning to dispose of the ash in landfills. Amesbury is their proposed site, and Freetown is the backup. Both are fully licensed. NEP is also contacting other municipalities with regard to use of the ash as a landfill cover. Of these contacts, Hamilton and Danvers have approved the use of ash as cover in their existing facilities, and other sites have been offered. Given these options, plus the potential commercial market, the project is unlikely to require use of disposal sites other than existing, licensed commercial and municipal landfills.

Dames & Moore

We trust that the enclosed information will be sufficient for your review of the proposed conversion. Please address your response Lynda Nesenholtz at DOE at the address below, with a copy to me. If I can be of help or answer any questions, please call.

Very truly yours,

DAMES & MOORE

John C. Kittridge

John C. Kittridge
Project Manager

JCK:erk

Enclosures (2)

Reply to: Ms. Lynda Nesenholtz
Office of Fuels Programs
Fuels Conversion Division
Economic Regulatory Administration
Forrestal Building, Room GA-093, RG-62
1000 Independence Avenue, S.W.
Washington, D.C. 20585

MASSACHUSETTS
HISTORICAL
COMMISSION

COMMONWEALTH OF MASSACHUSETT
Office of the Secretary of State

294 Washington Street
Boston, Massachusetts
02108
617-727-8470

MICHAEL JOSEPH CONNOLLY
Secretary of State

May 24, 1982

Ms. Lynda Nesenholtz
Office of Fuels Program
Fuels Conversion Division
Economic Regulatory Administration
Forrestal Building, Room GA-093, RG-62
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Re: Coal Conversion Project, Salem Harbor Generating Station--Archaeological Review

Dear Ms. Nesenholtz:

Staff of the Massachusetts Historical Commission have reviewed the draft Environmental Impact Statement for the project listed above as well as the Environmental Impact Report for the proposed expansion of the Amesbury sanitary landfill. These materials have been examined in reference to known sites listed in the Inventory of Historic Assets of the Commonwealth and expected archaeological properties. This review was conducted in compliance with Section 106 of the National Historic Preservation Act.

MHC anticipates that the coal conversion project will have "no effect" on significant archaeological properties (36 CFR 800.4(6)(1)). The conversion project is proposed for areas within the existing Salem Harbor generating station, where previous construction has probably disturbed any archaeological properties which may have been present.

The proposed ash disposal location at the licensed landfill in Amesbury has also been previously disturbed by stripping and filling operations. MHC feels that the proposed use of the Amesbury landfill area for ash disposal will also have "no effect" on archaeological properties. Since

maps for alternate disposal sites were not submitted, MHC is unable to assess the archaeological significance of these areas. Should the Amesbury landfill site not be selected for ash disposal, MHC should be given the opportunity to review the alternate disposal locations.

If you have any questions or need further assistance, feel free to contact Valerie Talmage, State Archaeologist, or Brona Simon of MHC staff.

Sincerely,

Valerie Talmage

for Patricia L. Weslowski
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

PW/my

xc: John C. Kittridge, Dames & Moore

MASSACHUSETTS HISTORICAL COMMISSION

COMMONWEALTH OF MASSACHUSETT
Office of the Secretary of State
294 Washington Street
Boston, Massachusetts
02108
617-727-8470

MICHAEL JOSEPH CONNOLLY
Secretary of State

June 4, 1982

Ms. Lynda H. Nesenholtz
Office of Fuels Program
Division of Fuels Conversion
Economic Regulatory Administration
Department of Energy
Washington, D.C. 20585

Re: Coal Conversion Project, Salem Harbor Generating Station
Draft Environmental Impact Statement

Dear Ms. Nesenholtz:

Staff of the Massachusetts Historical Commission have reviewed the draft EIS for the proposed coal conversion project at the Salem Harbor Generating Station in Salem, Massachusetts.

The Massachusetts Historical Commission agrees that while the proposed conversion project will have an effect on historic resources (36 CFR 800.3(a)), there will be "no adverse effect" (36 CFR 800.4(2)(c)) on National Register properties located in Salem.

A copy of this documentation should be forwarded to the ACHP with your determination of effect.

If you have any questions, please call Valerie Talmage, Deputy State Historic Preservation Officer.

Sincerely,

Valerie Talmage
for Patricia L. Weslowski
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

PW/my

xc: Jordan Tannenbaum, ACHP

6.4 NEED FOR A COAL PILE LINING

The following section addressing the need for an impervious liner under the coal pile at Salem Harbor was prepared by New England Power Company in response to comments on the Draft EIR for the State MEPA process. The discussion was originally submitted as Section 4.4.2.1 of the State Final EIR and is reproduced verbatim.

4.4.2.1 Need for Coal Pile Lining

Lining the coal pile even when the existing inventory of old coal is reduced to its lowest level (approximately 40,000 tons) would be costly and NEP believes that such a measure is not necessary to protect the marine resources of Salem Harbor. The reasons for this conclusion fall into two areas:

- Percolation of coal pile leachate into the groundwater to Salem Harbor is very slow.
- Past environmental studies in Salem Harbor and of coal pile runoff and leachate from Brayton Point Station into Mount Hope Bay show no impact on receiving water, sediments or organisms living there.

The coal pile at Salem Harbor Station rests on filled land made up of silty sand, some gravel, clay and organic silt overlaying a region of green clay roughly 40 feet thick. The area was filled in 1922 and contained by granite block seawalls on the easterly and southerly sides. More recently, sheet piling was driven into the clay region on the easterly side to provide a berthing area for fuel ships delivering fuel. Figures 4.4-1 through 4.4-4 illustrate from past boring data the subsurface characteristics in and around the coal pile.

The coal pile, as it is built up over time, will rest on a layer of old coal and coal fines in the top layer of base material, resulting from many years of coal storage at the site.

On March 11 and 12, 1982, additional field investigations were conducted at the site to better understand the effects, if any, of coal storage at the site. Five observation wells were drilled to below the groundwater layer, including two under the coal pile, two between the coal pile and the wharf, and one 340 feet west of the coal pile to serve as a control. Samples of groundwater were collected and analyzed for a list of heavy metals selected from those identified as being of potential concern by the Draft Northeast Regional Environmental Impact Statement, plus other parameters felt to be useful. A seawater sample from Salem Harbor was also analyzed for comparison. The wells are located as HW-1 through HW-5 on the site plan, Figure 4.4-1.

In addition, two percolation test pits were dug under the coal pile to determine the permeability of the base of the pile. These pits are identified as TP-1 and TP-2 on Figure 4.4-1.

The results of groundwater analyzes are presented in Table 4.4-1. They show that the groundwater is alkaline and slightly brackish indicating an influence of the seawater surrounding the site. Metals analyses show levels not elevated above background except for iron which probably reflects coal pile runoff and leachate, particularly from pyrites. None of the toxic metals show high levels except lead from well MW-2 which is probably an anomaly because this was the control well and does not show any other influence from the coal pile, i.e., its level of iron is low. Another observation was that the water levels in the wells didn't change measurably, even though the observation occurred over a 9' tidal change which indicates little exchange of groundwater with the water of Salem Harbor.

Percolation tests indicated that where a base of coal fines existed, it was nominally impervious. Water level in the test pit did not change throughout the test period. Where all coal was scraped aside revealing a gravel layer, the percolation rate was low, one inch decrease in water level over 1 1/2 hours. Other observations were that the soil under the coal pile was only damp, rather than wet. At the toe of the pile, however, the soil was wet and muddy indicating water percolating through the pile meets a relatively impermeable layer and migrates toward the toe of the pile where it becomes surface water drainage.

An assessment of the data suggests that coal pile leachate will enter the groundwater only very slowly. The elevated levels of iron probably result from iron pyrites in the coal as noted in the MEPA comments to the Draft EIR. It is worth noting that new coal delivered to the site will be washed which has the effect of pre-weathering the coal and also removed much of the pyrites because of its higher density. The data also suggests that the granite wall and sheet pile containment around the site have become sealed with silt over time and are relatively impermeable, thus, providing a very slow exchange of groundwater with Salem Harbor. Nothing in the data suggests the need for placing an additional lining under the pile beyond what will exist with the roughly 40,000 tons of old coal left in place.

The second area of expressed concern is the applicability of past studies of Salem Harbor and Mount Hope Bay. This can be addressed in four issues as raised in the MEPA comments to the Draft EIR.

Issue 1

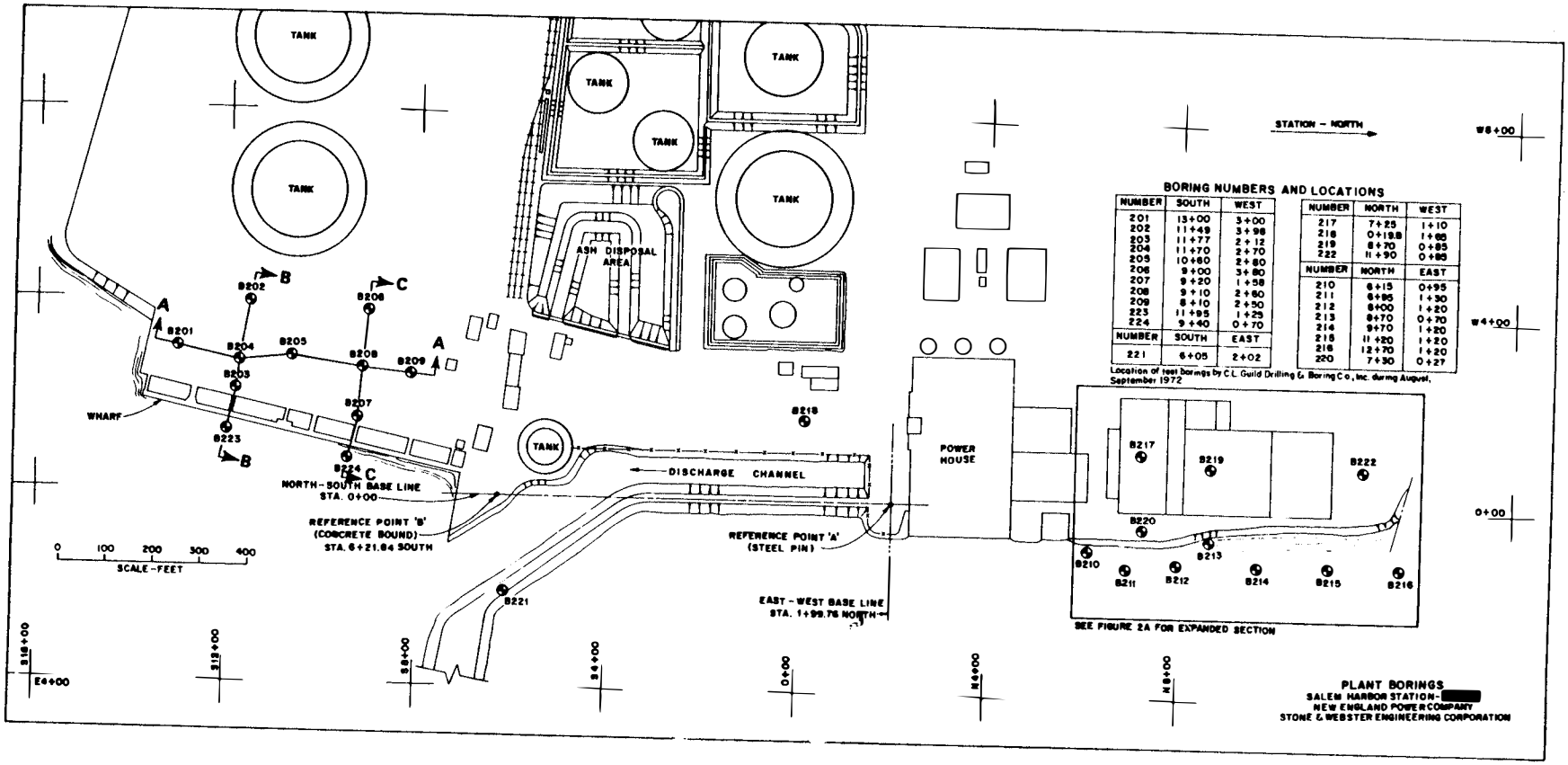
NEP should provide those reports on Salem Harbor and Brayton Point used to substantiate its position of not lining the coal pile.

Response

The marine resources of Salem Harbor were extensively studied by the Massachusetts Division of Marine Fisheries from January 1971 through March 1979. The purpose of these studies was to address the effects of electrical power generation on the marine resources of Salem Harbor. These studies included an evaluation of the phytoplankton, zooplankton, benthos, finfish, ichthyoplankton and water quality.

Results of these studies are summarized in one final report, "The Effects of the Addition of a Fourth Generating Unit at the Salem Harbor Electric Generating Station on the Marine Ecosystem of Salem Harbor" by C. O. Anderson, et al, dated December 1975, nine Semi-Annual Reports (1A-5A and 1B-4B) entitled, "Investigations on the Effects of Electrical Power Generation on Marine Resources in Salem Harbor" by C. O. Anderson, et al, and two reports prepared by Battelle Columbus Laboratories, W. F. Clapp Laboratories entitled, "Salem Power Plant Studies-Benthic and Plankton Surveys" by M. S. Stuart, and J. B. Kirkwood dated June 1, 1974 and "Salem Power Plant Studies Benthic Survey" by M. S. Stuart dated April 30, 1975.

A draft of final report of effects on the marine ecosystem, which did not change in the final report, were distributed at the Salem Harbor Technical Advisory Committee (TAC) meeting of April 26, 1976. The W. F. Clapp


TANK
TANK
TANK
TANK
TANK
ASH DISPOSAL AREA
STATION - NORTH
W8+00
W4+00
0+00
BORING NUMBERS AND LOCATIONS
NUMBER | SOUTH | WEST
201 | 13+00 | 3+00
202 | 11+48 | 3+98
203 | 11+77 | 2+12
204 | 11+70 | 2+70
205 | 10+80 | 2+80
206 | 9+00 | 3+80
207 | 9+20 | 1+98
208 | 9+10 | 2+80
209 | 8+10 | 2+50
223 | 11+95 | 1+25
224 | 9+40 | 0+70
NUMBER | SOUTH | EAST
221 | 6+05 | 2+02
NUMBER | NORTH | WEST
217 | 7+25 | 1+10
218 | 0+19.8 | 1+66
219 | 8+70 | 0+85
222 | 11+90 | 0+85
NUMBER | NORTH | EAST
210 | 6+15 | 0+95
211 | 6+85 | 1+30
212 | 8+00 | 1+20
213 | 8+70 | 0+70
214 | 9+70 | 1+20
215 | 11+20 | 1+20
216 | 12+70 | 1+20
220 | 7+30 | 0+27
Location of test borings by C.L. Guild Drilling & Boring Co., Inc. during August, September 1972
B201
B202
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B204
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B206
B207
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B209
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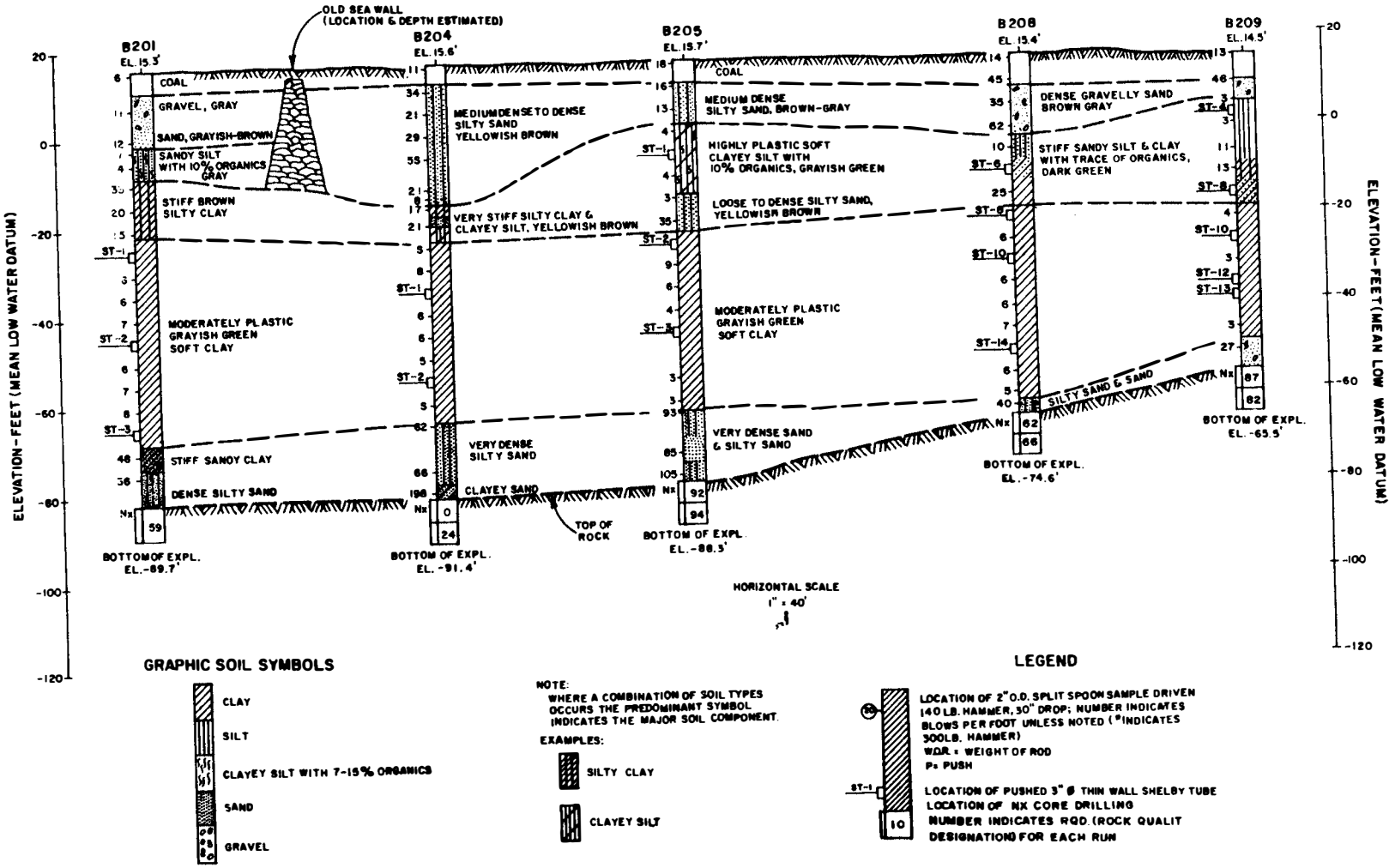
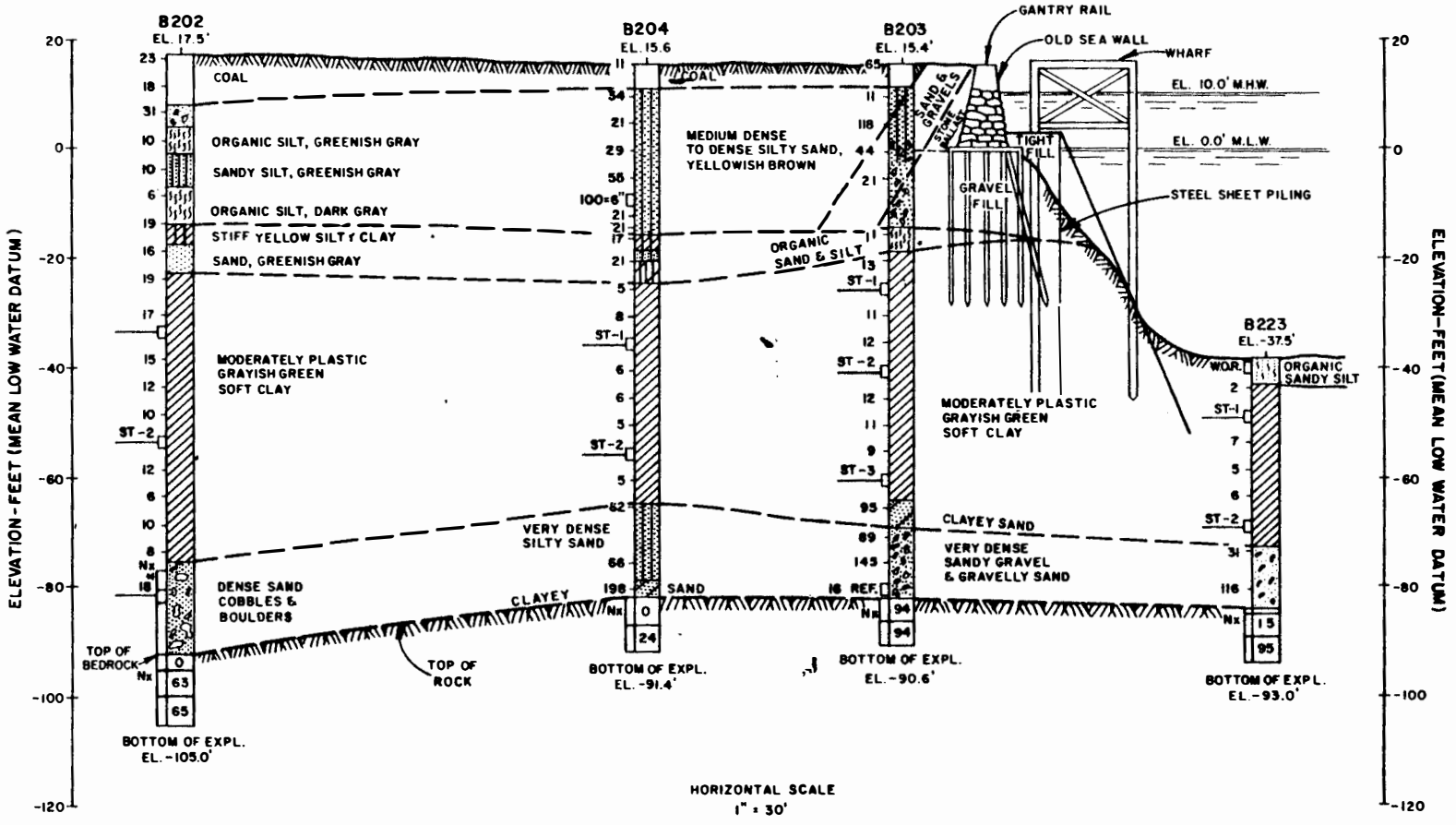
B211
B212
B213
B214
B215
B216
B217
B218
B219
B220
B221
B222
B223
B224
A
B
C
WHARF
NORTH-SOUTH BASE LINE
STA. 0+00
REFERENCE POINT 'B'
(CONCRETE BOUND)
STA. 6+21.84 SOUTH
DISCHARGE CHANNEL
POWER HOUSE
REFERENCE POINT 'A'
(STEEL PIN)
EAST-WEST BASE LINE
STA. 1+99.76 NORTH
0 100 200 300 400
SCALE-FEET
SEE FIGURE 2A FOR EXPANDED SECTION
E4+00
E8+00
E12+00
E16+00
N0+00
N4+00
N8+00
N12+00
PLANT BORINGS
SALEM HARBOR STATION-
NEW ENGLAND POWER COMPANY
STONE & WEBSTER ENGINEERING CORPORATION


OLD SEA WALL
(LOCATION & DEPTH ESTIMATED)
B201
EL. 15.3'
B204
EL. 15.6'
B205
EL. 15.7'
B208
EL. 15.4'
B209
EL. 14.5'
COAL
GRAVEL, GRAY
SAND, GRAYISH-BROWN
SANDY SILT WITH 10% ORGANICS GRAY
STIFF BROWN SILTY CLAY
MODERATELY PLASTIC GRAYISH GREEN SOFT CLAY
STIFF SANDY CLAY
DENSE SILTY SAND
MEDIUM DENSE TO DENSE SILTY SAND YELLOWISH BROWN
VERY STIFF SILTY CLAY & CLAYEY SILT, YELLOWISH BROWN
VERY DENSE SILTY SAND
CLAYEY SAND
TOP OF ROCK
MEDIUM DENSE SILTY SAND, BROWN-GRAY
HIGHLY PLASTIC SOFT CLAYEY SILT WITH 10% ORGANICS, GRAYISH GREEN
LOOSE TO DENSE SILTY SAND, YELLOWISH BROWN
MODERATELY PLASTIC GRAYISH GREEN SOFT CLAY
VERY DENSE SAND & SILTY SAND
DENSE GRAVELLY SAND BROWN GRAY
STIFF SANDY SILT & CLAY WITH TRACE OF ORGANICS, DARK GREEN
SILTY SAND & SAND
BOTTOM OF EXPL. EL.-89.7'
BOTTOM OF EXPL. EL.-91.4'
BOTTOM OF EXPL. EL.-86.3'
BOTTOM OF EXPL. EL.-74.6'
BOTTOM OF EXPL. EL.-65.5'
ELEVATION-FEET (MEAN LOW WATER DATUM)
HORIZONTAL SCALE
1" = 40'
GRAPHIC SOIL SYMBOLS
CLAY
SILT
CLAYEY SILT WITH 7-15% ORGANICS
SAND
GRAVEL
NOTE:
WHERE A COMBINATION OF SOIL TYPES OCCURS THE PREDOMINANT SYMBOL INDICATES THE MAJOR SOIL COMPONENT.
EXAMPLES:
SILTY CLAY
CLAYEY SILT
LEGEND
LOCATION OF 2" O.D. SPLIT SPOON SAMPLE DRIVEN 140 LB. HAMMER, 30" DROP; NUMBER INDICATES BLOWS PER FOOT UNLESS NOTED ("P" INDICATES 300 LB. HAMMER)
WOR = WEIGHT OF ROD
P = PUSH
LOCATION OF PUSHED 3" Ø THIN WALL SHELBY TUBE
LOCATION OF NX CORE DRILLING
NUMBER INDICATES RQD. (ROCK QUALITY DESIGNATION) FOR EACH RUN


B202
EL. 17.5'
B204
EL. 15.6
B203
EL. 15.4'
B223
EL. -37.5'
GANTRY RAIL
OLD SEA WALL
WHARF
EL. 10.0' M.H.W.
EL. 0.0' M.L.W.
STEEL SHEET PILING
TIGHT FILL
GRAVEL FILL
SAND & GRAVELS
COAL
ORGANIC SILT, GREENISH GRAY
SANDY SILT, GREENISH GRAY
ORGANIC SILT, DARK GRAY
STIFF YELLOW SILTY CLAY
SAND, GREENISH GRAY
MEDIUM DENSE TO DENSE SILTY SAND, YELLOWISH BROWN
ORGANIC SAND & SILT
MODERATELY PLASTIC GRAYISH GREEN SOFT CLAY
VERY DENSE SILTY SAND
CLAYEY SAND
VERY DENSE SANDY GRAVEL & GRAVELLY SAND
DENSE SAND COBBLES & BOULDERS
CLAYEY SAND
ORGANIC SANDY SILT
TOP OF BEDROCK
TOP OF ROCK
BOTTOM OF EXPL. EL. -105.0'
BOTTOM OF EXPL. EL. -91.4'
BOTTOM OF EXPL. EL. -90.6'
BOTTOM OF EXPL. EL. -93.0'
ELEVATION - FEET (MEAN LOW WATER DATUM)
HORIZONTAL SCALE
1" = 30'

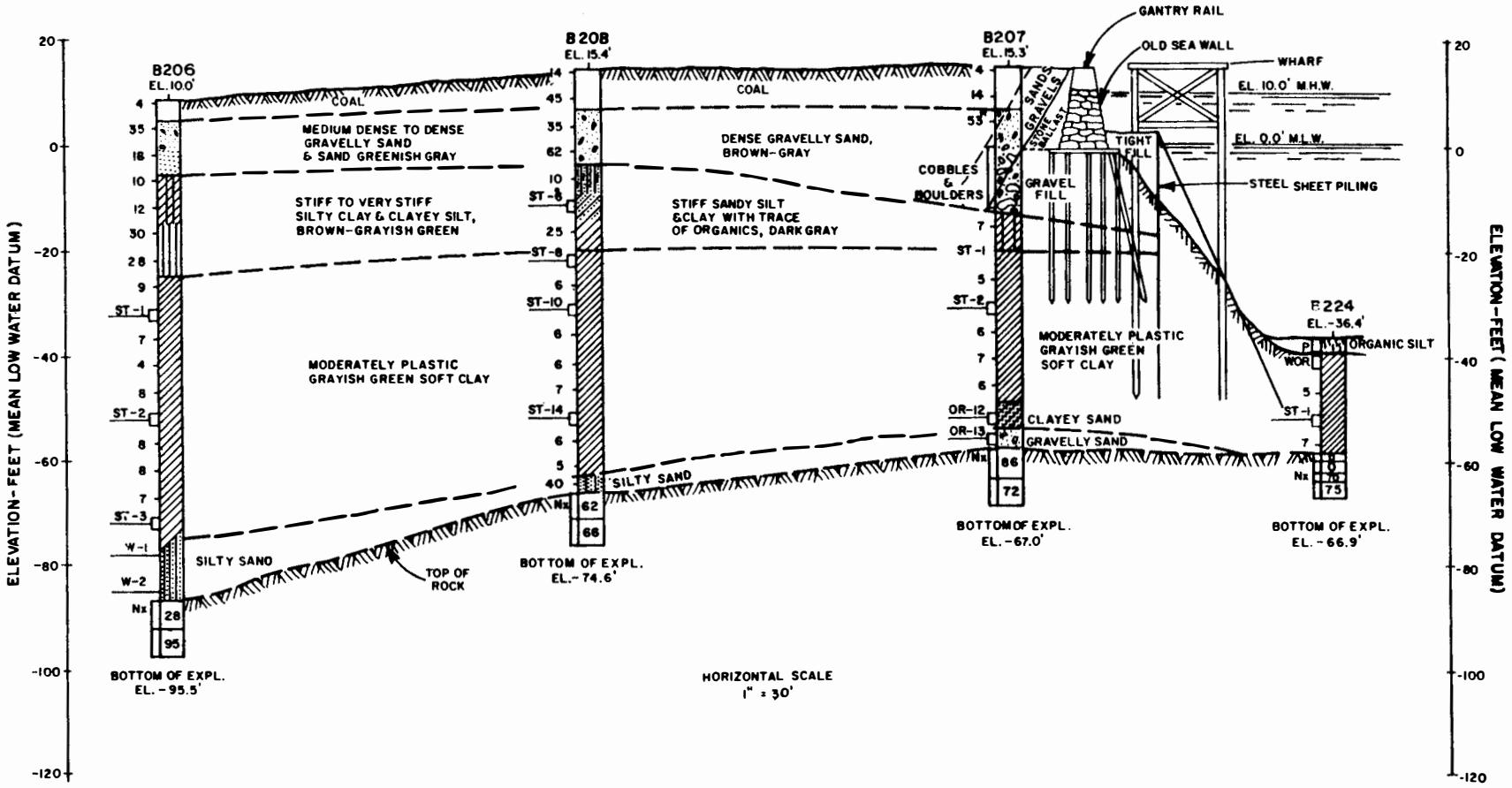

B206
EL. 10.0'
B208
EL. 15.4'
B207
EL. 15.3'
B224
EL. -36.4'
GANTRY RAIL
OLD SEA WALL
WHARF
EL. 10.0' M.H.W.
EL. 0.0' M.L.W.
TIGHT FILL
STEEL SHEET PILING
GRAVEL FILL
COBBLES & BOULDERS
SANDS, GRAVELS, STONE AST
COAL
MEDIUM DENSE TO DENSE GRAVELLY SAND & SAND GREENISH GRAY
STIFF TO VERY STIFF SILTY CLAY & CLAYEY SILT, BROWN-GRAYISH GREEN
DENSE GRAVELLY SAND, BROWN-GRAY
STIFF SANDY SILT & CLAY WITH TRACE OF ORGANICS, DARK GRAY
MODERATELY PLASTIC GRAYISH GREEN SOFT CLAY
ORGANIC SILT
CLAYEY SAND
GRAVELLY SAND
SILTY SAND
SILTY SAND
TOP OF ROCK
BOTTOM OF EXPL. EL. -95.5'
BOTTOM OF EXPL. EL. -74.6'
BOTTOM OF EXPL. EL. -67.0'
BOTTOM OF EXPL. EL. -66.9'
HORIZONTAL SCALE 1" = 30'
ELEVATION - FEET (MEAN LOW WATER DATUM)
ELEVATION - FEET (MEAN LOW WATER DATUM)
20
0
-20
-40
-60
-80
-100
-120

TABLE 4.4-1

GROUNDWATER CHARACTERISTICS
UNDER AND ADJACENT TO COAL PILE
March 12, 1982

Concentration in Parts Per Million

Observation Well No.	Total Alkalinity	Salinity as NaCl	As	Al	Ca	Cr	Cd	Fe	Mg	Pb	Se	Ti
MW 1	82	3,249	<0.01	<0.01	277	0.11	<0.01	290	288	<0.01	<0.01	1.0
MW 2	45	228	<0.01	0.3	126	0.04	<0.01	1.57	34	1.8	<0.01	<0.01
MW 3	30	4,500	<0.01	<0.01	323	0.02	<0.01	734	146	<0.01	<0.01	<0.01
MW 4	81	1,710	<0.01	<0.01	246	0.04	<0.01	216	138	<0.01	<0.01	0.1
MW 5	25	900	<0.01	<0.01	428	0.02	<0.01	325	75	<0.01	0.01	0.1
Salem Harbor Seawater	110	32,000	<0.01	<0.01	257	0.1	0.02	0.11	320	<0.01	<0.01	3.1

Laboratory reports were distributed at the Salem Harbor TAC meetings of August 9, 1974 and May 8, 1975. Members of the TAC include DEQE, Division of Marine Fisheries, EPA, U.S. Fish and Wildlife Service and National Marine Fisheries Service. Copies of the Salem Harbor report and the W. F. Clapp reports are being made availble to MEPA for public review.

These studies were not specifically designed to examine the effect of coal pile leachate, but rather were designed to examine the overall effect of electric power generation on the marine life and water quality of Salem Harbor. It is important to note that these studies were conducted during the time when coal was burned at Salem Harbor (January-May 1974 and April-June 1975) and the coal pile was active.

Several conclusions reached by the State in their report on Salem Harbor are noteworthy:

1. "The finfish species collected and their relative rank of abundance are similar to those found during past studies conducted by the Massachusetts Division of Marine Fisheries in other northern coastal waters of Massachusetts."

2. "Normal ranges and seasonal variation of phytoplankton and their primary productivity were shown by the chlorophyll and ^{14}C uptake studies."

3. "Based on all water quality measurements taken during this study (including copper concentrations in shellfish, water and sediment), it is our conclusion that those chemical constituents which were monitored are well within normal ranges found in seawater and are not considered to be limiting factors to the marine life of Salem Harbor."

Battelle Laboratories found that the benthic population at an intertidal station just south of the coal pile was similar to the benthic population of an intertidal station on the opposite site of the harbor on the Marblehead shore, approximately 3/4 of a mile to the south.

We believe these studies prove the marine life and water quality of Salem Harbor were not adversely affected by the generation of electrical power at Salem Harbor Station, including that period when coal was burned and the coal pile was active.

Issue 2

The applicability of the Brayton Point coal pile evaluation to Salem Harbor should be evaluated.

Response

The studies done at Salem Harbor did not specifically focus on the question of coal pile leachate and the accumulation of heavy metals in sediments and shellfish. This issue was raised as part of the Brayton Point coal conversion environmental review and a separate study of shellfish living near the coal pile was initiated to address this concern. We have measured the accumulation of metals in shellfish near our coal pile at Brayton Point. These measurements show what was seen in the sediments and shellfish in Mount Hope Bay and, thus, the impact on marine resources of Mount Hope Bay.

The coal pile studies at Brayton Point were summarized in a report entitled, "Mount Hope Bay Quahogs Heavy Metal Concentration Study" dated December 23, 1980 which was sent to the Division of Water Pollution Control on December 23, 1980. A copy of this report is included as Attachment 1.

This report compares the concentration of 13 metals (zinc, manganese, copper, aluminum, arsenic, cadmium, cobalt, chromium, nickel, lead, selenium, vanadium, iron) found in quahogs (Mercenaria mercenaria) taken from three areas adjacent to the Brayton Point coal pile with the concentration of metal in quahogs taken from Spar Island, a control area, approximately 1.5 nautical miles south of the coal pile.

The Brayton Point coal pile studies showed:

1. "In the ten total samples, four from Spar Island (the control area) and six from nearby the coal pile, the highest single per sample concentrations for copper, iron and aluminum were found in coal pile samples. However, the lowest per sample concentrations for copper, iron and aluminum were also found in coal pile samples."

2. "The mean coal pile heavy metal concentrations per element are, except for iron, less than or equal to the mean Spar Island heavy metal concentrations."

We concluded from the survey that there were no unusual concentrations of heavy metals in the quahogs near our Brayton Point coal pile. We anticipate similar results at Salem Harbor because the coal comes from the same source and both coal piles are built on filled land adjacent to saline water. Both locations use bivalve shellfish as indicator species because they don't move, they are filter feeders and they will accumulate metals if available. The response to these organisms would be the same at both locations. The land under the Salem coal pile was filled in 1922, while the land under the Brayton Point coal pile was filled in 1960.

Issue 3

Any evaluation of coal pile leachate done at Salem Harbor now or in the recent past would not be sufficient since the coal pile has been inactive.

Response 3

As previously stated, the studies on the marine environment and water quality of Salem Harbor were contracted during the time when the coal pile was active. Additionally, as of March 1, 1982, the coal pile is again active and any sampling of groundwater, shellfish or sediments would reflect that active state.

Issue 4

We should propose an evaluation program to examine the amount of coal pile leachate, including sampling of shellfish, sediments and water.

Response 4

Since site differences do exist, we propose to measure the accumulation of metals in sediment and shellfish in areas adjacent to and remote from the Salem Harbor coal pile. We propose taking these samples within the next 90 days and repeating the measurement in yearly intervals. This information can be used in conjunction with the well test data to make an accurate assessment of the level of leachate, if any, from the Salem Harbor coal pile which reaches Salem Harbor and the impacts on its marine resources.

ATTACHMENT 1

NEW ENGLAND POWER COMPANY

BRAYTON POINT STATION

Mount Hope Bay Quahogs
Heavy Metal Concentration Study

December 23, 1980

Quahogs were collected from Mount Hope Bay and analyzed for their heavy metal burden. The objective of the program is to determine if coal pile runoff and leachate will have an adverse impact of the Mount Hope Bay environment. Quahogs were selected as test animals because they are stationary animals four to six years old and are known to bioaccumulate a number of substances, including heavy metals.

The heavy metal concentration study was conducted under worst-case conditions in that no coal pile runoff was collected for treatment. The results indicate that heavy metal contamination of quahogs has not occurred nor were the animals affected by metal hydroxide precipitates.

Quahogs were collected in the fall of 1979 and 1980 from Stations 1, 2 and 3 and in 1975, 1977, 1979 and 1980 from Control Station F (see Figure 1). Stations 1, 2 and 3 are approximately 30 feet offshore of the coal pile where the animals are maximally exposed to runoff and leachate. Station F is located at Spar Island and has been used as a control station for nine years as part of the ongoing biological monitoring program.

At each station, five or six quahogs were collected. Samples were homogenized and three extracts taken for analysis. Each extract was analyzed for 13 metals by New England Aquarium and the results reported as a mean of the three extracts $\pm$ one standard deviation, for each location.

The results of the survey data is presented in Table 1. This table gives the heavy metal concentration in ppm for 13 metals in quahogs taken on four occasions from Control Station F and on two occasions at the three coal pile stations. Several points are noteworthy:

1. In the ten total samples, four from Spar Island and six from the coal pile the highest single per sample concentrations for copper, iron and aluminum were found in coal pile samples. However, the lowest per sample concentrations for copper, iron and aluminum were also found in coal pile samples.

2. The mean coal pile heavy metal concentrations per element are, except for iron, less than or equal to the mean Spar Island heavy metal concentrations.

For comparison, Table 2 below gives the ranges and/or means of heavy metal concentrations in quahogs, taken along the eastern seaboard as given in three separate reports.

The average heavy metal concentration per element for coal pile samples is within the range of values reported by the Department of Health, Education and Welfare from 15 coastal states and are below the mean values reported for approximately 130 shellfish samples taken from the Atlantic and Gulf Coast region as reported in the 1971 Shellfish Sanitation Workshop. The mean levels for zinc and manganese near the coal pile are slightly greater than the mean levels reported by the Food and Drug Administration. However, they are well within the 95% confidences interval presented by the Food and Drug Administration.

Based on the results of our survey and the other data available, it would appear that there is no unusual concentration of heavy metals in the estimates near our coal pile, a concern raised in the Final Environmental Impact Statement. Additionally, the abundance of quahogs in the area south of the coal pile indicates that flocculent precipitators of iron hydroxide are not present in amounts necessary to block shellfish respiration; a concern raised in the Final Environmental Impact Statement.

All collected animals were observed to be in good health and showed no effects of metal hydroxide precipitates.

TABLE 1

Heavy Metal Concentration in PPM of Wet Tissue

	Spar Island					Coal Pile (1979)				Coal Pile (1980)				1979 1980
	1975[1]	1977[2]	1979[2]	1980[2]	X	1	2	3	X	1[2]	2[2]	3[2]	X[2]	Mean
Zinc	60	33	23.7	17.3	33.5	15.2	23.5	14.8	17.8	30.2	42.0	31.0	34.4	26.1
Manganese	--	32	17.8	16.8	22.2	2.6	11.2	4.0	5.9	26.1	20.1	24.6	23.6	14.8
Copper	3.3	3.1	2.2	1.7	2.6	1.2	3.1	2.3	2.2	2.1	4.9	2.3	3.1	2.6
Aluminum	7.3	--	--	6.6	6.9	4.7	10.4	0.7	8.3	6.4	5.4	4.3	5.4	6.8
Arsenic	00	--	--	1.2	1.2	< 1	< 1	< 1	< 1	1.0	0.8	1.1	1.0	1
Cadmium	1.7	1.1	<.06	<.1	.7	<.06	.06	0.1	.03	<.1	<.1	<.1	<.1	.5
Cobalt	--	.83	.38	.26	.49	.25	.36	.38	.33	.48	.38	.54	.46	.4
Chromium	1.5	7.6	.3	.26	2.4	.46	.35	.50	.44	.7	.5	.2	.5	.4
Nickel	3.7	1.0	2.1	2.0	2.2	1.3	1.9	3.1	2.1	2.2	1.4	1.6	1.7	1.9
Lead	1.7	2.9	<.4	< 1	2.0	<.4	<.4	<.4	<.4	<.5	1.0	<.5	< 1	.7
Selenium	--	--	--	<.2	.2	.8	1.5	.6	1.0	<.5	<.5	<.5	<.5	.7
Vanadium	--	1.4	.34	.23	.65	.49	.58	.77	.61	.5	.6	.4	.5	.5
Iron		36	43	20.5	33.2	7.0	50.0	72.0	43	18.9	25.8	58	34.2	38.6

[1] Values represent the mean heavy metal concentration of six separate quahog samples.

[2] Values represent the mean heavy metal concentration of three extracts from a pooled sample of quahogs.

TABLE 2

	Coal Pile	HEW Shellfish Sanitation Technical Report [1]	1971 Shellfish Sanitation Workshop [2]	FDA Shellfish Sanitation Division [3]
	Mean	Range	Mean	Mean
Zinc	34.4	11.5-40.2	40.0	32.9
Manganese	23.6	0.7-29.7	--	13.5
Copper	3.1	1-16.5	5.4	3.5
Aluminum	5.4	--	--	--
Arsenic	1.0	--	--	0.13
Cadmium	<.1	0.1 - 0.7	0.2	0.1
Cobolt	.46	0.1 - 0.2	--	--
Chromium	.5	0.2 - 5.8	0.28	0.65
Nickel	1.7	0.1 - 2.4	--	--
Lead	<1	0.1 - 7.5	2.1	0.39
Selenium	<.5	--	--	0.25
Vanadium	.5	--	--	--
Iron	34.2	9-83.0	--	--

[1] Shellfish Sanitation Technical Report - A Guide to Trace Metals in Shellfish.

[2] Proceedings of the 1971 Shellfish Sanitation Workshop.

[3] U.S. Food and Drug Administration Shellfish Sanitation Division - Summary Data Sheets

6.5 NEW ENGLAND POWER COMPANY'S FUGITIVE DUST CONTROL PROGRAM FOR THE SALEM HARBOR GENERATING STATION

The following section was prepared by New England Power Company in response to comments on the Draft EIR for the State MEPA process. The section was originally submitted as Attachment A to the State Final EIR and is reproduced verbatim.

ATTACHMENT A

NEW ENGLAND POWER COMPANY

Salem Harbor Station

FUGITIVE PARTICULATE EMISSION CONTROL PROGRAM

1.0 Coal Handling Systems

1.1 Coal Unloading

Coal will be unloaded from barges at the Salem Harbor Station pier using a crane (or cranes) with a clamshell bucket. The operator will lower the bucket as close to the top of the unloading pile as possible to minimize the fall distance of the coal. The coal will be pushed from the unloading area to the main coal pile using a bulldozer or front end loader. A dust suppression spray system consisting of 7 portable water spray stands and 10 fixed spray towers will be available as necessary to minimize coal dust emissions from the unloading and stacking operations.

At some point in 1983, delivery of a new self-discharging coal collier is expected. All, or a portion, of the Salem Harbor coal requirements may be delivered by the new collier starting in 1983. Coal discharge from the new collier will be accomplished via a movable discharge boom which can be positioned to discharge directly to the coal pile. When the schedule for delivery of the new vessel and its unloading procedures are more clearly defined, the coal unloading section of this procedure will be modified appropriately.

1.2 Coal Pile Management

The coal pile will be divided into two basic parts, the active and inactive portions. Each will have its own dust control measures.

In the active portion, portable and fixed sprays will be activated as necessary to prevent fugitive dust from being generated.

The inactive part of the coal pile will be built up over a period of time. Sprays will be used to prevent dust emissions during that time.

When complete, the inactive portion will be compacted and a crusting agent will be applied to control the generation of airborne coal dust. If the inactive portion were to be used, dust would be controlled as in the active part.

1.3 Coal Conveyor System

The main coal conveyor from the crusher house to the power plant is totally enclosed which will eliminate the problem of dust emissions. The short U-belt conveyor from the coal pile to the crusher house is enclosed on three sides with a small opening on the side facing Salem Harbor. The enclosure extends below the top of the belt. It is expected that dust emissions from this conveyor section will be minimal.

2.0 Coal Ash Systems

2.1 Wet Ash Handling System

During the early part of coal burning under the DCO, coal ash will be removed from ash ponds with a clamshell bucket and trucked to a windrow drying area on the property. After partial drying, the ash will be loaded on trucks for offsite disposal.

Water wagons, hand-held hoses and street sweepers will be used as necessary to control dust on haul roads on the Station property. Ash will be allowed to dry only to a damp state prior to being trucked off-site. All trucks will be washed down and the ash in trucks covered prior to leaving the Station to prevent ash from being tracked or blown onto City streets.

2.2 Dry Ash Handling System

Approximately 30 weeks, after the commencement of coal burning, a dry system will be put in operation to collect fly ash from precipitators, economizers and the stack. Bottom ash will continue to be collected with a wet system.

The dry system will improve control of fugitive dust because it will eliminate the windrow drying of fly ash. It will also improve precipitator performance because it allows nearly continuous ash removal from all fly ash hoppers. Fly ash will be conveyed from hoppers to a storage silo using a totally enclosed vacuum pneumatic system. This discharge from the vacuum pumps will pass through two cyclone separators and a bag filter in series. The combined ash removal efficiency of the three steps is 99.985% which will minimize fugitive emissions from the dry ash handling system.

Ash will be loaded on trucks directly from the silo for offsite disposal. The ash will be water-conditioned as it is loaded on trucks to minimize fugitive emissions. The trucks will be washed down and covered prior to leaving the Station property.

AHA:gv

February 12, 1982

6.6 ANTICIPATED ASH CHARACTERISTICS FROM COAL COMBUSTION AT THE SALEM HARBOR GENERATING STATION

The following information was prepared by New England Power Company in response to comments on the Draft EIR for the State MEPA process. It was originally submitted as Attachments B through G to the State Final EIR.

USE OF FLY ASH AS AN INTERMEDIATE COVER OVER REFUSE IN SANITARY LANDFILLS

Clearly, one of the most effective means of disspelling negative notions about fly ash is to demonstrate its effectiveness and safety as an intermediate cover over refuse. During 1976, 1977 and 1978, the following areas have been pursued with this objective in mind:

1976 State Legislation

Massachusetts became the second State to enact legislation designating ash as a resource with a new aspect that ash may be used as an intermediate cover over refuse.

1977--The Norton Landfill Demonstration Project

At present, the sanitary landfill method of household refuse disposal is the least expensive, environmentally acceptable approach to municipal waste management. One criterion for a landfill is that deposited wastes be covered with soil at the end of each day in order to prevent access for rodents and insects.

Our objective was to substitute damp ash in place of sand used for daily cover over rubbish.

A workshop was held at the landfill site and some 30 Town engineers and State solid waste personnel found the demonstration to be very enlightening. In fact, the Massachusetts Department of Environmental Quality Engineering, hereafter (MDEQE), agreed that the material could be used as a substitute for soil cover (see attached photographs).

1978--Rehoboth Landfill Demonstration Project

In order to prove to the MDEQE that fly ash would not contribute to landfill leachates and groundwater contamination, we chose another town for a demonstration project.

The results of our 14-month experimental program are summarized below and Table 1 on the following page contains the elements examined. On the whole, the concentrations of elements in the ash are very low, in some cases, near the analytical detection limit. Lead is listed in the proposed EPA standard for extract concentrations under RCRA regulations for hazardous waste, and our data falls well within the proposed standard of 0.50 (mg/l).

Five sampling stations were set up under the guidance of MDEQE. The station locations represented a variety of geological settings. The following is a brief description of the areas:

1. Rehoboth Landfill

   Well No. 1--Placed downstream from the landfill at a depth of three feet in the groundwater.

2. Rehoboth Landfill

   Well No. 2--Placed downstream from the landfill approximately 600 feet from well No. 1 at a depth of 12 feet in the groundwater.

3. Rehoboth Brook

   The Brook is located approximately one mile from the Town landfill. Surface water samples were taken for use as comparative data as this Brook is relatively clean.

4. Brayton Point Fly Ash Storage Pit

   Approximately 90,000 tons of ash was stored in this area in 1975. The area contains a large depression which holds rainwater most of the year. This trapped water is approximately 18 feet above the water table. The underbed contained fly ash and surface water samples were taken from this area.

5. Brayton Point Gravel Pit

The pit is located adjacent and downstream to the fly ash storage pit.

Gravel was extracted to the groundwater level and surface water samples were taken from this area. Both the storage and gravel pits are located within 200 feet of a tidal estuary, and this plus the sluicing of fly ash from the Station by seawater is the reason for higher calcium and magnesium concentrations in the reported data.

Preoperational Data and Operational Data

After placement of the wells at the Rehoboth landfill, we took baseline data for two months before ash was brought to the site. As shown in Table 1, there is not much difference in data between preoperational and operational. The comparative Brook analyses and those of the Station onsite disposal area also showed similar results except for those parameters associated with saltwater sluicing.

Sample collection was performed by Company personnel. The liquid samples were taken in polypropylene bottles and were analyzed by a Perkin-Elmer (AA 503) Atomic Absorption unit.

Within a few weeks, the MDEQE will make a final determination on the use of ash at town landfills. If approved, this action will keep our disposal costs to a minimum, and also save landfill operational costs in the surrounding towns.

TABLE 1

LANDFILL COVER DEMONSTRATION PROJECT - SEPTEMBER 1977-JANUARY 1979

12-Month Average Concentrations

	Preoperation Data (mg/l) Town of Rehoboth Landfill		Operational Data (mg/l) Town of Rehoboth Landfill		Comparative Data Rehoboth Brook Rehoboth, Mass.	Brayton Point Gravel Pit Somerset, Mass.	Brayton Point Ash Storage Pit Somerset, Mass.	The limit of extract concentrations for hazardous waste under Proposed RCRA Regulations (mg/l)
	Well No. 1	Well No. 2	Well No. 1	Well No. 2				
Al	4.88	3.53	.083	.578	.085	1.157	.391	
Fe	.311	3.68	.428	1.133	.545	2.339	.114	
Mn	.596	3.04	.014	.125	.011	.047	.036	
Ca	3.415	3.808	5.93	1.868	1.173	13.02	31.08	
Mg	1.027	2.076	2.85	1.433	.956	4.107	6.547	
Pb	<.01	.04	.060	<.01	.051	.04	.04	0.50
Ph	6.28	6.9	6.92	6.24	5.43	7.33	7.19	

ATTACHMENT C

A REPORT ON THE EXPERIMENTAL USE OF COAL ASH AS COVER MATERIAL AT THE TOWN OF NORTON LANDFILL

Prepared for the
Department of Environmental Quality Engineering
Southeast Region

August 4, 1977

Prepared by
Herbert B. Glick, Environmental Analyst

New England Power Company
Westboro, Massachusetts 01581

TABLE OF CONTENTS

INTRODUCTION

In July of 1977, New England Power Company requested approval from the Department of Environmental Quality Engineering and the town of Norton to conduct an experimental program utilizing coal fly ash residue as intermediate cover material at the Norton Landfill under M.G.L. Section 150A of Chapter 111.

The experiment was instituted in anticipation of conversion to coal at the Brayton Point Electric Generating Station and in order to introduce a product from which local municipalities could benefit economically.

Upon conversion, Brayton Point Units No. 1, 2 and 3 will have the capability of burning 2,500,000 tons of coal annually with a fly ash residue in excess of 220,000 tons per year or 604 tons per day.

The broad objectives of the proposal were as follows:

1. A limited, two-week, experimental period substituting damp ash in place of the coarse gravelly sand normally used to cover the rubbish daily in the amount of 600 cubic yards per week.
2. To observe and develop guidelines which would enable the use of ash on landfills in an environmentally acceptable manner.

House No. 4596, as prepared for final passage.

H 4596

igned by
ov. Dukakis
5/20/76

ECLARED EMERGENCY LAW BY
GOVERNOR DUKAKIS
FFECTIVE MAY 25, 1976,
10:0- A.M.

Chapter 118

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Seventy-six

AN ACT RELATIVE TO THE USE OF ASH AS A RAW MATERIAL AND FOR CERTAIN OTHER PURPOSES AND RELATIVE TO THE STORAGE THEREOF.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Section 150A of chapter 111 of the General Laws is hereby amended by adding the following paragraph:-

Ash produced from the combustion of coal, including but not limited to fly ash and bottom ash, shall not be construed as refuse, rubbish, garbage, or waste material under this section when used as a raw material for concrete block manufacture, aggregate, fill, base for road construction, or other commercial or industrial purpose, or stored for such use. A location where such use or storage takes place may be constructed, established, maintained, and operated without being construed as a facility or site for a facility under this section, and no assignment or approval from the board of health or the department shall be required for such construction, establishment, maintenance, or operation; provided, however, the department shall have jurisdiction to determine, after notice and hearing, that the establishment or operation of such a location has created a nuisance condition by reason of odor, dust, fires, smoke, the breeding or harboring of rodents, flies or vermin, or other causes, and to prevent or order abatement thereof; and provided, further, that no final disposal of ash produced by the combustion of coal may be accomplished by burial of such ash in the ground, other than as base for road construction or fill, unless the place where such disposal takes place has been assigned for such disposal by the board of health and plans for such disposal have been approved by the department pursuant to this section. The department may waive the requirements of the preceding paragraphs of this section and the application of any regulations, or

H 4596A

the burning of coal, and shall review and may approve the plans, site and method of storage upon a determination that no nuisance is created and damage to the environment is minimal. Use of ash produced from the combustion of coal as intermediate cover material over rubbish at sanitary landfill facilities may be permitted by assignment of the board of health with approval of the department under this section.

House of Representatives, May 10, 1976.

Passed to be enacted, , Speaker.

In Senate, May 10, 1976.

Passed to be enacted, , President.

May 20, 1976.

Approved.

Signed by

Governor.

DECLARED TO BE EMERGENCY LAW BY GOVERNOR DUKAKIS--
EFFECTIVE MAY 25, 1976, 10:04 A.M.

II. General Information on Fly Ash

Fly ash is the residue obtained from burning pulverized coal in electric plants. It is essentially an inorganic or mineral material and only very slightly soluble in water on leaching. There are no known elements or compounds in fly ash which have been shown to be toxic or physiologically dangerous. This can be expected since it is the ash material of a fossil fuel, originally of vegetative origin. Chemical analysis gives the elementary composition of fly ash, which is essentially the same as most silicate rocks and clays. The particle sizes fall largely into the category of sandy silt, with specific gravity in the range of 1.9 to 2.4. Between 1% and 3% of fly ash particles are hollow spheres.

III. Truck Transportation to Norton Landfill

The hauling of damp fly ash was accomplished by using two 40 cubic-yard tractor trailers both equipped with nylon mesh covers (the mesh size was about the size of household screens) and a 7 cubic-yard John Deere tractor for loading. During loading, the observer noted that damp ash did not become wind borne upon impact contact with the dump truck bodies or during the dumping process at Norton. (See photos on next page).

On the haul route which encompassed Route Interstate 195 and State Routes 79 and 24, speeds of 55 mph had been clocked by the observer. The trucks held ash with none observed blowing into the atmosphere.

During the experimental period, New England Power Company had not received complaints from any of the neighborhoods along the 75-mile haul route which included many trips through downtown Taunton.

IV. Brayton Point Station Fly Ash Loading Area

As shown in the photos below, the ash was scooped out of the basin and stockpiled for easy load handling. The observer requested that approximately 120 cubic yards be set aside for a drying out test. After approximately a 72-hour period, the upper layers of ash had dried out in the hot sun and slid or were wind whipped to the bottom of the pile.

After 72 hours, some drying occurred.

Within the first few days of operation, the truck loading area, which consisted of surface fly ash as a road base, dried out from the heavy traffic. As a dust preventive measure, a water wagon sprayed down the area. The observer noted that after rainy days, the fly ash loading area had naturally cemented itself by creating a crust(pozzolanic action) in the hot sun (nature's own way of preventing an airborne nuisance). But as truck traffic increased, the crust broke down and again a water wagon was brought in.

V. Norton Landfill Operation

As required in a letter from the Department of Environmental Quality Engineering dated June 13, 1977, a rain gauge was set up at the landfill site. Rain showers occurred on the following dates:

July 5	July 8	July 12	July 13
.05"	.04"	.11"	.04"

In total, 1,200 cubic yards of ash had been delivered to the landfill. The schedule was as follows:

July 5	July 6	July 7	July 8	July 11	July 12	July 13
120	120	120	240	240	240	120

Starting July 5, the landfill operator used all the delivered ash for rubbish cover as shown in the photos below. The operator did not cover the fly ash that night with gravel as the ash remained damp in the hot late afternoon sun. On July 6, rubbish was dumped over the ash covered cell from the previous day and the same process repeated. The observer noted that the ash retained its moisture in the hot sun and did not show signs of becoming a wind borne nuisance. On July 7, the operator moved horizontally to another cell area leaving the ash cell exposed to the elements. During the day, the observer monitored vehicles driving over the damp ash cells left from the previous days. The ash compacted well, with a damp moisture content, which, in turn, set up a solid roadbed for heavy vehicle travel. See photos below.

According to the landfill operator, ash is easily handled and traction is good when pushing up or down on a 30° slope (see photos). In the remaining days of the experiment, the landfill was operated as it had been in the past and no nuisance conditions were monitored.

VI. Recommendations

1. Fly ash for landfill use should be handled at all times within a range 18% to 30% moisture content.
2. Fly ash piles should not be stored out in the open for longer than a 72-hour period. A three-sided gravel containment area could be used if ash is stored at the landfill site and not freshly delivered.
3. As stated earlier in the Report, fly ash has a natural cementing (pozzolanic) action after contact with water. If motor vehicles are restricted from travel on the ash covered cell area, final shallow cover would not be needed. However, the landfill working face is constantly being moved horizontally and vehicular action on the ash breaks the crust and results in a powdery dust. Therefore, shallow earthen cover should be placed on the ash covered cell within 72 hours.
4. Because fly ash has a low permeability, it lessens the probability of rubbish leachates entering the groundwater through percolation. The observer believes that fly ash could be used effectively in sealing out rainwater from individual cells and also in the final completion cover of the entire landfill area.
5. Carry out a similar demonstration in the town of Rehoboth where a well monitoring program could be set up using existing landfill wellheads. This test would hopefully clear up the question of salt and metal movement through the fill and into environmental sensitive areas.

ATTACHMENT D

The Commonwealth of Massachusetts

Department of Public Works

RESEARCH & MATERIALS ENGINEER
99 WORCESTER STREET
WELLESLEY HILLS, MASS. 02181

December 31, 1980

Mr. William J. Hilaire
Regional Engineer
Massachusetts Department of
Environmental Engineering
323 New Boston Road
Woburn, Mass. 01801

RE: New England Power Co.
Coal Fly Ash
Permability Test

Dear Bill;

At your request and New England Power Company's we have tested a number of fly ash samples for permability rate.

As shown below we rate the ash as low to very low permability.

Test Day	#1	#2
3/25/80	1.75×10^{-5} cm/sec	---------
4/28/80	8.2×10^{-6} cm/sec	---------
5/21/80	3.7×10^{-5} cm/sec	---------
5/29/80	4.3×10^{-6} cm/sec	2.2×10^{-5} cm/sec
7/1/80	2.6×10^{-6} cm/sec	2.5×10^{-5} cm/sec
7/29/80	2.7×10^{-6} cm/sec	2.4×10^{-5} cm/sec
8/26/80	5.2×10^{-5} cm/sec	1.5×10^{-5} cm/sec
9/25/80	7.3×10^{-5} cm/sec	1.9×10^{-5} cm/sec
10/28/80	7.3×10^{-5} cm/sec	1.9×10^{-5} cm/sec
12/3/80	6.6×10^{-5} cm/sec	1.4×10^{-5} cm/sec
12/30/80	6.6×10^{-5} cm/sec	1.4×10^{-5} cm/sec

#1 Blend of Fly Ash Shells Bottom Ash trace of sand

#2 100% Fly Ash

Very truly yours

Francis W. Holden P.E.
Research & Materials Engineer

NMcK/dmh

ATTACHMENT E

New England Testing Laboratory, Inc.

Chemists Bacteriologists

TEL 353-3420

MILK & ICE CREAM
FOODS & BEVERAGES
WATER & WASTES
METALS & TEXTILES
INDUSTRIAL MICROBIOLOGY

1254 DOUGLAS AVENUE, NORTH PROVIDENCE, RHODE ISLAND 02904

Certificate of Analysis

TO: New England Electric
20 Turnpike Road
Westborough, MA 01581
Attn: Mr. Herbert B. Glick

DATE REPORTED: 1/8/81
DATE RECEIVED: 1/5/81
ORDER NO. 296771
CASE NO. 10105-08

SAMPLE DESCRIPTION One (1) Submitted Sample Fly Ash
Sample of ash taken from BP Unit 1 on July 28, 1980

SUBJECT: Toxicant Extraction/EP Toxicity Characterization & Elutriant Analysis. RI Hazardous Waste Regulations Appendix 7.

RESULTS:

1. Characterization

Appearance:	Homogeneous fine particulate gray powder
Solids, %	99+
Flash Point, °F	>175

2. Toxic Metals

	FOUND, mg/L	USEPA LIMITS
Arsenic	<0.001	5.0
Barium	<0.001	100.0
Cadmium	<0.001	1.0
Chromium	0.046	5.0
Lead	0.252	5.0
Mercury	<0.001	0.2
Selenium	0.129	1.0
Silver	<0.001	5.0

COMMENTS:

Based upon the testing performed, this material would be considered non-hazardous.

ERT
ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.
696 VIRGINIA ROAD, CONCORD, MASSACHUSETTS 01742, USA, (617) 369-8910, TELEX: 923 335 ENVIRORES CNCM, CABLE: ERTCON

ERT Document No. A209-130
ERT Ref. No. 82-03-CSD-578

March 9, 1982

Mr. Herbert Glick
New England Power Company
25 Research Drive
Westboro, Massachusetts 01581

Dear Mr. Glick:

Listed below please find the results of the analyses for the Characteristic of EP Toxicity for the coal ash sample which was obtained in my presence from the electrostatic precipitator at the Salem Harbor Number 3 unit at 11:00 AM on March 3, 1982. The sample was extracted and the extract analyzed following the protocols found in Federal Register, Vol. 45, No. 98, May 19, 1980, pp 33127-33128.

Contaminant	Coal Ash mg/l	Maximum Concentration mg/l
Arsenic	<0.01	5.0
Barium	<0.1	100.0
Cadmium	0.006	1.0
Chromium	0.08	5.0
Lead	0.047	5.0
Mercury	<0.0002	0.2
Selenium	<0.01	1.0
Silver	<0.01	5.0

If you have any questions concerning the results of the analyses, please feel free to call me at your convenience. Thank you for using ERT's Analytical Services.

Sincerely,

William W. Mogayzel
Laboratory Manager

WWM/amr

ATTACHMENT G

New England Power

New England Power Company
20 Turnpike Road
Westborough, Massachusetts 01581
Tel. (617) 366-9011

November 17, 1980

Mr. Thomas C. McMahon, Director
Division of Water Pollution Control
Massachusetts Department of
Environmental Quality Engineering
110 Tremont Street
Boston, Massachusetts 02108

Dear Mr. McMahon:

Enclosed, for your review, are the results of the coal conversion test program as required by the NPDES permit for New England Power Company's Brayton Point Station. The program was designed to evaluate potential changes in wastewater discharges at the Station that might occur as a result of long-term coal conversion. The program was conducted in 1980 while new source coal was being burned under a Delayed Compliance Order (DCO).

Coal samples were collected from all cargoes delivered between January and April 1980. The samples were composited and sent to the Colorado School of Mines Research Institute for analyses of coal and ash. Fly ash and bottom ash samples collected on one day were also sent to the School of Mines for analysis. The results of these analyses are attached.

Liquid streams were sampled on two different days. The samples were analyzed by the Colorado School of Mines and Rhode Island Analytical Laboratories. The results of these analyses have been averaged and presented on the attached tables as concentration and pounds per day for discharge streams.

Coal Pile Runoff

Coal pile runoff samples were composits of runoff collected during two rainfall events. They are felt to be representative of the runoff from new source coal. The impact of coal pile runoff will be minimized as part of the long-term coal conversion project. The runoff will be collected and pumped to the existing wastewater treatment system.

The constituents of coal pile runoff which occurred at the highest levels and could have an impact on Mount Hope Bay are suspended solids, iron and aluminum. Fortunately, the existing wastewater treatment system will be able to remove these materials with no difficulty. Iron, for example, was present at 45 mg/l. The treatment system routinely receives wastewater with iron concentrations of several hundred mg/l. Please refer to the New England Power Company report, "Evaluation of Interim Wastewater Treatment Plant, Salem Harbor Station, Salem, Massachusetts" submitted on May 31, 1977 for review of wastewater influent characteristics.

In addition to the tests carried out under the coal conversion test program, we will conduct a detailed observation of quahogs living in the vicinity of the coal pile. The heavy metal burden of these quahogs will be compared to those from a control station which have been observed over the years as part of the biological monitoring program. From this study, we will evaluate the potential impact, if any, of coal pile runoff and leachate on Mount Hope Bay. The results of the evaluation will be forwarded for your review as soon as possible.

If you have any questions about this material, feel free to contact me.

Very truly yours,

Andrew H. Aitken
Staff Asst. to Vice President Operations

AHA:gv

Enclosures

cc: H. E. Cabana, Jr.
P. H. R. Cahill,
J. F. Kaslow
E. M. Keith
A. S. Lewis
H. C. Richardson, Jr.
G. P. Sasdi

Golden, Colorado 80401
(303) 279-2581

ATTACHMENT G

COLORADO SCHOOL OF MINES RESEARCH INSTITUTE
COAL ANALYSIS REPORT

5377

Sponsor New England Power Co. Sample No. 1 Description

Lab No. Project No. Analyst Date

Proximate Analysis (ASTM D 3172)

Moisture: Air Dry 3.44 % Oven Dry 1.75 % Total 5.13 %

	As-received	Dry basis	Moisture and ash free basis
Volatile Matter	30.4 %	32.1 %	
Ash	7.62 %	8.03 %	
Fixed Carbon	56.8 %	59.9 %	
Heating Value (ASTM D 3286)	13348 Btu/lb	14065 Btu/lb	-- Btu/lb

Ultimate Analysis (ASTM D 3176)

Carbon	75.0 %	79.0 %	H_{dry} and O_{dry} are corrected for moisture
Hydrogen	5.40 %	5.08 %	
Sulfur	1.22 %	1.28 %	
Nitrogen	1.37 %	1.45 %	
Oxygen (by difference)	9.47 %	5.18 %	

Forms of Sulfur (ASTM D2492)

Sulfate sulfur	%
Pyritic sulfur	%
Organic sulfur	%

Hordgrove Grindability Index (ASTM D409) 66

Free-swelling Index (ASTM D720)

Fusibility of Ash (ASTM D1857)

	Reducing Atmosphere	Oxidizing Atmosphere
Initial Deformation Temperature (IT)	2210 °F	2260 °F
Softening Temperature (ST)	2460 °F	2670 °F
Hemispherical Temperature (HT)	2635 °F	2690 °F
Fluid Temperature (FT)	2735 °F	2760 °F

Approved

Colorado School of Mines Research Institute

P.O. BOX 112 • GOLDEN, COLORADO 80401
PHONE (303) 279-2581 • TWX 910-934-0194 • CSM Res Gldn

CSMRI

Sponsor: New England Power Co. Sample No. 1
Description: Coal Composite Project No. A-00515

ASH MINERAL ANALYSIS (REPORTED AS % IN ASH)

SiO_2	48.1 %
Al_2O_3	28.9 %
Fe_2O_3	9.33%
TiO_2	1.36%
P_2O_5	0.60%
CaO	2.06%
MgO	1.01%
K_2O'	2.41%
Na_2O	0.52%
SO_3	2.52%

Stanley D. Schwartz

Colorado School of Mines Research Institute

Project Number: A00515
Sponsor: New England Power Co.

P.O BOX 112 • GOLDEN, COLORADO 80401
PHONE (303) 279-2581 CSMRI

All PPM except otherwise noted.

		Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Hg
1	Coal Composite	<50	2.7	0.013 (%)	4	<10	16	15	10	0.04
2	Top Ash	<50	120	0.17 (%)	63	<10	278	356	238	0.36
3	Bottom Ash	<50	<0.4	0.063 (%)	16	<10	202	85	21	0.05

		Ni	Se	Ag	Tl	Zn	Fe	Si	Mn	Ti
1	Coal Composite	14	7.0	<10	<50	14	0.52 (%)	1.78 (%)	16	0.064 (%)
2	Top Ash	254	280	<10	<50	546	8.14 (%)	19.0 (%)	188	1.16 (%)
3	Bottom Ash	138	1.4	<10	<50	42	12.9 (%)	20.2 (%)	83	0.83 (%)

		Al
1	Coal Composite	1.21 (%)
2	Top Ash	13.5 (%)
3	Bottom Ash	12.9 (%)

Remarks: All values corrected to ppm or (%) in original sample.

Stanley D. Schwenzfeier

Fly Ash Sluicing and Wastewater Treatment Discharge - 004

Parameter	Freshwater for sluicing Avg.-mg/l	Fly Ash Sluicewater Avg.-mg/l	Wastewater Treatment Discharge - 004 Avg.-mg/l	Avg.-lbs./day
pH	6.3	6.6	7.8	--
BOD_5	<1	2	11	376
COD	218	340	447	15,300
Total Organic Carbon	5.0	4.5	22.3	762
Total Dissolved Solids	72	4,245	20,400	--
Total Suspended Solids	0.3	204	38.5	1,320
Total Kjeldahl Nitrogen	0.7	2.0	11.8	403
Nitrite (as N)	0.25	1.8	0.08	2.7
Sulfate (as SO_4)	18.3	311	1,975	67,500
Acidity (as $CaCO_3$)	8.9	6.2	--	--
Alkalinity (as $CaCO_3$)	--	--	100	3,420
Iron	0.08	30.0	0.14	4.8
Manganese	0.04	0.59	0.02	0.68
Zinc	0.05	0.22	0.06	2.1
Cadmium	<0.01	0.01	0.02	0.68
Copper	0.02	0.30	0.03	1.03
Chromium	<0.03	0.06	<0.03	--
Lead	0.03	0.18	0.10	3.42
Nickel	<0.05	6.34	0.12	4.1
Aluminum	0.7	30.0	0.5	17.1
Barium	<0.2	0.6	0.5	17.1
Beryllium	<0.005	0.013	<0.005	--
Selenium	<0.005	0.088	0.043	1.47
Antimony	<0.005	0.014	0.059	2.02
Arsenic	0.003	0.148	0.004	0.14
Mercury	<0.005	<0.005	<0.005	--
Silver	<0.01	<0.01	0.03	1.03
Thallium	<0.1	<0.1	0.1	3.42
Titanium	0.25	0.08	<0.1	--

Bottom Ash Sluicing and Ash Pond Discharge - 019

Parameter	Saltwater for sluicing Avg.-mg/l	Bottom Ash Sluicewater Avg.-mg/l	Bottom Ash Pond Discharge - 019 Avg.-mg/l	Avg.-lbs./day
pH	7.4	7.9	7.4	--
BOD_5	1	< 1	<1	--
COD	688	2,783	1,178	6,380
Total Organic Carbon	17.3	272	5.0	27.1
Total Dissolved Solids	33,600	33,800	33,600	--
Total Suspended Solids	53.2	14,700	101	550
Total Kjeldahl Nitrogen	1.4	0.6	1.8	9.76
Nitrite (as N)	0.04	0.03	0.09	0.49
Sulfate (as SO_4)	2,165	2,145	2,185	11,800
Acidity (as $CaCO_3$)	--	--	--	--
Alkalinity (as $CaCO_3$)	105	112	112	607
Iron	0.31	98	2.01	10.9
Manganese	0.06	0.26	0.17	0.92
Zinc	0.06	0.22	0.07	0.38
Cadmium	0.03	0.03	0.03	0.16
Copper	0.05	0.27	0.05	0.27
Chromium	0.03	0.17	0.03	0.16
Lead	0.23	0.29	0.23	1.25
Nickel	0.14	0.46	0.26	1.41
Aluminum	0.2	78	2.3	12.5
Barium	0.3	0.15	0.3	1.63
Beryllium	<0.005	0.045	0.003	0.02
Selenium	<0.005	0.048	0.008	0.04
Antimony	<0.005	0.016	0.010	0.05
Arsenic	<0.005	0.057	0.007	0.04
Mercury	<0.005	<0.005	<0.005	--
Silver	0.05	0.05	0.05	0.27
Thallium	0.3	0.3	0.2	1.08
Titanium	0.1	4.88	0.16	0.87

Coal Pile Runoff and Unit No. 4 Cooling Canal

Parameter	Coal Pile Runoff		Unit No. 4 Cooling Canal
	Avg.-mg/l	Avg.-lbs./event	Average-mg/l
pH	5.2	--	8.2
BOD_5	3.0	4.8	<1
COD	999	1,600	109
Total Organic Carbon	483	780	11.3
Total Dissolved Solids	497	800	6,170
Total Suspended Solids	3,180	5,100	13.4
Total Kjeldahl Nitrogen	1.5	2.4	0.7
Nitrate (as N)	0.2	0.3	0.04
Sulfate (as SO_4)	243	390	679
Acidity (as $CaCO_3$)	9.8	15.8	--
Alkalinity (as $CaCO_3$)	--	--	100
Iron	45.0	72.4	0.17
Manganese	1.06	1.71	0.07
Zinc	2.26	3.64	0.03
Cadmium	0.01	0.02	0.01
Copper	0.23	0.37	<0.02
Chromium	0.04	0.06	<0.03
Lead	0.32	0.52	0.08
Nickel	0.46	0.74	0.03
Aluminum	11.3	18.2	0.3
Barium	0.5	0.8	0.3
Beryllium	0.010	0.016	<0.005
Selenium	0.015	0.241	<0.005
Antimony	0.018	0.029	<0.005
Arsenic	0.032	0.052	<0.005
Mercury	0.005	0.008	<0.005
Silver	0.06	0.10	<0.01
Thallium	0.1	0.2	<0.1
Titanium	0.39	0.63	<0.1

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