COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Board

In the Matter of the Petitions of Boston Edison Company for Approval of Its 1990 Long Range Forecast of Electric Requirements and Resources and for Approval to Construct a Bulk Generating Facility and Ancillary Facilities	)	EFSB 90-12/90-12A (Phase II)

FINAL DECISION

Robert W. Ritchie
Hearing Officer
August 5, 1993

On the Decision:

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Phyllis Brawarsky
Enid Kumin
Dana Reed
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TABLES:

The Energy Facilities Siting Board[1] hereby CONDITIONALLY APPROVES Boston Edison Company's primary site in Weymouth, Massachusetts for possible future use as a site for a 306 megawatt, gas-fired, bulk electric generating facility and ancillary facilities.

I. INTRODUCTION

A. Summary of Proposed Project and Facilities

Boston Edison Company ("BECo" or "Company") has proposed to construct the Edgar Energy Park Project ("Edgar project"), a 306 megawatt ("MW") combined cycle generating unit to be fueled by natural gas with possible dual fuel capabilities[2] on a 56-acre parcel of land located in the Town of Weymouth

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1/ Pursuant to Chapter 141 of the Acts of 1992 ("Reorganization Act"), effective September 1, 1992, the functions of the Energy Facilities Siting Council ("Siting Council" or "EFSC") were merged into the Department of Public Utilities ("Department" or "DPU"). Reorganization Act, § 55. Under the Reorganization Act, facility siting cases are now reviewed and decided by a newly created Energy Facilities Siting Board ("Siting Board"). (§ § 9, 15). The Reorganization Act provides that all facility petitions before the Siting Board, regardless of when they were filed, will be reviewed consistent with all orders, rules and regulations duly made, all approvals duly granted, and all legal and decisional precedents established by the Siting Council until superseded, revised, rescinded or cancelled in accordance with law by the Siting Board. Id., § 46.

The Reorganization Act provides further that wherever the name of the Siting Council appears in any general or special law, or in any order, rule, regulation or other document, such name shall mean and shall be construed as referring to the Siting Board or the Department, as appropriate, in accordance with G. L. c. 164, § § 69G through 69Q.

The terms Siting Council and Siting Board will be used throughout this decision as appropriate to the circumstances being discussed.

2/ BECO had originally proposed that the facility would utilize natural gas for seven months and fuel oil for up to five months, then later proposed to utilize natural gas for 320 days and No. 2 distillate fuel oil for up to 45 days (Exhs. BE-6, sec. 6,

("Weymouth"), Massachusetts ("primary site" or "Edgar site").[3] BECo proposed that natural gas would be supplied to the facility via a new 24-inch, 10.7 mile pipeline to be constructed by Algonquin Gas Transmission Company ("Algonquin") which would extend from the termination of Algonquin's existing line in Avon, Massachusetts to the primary site (Exh. HO-E-102, pp. 1, 2).[4] Distillate fuel oil, if required for the operation of the facility, will be delivered to the site via barge and stored in an existing tank (Exh. BE-6, p. 2-8). Electric power generated by the proposed facility will be supplied for transmission through interconnection to the existing 115 kilovolt ("kV")

BE-48, AQ-3 through AQ-10). More recently, in a submittal to the Massachusetts Department of Environmental Protection ("MDEP"), the Company recommended that in addition to the above fuel mix, still another fuel mix be considered as an alternative for the project -- use of natural gas for 365 days, with oil as a back-up fuel for emergency periods only (Exh. HO-RR-93). See Section II.D.1.a.(1)(a), below.

3/ At the time BECo filed its original proposal to construct the facility on May 1, 1990, the Company estimated a completion date of November 1993 for the project (Exh. BE-6, p. 2-9). By letters dated January 31 and February 14, 1992, BECo notified the Siting Council that it was revising its projected in-service date to January 1, 1996. On May 1, 1992, BECo notified the Siting Council that the Company decided to defer construction of the facility indefinitely, but requested that the Siting Council continue the review of, and issue a decision approving, the company's resource plan and the siting and environmental aspects of its proposal. See Section I.B., below.

4/ Algonquin filed an application with the Federal Energy Regulatory Commission ("FERC") on January 16, 1991, for a certificate of convenience and necessity to construct and operate this natural gas pipeline (Tr. 14, p. 12; see FERC Docket CP91-952-000). As a result of BECo's decision to defer construction of the Edgar project, Algonquin submitted a notice to FERC on December 1, 1992, withdrawing its application concerning the natural gas pipeline. The Siting Board takes administrative notice of this withdrawal. In its withdrawal notice, Algonquin stated that it would refile the application when the timing of the proposed facility is more definite.

switchyard at the primary site (id., p. 2-9). This interconnection will require new underground 115 kV lines to the switchyard (id.). Off-site transmission of electric power from the switchyard will make use of existing lines and will not require establishment of new off-site transmission or distribution facilities, nor require off-site reconductoring of existing lines (id.).

Other major components of the proposed facility at the primary site include two combustion turbine generators with dual fuel capability; two heat recovery steam generators ("HRSG") with selective catalytic reduction ("SCR") units;[5] a single steam turbine generator; a steam surface condenser; a demineralization system consisting of several storage tanks, including a 10,000 gallon bulk acid storage tank, a 20,000 gallon bulk caustic storage tank, a 200,000 gallon demineralized water storage tank; a circulating water intake structure; a circulating water discharge structure; clean and dirty lube oil tanks; and main and unit auxiliary transformers (id., pp. 2-4, 2-5, 2-7 to 2-9; Exh. BE-120, App. B). The proposed facility would also include two emission stacks 245 feet in height and two 100-foot high auxiliary boiler stacks (Exhs. BE-6, pp. 7-6 and 7-7; HO-E-50). The Company expects to pursue use of potable water from the City of Quincy as its water supply for the proposed facility at the primary site (Exh. BE-120, p. ii).

The primary site is located in an industrially zoned area in Weymouth (Exhs. BE-6, p. 2-1; BE-59, p. 5.9-2). The site is bounded by the Weymouth Fore River on the north, south, and west sides (Exh. BE-6, p. 2-2). The east side of the site is partially bounded at its northern end by Kings Cove; at the center by Monatiquot Street and its adjacent residential area; and at the south end by Mill Cove (id.). The surrounding land area is predominantly densely populated (id.).

In accordance with G. L. c. 164, § 69J, BECo presented an alternative

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5/ BECo filed a new air emissions control plan with the MDEP on November 13, 1992 which contains a number of alternative fuel proposals that would not utilize SCR (Exh. HO-RR-93). See Section II.D.1.a.(1)(a), below.

site for the proposed project in the Town of Uxbridge ("Uxbridge"), Massachusetts ("alternative site" or "Ironstone site") (id., p. 5-1).[6] The alternative site proposed by BECo is a 300-acre parcel consisting of agricultural and undeveloped land and is located two miles southwest of the center of Uxbridge (id., pp. 5-10 and 5-11).[7] The site is bordered on the south by the Massachusetts/Rhode Island state line and by residential development along the north, east, and west site boundaries (id., p. 5-10).

In addition to requiring the same major components that would be constructed at the Weymouth site, the Uxbridge site would require construction of additional components. Due to the inland nature of the site, a closed loop heat rejection system will be required at the site, necessitating the construction of a mechanical draft cooling tower, a cooling tower make-up water pumphouse, and a water pipeline connecting the pumphouse to the cooling tower (id., pp. 5-21, 5-23, 5-24, 5-26). Additional facilities required on and off-site would include a new 345 kV switchyard with transmission connections and improvements to the existing 345 kV transmission system, and a natural gas pipeline to connect with Algonquin's natural gas pipeline located approximately one-quarter mile north of the northern site boundary (id., pp. 5-21, 5-23, and 5-26; Tr. 56 at 143).

B. Procedural History

On May 1, 1990, the Company filed with the Siting Council its 1990 long-range demand forecast and supply plan, and a proposal to construct the 306 MW gas-fired electric generating facility and ancillary facilities (Exhs. BE-1, BE-2, BE-3, BE-6).

On June 22, 1990, the Siting Council and the Department issued a

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6/ Prior to September 1, 1992, when the functions of the Siting Council were merged into the Department of Public Utilities, this requirement was found in G.L. c. 164, § 69I.

7/ The site is zoned for agricultural uses, recreational and residential development, and development of airports, drive-in theaters and cemeteries (Exh. BE-6, p. 5-11).

joint notice of adjudication and public hearing concerning this proceeding and three related petitions filed with the DPU by BECo as follows: (1) a petition for a zoning exemption to site the proposed generating facility at the Edgar site (D.P.U. 90-106); (2) a petition for approval of investments in a new subsidiary to construct and operate the Edgar project (D.P.U. 90-117); and (3) a petition for preapproval of the Edgar project construction costs and the Edgar project power purchase agreement pursuant to 220 C.M.R. 9.00 et seq. (D.P.U. 90-118). On July 27, 1990, the Siting Council and DPU signed a joint Memorandum of Understanding ("MOU") which set forth the procedures and a tentative schedule to be followed for these interrelated proceedings.[8]

The Siting Council held a public hearing in Uxbridge on July 23, 1990, and, with the DPU, held a joint public hearing in Weymouth on July 24, 1990. BECo provided notice of the public hearings and adjudication as directed by the Hearing Officers.

A notice of intervention was filed by the Office of the Attorney General of the Commonwealth ("Attorney General") on July 6, 1990. Motions to intervene subsequently were filed by the Conservation Law Foundation ("CLF"), Distrigas of Massachusetts Corporation ("DOMAC"), the Energy Consortium, the Massachusetts Public Interest Research Group ("MASSPIRG"), Nancy Zerfoss, Weymouth, the Weymouth Board of Public Health ("WBH"), the Weymouth Department of Public Works, Richard and Suzanne Dauphin, the East Braintree Civic Association ("EBCA"), the Blackstone River and Canal Commission, the Blackstone River Valley National Heritage Corridor ("BRVNHC") Commission, Uxbridge, the Uxbridge Planning Board, Uxbridge Parents for Clean Air and Water, Daniel Richardson, and the South Uxbridge Community Association. Motions to participate as interested persons were filed by Richard and Jacquelyn Aloise, Robert and Leslie Sahagian, the Boston Gas Company, Cogen Technologies, Save the Bay, Inc., and the New England Cogeneration Association ("NECA").

On August 16, 1990, NECA filed a motion to substitute its petition to

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8/ The Department approved BECo's motions to withdraw all three of these proceedings on July 15, 1992.

participate as an interested person with a petition to intervene. On August 30, 1990, Nancy Zerfoss submitted a letter clarifying her motion to intervene. Ms. Zerfoss stated that the intent of her original motion was to request intervenor status on behalf of the citizen group, Weymouth Against the Edgar Revitalization ("WATER"). On September 14, 1990, DOMAC requested that its motion to intervene be considered instead as a motion to participate as an interested person. At a prehearing conference on September 14, 1990, all motions for intervention and all motions for interested person status were granted (September 14, 1990 Prehearing Conference, Tr. pp. 6-19).

The Siting Council held 49 evidentiary hearings on the demand forecast, supply plan, and Edgar project beginning on February 22, 1991, and ending on June 21, 1991. During the course of the hearings, BECo presented 12 witnesses: Robert J. Cuomo, manager of forecasting and market analysis at BECo, who testified regarding energy and peak demand forecasts; Gregory R. Sullivan, manager of the distribution and planning section of the electrical engineering and station operations department at BECo, who testified concerning the need for transmission and distribution facilities; Johannes H. Baumhauer, principal engineer at BECo, who testified regarding the Performance Management Study; William P. Killgoar, manager of energy resource planning and forecasting at BECo, who testified regarding BECo's long-range integrated resource plan; Paul D. Vaitkus, head of supply planning at BECo, who testified regarding the supply-side planning portion of the BECo Resource Plan; Richard S. Hahn, vice-president of marketing at BECo, who testified concerning the BECo Resource Plan and Pilgrim Analysis; Kathleen A. Kelly, manager of demand-side planning, monitoring and evaluation at BECo, who testified regarding demand-side planning; John F. Carlin, manager of fossil fuel planning, procurement, regulation and performance at BECo, who testified concerning fuel supply; Cameron H. Daley, senior vice-president for power supply at BECo, who testified regarding project approach and least cost analysis; John J. Reed, president of Reed Consulting Group, who testified concerning the power purchase agreement between BECo and Edgar Electric Energy Corporation ("EEEC"); Douglas C. Schmidt, project manager for engineering and

licensing for the Edgar project, who testified regarding project design and costs, water supply and alternative sites; and Dr. Lillian N. Morgenstern, principal environmental planner at BECo, who testified concerning potential environmental impacts of the Edgar project and alternative sites.

Weymouth presented the testimony of 13 witnesses: John F. Buckley, water and sewer superintendent for Weymouth, who testified regarding water supply; James J. Pescatore, engineer for Camp, Dresser & McKee, who testified concerning water supply; William C. Woodward, conservation administrator for Weymouth, who presented testimony regarding water quality; Jeffrey R. Coates, inspector of buildings for Weymouth, who presented testimony concerning zoning issues; Robert S. Knorr, deputy director of the Division of Environmental Health Assessment at the Massachusetts Department of Public Health, who testified regarding health-related issues; Jane Gallahue, Commissioner of Public Health in the City of Quincy, who testified concerning health issues; Mary McAdams, Chairperson of the Weymouth Board of Health, who testified regarding health issues; Karen M. Durgin, chemicals management and surveillance officer for the WBH, who testified concerning hazardous conditions at the primary site; Maura Kelly, member of the WBH, who presented testimony regarding elevated cancer rates in the area around the primary site; Robert Hedlund, State Senator for Weymouth, who testified concerning health problems; Robert A. Cerasoli, State Representative for Weymouth and Quincy, who presented testimony regarding health problems; David Jenkins, a former member of the Weymouth Local Assessment Committee, who testified regarding existing health problems in Weymouth; and Brian J. McDonald, vice chairman of the Weymouth Board of Selectmen, who presented testimony concerning health issues.

The Attorney General presented one witness: Susan Geller, an economist for the Attorney General, who testified regarding the Company's Supply Plan.

CLF presented two witnesses: Paul L. Chernick, president of Resource Insight, Inc., who testified concerning demand-side analysis and the Company's Supply Plan; and Susan E. Coakley, technical coordinator for CLF, who

testified regarding demand-side analysis. Uxbridge presented five witnesses: Russell Cohen, Blackstone River coordinator for the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement, who testified concerning water supply and water quality issues at the alternative site; Noelle F. Lewis, water quality specialist for Save the Bay, Inc., who testified regarding water quality issues at the alternative site; James Cormier, former chairman of the Growth Study Committee for Uxbridge, who testified concerning land use issues; James Pepper, executive director of the BRVNHC Commission, and Douglas M. Reynolds, historian for the BRVNHC Commission, who both testified on issues related to the alternative site in Uxbridge.

The Hearing Officers entered 569 exhibits into the record, primarily consisting of responses to information requests and record requests. The Attorney General entered 161 exhibits into the record. BECo entered 125 exhibits into the record. MASSPIRG entered 73 exhibits into the record. NECA entered 40 exhibits into the record. The Energy Consortium entered one exhibit into the record. Uxbridge entered 101 exhibits into the record. WATER entered 52 exhibits into the record. Weymouth entered 26 exhibits into the record.

Initial briefs of the Attorney General ("AG Initial Brief"), CLF, MASSPIRG, NECA and Uxbridge ("Uxbridge Initial Brief") were filed on July 26, 1991. The New England Council, the Associated Industries of Massachusetts and the Greater Boston Chamber of Commerce ("Business Associations")[9] filed a joint brief on July 26, 1991. In lieu of a brief, on July 26, 1991, Weymouth filed an agreement entered into with BECo which addresses commitments made by the Company with respect to water supply, a health study, and other issues ("Weymouth/BECo agreement"); and a statement of position of the Town's Board of Public Works (Exhs. WEY-21 and WEY-22). WATER filed two initial briefs, one related to water use issues ("WATER Initial Brief") on August 2, 1991, and

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9/ On June 17, 1991, the Business Associations filed a motion, subsequently granted, to participate as interested persons for the sole purpose of filing a brief.

one related to health issues ("Carey Brief") on August 5, 1991. BECo's initial brief ("BECo Initial Brief") was filed on August 16, 1991.

The Attorney General, MASSPIRG, NECA and WATER[10] filed reply briefs on September 3, 1991. Weymouth filed a statement in lieu of a reply brief on September 3, 1991. BECo's reply brief ("BECo Reply Brief") was filed on September 13, 1991.

Due to the extensive record compiled in the docket, the Hearing Officers, in a memorandum to all parties dated September 30, 1991, determined that the decision in this proceeding should be separated into two phases. In that memorandum, the Hearing Officers determined that the Phase I decision would address issues associated with the Company's demand forecast and resource need. More specifically, the memorandum stated that the Phase I decision would include:

> (1) an analysis of the Company's demand forecasting methodology, an examination of its projections of existing and planned resources, and the integration of those factors to achieve various levels of system reliability; (2) a determination of the level of resource need; and (3) a determination of the adequacy of the Company's supply plan in the short run.

Hearing Officers' Memorandum dated September 30, 1991, p. 2.

The Hearing Officers' memorandum further indicated that the Phase II decision would address: (1) the adequacy of the Company's supply plan in the long run; (2) the least-cost nature of the Company's supply plan, including consideration of the Edgar project and other resource options available to serve the resource need identified in Phase I; (3) the Company's site selection process; and (4) the cost, environmental and reliability impacts of the proposed facilities at both the primary and alternative sites.

On April 10, 1992, the Siting Council issued a final decision in Phase I of this matter, approving BECo's 1990 demand forecast, and finding that the Company could anticipate a capacity surplus of 149 MW in 1996 and 120

10/ WATER submitted two reply briefs, one concerning water issues and one concerning health issues.

MW in 1997, and that its base case supply plan was adequate to meet its projected requirements in the short run. Boston Edison Company (Phase I), 24 DOMSC 125 (1992) ("1992 BECo Decision (Phase I)").

On May 1, 1992, BECo filed a motion with the Hearing Officers stating that the Company had decided to defer construction of the Edgar project and requesting that the Siting Council continue the review of, and issue a decision approving, the Company's resource plan and the siting and environmental aspects of this proceeding. In that motion, BECo asserted that the request was made on the basis of the Company's intention to retain the Edgar project as a contingency resource to be relied upon in the future when the need for additional capacity would arise.

At a Procedural Conference on May 11, 1992, and by memorandum dated May 12, 1992, the Hearing Officers asked all parties to submit written comments regarding the Company's request by June 8, 1992.[11]

On May 20, 1992, comments were submitted on behalf of EBCA, and on June 1, 1992, comments were filed by WATER. On June 8, 1992, comments were filed by BECo ("BECo Comments"), NECA, and Weymouth. On the same date, the

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11/ The Hearing Officers requested that the parties address, at a minimum, the following questions:

> (1) What legal authority does the Siting Council have to issue a decision only on the siting and environmental aspects of a facility project whose construction has been indefinitely deferred? Do any other jurisdictions issue comparable "site-banking" findings?
>
> (2) If such authority does exist, why should the Siting Council decide to proceed with Phase II as a matter of policy?
>
> (3) What should be the precise scope of any further proceedings in Phase II at this time, e.g., which resource plan issues, if any, should be reviewed; should the Siting Council determine whether Edgar Station is a superior site to the Ironstone site or just determine whether Edgar Station is an acceptable site?
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> (4) If the Siting Council does issue "site-banking" findings this year, what conditions on such findings would be appropriate?

Attorney General, CLF, and MASSPIRG filed a joint memorandum in opposition to BECo's request.

In a Procedural Order dated July 10, 1992 ("Site Banking Procedural Order"), the Hearing Officer deferred review of the Company's resource plan to its next filing (Site Banking Procedural Order, at 21),[12] and granted the Company's request to continue the review of the siting and environmental impacts of the project (id., at 1-18).[13] With respect to project viability

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12/ In its comments, BECo maintained that further review of supply planning issues would be best deferred to the Company's next filing (BECo Comments, at 15).

13/ In the Site Banking Procedural Order, at 8, the Hearing Officer stated that no language in either the Siting Council's enabling statute or its regulations prohibits the issuance of conditional approvals, pending a final review to ensure the completion of all such conditions. (In fact, G.L. c. 164, § 69J specifically provided the Siting Council, and now the Siting Board, with the authority to issue conditional approvals. See Section I.C. below.) The Hearing Officer also noted that no language in either the statute or regulations explicitly limits "the subject matter that may be conditioned or the length of time for compliance with a condition imposed in a decision." (Site Banking Procedural Order, at 8). The Hearing Officer noted further that:

> site banking of energy generating resources could shorten the final review of projects and thus make more projects eligible to meet a near term resource need. Site banking could thus provide more resources from which utilities might select the least-cost, least-environmental resources available. In this manner, site banking can better enable the Siting Council to meet its statutory mandate to "ensure a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost." (id., at 9).

The Hearing Officer then concluded that the Siting Council had the authority consistent with G.L. 164, § 69H to issue a site-banking decision (id., at 10).

After determining that the Siting Council had the legal authority to proceed with a site-banking review, the Hearing Officer

issues, the Hearing Officer agreed with the Company that any unresolved issues would be addressed in the future, but indicated that, to the extent that the Company could provide specific plans and contracts, the Siting Council could review such plans and contracts in this proceeding (id., at 22).[14]

The Company later indicated that, due to the deferral of the Edgar project, it would not be seeking findings on project viability in this proceeding (Tr. 50, p. 7). BECo further stated that it would present more specific evidence on project viability when the Company proceeds with its need case for the project. (id.).

Nine additional hearings were held on siting, costs, and environmental issues in Phase II beginning on August 24, 1992, and ending on October 1, 1992. During the course of this round of hearings, BECo presented two witnesses, Douglas C. Schmidt and Lillian N. Morgenstern, both of whom testified regarding project design and costs, water supply, alternative sites, and potential environmental impacts at the primary and alternative sites. WATER presented one witness, Robert Loring, member of WATER, who testified concerning an exhibit introduced by WATER.

The Hearing Officers entered 78 additional exhibits into the record

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stated that requests for site-banking reviews must be evaluated on a case-by-case basis, and then explained why such a review would be appropriate in this case (id., at 16-19). The Hearing Officer stated that the proposed project had "been under development for several years and had reached a relatively mature stage of design", and thus was "sufficiently defined to allow a detailed examination of the environmental impacts at the proposed and alternative sites" (id., at 17). The Hearing Officer noted that a substantial record had already been developed in this proceeding on the majority of the issues pertinent to a site-banking decision and, "[c]onsequently, the potential benefits associated with proceeding with a siting review and a conditional decision in this proceeding warrant such an approach" (id., at 18). See Section I.D., below, for a discussion and analysis of the scope of this site-banking review.

14/ On July 20, 1992, WATER filed a Motion for Reconsideration of the Site Banking Procedural Order. The motion was denied in a Procedural Order issued by the Hearing Officers on August 24, 1992.

in Phase II of this proceeding, primarily consisting of responses to information requests and record requests. The Attorney General entered six exhibits into the record in Phase II. BECo entered two exhibits into the record in Phase II. WATER entered 37 exhibits into the record in Phase II. Weymouth entered 32 exhibits into the record in Phase II. The EBCA entered 7 exhibits into the record in Phase II.

The initial site banking briefs of BECo ("BECo Site Banking Brief"), the Attorney General ("AG Site Banking Brief"), Weymouth ("Weymouth Site Banking Brief"), and WATER ("WATER Site Banking Brief") were filed on November 13, 1992. The reply site banking briefs of BECo ("BECo Site Banking Reply Brief") and WATER ("WATER Site Banking Reply Brief") were filed on November 20, 1992, while the Attorney General filed a letter in lieu of a reply brief on November 20, 1992. Uxbridge filed a letter in lieu of a reply brief on November 24, 1992.

C. Jurisdiction

BECo's petition to construct a bulk generating facility was filed in accordance with G.L. c. 164, § § 69H and 69J, which required the Siting Council to ensure a necessary energy supply for the Commonwealth with minimum impact on the environment at the lowest possible cost, and pursuant to G.L. c. 164, § 69I, which required electric companies to obtain Siting Council approval for construction of proposed facilities at a proposed site before a construction permit may be issued by another state agency.[15]

As a generating facility with a design capacity of approximately 306 MW, BECo's proposed generating unit falls squarely within the first definition of "facility" set forth in G.L. c. 164, § 69G. That section states, in part, that a facility is:

> (1) any bulk generating unit, including associated buildings and structures, designed for, or capable of

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15/ Pursuant to Chapter 141 of the Acts of 1992, which reorganized the Siting Council into the Siting Board, this requirement now appears in G.L. c. 164, § 69J.

> operating at a gross capacity of one hundred megawatts or more.

At the same time, BECo's proposals to construct a switchyard at the alternative site, and electric transmission lines and other structures at both sites fall within the third definition of "facility" set forth in G.L. c. 164, § 69G, which states that a facility is:

> (3) any ancillary structure including fuel storage facilities which is an integrated part of the operation of any electric generating unit or transmission line which is a facility.

In accordance with G.L. c. 164, § § 69H and 69J, before approving an application to construct facilities, the Siting Council required applicants to justify generating facility proposals in four phases. First, the Siting Council required the applicant to show that additional energy resources are needed. New England Power Company, 21 DOMSC 325, 333 (1991) ("1991 NEPCO Decision"); Boston Edison Company/Massachusetts Water Resources Authority, 19 DOMSC 1, 8 (1989) ("BECo/MWRA"); Altresco-Pittsfield, 17 DOMSC 351, 358 (1988); Northeast Energy Associates, 16 DOMSC 335, 343 (1987) ("NEA"). Second, the Siting Council required the applicant to establish that its project is superior to alternative approaches in terms of cost, environmental impact, reliability and ability to address the previously identified need. Id. Third, the Siting Council required the applicant to show that its project is viable. MASSPOWER, 20 DOMSC 301, 310 (1990). Finally, the Siting Council required the applicant to show that its site selection process did not overlook or eliminate clearly superior sites, and that the proposed site for the facility is superior to the alternative site in terms of cost, environmental impact, and reliability of supply. 1991 NEPCO Decision, 21 DOMSC at 333; BECo/MWRA, 19 DOMSC at 8; Altresco-Pittsfield, 17 DOMSC at 358; NEA, 16 DOMSC at 343. As noted above, pursuant to the Reorganization Act, all facility petitions before the Siting Board, including the instant one, will be reviewed consistent with all legal and decisional precedents established by the Siting Council until such standards are superseded, revised, rescinded, or cancelled in accordance with law by the Siting Board. Reorganization Act, § 46.

As noted in Section I.B. above, after BECo notified the Siting Council that the Company decided to defer the construction of the Edgar project, the Hearing Officer issued a Procedural Order deferring review of the Company's supply plan, and granting the Company's request to continue the review of the siting and environmental aspects of the project (Site Banking Procedural Order, at 1-18, 21).[16] In the Site Banking Procedural Order, the Hearing Officer concluded that the Siting Council had the authority to issue a conditional site-banking decision (id., at 10).

The Siting Board notes that G.L. c. 164, §69J specifically provides the Siting Board with the authority to issue conditional approvals. As noted by the Hearing Officer in the Site Banking Procedural Order, there is no language in the enabling statute or regulations limiting the subject matter that may be conditioned or the length of time for compliance with a condition imposed in a decision. See G.L. c. 164, § §69H, 69I, and 69J.

The Siting Board further notes that in Massachusetts Municipal Wholesale Electric Company v. Massachusetts Energy Facilities Siting Council, 411 Mass. 183, 194 (1991), the Supreme Judicial Court stated:

> "An agency's powers are shaped by its organic statute taken as a whole and need not necessarily be traced to specific words." Commonwealth v. Cerveny, 373 Mass. 345, 354 (1977). "Powers granted include those necessarily or reasonably implied." Grocery Manufacturers of America, Inc. v. Department of Public Health, 379 Mass. 70, 75 (1979).

The Supreme Judicial Court has also stated that an administrative agency has "considerable leeway in interpreting a statute it is charged with enforcing." Id. Thus, given the express authority to issue conditional approvals pursuant to G.L. c. 164, § 69J, the Siting Board agrees with the Hearing Officer that the issuance of a conditional site-banking decision valid for an extended period of time, subject to a later review of compliance with stated conditions and to a subsequent balancing of environmental impacts, cost, and reliability issues prior to a final decision, is a power that is reasonably implied by our

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16/ As stated in Section I.B. above, the issues of need and project viability will be deferred until the Company's next filing.

enabling statute (Site Banking Procedural Order, at 10).

The Siting Board also agrees with the Hearing Officer that site banking of energy generating resources could potentially reduce the length of time needed for a final review of a project proposal, and thus make more projects eligible to meet a near-term resource need. In situations where a short-term need for energy resources has been established, site banking could make more resources available from which utilities could select the least-cost, least-environmental impact resource. Thus, site banking may better enable the Siting Board to meet its statutory mandate to "ensure that the Commonwealth has a necessary energy supply with a minimum impact on the environment at the lowest possible cost." G.L. c. 164, §69H. See Site Banking Procedural Order, at 9.

Therefore, we reaffirm the decision of the Hearing Officer that the Siting Board has the inherent authority consistent with G.L. c. 164, § §69H and 69J to issue a conditional site banking decision for an extended period of time.[17]

D. Scope of Review

This is the first case in which the Siting Board or its predecessor, the Siting Council, has reviewed a request for a site banking approval. In

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17/ Having determined that the Siting Board has the authority to issue site-banking decisions, we also agree with the Hearing Officer's decision in the Site Banking Procedural Order that requests for site banking reviews must be evaluated on a case-by-case basis (Site Banking Procedural Order, at 16-19). In the instant case, as the Hearing Officer noted, the project under review has been under development for several years and the facility design is sufficiently defined to allow a detailed review of the site selection process and the environmental impacts at the proposed and alternative sites. Prior to the issuance of the Site-Banking Procedural Order, the parties had been involved in 49 days of hearings, a number of which pertained to the site selection, cost, and environmental issues addressed in this decision. Therefore, we reaffirm the decision of the Hearing Officer that the Edgar project is sufficiently mature to proceed with a site banking review in this case.

their briefs, the Company, the Attorney General, and WATER addressed the scope of this decision, and the potential effect of findings made by the Siting Board herein. In this Section, the Siting Board reviews these arguments and specifies the detailed scope of review of this decision.

1. Positions of the Parties

a. The Company's Arguments

The Company acknowledged that the site banking approval that it seeks would not constitute a final approval of the Edgar project (BECo Site-Banking Brief, p. 9). The Company further stated that the findings should be subject to modification based upon significant new information, such as changes in the project or changes in the applicable law (BECo Comments, pp. 16-17). BECo also suggested that parties should be required to notify the Siting Board of any new information that would "materially affect" one of the Siting Board's findings (id.). The Company noted that the Siting Board will retain jurisdiction over this project until final approval is given and construction begins (BECo Site Banking Brief, p. 60). Finally, the Company argued that this decision should include "permission" for other state environmental agencies to "proceed with their licensing activities" and issue permits for the facility (id., p. 10).[18]

BECo responded to the Attorney General's arguments regarding the uncertainty of future regulatory, technological, economic, and other conditions by stating that such uncertainty could appropriately be addressed by the Siting Board in its decision (BECo Site Banking Reply Brief, p. 2). The Company noted that the Site Banking Procedural Order recognized the potential for regulatory change, but that order noted that the Siting Council (now Siting Board) would retain jurisdiction over all aspects of a facility until a final decision is issued and, thus, the Siting Board would be able to

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18/ G.L. c. 164, § 69J provides that "no state agency shall issue a construction permit for [a] facility unless the petition to construct such facility has been approved by the [siting] board and the facility conforms with [the Company's] long-range forecast."

revisit any aspects of a site banking decision affected by such changes (BECo Site Banking Reply Brief, p. 3).

b. The Intervenors' Arguments

The Attorney General urged the Siting Board to deny the Company's request for site-banking approval because of potentially significant changes in the applicable laws, regulations, and project elements, such as environmental control technology and fuel and water supplies, between now and the projected date of need for the proposed facility. (AG Site-Banking Brief, p. 8).[19] The Attorney General also urged that, in the event the Siting Board grants any part of the Company's request, the Siting Board's review should be limited to "only those facts known with some certainty today and that appear likely to be stable over the decade" (AG Site Banking Brief, p. 14). The Attorney General requested that any assumptions made by the Siting Board in its review must be very clearly and explicitly set forth (id., pp. 9, 14). The Attorney General argued that any decision should be conditioned on the results of a subsequent review conducted prior to, but "reasonably contemporaneous in time with, construction." (id., p. 14). During that review, the Attorney General argued, the Company must affirmatively prove that there have been no significant changes in the facts and law upon which all earlier approvals were based, and the Siting Board must review all deferred

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19/ The Attorney General asserted that the date of need would be 1998 or later (AG Site Banking Brief, p. 8). Since BECo indefinitely delayed the project, the Company has made no assertion regarding the date of need for the Edgar project, or under what circumstances it would propose to move forward with the final review of the Edgar project. The Siting Board notes that in BECo's recent draft initial filing made with the DPU pursuant to the Integrated Resource Management process ("BECo Draft IRM Filing"), the Company identified the first year of capacity need as 2002 (BECo Draft IRM Filing, Volume C, p. 2) However, the Siting Board recognizes that numerous combinations of circumstances could lead BECo to identify a need for the project prior to that date. The Siting Board makes no determination regarding the likely year of need for the proposed project in this decision.

facts, new facts, and then-current law (id.).

WATER argued that the Company's request for site banking approval should be denied on the grounds that the Company failed to provide sufficient information for the Siting Board to make a determination because of the lack of an approved water supply at the Edgar site (WATER Initial Site Banking Brief, pp. 1-2).[20] In response to BECo's request that other state agencies should be permitted to issue permits based on this decision, WATER argued that because this decision is not a final approval of the project, other agencies may not issue final permits for the project[21] (WATER Site Banking Reply Brief, p. 2).

WATER also argued that any decision to allow banking of the Edgar site should not be open ended, but should have an expiration date (id., pp. 6, 7). WATER suggested that the expiration date should be concurrent with the date that the Secretary of Environmental Affairs ("Secretary") must revisit the Certificate on the Environmental Impact Report ("EIR") to determine whether a five-year lapse of time significantly increases the environmental consequences of the project and warrants resubmission of an Environmental Notification Form ("ENF"), rescoping, supplementary documentation, or another EIR (id.).[22]

20/ For a further discussion of WATER's argument regarding the water supply issue, see Section II.D.1.e below.

21/ WATER argued that this decision does not constitute a final decision because the Siting Board has not evaluated the need for the facility, nor has it determined the viability of the project (WATER Site Banking Reply Brief, p. 2). Referring to the Company's brief, WATER also pointed out that BECo acknowledged in its Site Banking Brief that the requested site banking approval is not a final approval of the project (id.).

22/ Massachusetts Environmental Policy Act ("MEPA") regulations require this action by the Secretary if more than five years have elapsed after the filing of the final EIR and construction of the project has not begun (see 301 C.M.R. 11.17). The Final EIR for this project was filed in February 1992 (Exh. HO-RR-57B).

c. Discussion and Analysis

BECo and WATER are both correct in asserting that this decision does not constitute a final approval of the Edgar project. This decision is a conditional approval of limited, site-related issues only, pending a final review to ensure the completion of all conditions set forth in this decision and to review and make findings on other statutory and regulatory requirements not addressed herein. As the Company stated, all findings in this decision are subject to modification based upon new information, such as significant changes in the project,[23] site conditions, or the applicable law. As stated in the Site Banking Procedural Order, the Siting Board

> ... retains jurisdiction over all aspects of a facility until a final decision is issued, thereby enabling us [the Board] to revisit any environmental requirements or other project elements which may change. Clearly, the final balancing between need, cost and environmental impact could not take place until all elements of the proposal are in place (at 8-9).

See Eastern Energy Corporation, 22 DOMSC 188, 312, 411 (1991), ("EEC"); West Lynn Cogeneration, 22 DOMSC 1, 76, 110 (1991) ("West Lynn"); MASSPOWER, 20 DOMSC 301, 370, 405 (1990). This language, which the Siting Board hereby reaffirms, adequately addresses the concerns raised by the Attorney General concerning potential changes that could occur in the applicable law, environmental control technology, fuel and water supplies, and any other changes relevant to the findings contained herein.

The Siting Board notes that the other concerns of the Attorney General are similarly addressed, insofar as the Company is required to submit another filing with the Siting Board before the project can be constructed.

23/ All findings in this decision are based on the project design proposed by BECo in its filing, and as described in the record of this proceeding, namely a 306 MW combined cycle generating unit to be fueled primarily by natural gas and up to 45 days on No. 2 distillate fuel oil. Should the Company propose any changes in the design of the project, all findings affected by such changes may be revisited and modified as deemed appropriate by the Siting Board at such time as BECo wishes to petition for final approval.

If the Company submits such a filing, there will be another review of the project by the Siting Board at that time. The Company will have the burden of demonstrating that there have been no significant changes in the facts and law upon which the findings in this decision were based. The Siting Board will review all new facts and information, as well as the law in effect at that time, to determine whether significant changes have occurred that would modify any of the findings contained herein. Thus, the Siting Board is confident that a conditional decision of limited scope in this matter at this time will not allow the Company to construct a facility at some point in the future which does not meet all then applicable laws and standards.

In addition to the review of any changes in design, site conditions, applicable law, or other relevant facts, and a showing that all conditions specified herein are addressed (see Section III), final approval of the Edgar project will require a showing of need on reliability or economic efficiency grounds. The Company will also have to compare its proposed project with other energy resource alternatives, as required by G. L. c. 164, § 69J (see City of New Bedford v. Energy Facilities Siting Council, 413 Mass. 482 (1992)), and BECo will have to establish that the project is viable.[24] Further, the Siting Board will conduct its final balancing of need, cost and environmental impacts in accordance with G.L. c. 164, § § 69H and 69J before a final decision on the project is made (see Section II.A., below).

In regard to the Attorney General's proposal that the Board's current review be limited to "only those facts known with some certainty today and that appear to be likely to be stable over the decade," the Siting Board notes that such a standard is vague and impractical. In this and all future reviews, the Siting Board will examine every relevant issue that has been adequately developed in the record. Where there is a strong likelihood of changed circumstances or a need for additional analysis, the Siting Board has

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24/ BECo, of course, will be required to comply with all applicable Siting Board statutes, regulations and standards of review in effect at the time of its filing.

the ability to place conditions on findings in this decision in order to ensure that any such changes will be adequately addressed in the future should they occur.

In regard to BECo's argument that this decision should include "permission" for other state agencies to issue permits, G.L. c. 164, § 69J provides that "no state agency shall issue a construction permit for [a] facility unless the petition to construct such facility has been approved by the board and the facility conforms with [the Company's] long-range forecast." In this case, neither of the two statutory criteria have been met which would allow another state agency to issue a construction permit. As discussed above, this decision is not a full and final approval, or even a conditional approval, to construct the Edgar facility, nor does this decision contain a finding that the facility conforms to an approved long-range Company forecast. Therefore, the Siting Board finds that other agencies are prohibited from issuing a construction permit for BECo's proposed facility until these statutory requirements are met.[25]

Finally, in response to WATER's argument that a site banking decision should have an expiration date, the Siting Board does not agree. As explained above, there is no language in our statute or regulations which limits the length of time a conditional decision may remain in effect. Imposing such a limit would defeat the purpose of a site banking review, which is to ensure a greater selection of resources from which utilities may select the least-cost, least-environmental impact resource to meet a near-term resource need. In response to WATER's concerns regarding an "open-ended" site banking decision, the Siting Board reiterates that BECo will not be able to construct its

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25/ The Siting Board notes that until the above requirements of c. 164, § 69J are met, other agencies have the discretion consistent with their own statutes and regulations to proceed in various ways including, but not limited to, the rejection or conditional approval of permit applications or deferral of consideration of such applications until final project plans are submitted. See Procedural Order, EFSB 90-12/12A, August 24, 1992, p. 6, n. 4.

proposed project at the primary site unless and until it has received a final Siting Board decision regarding all matters not addressed herein and compliance with all conditions contained herein, and either has established that no significant changes[26] have occurred with respect to environmental impacts and costs at the primary site, or has addressed such changes and demonstrated that environmental impacts have been minimized at the primary site and an appropriate balance has been achieved among conflicting environmental concerns and among environmental impacts, cost and reliability.[27] Furthermore, as noted above, this decision does not allow other state agencies to issue final construction permits for the project. This provides added assurance that all relevant facts and law will be fully considered by the appropriate regulatory authorities at the time the Company decides to proceed with its project.

The Siting Board is sympathetic to the concerns of a community which hosts a "banked" site due to the uncertainty regarding whether or when such a site will be developed. Nevertheless, it is our view that, aside from this uncertainty, the most significant risk associated with a site banking decision is borne by the applicant. If, in fact, circumstances change sufficiently to render a site unacceptable between the time a site banking decision is issued and the time that need is established for the project, the applicant's final petition for approval of the project will be rejected.[28] Further, if the applicant is unable to establish that the proposed project is superior to

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26/ The Siting Board notes that examples of significant changes that could affect the findings in this decision include, but are not limited to, amendments to relevant law, changes in facility design or site characteristics, or advancements in technology.

27/ It is specifically for this reason that this decision is fundamentally different than a certificate on a final EIR, which is a final determination.

28/ The Siting Board notes that at such time as the applicant seeks such final approval, the local community will have a full and fair opportunity to address any changed circumstances affecting the environmental impacts or costs at the site.

alternative resources available to meet the identified need, the final petition for approval of the project will likewise be rejected.[29] Thus, the Siting Board believes that the benefits associated with site banking, as discussed above, significantly outweigh any associated risks.

Accordingly, with respect to the scope of this decision, the Siting Board will address herein (1) the Company's site selection process, and (2) the environmental impacts and costs of the proposed facilities at both the primary and alternative sites. As explained further in Section II.A below, after making a final determination on the site selection process and after reviewing and balancing the environmental impacts and costs at both sites, the Siting Board will make a final decision as to which of the two sites is superior. Should the Company choose to pursue this project further, all issues that the Company will be required to address in its next filing with the Siting Board will relate solely to the site approved in this decision.

29/ As noted above, a showing that the proposed project is superior to alternative energy resources will be required if the Company chooses to seek final approval of the Edgar project. The Siting Board notes that when a project proponent is a utility, such as BECo, the DPU routinely reviews the applicant's long-range forecast and supply plan. See 220 C.M.R. 10.00. These reviews will ensure that alternative resources within the utility's control will be adequately considered and compared to the Edgar project.

II. ANALYSIS OF THE PROPOSED AND ALTERNATIVE FACILITIES

A. Standard of Review

The Siting Board has a statutory mandate to ensure a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § § 69H and J. Further, G. L. c. 164, § 69J requires the Siting Board to review alternatives to planned projects, including "other site locations." In implementing this statutory mandate and requirement, the Siting Council required the petitioner to show that its proposed facilities' siting plans are superior to alternatives and that its proposed facilities are sited at locations that minimize costs and environmental impacts while ensuring supply reliability.

1. Site Selection Process

In order to determine whether a facility proponent has shown that its proposed facilities' siting plans are superior to alternatives, the Siting Council required a facility proponent to demonstrate that it examined a reasonable range of practical facility siting alternatives. Berkshire Gas Company, 25 DOMSC 1, 48 (1992) ("1992 Berkshire Decision"); Berkshire Gas Company, 23 DOMSC 294, 323 (1991) ("1991 Berkshire Decision"); Enron Power, 23 DOMSC 1, 115 (1991) ("Enron"); EEC, 22 DOMSC at 314; West Lynn, 22 DOMSC at 77 (1991); 1991 NEPCO Decision, 21 DOMSC at, 48 (1991); MASSPOWER, 20 DOMSC at 371; Berkshire Gas Company (Phase II), 20 DOMSC 109, 148 (1990) ("1990 Berkshire Decision"); Altresco-Pittsfield, 17 DOMSC at 387 (1988); NEA, 16 DOMSC, 381-409 (1987). In order to determine that a facility proponent has considered a reasonable range of practical alternatives, the Siting Council typically required the proponent to meet a two-prong test. First, the facility proponent must establish that it developed and applied a reasonable set of criteria for identifying and evaluating alternatives in a manner which ensures that it has not overlooked or eliminated any alternatives which are clearly superior to the proposal. 1992 Berkshire Decision, 25 DOMSC at 48; 1991 Berkshire Decision, 23 DOMSC at 323; Enron, 23 DOMSC at 121; EEC, 22 DOMSC at 122-123; West Lynn, 22 DOMSC at 77; 1991 NEPCo Decision, 21 DOMSC at

376; MASSPOWER, 20 DOMSC at 373-374, 382; 1990 Berkshire Decision, 20 DOMSC at 148-149, 151-156. Second, the facility proponent must establish that it identified at least two noticed sites or routes with some measure of geographic diversity.[30] 1992 Berkshire Decision, 25 DOMSC at 49; 1991 Berkshire Decision, 23 DOMSC at 324; Enron, 23 DOMSC at 122; EEC, 22 DOMSC at 123; West Lynn, 22 DOMSC at 77-78; 1991 NEPCo Decision, 21 DOMSC at 376-377; MASSPOWER, 20 DOMSC at 371-372; 1990 Berkshire Decision, 20 DOMSC at 148; NEA, 16 DOMSC at 381-409.[31]

The Siting Board notes that proposed sites or routes located in the coastal zone as defined under the Massachusetts Coastal Zone Management ("CZM") program and the Coastal Zone Management Act, 16 U.S.C. § 1453, are subject to additional regulatory requirements.[32] The Siting Board is the designated energy facilities siting agency under the CZM program pursuant to 980 CMR 9.01ff. These regulations implement the CZM program as adopted by the Secretary of Environmental Affairs under G.L.c. 21A, § § 2, 3, and 4.

Under the Siting Board's Coastal Zone Facility Site Selection,

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30/ When a facility proposal is submitted to the Siting Board, the petitioner is required to present (1) its preferred facility site or route and (2) at least one alternative facility site or route. These sites and routes often are described as the "noticed" alternatives because these are the only sites and routes described in the notice of adjudication published at the commencement of the Siting Board's review. In reaching a decision in a facility case, the Siting Board can approve a petitioner's preferred site or route, approve an alternative site or route, or reject all sites and routes. The Siting Board, however, may not approve any site, route, or portion of a route which was not included in the notice of adjudication published at the commencement of the proceeding.

31/ As noted previously, all facility petitions before the Siting Board will be reviewed consistent with all legal and decisional precedents established by the Siting Council until superseded, revised, rescinded, or cancelled in accordance with law by the Siting Board. Reorganization Act, § 46.

32/ In the instant case, the primary site proposed by BECo is located in the coastal zone as defined by the CZM Program and the CZM Act and regulations, 16 U.S.C. § 1453 (Exh. BE-6, p. 5-1).

Evaluation, and Assessment regulations, when a facility is proposed for coastal siting, the petitioner must "propose, evaluate and compare at least one alternative site." 980 CMR 9.02(1)(a). When a facility proposed for coastal siting is not a coastally dependent energy facility (see 980 CMR 9.01(2)), the alternative site to be proposed, evaluated and compared "shall be inland of the coastal zone." 980 CMR 9.02(1)(a).[33] Any alternative site "shall be reasonably determined and demonstrated to be capable of development and licensing or approval by all federal, state, regional and local agencies" (id.). The site evaluation and comparison must "include a justification of the necessity for or advantage of coastal siting along with an explicit definition of the process developed to compare alternative sites" (id.).[34]

In Section II.C below, the Siting Board reviews the Company's site selection process, including the consistency of the Company's proposal with the Coastal Zone facility regulations.

2. Environmental Impacts and Cost of the Proposed Facilities

As noted above, in implementing the statutory mandate to ensure a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost, the Siting Council required project proponents to show that proposed facilities are sited at locations that minimize costs and environmental impacts, while ensuring a reliable supply. In order to determine whether such a showing was made, the Siting Council required project proponents to demonstrate that the proposed site for the facility is superior to the noticed alternative on the basis of balancing cost, environmental impact and reliability of supply. 1991 Berkshire Decision, 23 DOMSC at 324; Enron, 23 DOMSC at 122; EEC, 22 DOMSC at 315; West Lynn, 22 DOMSC at 78; 1991 NEPCo Decision, 21 DOMSC at 377-379; MASSPOWER, 20

33/ The Company stated that the Edgar project does not meet the definition of a coastally dependent facility as set forth in 980 CMR 9.01(2) (Exh. BE-6, p. 5-1).

34/ These requirements apply only to proposed sites located in the coastal zone as defined under the Massachusetts CZM program.

DOMSC at 382; 1990 Berkshire Decision, 20 DOMSC at 148.

In prior decisions, the Siting Council stated that an overall assessment of all impacts of a facility is necessary to determine whether an appropriate balance is achieved both among conflicting environmental concerns as well as among environmental impacts, cost and reliability.[35] Enron, 23 DOMSC at 137; EEC, 22 DOMSC at 335-336. The Siting Council concluded that a facility proposal which achieves that appropriate balance is one that meets the Siting Council's statutory requirement to minimize environmental impacts. Enron, 23 DOMSC at 137; EEC, 22 DOMSC at 336.

35/ The Siting Board notes that project proponents are required to submit to the Siting Board a substantially accurate and complete description of the environmental impacts of the proposed facility. G.L. c. 164, § 69J. Specifically, Siting Board regulations require that a proponent of a generating facility provide a description of the primary and alternative sites and the surrounding areas in terms of: natural features, including, among other things, topography, water resources, soils, vegetation, and wildlife; land use, both existing and proposed; and an evaluation of the impact of the facility in terms of its effect on: the natural features described above, land use, visibility, air quality, solid waste, noise, and socioeconomics. 980 CMR 7.04(8)(e)2,6.

In cases where a site is proposed in the coastal zone, as defined by CZM statutes and regulations, the Siting Board's Coastal Zone Facility Site Selection, Evaluation and Assessment Regulations require: (1) an environmental description of each site and its vicinity, including a review of: significant land, air, and water use; ecology; geology; hydrology; meteorology; (2) an environmental analysis of construction impacts; (3) an environmental analysis of facility operation, including, but not limited to, land, air and water use impact, waste impacts, visual and aesthetic impacts; (4) a socioeconomic impact analysis, including measures to mitigate adverse impact during construction and operation; and (5) an analysis of all measures taken to comply with land, air, and water use and ecological standards, policies, regulations, bylaws and statutes of the Commonwealth and its political subdivisions. 980 CMR 9.02(1)(b).

Finally, the Siting Board notes that G. L. c. 164, § 69J also requires that plans for construction of new facilities be consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth.

The Siting Council also held that an overall assessment of the impacts of a facility on the environment, rather than a mere checklist of a facility's compliance with regulatory standards of other government agencies, is consistent with the statutory mandate to ensure a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. EEC, 22 DOMSC at 334, 336. Compliance with other agencies' standards clearly does not establish that a proposed facility's environmental impacts have been minimized. Id. Furthermore, the Siting Council stated that the levels of environmental control that the project proponent must achieve cannot be set forth in advance in terms of quantitative or other specific criteria, but instead, must depend on the particular environmental, cost and reliability trade-offs that arise in respective facility proposals. Id., at 334-335.

The Siting Board recognizes that an evaluation of the environmental, cost, and reliability trade-offs associated with a particular decision must be clearly described and consistently reviewed from one case to the next. Therefore, in order to determine if a project proponent has achieved the appropriate balance among environmental impacts and among environmental impacts, costs and reliability, the Siting Board must first determine if the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures in order to make such a determination. The Siting Board can then determine whether environmental impacts have been minimized. Similarly, the Siting Board must find that the project proponent has provided sufficient cost information in order to determine if the appropriate balance among environmental impacts, costs, and reliability has been achieved.

Accordingly, in Sections II.D and II.E below, the Siting Board examines the environmental and cost impacts of the proposed facilities at the primary and alternative sites to determine:
(1) whether environmental impacts would be minimized at each site; (2) whether an appropriate balance would be achieved at each site among conflicting environmental concerns as well as among environmental impacts, cost and

reliability; and (3) which of the sites is superior on the basis of balancing environmental impact, cost, and reliability of supply.

B. Description of the Proposed Facilities at the Proposed and Alternative Sites

BECo proposes to construct a 306 MW combined cycle generating unit to be fueled by natural gas and No. 2 distillate fuel oil at one of two proposed sites (Exh. BE-6, p. 2-1, 5-1). The primary site is a 56-acre parcel of land located in Weymouth. (id., p. 2-1). The site, which is owned by BECo, is the location of the Company's now-retired Edgar Station generating units (id.). Active facilities on the site include two peaking combustion turbines, a barge off-loading dock, liquid fuel storage tanks and substation equipment (id.). Approximately 5.3 acres in the southwest portion of the site will be utilized for the proposed facility (Exh. BE-59, p. 6.5-3).

The Edgar site is bounded by the Weymouth Fore River on the north, south, and west sides (Exh. BE-6, p. 2-2). The east side of the site is partially bounded at its northern end by Kings Cove; at the center by Monatiquot Street and its adjacent residential area; and at the south end by Mill Cove (id.). The surrounding land area is predominantly densely populated (id.).

The major components of the proposed facility at the primary site include two combustion turbine generators with dual fuel capability; two HRSG with SCR;[36] a single steam turbine generator; a steam surface condenser; a demineralization system consisting of several storage tanks, including two 6,000 gallon tanks and a 200,000 gallon demineralized water storage tank; a circulating water intake structure; a circulating water discharge structure; main and unit auxiliary transformers; and three new 300-foot underground 115 kV lines from each of the three generating facility transformers to the

36/ BECo filed a new Best Available Control Technology ("BACT") plan with the MDEP on November 13, 1992 which contains a series of alternative fuel proposals that would have an effect on whether SCR will be utilized at the proposed facility (Exh. HO-RR-93). See Section II.D.1.a.(1)(a), below.

existing 115 kV electrical switchyard (id., pp. 2-4, 2-5, 2-7 to 2-9).

The turbine generator building as proposed would be a rectangular structure that houses the steam turbine generator and the two combustion turbine generators (id., p. 2-6). An attached separate building will house the two HRSGs (id.). A general services building will house the water demineralization facility (id.).

Natural gas will be supplied to the facility by a new 10.7 mile, 24-inch pipeline to be constructed by Algonquin which will extend from the termination of an existing line in Avon, Massachusetts (HO-E-102, pp. 1, 2). Distillate fuel oil, if required for the operation of the facility, will be delivered to the site via barge, utilizing an existing wharf, off-loading equipment, and a 268,000 barrel capacity storage tank located at the northern portion of the site (Exh. BE-6, p. 2-8).

Off-site transmission of electric power from the existing switchyard will make use of the existing 115 kV Edgar to Medway overhead lines and will not require establishment of new off-site transmission or distribution facilities, nor require off-site reconductoring of existing lines (id.).

The Company stated that the proposed facility would cost approximately $210 million in 1994 dollars at the primary site (Exh. HO-RR-120, Table AS-5-2).

The alternative site proposed by BECo is a 300-acre parcel of land located in Uxbridge. (Exh. BE-6, pp. 5-10, 5-11). The alternative site consists of agricultural and undeveloped land and is located two miles southwest of the center of Uxbridge (id.). The site is bordered on the south by the Massachusetts/Rhode Island state line and by residential development along the north, east and west site boundaries (id.). In addition to requiring the same major components that would be constructed at the Edgar site, the Ironstone site would require construction of additional facilities.[37] Due to the inland nature of the site, a closed loop heat

37/ The Siting Council notes that due to the possibility of BECo utilizing natural gas 365 days of the year, the alternative site may require a smaller oil tank than that presently existing at the

rejection system will be required at the site, necessitating the construction of a mechanical draft cooling tower, a cooling tower make-up water pumphouse, and a water pipeline connecting the pumphouse to the cooling tower (id., pp. 5-21, 5-23, 5-24, 5-26). Additional construction both on and off-site includes a new 345 kV switchyard and transmission connections to BECO's existing 345 kV Sherman Road to Medway transmission line and a gas supply connection to Algonquin's interstate pipline system (id., pp. 5-21, 5-26; Tr. 56 at 143)[38].

The aforementioned Sherman Road to Medway transmission line passes within approximately 100 feet of the northwest extreme of the Ironstone site (id., p. 5-11). A natural gas pipeline owned by Algonquin passes within approximately 1400 feet of the site's northwest extreme (id.).

The Company stated that the proposed facility would cost approximately $246 million in 1994 dollars at the alternative site (Exh. HO-RR-120, Table AS-5-2).

C. Site Selection Process

1. Overview of Siting Process

BECo asserted that the process which led to the selection of the primary and alternative sites for the Edgar project included a series of siting studies conducted over the period 1978 to 1989 (BECo Initial Brief, pp. 184-185). The Company stated that the process began with a site selection study performed in 1978 by Stone & Webster Engineering Corporation ("Stone & Webster") to identify and evaluate sites to construct coal- or nuclear-fueled generating stations ranging in size from 800 to 1500 MW ("1978 Study")

Edgar site. See Section II.D.1.a.(1).

38/ The Company indicated that electrical connection of the proposed facility at the alternative site also would require transmission reinforcements on a segment of the regional transmission system outside the immediate area of the alternative site -- specifically, the addition of a new 17-mile 345 kV circuit extension between the Carpenter Hill/Millbury, MA substation and the Charlton, MA substation (Exhs. HO-RR-125, HO-RR-114).

(Exh. UX-37, p. E-1).

BECo stated that Stone & Webster performed two follow-up studies for BECo in 1984 ("1984 Study") and in 1985 ("1985 Study") (Exhs. UX-3, p. 1-1, UX-46, p. 1). The Company indicated that the 1984 Study evaluated sites in eastern Massachusetts for the construction of 400 MW coal-fired units utilizing information and data obtained from the 1978 Study (Exh. UX-3, p. 1-1).[39]

BECo indicated that the 1985 Study evaluated possible sites for the construction of a 440 MW combined-cycle gas turbine generating station (Exh. UX-46, p. 1). The Company stated that the 1985 study evaluated only the four preferred sites identified in the 1984 Study and one additional BECO-owned site (id., p. 1, Addendum, pp. 1 ff.).[40] The 1985 study concluded that the Mystic site and the Edgar site were the preferred sites, and ranked the Edgar site first with respect to costs. (id., Addendum, p. 7).[41]

BECo stated that in 1987 the Company evaluated the Ironstone and Nickel Mine Hill sites for the purpose of identifying an inland site as a potential inland alternative to the Edgar site (Exh. BE-6, p. 5-10). The

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39/ BECo stated that the potential site inventory of 61 sites in the 1984 Study included all of the potential sites identified in the 1978 Study in eastern Massachusetts and, in addition, all BECo-owned sites capable of supporting at least one 400 MW fossil unit and several new sites in the Taunton and Blackstone River Valleys (Exh. UX-3, pp. 3-1, 3-3, 4-2). From the potential site inventory of 61 sites, the 1984 Study ultimately selected four preferred sites: the Edgar and Ironstone sites, the Mystic site in Everett, Massachusetts, and the Nickel Mine Hill site in Dracut, Massachusetts (id., pp. 5-54, 6-1, 6-6).Z

40/ The additional site reviewed in the 1985 Study was the BECo-owned K Street site in South Boston (Exh. UX-46, Addendum). The Company stated that all five sites were also evaluated for their ability to support an additional coal plant and coal gasification facility (id., p. 1).

41/ The Company also indicated that the Edgar site had the most favorable environmental score in the 1984 Study (Exh. UX-3, Table 6-5).

Company stated that this evaluation, which was based on land availability, rail access potential, and transmission access, led to the selection of the Ironstone site as the preferred inland alternative site for the proposed facility (id.). The Company also stated that the 1987 evaluation confirmed that the Edgar site should be the primary site for development of a generating facility (Tr. 29, p. 126).[42]

Finally, the Company stated that a "Site Update Survey" was completed in 1989 (Exh. BE-55, p. 4). BECo stated that the 1989 study, which was prepared for the Company by United Engineers and Constructors, Inc. ("UE&C"), was based on information and data obtained during site surveys conducted in 1989, and on the previous siting studies conducted for the Company (Exh. UX-48, p. 2). The Company stated that the review conducted by UE&C supported the results of the prior siting studies, confirming the Edgar site as the primary site and the Ironstone site as the alternative site (id., p. 13).

In its review of BECo's site selection process, the Siting Board will focus primarily on the 1984 Study, which examined sites in eastern Massachusetts and developed and applied environmental and cost criteria for use in evaluating those sites, and on the 1985 Study, which evaluated the preferred sites from the 1984 Study for a combined-cycle gas facility.[43]

2. Description

a. Development of Siting Criteria

42/ The Siting Board notes that Exhibit UX-47, described by BECo as the 1987 Availability Review, does not compare the Ironstone and Nickel Mine Hill sites, as it does not include any reference to Nickel Mine Hill. Nor is there any reference to the Edgar site in this document.

43/ Because the 1978 Study focussed on 800-1500 MW coal and nuclear facilities, and because the 1987 and 1989 siting reviews were not comprehensive site selection studies, the Siting Board does not place significant weight on these documents in its review and analysis.

BECo asserted that the criteria developed and the methodology utilized in the 1978 Study and the 1984 Study were essentially identical, but that the 1984 Study expanded on the environmental criteria used to evaluate potential sites (BECo Initial Brief, at 189). The 1984 Study identified a "region of interest" -- namely, eastern Massachusetts -- for which siting criteria were developed and from which potential sites were selected (Exh. UX-3, p. 1-1). The 1984 Study employed three phases in developing siting criteria: (1) identification of candidate areas ("Phase 1"), (2) identification of potential sites ("Phase 2"), and (3) selection of preferred sites ("Phase 3") (id., p. 2-4).

In Phase 1 of the 1984 Study, exclusion criteria were developed for removing large areas from consideration in the defined region of interest (id., pp. 3-1, 3-2). The two exclusion criteria used to develop candidate areas were: (1) incompatible land use (e.g., military installations, airports, national and state parks and forests, and wildlife refuges) and (2) water availability (id., p. 3-2).

In Phase 2 of the 1984 Study, potential sites were identified and evaluated within the candidate areas defined in Phase 1 using a series of environmental and design criteria (id., p. 4-1). Phase 2 consisted of four steps: (1) screening areas with major engineering or environmental constraints ("Step 1" or "area deferral") (id., p. 4-1, Table 4-1); (2) comparing areas based on engineering suitability and environmental constraint criteria ("Step 2" or "area comparison") (id., p. 4-1, Table 4-2); (3) identifying sites within areas based on site area requirements, such as site size ("Step 3" or "site identification") (id., p. 4-2, Exh. UX-37, pp. 5-1, 5-6 to 5-8); and (4) evaluating sites based on engineering suitability and environmental constraint criteria ("Step 4" or "site evaluation") (Exh. UX-3, p. 4-2).

As part of Step 1, the Company identified the following deferral criteria which were developed to screen areas for fossil plants: topography, proximity to water, hydrology, water quality, land use, socioeconomics, and ecology (id., Table 4-1). The Company stated that the following engineering

suitability and environmental constraint criteria were developed for use in Step 2: topography, proximity to water, land use, and air quality (id., p. 4-1, Table 4-2). The Company did not list criteria for identifying specific sites in the selected areas as part of Step 3.

For purposes of site evaluation in Step 4 of Phase 2, the following engineering suitability criteria were developed: topography, foundations, water availability, proximity to water and railway transportation, proximity to transmission, and proximity to load center (id., pp. 4-2 to 4-11).[44] In addition, the following environmental constraint criteria were developed for fossil fuel plants in the 1984 Study: land use, aquatic ecology, terrestrial ecology, air quality/meteorology, and aesthetics (visibility) (id.).[45] The Company stated that these criteria were scored according to a zero to five scale for the engineering suitability criteria and a zero to minus five scale for the environmental constraint criteria (id., p. 4-2). The Company stated that the scoring consisted of a gross score with no weighting (Tr. 27, pp. 184-185). By the end of Phase 2, the Company had identified eight potential sites (Exh. UX-3, pp. 4-20, 4-21).

BECo stated that Phase 3 was performed to identify preferred sites from among the eight potential sites identified in Phase 2 (id., p. 5-1). Phase 3 consisted of three steps, including: (1) a cost evaluation, (2) an environmental impact evaluation, and (3) an evaluation based on permitting issues (id.).

The cost evaluation was based on estimates of differential 1984 capital and operating costs for each candidate site (id.). Plant costs not

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44/ In the 1978 Study, both hydrology and land requirements were considered as engineering and suitability criteria (Exh. UX-37, p. 5-2). These criteria were both deleted in the 1984 Study without explanation, while proximity to water and railway transportation for fuel delivery was added as a criterion in the 1984 Study (Exh. UX-3, pp. 4-2 to 4-19).

45/ The 1978 Study also considered the following environmental constraint criteria: water use, socioeconomics, and water quality (Exh. UX-37, p. 5-2).

influenced by site location were not included in the estimate (id.). The criteria for the cost evaluation included site development, foundations, cooling system, materials handling, transportation, labor, and transmission (id., Fig. 5-1).[46]

The environmental impact evaluation consisted of a rating and weighting analysis utilizing criteria designed to reflect the environmental acceptability of each site option (id., pp. 5-3, 5-4).[47] The Company stated that the criteria developed for the environmental assessment evaluation were as follows: terrestrial ecology, aquatic ecology, water quality, socioeconomics,[48] noise, hydrology, hydrothermal, land use, and aesthetics (id., Table 5-1, pp. 5-14 to 5-36).[49] Subcriteria were developed for many of these criteria,[50] and weights were established for each of the environmental

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46/ Site-related costs were estimated for each of these criteria (Exh. UX-3, pp. 5-2, 5-3); however, land acquisition costs were not considered (id., p. 5-8).

47/ BECo stated that the Nominal Group Technique ("NGT") was used to define the criteria for Phase 3 (Exh. UX-37, p. 6.1-3). According to the Company, the NGT procedure was designed to ensure a systematic group decision making process (id.). For all environmental criteria, NGT panels of Stone and Webster individual discipline specialists followed a documented NGT procedure to identify pertinent issues within each discipline, and a rating scale and weighting factor for each criterion (id.).

48/ The Company defined socioeconomics as the economic benefit which a community or town could derive from hosting a facility (Exh. UX-3, pp. 5-23 to 5-26). The Company included within its socioeconomic criterion the following subcriteria: per capita income, unemployment rate, effective tax rate, and existing municipal costs (id.).

49/ The Company stated that environmental impacts of areas remote from the sites of the proposed facilities were not performed (Exh. UX-37, p. 6.4-1). Therefore, concerns such as impacts from transmission lines and pipeline routes were not evaluated (id.).

50/ As an example, the criterion of aquatic ecology included the following subcriteria: rare and endangered species, value of habitat, and sport and commercial fisheries (Exh. UX-3, pp. 5-19 to

criteria to reflect the fact that some criteria may have a more significant impact on the licensing process than others (id.; Exh. UX-37, p. 6.1-6).[51]

BECo explained that in the last step of Phase 3, permitting issues were identified for each site option in order to highlight potential siting problems that had been identified in the environmental evaluation but that could not be quantified in the environmental score (Exh. UX-3, p. 5-5). The Company stated that permitting issues considered in this step of the process were the following: air quality,[52] solid waste disposal,[53] land availability,[54] and public acceptance (id., p. 5-37).

BECo explained that in the 1985 Study, Stone and Webster evaluated the site-related differential capital and operating costs for each of the four

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5-21).

51/ The subcriteria were scored and weighted within each criterion, thus producing a rating factor for each criterion (Exh. UX-3, pp. 5-3, 5-4, 5-14 to 5-36). Weights were then assigned to each criterion on a scale of 1 to 10 (id., pp. 5-3, 5-4, Tables 5-1 and 6-4; Exh. UX-37, p. 6.1-7). The weights and the rating factors for each criterion were then multiplied to provide a score for each criterion (Exhs. UX-3, Table 5-2, UX-37, p. 6.1-7). The scores were then added up to provide a final environmental score for each site option (id.). According to the Company, the weights were developed by a panel of individuals encompassing a broad range of expertise using the NGT (see n. 47, above) (Exh. UX-37, p. 6.1-6).

52/ According to the Company, the air quality/meteorology criterion was not rated or weighted because site specific dispersion modeling was beyond the scope of the site selection studies (Exh. UX-3, p. 5-38).

53/ Solid waste disposal was a major issue in the 1984 Study because coal-fired power plants produce large quantities of solid wastes (Exh. UX-3, p. 5-43). Therefore, in the 1984 Study, the potential for on site disposal, necessitating a larger site size, was considered to be preferable (id.).

54/ The 1984 Study assumed that sites that were already developed with sufficient additional available land for expansion were preferable to undeveloped sites (Exh. UX-3, p. 5-44).

preferred sites identified in the 1984 Study (Exh. UX-46, p. 1-1).[55] The Company stated that costs evaluated for each site included: (1) capital costs for site development/site preparation, foundations, fuel delivery and storage, heat rejection systems, power transmission, labor productivity, and (2) operating costs for selected items such as decremental generation, auxiliary power, and incremental capability (id., pp. 3-1, 3-2, 3-4 to 3-10). Acquisition costs for land and easements for pipeline and transmission lines and other necessary easements were not evaluated (id., p. 3-4, Addendum, p. 4).

The 1985 Study also included a review of the federal and state permits and approvals required for the construction and operation of a combined-cycle facility (id., pp. 4-1 to 4-15). However, the 1985 Study identified no criteria to evaluate the sites with respect to permitting issues (id.). The 1985 Study noted that one of the major differences between a combined cycle plant and a coal plant is that the combined-cycle facility does not require disposal of solid waste (id., p. 4-1).[56]

b. Application of Siting Criteria

The Company stated that it originally considered a geographical area consisting of Massachusetts, Rhode Island, and southeastern New Hampshire in the 1978 Study, and identified 20 candidate areas (Exh. UX-37, p. 1-1). In the 1984 Study, BECo indicated that the region of interest was to consist of

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55/ In accordance with BECo's specifications, in addition to a cost evaluation other purposes of the 1985 Study included: (1) an evaluation of the facility layout; (2) preparation of an engineering and construction schedule for the facility; (3) an evaluation of each site for possible future coal-fired units and coal-gasification facilities; (4) identification of all federal and state environmental permits and approvals; (5) preparation of detailed environmental permitting schedules; and (6) evaluation of risks associated with sequential and parallel permitting and construction activities (Exh. UX-46, pp. 1-1, 1-2).

56/ Solid waste disposal was one of the licensing issues evaluated in the 1984 Study (Exh. UX-3, p. 5-37).

only eastern Massachusetts, as it had determined from the 1978 Study that an adequate inventory of viable candidate sites could be identified in this area without considering other areas (Exh. UX-3, p. 3-1; Tr. 27, p. 128). The Company stated that eastern Massachusetts was selected due to the distinct advantage of locating plants closer to BECo's own load center and service territory (Tr. 32, p. 143).

In the 1984 Study, BECo applied the two Phase 1 exclusion criteria to identify candidate areas in the region of interest, and selected eight areas (Exh. UX-3, pp. 3-1 to 3-3).[57] As part of Phase 2 of the 1984 Study, the Company utilized deferral criteria, engineering suitability criteria, and environmental constraints to identify 61 potential sites in candidate areas (id., pp. 4-1, 5-3). BECo indicated that, based on the 12 criteria related to engineering suitability and environmental constraints, it developed overall scores for the 61 sites (id., pp. 4-2 through 4-18; Exh. BE-48, p. 6).

BECo stated that the highest scoring sites were visually inspected by helicopter and, therefore, some sites with initial high scores were rejected based on such inspection (Exh. UX-3, p. 4-20). The Company stated that in order to be selected, a site must have a total score of 15 or more, and that each candidate area could provide only one site meeting this scoring threshold; as a result five sites were identified (id.). In addition to those sites identified, the three BECo-owned sites were included, for a total of eight candidate sites consisting of: the Edgar, Mystic, Ironstone, and Nickel Mine Hill sites, and the Otis site in Bourne, the Cowdry Hill site in Groton, the Lynn Harbor site in Lynn and the Pilgrim site in Plymouth (id., pp. 4-20 and 4-21).[58] The Company then indicated that the eight sites were reviewed by BECo's Real Estate Department, whereupon the Lynn Harbor site was deemed to be

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57/ The candidate areas selected were Metro Boston, North Shore, Plymouth, Merrimack West, Blackstone, Taunton, Buzzards Bay, and the Lower Cape (Exh. UX-3, p. 3-3).

58/ The scores for each potential site are Mystic, 24; Edgar, 23; Ironstone, 21; Pilgrim, 20; Lynn Harbor, 20; Nickel Mine Hill, 18; Cowdry Hill, 17; and Otis, 17 (Exhs. BE-48, p. 6, UX-3, Table 4-4).

unavailable; therefore, seven sites advanced to Phase 3 (id.).

The Company indicated that, to evaluate the preferred sites in Phase 3, it separately ranked the sites with respect to cost and non-cost items (id., p. 5-5; Tr. 27, p. 97). BECo stated that it utilized site layouts as the basis for the site related cost differentials and the environmental assessment
(Exh. UX-3, p. 5-1).

With respect to the non-cost items, the Company developed discrete ratings for each site generating a score for each criterion and multiplying that score by the identified weighting factor, and summing each score for a final tally (id., p. 5-4). The Company indicated that the Edgar site had the highest (best) environmental score, with the Mystic site ranked second (id., p. 6-2). As noted above in Section II.C.2.a., the Company stated that it also considered environmental permitting issues that could not be included in the rating and weighting system (id., p. 5-3).

For cost items, the Company indicated that it used estimates of differential 1984 costs for six capital and four operating cost items, representing plant costs influenced by the site location (id., pp. 5-1 to 5-3). The Company stated that as a result of the Phase 3 differential cost and environmental scoring of the seven sites, the following four sites were deemed preferable: the Edgar, Mystic, Nickel Mine Hill and Ironstone sites (Exh. BE-48, p. AS 1-7).

BECo stated that the candidate site inventory for the 1985 Study initially consisted of the four Phase 3 preferred sites from the 1984 Study (id., p. AS 1-8). BECo stated that a fifth site -- the BECo owned K Street site -- was added in an addendum (id.).[59] The Company stated that the

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59/ Mr. Schmidt stated that the K Street site was not included in the earlier rounds because the site is somewhat small, approximately seven acres, and BECo previously had other plans for the site (Tr. 33, p. 44). The Siting Board notes since K Street was not added until the 1985 Study, it was not subjected to an environmental assessment which would have resulted in an environmental score.

evaluation of the five sites for combined-cycle generation was based on (1) the Phase 3 cost differential criteria from the 1984 Study,[60,61] and (2) the environmental site scores from the 1984 Study (id., p. AS 1-9; Tr. 29, p. 97). The Company stated that it did not consider whether any of the individual environmental scores from the 1984 Study would be different given the change in the 1985 Study from coal technology to combined-cycle technology (Tr. 33, p. 50). The Company stated that the criteria used were not very specific to the technologies, and that an existing site condition would not change between technologies (Tr. 33, p. 50). In addition, the Company stated that it did not perform any further environmental analysis after the 1984 Study, as it felt that none of the situations had changed at any of the sites to warrant a new comparison (Tr. 29, p. 163).

Based on the 1985 Study, the Edgar site exhibited the lowest site specific total capital and operating cost, with the K Street site and the Mystic site ranked as second and third (Exh. UX-46, Addendum, p. 7). The Company noted that high operating cost differentials associated with the two inland sites reflected the use of cooling towers at those sites, while once-through cooling could be used at the Edgar, Mystic and K Street sites (id., pp. 3-7, 3-11, Addendum, pp. 5, 7). The 1985 Study concluded, however, that there would not be a significant difference in total site differential costs among the five sites (id., pp. 5, 7).[62] The 1985 Study also concluded,

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60/ The Siting Board notes that the 1985 Study and the earlier 1984 Phase 3 cost criteria vary somewhat, in that the 1985 Study added fuel delivery and storage and did not include material handling, transportation, and transshipment of wastes (Exhs. UX-46, pp. 3-1, 3-2, UX-3, pp. 5-2, 5-3).

61/ The Company stated that the cost estimates for the 1985 Study were based on an oil-fired combined cycle unit utilizing No.2 fuel oil; and there was no cost consideration of natural gas-fired units (Tr. 29. pp. 109, 110; Exh. UX-46, p. 3-3).

62/ The 1985 Study indicates that the maximum difference in total site related costs between the lowest cost, estimated for the Edgar site, and the highest cost, estimated for the Nickel Mine Hill

as did the 1984 Study, that adding a new unit to an existing site is expected to be easier, with respect to environmental permitting, than building at a new site, and that the Mystic and Edgar sites are preferred because they are existing sites owned by BECo (id., Addendum, p. 7).[63]

Mr. Schmidt stated that as of 1987, BECo had decided that the Edgar site was to be the primary site based on the siting studies reviewed up to that point, but had not specifically identified an alternative site for purposes of Siting Board review (Tr. 29, p. 126). The Company stated that, although the Mystic site was the second best site in eastern Massachusetts, according to CZM requirements, an alternative inland site must be considered, and therefore BECo focused on determining whether it would select the Ironstone site or the Nickel Mine Hill site as the alternative site (Tr. 27, p. 145; Exh. BE-6, p. 5-1).[64] The Company stated that it concluded from the 1987 Study that a majority of the Nickel Mine Hill property could not be

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site, represents less than 10 percent of the installed capital cost, and is within the accuracy of an order-of-magnitude estimate (Exh. UX-46, Addendum, p. 7).

63/ The Siting Board notes that the conclusions made in the 1985 Study were based on the original four sites without including the K Street site. Further, while the 1985 Study selected both the Edgar and Mystic sites, this Study stated that development of either site for multiple facilities is limited by the availability of land and, therefore, it may be wise to develop one site for a combined-cycle facility and one for a coal facility (Exh. UX-46, p. 5). The Company stated it designated the Edgar site for a combined-cycle facility since it was difficult to assess the community reaction to a new coal unit at that site, and designated the Mystic site for coal (id., pp. 5, 6).

64/ According to 980 CMR 9.02(1)(a), if the proposed site is located in a coastal zone, and it is deemed not to be coastally dependent, an alternative site must be located inland of the coastal zone (Exh. UX-6, p. 5-1). The Company stated that the Edgar site is located in the coastal zone and that the site is not coastally dependent according to the CZM Program, Policy 8 and 980 CMR 9.01(2) (Exh. BE-6, p. 5-1).

obtained by Boston Edison based on current ownership and current use of the property, and therefore, the Ironstone site was selected as the most viable inland alternative (Exh. UX-48, p. 10).

3. Arguments of the Parties

The Company argues that its site selection process was thorough, exhaustive, and complete, and "far superior to any other siting process" previously presented to the Siting Council (BECo Initial Brief, p. 194). BECo emphasizes the "wealth of detail" and the thoroughness of its site selection process in support of its argument that its process complies with Siting Board standards (id., pp. 194-195).

Uxbridge argues that BECo's site selection process was fundamentally flawed in a number of important respects (Uxbridge Initial Brief, p. 8). Uxbridge argues that BECo's siting studies were not performed for combined cycle technology, but for large nuclear or coal-fired facilities (id., pp. 13-16). As a result, Uxbridge argues that potential sites for combined cycle technology were either excluded from the siting analysis, or not actively advanced by BECo (id., p. 9). Uxbridge also argues that the studies relied upon by BECo are substantially outdated (id., pp. 16-19).

Uxbridge further argues that BECo's ranking of environmental factors is flawed because of the inclusion of the criterion "socioeconomics" as one of the environmental criteria (id., p. 19).[65] Uxbridge argues that the inclusion of this criterion in the environmental ranking "is highly misleading and skews the environmental analysis" (id., p. 20). Uxbridge also argues that the use of the socioeconomics criterion as defined by the Company promotes the selection of lower-income communities as facility hosts (id., p. 22).

Uxbridge asserts that the siting studies performed in the site selection process were not designed to, nor did they, identify the best

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65/ Uxbridge notes that BECo gave significant weight to the socioeconomics criterion, ranking it as more important than, inter alia, the hydrology, hydrothermal, and noise criteria, and almost as important as water quality (Uxbridge Initial Brief, p. 19).

alternative sites for the proposed facility (id., p. 1).[66] Finally, Uxbridge argues that the Siting Board should expressly disapprove BECo's site selection process, and find that selecting its best site and a clearly inferior site as the sole noticed alternative does not constitute compliance with the statutory and decisional law on alternative site analysis (id., p. 2).

In response to Uxbridge, the Company stated that its site selection process identified a very large universe of possible sites, and therefore "[i]t is hard to accept" that the Company missed a potential site because the 1978 and 1984 Studies were not performed for a combined-cycle facility (BECo Initial Brief, pp. 210-211).

4. Analysis

a. Development of Siting Criteria

This case presents the first utility-proposed generating facility in recent years, and only the second generating facility in recent years that did not involve cogeneration with steam sales to a host industrial plant. The Siting Board notes that a utility has a greater opportunity to engage in an ongoing site selection process and to examine a greater range of sites than a developer of an individual cogeneration project. Nevertheless, the standard of review established in previous decisions and described above in Section II.A.1., remains applicable to utility-proposed generating facilities. The Siting Board notes that in past decisions, the Siting Council discouraged the development of overly broad site selection criteria. 1992 Berkshire Decision, 25 DOMSC at 61-62; EEC, 22 DOMSC at 320, 1990 Berkshire Decision (Phase II), 20 DOMSC at 162. Prior decisions also expressed concerns regarding the

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66/ Uxbridge argues that the Ironstone site was inferior to the Edgar site and several other sites, notably the Mystic and K Street sites (Uxbridge Initial Brief, p. 25). Uxbridge notes that the 1984 Study indicates that at least four of the seven sites analyzed were superior to the Ironstone site for environmental impacts (id.). Uxbridge asserts that BECo has admitted that the CZM regulations did not preclude it from noticing the best alternatives (id., p. 26).

absence of weights for site selection criteria. 1992 Berkshire Decision, 25 DOMSC at 62; Enron, 23 DOMSC at 127; EEC, 22 DOMSC at 321; West Lynn, 22 DOMSC at 78-79; MASSPOWER, 20 DOMSC at 378-379; 1990 Berkshire Decision (Phase II), 20 DOMSC at 161-162. Furthermore, previous Siting Council decisions stated that the development of numerical values and weights and the ranking of alternatives based on such numerical values and weights are necessary steps in any process for identifying and evaluating routes or sites. 1992 Berkshire Decision, 25 DOMSC at 62, 1991 Berkshire Decision, 23 DOMSC at 329.

In this case, the Company's approach to developing site selection criteria was detailed and iterative, and included quantitative rating and weighting approaches. The Company developed specific environmental criteria and cost criteria in its site selection process, and divided the environmental criteria into subcriteria, which were largely based on quantifiable parameters. Thus, the Company has addressed concerns raised in previous reviews regarding the development of overly broad criteria as part of a Company's site selection process. The Company has also incorporated numeric scores and weights in its site identification and evaluation process. Therefore, the Company has addressed concerns that weights and numerical values be developed as part of a company's siting criteria.

The Siting Board notes that, generally, the siting criteria developed by the Company were appropriate. For example, land use, water availability, water quality, air quality, terrestrial ecology, aquatic ecology, aesthetics, noise, hydrology, and hydrothermal impacts were all appropriate environmental criteria developed by BECo for a project of this type and are similar to criteria approved by the Siting Council in previous decisions. Furthermore, the costs of site development, foundations, cooling systems, fuel delivery and storage, materials handling, transportation, labor, and transmission are all appropriate cost criteria developed by the Company.

However, the Siting Board shares a number of the concerns raised by Uxbridge concerning the development of the Company's site selection criteria. First, as Uxbridge pointed out, the 1984 Study, in which the Company developed its environmental criteria, weights, and scoring procedures, was performed for

coal facilities and not for oil or gas-fired combined cycle facilities.[67] Clearly, certain criteria developed for coal facilities may not be applicable to the siting of a gas or oil-fired facility. For example, solid waste disposal was considered to be an important licensing issue in the 1984 Study because coal plants produce large amounts of solid waste, but this issue is not relevant to the siting of a gas or oil facility. Second, the Siting Board notes that the record is unclear as to how the Company evaluated site size in the site selection process as the technology proposed in each study was modified. The Siting Board notes that a combined-cycle facility fueled by gas or oil requires much less land area than a coal facility, which requires additional storage for both fuel and solid waste. BECo recognized that a combined-cycle facility does not require additional area for disposal of solid waste in its 1985 Study, but despite this acknowledgement, the Company did not revisit the list of 61 potential sites evaluated in the 1984 Study to determine if any potentially preferable sites had been eliminated.

Conversely, criteria which would be specifically appropriate to the siting of a gas-fired plant were never considered or evaluated. Indeed, proximity to a gas pipeline to fuel the facility was not a siting criterion in any of the studies, and the environmental and cost impacts of such a pipeline were not considered. Thus, as Uxbridge pointed out, potential sites well-suited for a gas-fired combined cycle facility could have been screened out of the process or not considered at all because some of the criteria that were developed were inappropriate.

In regard to the Company's specific criteria, the Siting Board notes a valid argument raised by Uxbridge regarding the criterion of socioeconomics. The Siting Board is concerned that the Company has defined socioeconomics in

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67/ The environmental criteria developed in the 1984 Study were never revisited, revised, or even applied in the 1985 Study, even though that study was performed for a combined-cycle facility. Furthermore, no environmental criteria were developed in the 1985 Study. In fact, no comparative analysis was performed in the 1985 Study on environmental issues.

such a way as to favor selection of sites in lower income communities.[68] In particular, the Siting Board notes that the subcriteria of per capita income and unemployment rate are not necessarily indicative of a good siting location or of community sentiment towards a project proposal.[69, 70] A more appropriate way to measure community reaction to a project proposal is to incorporate community input into the site selection process and include community concern as one of the siting criteria. In the past, project proponents have been encouraged to incorporate community input into their site selection process. 1992 Berkshire Decision, 25 DOMSC at 61; 1990 Berkshire Decision (Phase II), 20 DOMSC 109 at 163.[71]

The Siting Board also has some concerns with the Company's assignment of weights to the criteria. First, the Company did not explain its rationale

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68/ For example, the Cowdry Hill site was eliminated from further consideration primarily due to the ratings it received for each of the four socioeconomic criteria (Exh. UX-3, p. 5-91). Based on these ratings, the Company assumed that there would be significant public opposition to the project at that site even though the Company had no specific information to evaluate public attitudes toward developing the site for power generation (id., p. 5-91).

69/ The other subcriteria in this criterion, tax rate and existing municipal costs, are also not necessarily reflective of the suitability of a particular site for a power facility or of community acceptance of a project.

70/ The Siting Board also notes its concern that the Company assigned a weight to the socioeconomics criterion greater than or comparable to individual environmental criteria such as hydrothermal, noise, hydrology and water quality.

71/ Concerning other specific criteria, the Siting Board notes that the Company provided no explanation as to why hydrology, which was an engineering suitability criterion in the 1978 Study, was dropped from consideration in the 1984 Study. It is also unclear to the Siting Board as to why the Company deleted water use and water quality from consideration in the preferred site evaluation (Phase 2, Step 4) of the 1984 Study, since these criteria were both included in this step in the 1978 Study. The criterion of water use does not appear to have been developed for any of the steps in the 1984 Study.

for assigning specific numerical weights to the environmental criteria and subcriteria.[72] Second, the Company failed to develop weights for the permitting criteria considered in Phase 3 of its analysis. Air quality, in particular, is a significant environmental criterion that was not weighted or scored.

In response to the concern of Uxbridge relative to the age of the studies, the Siting Board notes that the most recent study in which environmental criteria were developed was the 1984 Study, while the most recent study in which cost criteria were developed was the 1985 Study. The Siting Board recognizes that the Company filed its original petition in this case in 1990 and that the Company began design work on the proposed project sometime earlier. Thus, the studies which led to the selection of the Edgar and Ironstone sites were only a few years old at the time the project was developed. Furthermore, the Company noted that it reviewed these site selection studies in 1987 and again in 1989. The Siting Board expects companies to review the continued appropriateness of site selection criteria, weighting, scoring and ranking developed in studies that are prepared several years prior to the filing of a company's petition.

In sum, despite the concerns described above, including the concern that some criteria were inappropriate for a gas-fired combined-cycle facility, BECo has developed generally appropriate cost and environmental criteria, and developed numerical values and weights for its site selection process. Accordingly, the Siting Board finds that BECo has developed a minimally reasonable set of criteria for identifying and evaluating alternative sites.

b. Application of Siting Criteria

In regard to the identification of specific sites at which to locate the proposed facility, BECo undertook a comprehensive search for available sites in the 1984 Study. The application of Phase 1 exclusion criteria and

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72/ The Company did explain the method that was used to develop the criteria, namely NGT, but no rationale was provided as to how particular numerical weights were assigned to specific criteria.

the environmental and deferral criteria in the first steps of Phase 2 in the 1984 Study yielded a pool of 61 sites, a significant number of sites. In addition, the initial methodology in applying the above criteria to the 61 sites was generally appropriate -- utilizing scores for both the engineering and environmental criteria. The Company's development of weighted scores in Phase 3 of the 1984 Study was generally sound.

The Siting Board notes that the 1989 Study was a synopsis and affirmation of the previous studies. This check is important in that the Company did successively build upon iterative studies and was involved in ongoing site selection activities prior to final development plans. However, the Siting Board notes that it may be appropriate to update the scoring of sites, or review applicable criteria, in cases where a significant amount of time has lapsed since the last comprehensive site selection study was conducted.

The Siting Board has some concerns with the Company's application of siting criteria. First, the selection of the final sites that were to be carried on to the Phase 3 analysis was arbitrary. The designation of a score of 15 or more as the cut-off point was not explained, nor was the rationale for selecting only one site with said score in each candidate area justified by the Company.[73] Second, the two-tiered weighting system applied to the Phase 3 criteria was cumbersome. In the past, we have determined that the assigning of numerical values and weights which place an excessive emphasis on numerical differentiation, given the highly judgmental nature of the scoring system, may yield a rank based on relatively insignificant substantive differences. 1991 Berkshire Decision, 23 DOMSC at 329. Further, as noted in Section II.C.2.a., above, there was no explanation of how the importance factors or weights were developed.

73/ The Siting Board acknowledges the importance of geographic diversity; however, the inclusion of more than one site in a candidate area does not preclude the adherence to the goals of geographic diversity. In addition, the record does not demonstrate that BECo specified geographic diversity as an objective in this instance.

Thus, the Company utilized a parallel ranking system, generating a specific environmental score and a specific cost differential value for each site. However, the Company did not explain how it integrated the separate environmental and cost scores in Phase 3 in order to select its preferred site. Further, we note that the use of specific cost differentials may be misleading, as the relationship of the differential cost to the overall cost of each item is not provided. Finally, the use of costs from earlier iterations of the Company's analysis is problematic, as the costs are outdated and are based on a 400 MW coal plant rather than a 300 MW gas-fired combined cycle facility such as the Company is proposing to construct. The Siting Board has noted a number of flaws in the application of the Company's site selection criteria. However, the Siting Board also notes that BECo identified a significant pool of possible sites, and consistently applied its criteria to these sites. In addition, scores and rankings were generally appropriate, and the Company conducted a review of its siting studies prior to filing its petition in this case.[74]

Accordingly, the Siting Board finds that BECo has appropriately applied its criteria for identifying and evaluating alternative sites in a manner that ensures that it has not overlooked or eliminated any clearly superior sites.[75]

74/ In regard to the concerns raised by Uxbridge that the application of criteria related to a coal-fired facility may have led to the elimination of a superior site, there is no evidence in the record indicating that this occurred.

75/ In regard to Uxbridge's argument that the Company failed to notice its best alternatives to the Edgar site, the Siting Board agrees with BECo that since CZM regulations require it to notice an alternative inland site, that the Ironstone site or some other inland site would have to be a noticed alternative even if the Company had noticed the Mystic or K Street sites. Further, as BECo states, neither the Siting Board's nor CZM's regulations require the Company to notice three sites, as Uxbridge contends the Company should have done. However, as the Siting Council stated in the 1990 Berkshire Decision (Phase II), inclusion of the "best alternatives" as noticed alternatives in the applicant's filing may allow the

5. Geographic Diversity

In this section, the Siting Board considers the second prong of the practicality test -- whether BECo's site selection process included consideration of site alternatives with some measure of geographic diversity. In addition, the Siting Board reviews the consistency of the Company's siting plans with Coastal Zone facility regulations.

BECo asserts that its siting process was comprehensive in that a broad geographical area was considered and a large number of potential sites with geographic diversity were identified (BECo Initial Brief, p. 186). The Company also asserts that since the Edgar and Ironstone sites are located approximately 40 miles from each other in substantially different environmental and socioeconomic settings, they are clearly geographically diverse (id., p. 211). BECo noted that its primary site is located in the coastal zone as defined pursuant to the CZM Act, 16 U.S.C. § 1453 (Exh. BE-6, p. 5-1). The Company stated further that the Edgar project does not meet the definition of a coastally-dependent facility as set forth in 980 C.M.R. 9.01(2) (id.).

We require that an applicant must provide at least one noticed alternative with some measure of geographic diversity.[76] 1991 Berkshire Decision, 23 DOMSC at 332; Enron, 23 DOMSC at 130; 1991 NEPCo Decision, 21 DOMSC at 390-394; 1990 Berkshire Decision, 20 DOMSC. The Siting Council

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Siting Board to proceed more expeditiously, in the event such a best alternative is found to be clearly superior to the applicant's proposal (20 DOMSC at 155-156). The 1990 Berkshire (Phase II) decision states that such a circumstance may arise because additional information comes to light, or events take place, which adversely affect the ability of the applicant's proposal to meet the identified need with a minimum impact on the environment at the least cost (id.).

76/ In MASSPOWER, the Siting Council set forth a standard that, if met, would exempt certain cogeneration facilities from the noticed alternative requirement (20 DOMSC at 382). However, Edgar is not a cogeneration facility, therefore it is not exempt.

previously determined that simple quantitative diversity thresholds are not appropriate for evaluating geographic diversity, and that the specific characteristics of each site must be scrutinized as well as the locational separation. Enron, 23 DOMSC at 131; 1991 NEPCo Decision, 21 DOMSC at 392.

Here, BECo has provided two sites located 40 miles apart, where one site is located in an urban area and one site is located in a rural area. Further, one site is located in a coastal region and one is located inland. Accordingly, based on the foregoing, the Siting Board finds that BECo has identified at least two practical sites with a measure of geographic diversity.

Furthermore, as set forth in Section II.A.1. above, when a proposed site is located in the coastal zone as defined under the CZM Act, the project proponent must evaluate at least one alternative site and must provide a "justification of the necessity for or advantage of coastal siting along with an explicit definition of the process developed to compare alternative sites". 980 C.M.R. 9.02(1)(a). When a facility proposed for coastal siting is not coastally dependent, the alternative site to be proposed must be inland of the coastal zone. 980 C.M.R. 9.02(1)(a).

With respect to the CZM requirements, BECo has stated that its proposed project is not coastally dependent. By noticing the Ironstone site, BECo has complied with the requirement that the proposed alternative site be inland of the coastal zone. Further, as described above in Section II.C.2, the Company has also provided "an explicit definition of the process developed to compare alternative sites", as required by 980 C.M.R. 9.02(1)(a).

Finally, of the 61 sites evaluated by the Company in its site selection process, the Edgar site ranked first with respect to both environmental impacts and costs. The Company also considered the Edgar site to be advantageous for environmental permitting reasons, because it is an already existing utility site owned by BECo.

For the reasons stated above, the Siting Board finds that BECo has complied with the CZM requirement that its site evaluation and comparison "include a justification of the necessity for or advantage of coastal siting"

for its proposed facility.

6. Conclusion on the Site Selection Process

The Siting Board has found that: (1) BECo has developed a minimally reasonable set of criteria for identifying and evaluating alternative sites; (2) BECo has appropriately applied its criteria for identifying and evaluating alternative sites in a manner that ensures that it has not overlooked or eliminated any clearly superior sites; and (3) BECo has identified at least two practical sites with a measure of geographic diversity.

Finally, the Siting Board has found that BECo has complied with the CZM requirement that its site evaluation and comparison "include a justification of the necessity for or advantage of coastal siting" for its proposed facility.

D. Analysis of Proposed Facilities at the Primary Site

1. Environmental Impacts of the Proposed Facilities at the Primary Site

a. Air Quality

The Company asserted that facility emissions would fully comply with all federal and state air quality standards established to protect the public health and welfare and would have a minimum impact on ambient air quality in the vicinity of the Edgar site (BECo Initial Brief, pp. 231, 238, BECo Site Banking Brief, p. 49). BECo further asserted that the air quality impacts of the proposed facility would be adequately minimized consistent with the applicable environmental policies of the Commonwealth (BECo Initial Brief, p. 238).

The Company indicated that air pollutant emissions would result,

primarily, from operation of the two combustion turbines, and, to a smaller degree, from the two auxiliary boilers, but stated that emissions would be controlled through the use of clean fuels and advanced air pollution technology (Exhs. BE-59, p. 6.1-1, BE-6, pp. 7-6, 7-7, BE-48, Tables AQ-37-1, AQ-37-2). The Company estimated the emission rate for each pollutant based on manufacturers equipment guidelines and fuel characteristics, noting that emissions would increase with oil firing (Exhs. BE-59, p. 6.1-3, Table 4.6-6, BE-48, p. AQ-1-1; Tr. 23, p. 34). BECo then estimated ambient air impacts for required averaging periods, assuming an annual plant capacity factor of 100 percent and fuel oil usage for the entire year (Exh. BE-59, p. 6.1-3).[77]

With respect to applicable regulations, BECo indicated that the operation of the proposed facility would be subject to federal air quality standards and regulations that are administered by the MDEP, including (1) National Ambient Air Quality Standards ("NAAQS"), (2) New Source Performance Standards ("NSPS"), and (3) Prevention of Significant Deterioration ("PSD") regulations (Exhs. BE-6, pp. 3-1, 3-2, 3-5, BE-48, summary, p. 6). The Company explained that the NAAQS are ambient ceilings for six criteria pollutants: (1) sulfur dioxide ("SO_2"); (2) particulate matter of ten micrometers or less ("PM-10");[78] (3) carbon monoxide ("CO"); (4) nitrogen oxides ("NOx"); (5) ozone;[79] and (6) lead, and were established to protect the

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77/ The Company stated that estimated emissions would exceed actual emissions due to its conservative assumptions -- 100 percent capacity factor and oil use (Exh. BE-59, p. 6.1-3).

78/ The Company indicated that NAAQS apply to PM-10 emissions, whereas Massachusetts regulations and PSD increments apply to emissions of total suspended particles ("TSP"), which include PM-10 (Exhs. BE-59, p. 5.2-5, BE-48, mitigation, p. 16). For purposes of this review, no distinction is made between PM-10 and TSP.

79/ The Company stated that ozone is not directly emitted from combustion sources, but instead, is produced in the ambient atmosphere by the interaction of volatile organic compounds ("VOC"), NOx and sunlight (Exh. BE-59, p. 2.4-1). Thus, to control ozone formation, the MDEP enforces emission restrictions on VOC's and NOx

public health and welfare (Exhs. BE-6, p. 3-1, BE-59, p. 2.4-1).[80] The Company further explained that the PSD regulations limit increases in ambient concentrations of criteria pollutants in areas where the existing air quality is in attainment of the NAAQS or unclassified with regard to the NAAQS, and also require that emissions of all criteria pollutants, as well as emissions of sulfuric acid mist and beryllium, be minimized (Exhs. BE-6, p. 3-2, BE-65, pp. 1-1, 2-2). The Company added that the NSPS are emission limitations for new or modified major sources of air pollution (Exh. BE-65, p. 3-2).

(id.).

80/ The Siting Board notes that, with respect to NAAQS, regions are categorized as attainment, nonattainment or unclassified for each criteria pollutant. Where existing air quality is in attainment or unclassified with respect to a specific pollutant, the Company would be required to demonstrate that ambient concentrations of that pollutant, which include facility impacts, would comply with the NAAQS. Where existing air quality is in nonattainment for a specific pollutant, a more stringent Offset and Nonattainment Review would be required if emissions of that pollutant were above a threshold level.

BECo indicated that the Weymouth area is in attainment or cannot be classified for NAAQS for all criteria pollutants with the exception of ozone (Exh. BE-59, pp. 5.2-3, 5.2-4, 6.1-5). The Company noted that the Weymouth area, as well as the entire state of Massachusetts, is classified as non-attainment with respect to ozone (Exh. BE-65, p. 2-2). With respect to VOC emissions, the Company noted that dispersion modeling was not required because the entire state of Massachusetts is classified as a nonattainment area with respect to the NAAQS for ozone Exh. BE-65, p. 2-2). The Company added that the requirements of an Offset and Nonattainment Review also were not applicable because the annual VOC emissions would be below the threshold level of 100 tpy (Exhs. BE-48, summary, pp. 3-4, AQ-31, AQ-32, BE-65, p. 4-1). The Siting Board notes that the VOC threshold will be reduced to 50 tpy under the 1990 Amendments to the Clean Air Act ("CAAA").

Additionally, the Company noted that a portion of the primary site is located in Quincy, which is classified as nonattainment for CO (Exh. BE-48, p. AQ-2-2; Tr. 53, pp. 78-79). However, the Company indicated that the MDEP has not required an Offset and Nonattainment Review for CO emissions in that the facility itself would be located in Weymouth (id.).

The Company stated that the proposed facility also would be subject to: (1) an MDEP policy limiting the ambient one-hour concentrations of NOx; (2) MDEP acid rain regulations limiting the emission rate of SO_2; and (2) MDEP guidelines limiting ambient concentrations of air toxics (Exhs. BE-48, p. AQ 1-1, BE-59, pp. 2.4-1, 6.1-16, and 6.1-17). The Company noted that MDEP review of its air pollution control plans and PSD application would encompass review of the aforementioned state and federal requirements (Exh. BE-6, p. 3-5).

The Company further noted that the operation of the proposed facility would be subject to provisions in the 1990 CAAA including a requirement that the Company obtain an allowance for each ton of SO_2 emitted, beginning in the year 2000 (Exhs. HO-E-2).[81] The Company added that forthcoming MDEP regulations would determine how other provisions of the CAAA, including provisions regarding NOx emissions, would apply to the proposed facility (Exh. HO-E-97; Tr. 53, pp. 82-83).

In this section, the Siting Board reviews the impacts of emissions of PSD regulated pollutants, air toxics and CO_2 from the proposed facility at the primary site as well as requests for a health risk assessment.

(1) PSD Regulated Pollutants

(a) Description

BECo indicated that PSD review of the proposed facility requires (1) a demonstration that best available control technology ("BACT")[82] would be

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81/ The Company noted that it expects to transfer SO_2 allowances from its existing facilities to the proposed facility but that the precise mechanism for such transfers will be based on forthcoming regulations (Exh. HO-E-2).

82/ The Company indicated that a BACT analysis is the evaluation of potentially feasible emission control alternatives, beginning with the most stringent control alternative for each pollutant (Exh. BE-59, p. 2.4-2). BECo stated that a BACT determination would identify the most stringent control technology available, taking into account economic, environmental and energy factors (id.).

incorporated into facility design in order to minimize emissions of SO_2, NOx, CO, PM-10, VOC, beryllium and sulfuric acid mist,[83] and (2) an analysis of the ambient air impacts of the proposed facility (Exh. BE-65, pp. 1-1, 2-2). With respect to the minimization of facility emissions, BECo stated that revisions to its fuel mix and combustion technology proposals over the course of the proceedings have resulted in reductions in anticipated facility emissions (Exhs. BE-48, AQ-3 through AQ-7, BE-65, sec. 4, HO-RR-93; Tr. 53, pp. 17-43).

With regard to fuel mix, the Company explained that natural gas has a minimal sulfur content and is essentially ash free (Exh. BE-65, pp. 4-6, 4-8, 4-12; Tr. 53, p. 19). Thus, BECo stated that emissions of SO_2, which are directly related to fuel sulfur content, would be reduced with increased use of natural gas and lower sulfur fuel oil, and emissions of PM-10, which are related to the ash content of fuel, also would be reduced with increased use of natural gas (id.).[84] BECo initially proposed to utilize natural gas for seven months with 0.3 percent sulfur oil for five months, but, during the course of this proceeding, in order to further minimize SO_2 emissions, the Company revised its proposal to use natural gas for 320 days and 0.2 percent sulfur oil for 45 days (Exhs. BE-6, sec. 6, BE-48, AQ-3 through AQ-10).[85]

In a recent revision of its BACT analysis submitted to MDEP on November 13, 1992, the Company recommended two further fuel mix options which would result in additional reductions in facility emissions: (1) use of natural gas for 365 days, with 0.2 percent sulfur oil as back-up for emergency

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83/ The Company stated that although lead is also a PSD-regulated pollutant, emissions would be below the Environmental Protection Agency ("EPA") established threshold requiring PSD review (Exh. BE-59, p. 2-4.1).

84/ The Company noted that emissions of sulfuric acid and beryllium also would be reduced with increased use of natural gas and lower sulfur fuel oil (Exhs. BE-65, pp. 4-10, 4-12, BE-48, AQ-3 to AQ-7, p. 10).

85/ The Company noted that, even under its original fuel use proposal, SO_2 emissions would comply with all applicable NSPS and MDEP emissions limitations (Exhs. BE-65, p. 5.1, BE-59, p. 6.1-17).

periods only ("natural gas proposal"), and (2) use of natural gas for 320 days and use of 0.05 percent oil[86] for 45 days with an emission offset allowance for provision of making supplies available to a local gas distribution company ("LDC") ("emission offsets proposal") (Exh. HO-RR-93). The Company indicated that facility SO_2 and PM-10 emissions would be less under the natural gas proposal than under the emissions offsets proposal (id., Table 9, Table 16). However, the Company stated that under the emissions offset proposal, the Company could make available winter peaking supplies to an LDC and thus allow the LDC to add customers and increase gas sales (id., pp. 26 to 28).[87, 88] Based on potential customer conversion from oil to gas under this scenario, BECo estimated that reductions in area-wide SO_2 and PM-10 emissions from gas conversions would more than offset added facility emissions (id.).[89] The Company noted that the emissions offset approach also would result in a net decrease in area CO emissions (id., Table ES-1). The Company indicated that NOx emissions, which result from the combination of nitrogen in both the fuel and the combustion air with excess oxygen in the combustion air, could be minimized by combustion technology, such as reducing the temperature in the combustion chamber, as well as by post-combustion controls (Exh. BE-65, pp. 4-2, 4-3). BECo indicated that NOx emissions would be limited to no greater than 9 parts per million ("ppm") under each of the NOx emission

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86/ Citing current uncertainties regarding production and supply logistics of 0.05 percent sulfur oil, the Company indicated that 0.2 percent sulfur oil would be substituted if the lower sulfur oil were not available (Exh. HO-RR-93, pp. 23-24).

87/ The Company indicated that, under this scenario, the LDC would share in the costs of constructing the natural gas pipeline to the site (Tr. 53, p. 17).

88/ The Company did not explain the basis for its expectation that the peaking supplies would result in increased gas sales, as opposed to replacing existing LDC supplies.

89/ The Company indicated that Boston Gas provided an estimate of the number of residential and commercial customers that would potentially convert from oil to gas (Exh. HO-RR-93, pp. 27-28).

control strategies considered (id., p. 5-1).[90]

In order to minimize NOx emissions, BECo first proposed use of both (1) steam injection into the combustion chamber to reduce peak flame temperature, and (2) selective catalytic reduction ("SCR") (id., p. 4-6). BECo noted that SCR is a post-combustion process whereby ammonia, injected into the exhaust stream in the presence of a catalyst, reacts with NOx to form nitrogen and water (id., p. 4-5).[91]

During the course of the proceedings, the Company proposed replacing the steam injection control design with a dry combustor technology, which would restrict flame temperature and corresponding NOx formation by controlling the quantity and distribution of air supplied to the combustion process, and which would reduce facility water requirements (Tr. 53, pp. 26-27; Exh. HO-RR-93, p. 10).[92] The Company proposed use of two 110 MW turbine sets incorporating dry combustion ("dry combustion turbines" or "dry combustors") based on 320 days of gas-fired generation and 45 days of oil-fired generation with power augmentation and SCR ("base dry combustor design") (Exh. HO-RR-93, Table 4).[93] The Company indicated that emissions of

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90/ The Company noted that the NOx emission rate from the proposed facility would comply with the Northeast States Coordinated for Air Use Management ("NESCAUM") recommended guideline of 9 ppm, and would be well within the NSPS limitations of 101 ppm and 142 ppm for gas and oil firing, respectively (Exh. BE-59, p. 6.1-2).

91/ The Company noted that ammonia emissions would result from operation of the SCR (see Section II.D.1.a.(1)(b), below) (Exh. BE-65, p. 4-5).

92/ The Company noted that dry combustor technology was not commercially available when the facility was originally proposed (Exh. BE-48, AQ-3 through AQ-7, pp. 13-19).

93/ The Company indicated that the dry combustor technology could provide a nominal water savings of approximately 486,000 gallons per day ("gpd") at a 100 percent capacity factor, but this would reduce the power output of the facility by 22 MW (Exh. BE-120, p. 2-2). Therefore, the Company indicated that steam injection would be utilized to provide offsetting power augmentation, and noted that steam injection would reduce the net water savings for the base dry

NOx and ammonia combined would be 2.95 pounds per net kilowatt-year ("kWyr") with use of the base dry combustor design, compared to 2.87 pounds per net kWyr with the originally proposed steam injection control and SCR design (id.).[94]

In conjunction with its recently proposed natural gas and emission offsets BACT proposals, the Company considered several design options as BACT for NOx emissions, including the base dry combustor design (Exh. HO-RR-93, pp. 9-13).[95] With its natural gas proposal, BECo recommended that it achieve BACT for NOx through a new combustor design based on two 100 MW dry combustors with steam injection for power augmentation but without SCR (Exh. HO-RR-93). The Company indicated that this design would provide a NOx emission rate of 9 ppm or less, and would result in NOx emissions of 2.26 pounds per net kWyr, the lowest NOx emissions in net kWyr of all alternatives considered (id., p. 16).[96]

The Company maintained that the natural gas proposal with 100 MW dry combustors and steam injection for power augmentation would not require SCR (id., p. 12). The Company explained that it would be possible to attain a NOx

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combustor design to 135,000 gpd (id.). See Section II.D.1.e.(i), below.

94/ In evaluating the environmental impacts of the various NOx control strategies, the Company considered ammonia emissions as well as NOx emissions for the control strategies that include SCR (Exh. HO-RR-93, Table 6).

95/ The Company indicated that design options for reduction of NOx emissions included combustor type, combustor size, power augmentation and SCR (Exh. HO-RR-93).

96/ The Company indicated that 100 MW combustors without steam injection for power augmentation would be the most stringent NOx control alternative producing the lowest NOx emissions in tons per year but that due to reduced efficiency, NOx emissions would be 2.37 pounds per net KWyr (Exh. HO-RR-93, pp. 14-16). The Company also indicated that the estimated facility emissions per net kWyr of NOx and ammonia combined would be lower under its proposed design than under all of the alternative designs included in BECo's revised BACT analysis (id., Table 4).

emission rate of 9 ppm or less without SCR, with 100 MW combustors and with exclusive use of natural gas (id., Tr. 53, p. 27).[97] The Company noted that inclusion of steam injection for 28 MW of power augmentation would require an additional 609,700 gpd of water compared to BACT alternatives based on (1) use of 100 MW dry combustors without power augmentation or SCR, and (2) use of 110 MW dry combustors with SCR (Exh. HO-RR-93, Tables 4 and 5). Finally, BECo asserted that dry combustion technology also would minimize emissions of CO and VOC, which result from incomplete combustion of carbon in the fuel (id., pp. 17-20).[98]

In conjunction with the emission offset proposal, the Company also recommended that it achieve BACT for NOx through use of two 100 MW dry combustors with steam injection for power augmentation but noted that SCR would be required for oil firing periods (id., sec. 5). The Company estimated that facility emissions of NOx and ammonia combined under the emissions offset proposal would be 2.50 pounds per net kWyr, but that net area emissions of NOx and ammonia combined would be 0.88 pounds per net kWyr as a result of reductions associated with estimates of customer conversion from oil to gas (id., Table 13). By comparison, the Company estimated that net area emissions of NOx and ammonia combined under the natural gas proposal would be no less than the estimated facility emissions of 2.26 pounds per net kWyr (id., Tables

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97/ The Company indicated that SCR could be eliminated from natural gas control strategies that include 100 MW combustors because a 9 ppm NOx emission rate has been guaranteed by a manufacturer for 100 MW combustors (Exh. HO-RR-93, pp. 11, 12). The Company added that SCR would be included with 110 MW combustors because current NOx emission rate guarantees are in the range of 15 ppm to 25 ppm (id.).

98/ The Company indicated that during the course of the proceedings, guarantees for CO emissions by combustion turbine manufacturers have consistently decreased and that it expects to achieve a CO emission rate of 4 ppm, which is less than current NESCAUM guidelines of 10 ppm (Exh. HO-RR-93, p. 18). The Company noted that it had evaluated installation of a CO catalyst but determined that a CO catalyst, which also would increase CO_2 emissions, would not be a cost-effective means of further reducing CO emissions (Tr. 53, pp. 39-41).

4, 13).

In order to predict the facility impacts with regard to ambient concentrations of SO_2, PM-10, NOx, and CO, the Company performed dispersion modeling analyses utilizing the emission rates from its originally proposed emission control strategy, based on seven months of gas-fired generation and five months of oil-fired generation (Exh. BE-59, pp. 6.1-2 to 6.1-4).[99] Specifically, BECo stated that it first performed a screening-level analysis using the Industrial Source Complex-Short Term ("ISCST") model over the range of operating loads and ambient temperature conditions to predict the worst-case impacts of the proposed facility and the approximate distances of predicted worst case impacts from the facility (Exh. BE-65, pp. 6.5-6.8). BECo stated that it then performed a refined modeling analysis with five years of meteorological data 3using both the ISCST model and the COMPLEX I model[100] to predict facility impacts on existing air quality (id., pp. 6.8-6.14).[101]

The Company stated that its refined analysis demonstrated that ambient concentrations of SO_2 and PM-10 for all averaging periods would exceed

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99/ The Company indicated that modeling was performed assuming 100 percent oil-fired operation and use of 0.3 percent sulfur oil (Tr. 53, pp. 14-16). The Company indicated that it would perform an updated modeling analysis reflecting the proposed fuel mix when the emission control strategy was finalized, in conjunction with MDEP review (id.).

100/ The Company indicated that the ISCST and COMPLEX I models are used for differing terrain characteristics (Exh. BE-65, p. 6-8).

101/ The Company noted that sites located at or near the coastline may be subject to alternating land and sea breezes, which can occasionally elevate ground level concentrations (Tr. 23, pp. 107, 108, 110). At the request of the Secretary of Environmental Affairs, the Company also analyzed facility impacts with the MISRA-Shoreline Fumigation Model, which accounts for weather patterns specific to coastline locations (Exh. BE-73, p. 3). The Company indicated that the predicted facility impacts using this model were less than half the impacts predicted by the ISCST screening-level analysis (Exh. HO-RR-57A, p. AQ-3-1).

EPA-defined significance levels (id., p. 7-2; Exh. HO-RR-109, p. 2).[102] The Company stated that, therefore, an identification of an AQAI and interactive source modeling would be required for SO_2 and PM-10 emissions (Exh. BE-65, p. 7-2). In addition, the Company stated that the one-hour NOx concentrations would exceed MDEP-defined significance levels, requiring modeling of existing background concentrations (Exh. BE-65, p. 7-5).[103, 104] The Company further stated that annual NOx impacts and CO impacts for all averaging periods were below the significance levels, thus demonstrating compliance without further analysis (id.).[105]

The Company stated that its complete analysis, including background concentrations and interactive sources where applicable, demonstrated that ambient concentrations of all criteria pollutants would comply with NAAQS and

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102/ The Company indicated that the EPA-defined significance levels establish a threshold level of air quality impacts (Exh. BE-65, Table 6-13, p. 7-2). The Company explained that, where facility impacts for specific pollutants for specific averaging periods would exceed the significance levels, identification of an air quality area of impact ("AQAI") and interactive source modeling would be required for that pollutant (id.). The Company further explained that an AQAI defines the extent of predicted significant air quality impacts of a specific pollutant and that it must be demonstrated that air quality standards will be maintained within the entire AQAI (id., p. 7-2).

103/ The Company noted that the MDEP has established a significant impact level for one-hour NOx concentrations for administration of its one-hour NOx policy limitation (Exh. BE-65, p. 7-5).

104/ The Company noted that CO and NOx emissions would be higher during combustion turbine start-up than routine operation and, as such, predicted one-hour concentrations of CO and NOx based on start-up conditions (Exh. BE-65, pp. 7-5, 7-6).

105/ The Company indicated that although the predicted annual NOx concentration of 0.999 micrograms per cubic meter ("ug/m^3") was close to the significance level of 1 ug/m^3, air quality modeling included several conservative assumptions such that the actual NOx impact would thus be less than predicted levels under actual facility operation (Exh. BE-48, p. AQ-20-1).

PSD increments for all averaging periods as well as the MDEP one-hour NOx guideline (See Table 1) (Exh. BE-65, pp. 7-2 to 7-6).[106, 107] Finally, BECo indicated that the maximum concentrations of beryllium would be below the PSD "de minimis" monitoring level and that maximum concentrations of sulfuric acid mist would comply with MDEP guidelines (id., pp. 7-6 and 7-7, Exh. BE-48, sec. AQ-1).

(b) Position of the Parties

The Attorney General argues that forthcoming changes in environmental protection policies and standards, including likely 1995 requirements for NOx emissions, as well as continuing technological developments, will require a new review of the air quality impacts of the proposed facility when the Siting Board considers the Company's final petition (AG Site Banking Brief, pp. 8-11). The Attorney General also argues that the Siting Board should restrict its review to only those aspects of the proposed facility that are certain and that would likely remain unchanged over the next ten years (id., p. 14).

BECo responds that there is little evidence that changes in air quality regulations will have a significant impact on the proposed facility, and moreover, regulatory changes identified by the Attorney General would likely be associated with existing facilities rather than new facilities (BECo Site Banking Reply Brief, pp. 4-5). BECo notes that it has requested preliminary approval of certain environmental aspects of the proposed facility and that final approval would involve a determination that the facility is in full compliance with the applicable regulations at that time (id., p. 5).

106/ The Company maintained that the predicted 24-hour SO_2 concentration, which is close to the NAAQS, reflects conservative modeling measures (Exh. BE-48, p. AQ-21-1).

107/ BECo noted that increases in ambient concentrations of SO_2 and PM-10 would be less than five percent of the allowable PSD increases outside the AQAI's and not more than 50 percent of the maximum allowable increases inside the AQAI's (Exhs. HO-E-104, HO-E-105).

Finally, BECo asserts that although potential further development of the dry combustor technology would lead to additional review, the record includes sufficient documentation for the Siting Board to evaluate the technology and determine its appropriateness for the proposed facility (id., pp. 6, 7).

(c) Analysis

Over the course of the proceedings, the Company has revised its emission control strategy with respect to fuel mix and combustion technology focusing on (1) increasing the use of natural gas and lowering the sulfur content of back-up fuel oil, primarily to address SO_2 and PM-10 emissions, and (2) incorporating combustion control technologies and post-combustion controls, primarily to address NOx emissions. With these revisions, the Company has reduced expected emission rates for all criteria pollutants below initially proposed levels, with the exception that none of the Company's BACT proposals would guarantee a further reduction of the 9 ppm NOx emission rate initially proposed. The Siting Board notes that while the choice of a strategy for NOx control would not significantly impact the NOx emission rate, it would directly affect emissions of other substances as well as facility water requirements.

With regard to the first of BECo's most current BACT recommendations for fuel mix and combustion control technology -- use of two 100 MW dry combustors, steam injection for power augmentation and no SCR, combined with 365 days of gas-fired generation and use of 0.2 percent sulfur oil for emergency back-up -- the Siting Board recognizes the benefits of using natural gas for the entire year and eliminating the need for the SCR system, thereby avoiding ammonia emissions and safety concerns associated with the storage and transportation of ammonia. (See Section II.D.1.i.(2) below). In addition, the Company's BACT recommendation would result in combined emissions of NOx and ammonia totalling 2.26 pounds per kWyr, while the Company's earlier proposal -- use of two 110 MW combustors, power augmentation and SCR, with operations based on 320 days of gas-fired generation and 45 days of oil-fired generation -- would result in combined emissions of NOx and ammonia totalling 2.95 pounds

per kWyr.

However, BECo has not fully addressed a number of significant issues or trade-offs between environmental impacts associated with its recommended approach, including the substantial increase in water requirements relative to options without steam injection for power augmentation and the control of NOx emissions if oil is fired during an emergency. In addition, the Company has not explored the potential to reduce the NOx emission rate below the NESCAUM guideline of 9 ppm by including SCR with the proposed combustors.

The Company's second current BACT recommendation incorporating emission offsets -- that is, use of two 100 MW dry combustors, with operations based on 320 days of gas-fired generation and 45 days of oil-fired generation utilizing 0.05 percent sulfur, steam injection for power augmentation, and SCR during oil firing periods only -- would result in facility emissions of NOx and ammonia totalling 2.50 pounds per kWyr, slightly higher than BECo's natural gas BACT recommendation. In addition, the emissions offsets BACT recommendation would increase facility SO_2 and PM-10 emissions over the option of using natural gas for 365 days. Nonetheless, the Siting Board recognizes that the alternative BACT recommendation could provide benefits through the potential reduction of all criteria pollutants in the vicinity of the proposed facility, even with added facility emissions. Such reductions could result from anticipated customer conversions from oil to gas made possible by an LDC sharing in the Edgar pipeline capacity.

The Siting Board previously has recognized the potential benefits of an emissions offset approach in ensuring a least-cost, least environmental impact energy supply for the Commonwealth by providing a greater return in environmental protection without increasing costs. Eastern Energy Corporation, 25 DOMSC 296, 341-346 (1992) ("EEC Compliance"). In addition, the Siting Board recognizes the potential benefits in reducing background concentrations in an area such as the vicinity of the primary site, where existing measured background concentrations of criteria pollutants are already in excess of 50 percent of NAAQS (See Table 1, attached). However, the Company has not provided adequate documentation to either (1) support its estimation of

potential area-wide emissions reductions, or (2) ensure that emissions reductions would occur in the immediate area of the proposed facility.[108]

Further, as a threshold matter in previously accepting emissions offsets as a means of minimizing facility emissions, the Siting Board first considered whether or not the increased emissions at the site would be acceptable. EEC Compliance, 25 DOMSC at 341-346. Here, the Company has provided an analysis of predicted facility impacts based on fuel that is no longer being considered -- fuel oil with 0.3 percent sulfur content -- and has not yet updated its analysis of facility impacts to account for recent fuel use proposals. Although the Company's analysis of facility impacts demonstrated that ambient impacts for all PSD-regulated pollutants would be below respective NAAQS, the modelled ambient impacts are nonetheless high -- greater than 60 percent of NAAQS for all of the modelled criteria pollutants and averaging periods, and greater than 90 percent of NAAQS for twenty-four hour SO_2 and annual PM-10 (See Table I).[109] The Siting Board recognizes that existing background concentrations are significantly greater than the additional facility contributions estimated by the Company, and further that the actual facility impacts under either of the Company's current BACT recommendations would be less than the Company's estimates of ambient impacts. However, such reduced impacts have not been quantified by BECo and thus, the Siting Board cannot fully evaluate the trade-offs between BECo's two BACT recommendations or determine, at this time, whether facility impacts would be minimized by use of natural gas for 320 or 365 days.[110]

108/ The Company also has not addressed increased water requirements or potential reduction in NOx emissions below 9 ppm in this proposal.

109/ The Siting Board notes that in EEC, facility impact combined with background concentrations was greatest with respect to the 24-hour SO_2 concentration, but that such impact was 48 percent of NAAQS (22 DOMSC at Table 7).

110/ The Siting Board notes that emissions of air toxics would also be affected by the Company's choice of fuel mix. See Section II.D.1.a.(2)(a), below.

The Siting Board further recognizes emission control technology is continually evolving. In fact, emission control technology has advanced over the course of the proceeding; technologies that were not commercially available at the start of the proceedings (i.e., dry low NOx combustors) are now commercially available with guarantees for low emission rates. It is likely that emission control technology will continue to progress and that technologies not available at this time will be available when BECo files its final petition. For instance, should dry combustors with an output of 110 MW become available with appropriate NOx emission limitation guarantees, BECo would have more flexibility to achieve its proposed power output through a dry combustor technology, while addressing the trade-off between incorporating steam injection for power augmentation and saving associated water requirements of over 600,000 gpd.

Finally, the Siting Board recognizes that under either of BECo's BACT recommendations, air quality impacts would comply with existing federal and state air quality standards. However, compliance with existing air quality standards is a minimum threshold for purposes of the Siting Board's siting review. If air quality standards were not met by the Company's proposal, the Siting Board would not even consider proceeding with site banking in this docket at this time.

Siting Board review extends beyond a checklist of existing regulatory standards of other agencies. See EEC, 22 DOMSC at 336-337. Siting Board review considers the interactive effects between environmental impacts as well as the interrelationship among environmental impacts, cost and reliability in determining whether the environmental impacts of a facility have been adequately minimized. Id.

Here, BECo has continued to explore alternative emission control strategies to further reduce emissions as technology has evolved. However, in considering alternative emission control strategies, BECo has not fully evaluated all of the trade-offs in environmental impacts that would occur in implementing either of its currently proposed emission control strategies, nor has the Company provided sufficient documentation regarding its emissions

offsets proposal for the Siting Board to evaluate its potential. In addition, considering the unknown time-frame of facility construction, technology that is not commercially available at this time could potentially be available to further minimize impacts and the Siting Board expects that the Company will continue to evaluate emission control strategies in light of technological advancements.

Thus, it would be premature at this time for the Siting Board to determine whether the BECo has established that the impact of facility emissions of the PSD-regulated air pollutants would be minimized under any of its proposals or BACT recommendations. At such time as the Company presents its filing for final approval of the project, the Siting Board will evaluate fully whether the Company has minimized air quality impacts while considering the interactive effects between environmental impacts, and the balance between environmental impacts and cost.

(2) Toxic Pollutants

(a) Description

Based on a literature search and consultation with a combustion turbine vendor, BECo identified the following toxic pollutants that potentially would be emitted from the proposed facility due to their presence in fuel oil: beryllium, cadmium, chlorine, chromium, copper, fluoride, lead, mercury, nickel, vanadium, formaldehyde, hydrogen chloride, and sulfuric acid (Exh. BE-48, p. AQ-1-2).[111] BECo noted that for each of these substances, emissions from oil combustion would exceed those from natural gas combustion (id.) In addition, the Company indicated that ammonia emissions would result if the SCR process is used to reduce NOx emissions (id., p. 4.6-5).[112]

111/ The Company indicated that the MDEP has reviewed the Company's list of potential toxic emissions and has not required an analysis of any additional substances (Exh. BE-48, p. AQ-1-1).

112/ The Company explained that ammonia emissions result from "ammonia slip," the excess ammonia which passes through the catalyst bed without reacting with NOx (Exh. BE-59, p. 4.6-5). The Company stated that the SCR vendor has guaranteed an ammonia slip rate of

BECo calculated ambient air quality impacts of each of the aforementioned toxic pollutants based on 100 percent fuel oil firing (id. pp. AQ-1-1 through AQ-1-4). The Company stated that the 24-hour and annual concentration of each toxic pollutant would be below its respective 24-hour Threshold Effects Exposure Limit ("TEL") and annual average Allowable Ambient Limit ("AAL"), demonstrating compliance with the MDEP Air Toxics Assessment Guideline (id.).[113]

WATER argues that emission rates for beryllium, cadmium, chromium and formaldehyde were predicted through fuel sample analysis, but were not modeled or added to existing ambient air concentrations (Carey Brief, p. 3). WATER argues that, therefore, it cannot be determined if the impact of predicted emissions of these substances would exceed the AAL's and TEL's (id.).

WATER further argues that the proposed facility has the potential to emit additional toxic pollutants that are suspected or known carcinogens including benzene, ethylene compounds including toluene, arsenic, and benzo-a-pyrene and other polycyclic aromatic hydrocarbons ("PAH") (id., p. 4, citing Exhs. WAT-RR-8, WAT-RR-19). WATER asserts that BECo has not quantified the emissions of these substances and that, unlike the minute quantities that the Company claims for other air toxins, emissions of benzene, ethylene compounds, and PAH's could potentially be high (Carey Brief, pp. 4-5).[114]

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seven ppm when firing natural gas and ten ppm when firing fuel oil (id.). These rates would comply with MDEP ammonia slip guidelines (Tr. 23, p. 42).

113/ The Company stated that toxic pollutant emission rates were based on conservative assumptions, including year-round oil firing and overestimation of toxic concentrations in fuel oil, and therefore, impacts were overstated (Exh. BE-48, pp. AQ-1-2 through AQ-1-4).

114/ WATER notes that VOC emissions, which include benzene and ethylene compounds, were estimated to be approximately 56 tpy (Carey Brief, p. 5, citing Exhs. BE-48, Table AQ-37-2, WAT-11, WAT-RR-8). In addition, WATER noted that unburned hydrocarbon emissions include PAH's (Carey Brief, p. 5). Water stated that

Finally, WATER states that recent measurements of ambient levels of benzene and ethylene compounds in the vicinity of the proposed facility demonstrated that TEL's and AAL's were currently exceeded (id. pp. 7-8, citing Exh. WAT-15).[115]

In response to WATER, the Company stated that all toxic emissions would comply with the MDEP's air toxics assessment guideline, and that, further, virtually every substance analyzed would be emitted below minimum measurement detection limits (BECo Initial Brief, p. 273). With regard to arsenic and PAH emissions, the Company responded that (1) arsenic is generally not a constituent of 0.2 percent sulfur distillate fuel;[116] (2) PAH's are normally found in residual rather than distillate fuels; and (3) any emissions of either arsenic or PAH's would be negligible (Tr. 23, pp. 41, 45).[117]

(b) Analysis

The record demonstrates that toxic pollutant emissions from the proposed facility would be greater with oil combustion than natural gas combustion. The record further demonstrates that BECo's estimation of the emission rates and impacts of toxic substances was based on 100 percent fuel oil firing. Thus, even though BECo has demonstrated that ambient

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unburned hydrocarbon emissions were estimated to be 240 tpy based on oil burning for 45 days and that such emissions would be higher when burning natural gas than when burning oil (Carey Brief, p. 5, citing Exh. BE-59E, sec. F.3).

115/ WATER noted that recent ambient air modeling in Weymouth, Braintree and Quincy, which included monitoring at the site of the proposed facility, revealed ambient concentrations of benzene in excess of AAL's and TEL's, and ambient concentrations of toluene in excess of AAL's (Exh. WAT-15; Tr. 39, p. 127).

116/ The Company indicated that arsenic was not a constituent of any distillate oil samples analyzed (Tr. 23, p. 45).

117/ The Company stated that the combustion turbine vendor predicted maximum PAH emissions of less than one ppm for natural gas firing and less than five ppm for distillate oil firing (Exh. WAT-RR-19).

concentrations of all air toxics would comply with state standards, such concentrations would be greatly reduced by either of the Company's current fuel mix proposals, use of natural gas for either 320 or 365 days. In addition, if BECo successfully develops and implements a plan to eliminate SCR or to restrict its use to oil-fired periods, ammonia emissions would be reduced. The majority of WATER's concerns would be addressed by a reduction in emissions of air toxics.[118]

In comparing the impact of each of the Company's emission control strategies on the emission of toxic pollutants, the Siting Board notes that utilization of gas for 365 days and elimination of the SCR system would minimize facility emissions to the greatest extent possible, but conversion of oil customers to gas under an emissions offset approach could reduce area-wide emissions even further. Inasmuch as BECo has not finalized an emissions control strategy, and for the reasons enumerated in Section II.D.1.a.(1), above, it would be premature for the Siting Board, at this time, to determine whether the impact of facility emissions of air toxic pollutants has been minimized. At such time as the Company presents its filing for final approval of the project, the Siting Board will evaluate fully whether the Company has minimized air quality impacts while considering the interactive effects between environmental impacts, and the balance between environmental impacts and cost.

(3) Carbon Dioxide

(a) Description

BECo indicated that 830,000 tpy of CO_2 would be emitted from the

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118/ With regard to WATER's comments regarding the lack of ambient background modeling for beryllium, cadmium, chromium and formaldehyde, the Siting Board notes that there is no evidence that MDEP regulations require modeling of ambient background concentrations to demonstrate compliance with AAL's and TEL's, nor have we ever required such modeling.

proposed facility (Exh. HO-E-98).[119] The Company stated that the efficient generating technology of the proposed facility, with natural gas as the predominant fuel, would maintain CO_2 emissions at a minimum level (id.). BECo added that there are no readily available control technologies that would further reduce CO_2 emissions and that there are currently no applicable requirements to control CO_2 emissions (id.).

In addressing the impact of CO_2 emissions, BECo stated that it has not considered participation in state-sponsored programs to offset facility CO_2 emissions, such as the Massachusetts ReLeaf Program (Exh. HO-E-5). However, BECo stated that its Company-wide programs and policies, including implementation of demand side management ("DSM"), promotion of electric vehicles, increased utilization of natural gas and continued use of nuclear and hydroelectric power, have a direct impact on total Company CO_2 minimization (Exh. HO-E-98). For example, the Company estimated that its energy savings resulting from 1991 DSM programs have avoided 190,825 tons of CO_2 emissions (id.).

(b) Analysis

In Enron, the Siting Council first established a requirement that all applicants of proposed facilities that emit CO_2 must comprehensively address the mitigation of CO_2 (23 DOMSC at 195-196). In that decision, the Siting Council accepted a specific CO_2 mitigation cost commitment for the project without setting forth a guideline or standard for determining the adequacy of CO_2 mitigation. Id.

The Siting Council next addressed CO_2 mitigation in the EEC Compliance, 25 DOMSC at 348-367. In approving a specific cost commitment for the project, the Siting Council set forth general criteria it would consider in order to determine the appropriate level of CO_2 mitigation for a proposed

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119/ The Company calculated CO_2 emissions based on (1) natural gas firing for 320 days, oil firing 45 days, and (2) plant capacity factor of 60 percent (Exh. HO-E-98). The Siting Board notes that emissions of all other pollutants was based on a plant capacity factor of 100 percent. See n. 76, above.

facility. Id., at 365. Specifically, the Siting Council stated that it would consider various relevant project factors including facility cost, facility CO_2 emissions and any increment of such emissions exceeding the emissions of backed out capacity. Id. In addition, the Siting Council stated that it would address the adequacy of CO_2 mitigation in terms of the quantity of CO_2 emissions offsets to be attained rather than in terms of the cost to be committed for providing CO_2 emission offsets. Id., at 362. Further, the Siting Council provided that future applicants must present alternative CO_2 mitigation plans, including likely arrangements for ensuring implementation and verification of estimated results, to demonstrate that all cost-effective approaches have been adequately considered. Id., at 360.

Here, BECo has asserted that certain Company-wide programs and policies have a direct impact on CO_2 minimization, but BECo has not provided a specific proposal to offset the CO_2 emissions of the proposed facility nor has the Company provided an analysis of alternative CO_2 mitigation plans specific to the proposed facility.

The Siting Board notes that the Company's application predates both of the aforementioned decisions. Thus, the requirements set forth in both of these decisions were not addressed by BECo in its filing. Further, for reasons outlined below, a specific proposal to offset the CO_2 emissions of the proposed facility would be more appropriately addressed within the context of the Company's final petition than in the instant site banking review.

First, the Siting Board recognizes that the general criteria to determine the adequacy of a CO_2 mitigation proposal, set forth in the EEC Compliance, 25 DOMSC at 358-367, will continue to evolve as the Siting Board addresses this issue in petitions that will be decided before BECo files its final petition. Thus, further precedent will be established to assist BECo in developing a proposal that would adequately minimize CO_2 emissions. Second, issues that are necessary to determine the adequacy of a CO_2 mitigation proposal, such as the relationship of CO_2 mitigation to overall facility cost and the impact of proposed and increased levels of CO_2 mitigation on project viability would be addressed in the final review of the proposed facility

rather than the site banking review.

Accordingly, it would be premature for the Siting Board, at this time, to determine whether or not the impact of CO_2 emissions from the proposed facility has been minimized. In order to address minimization of CO_2 emissions, the Company shall include in its final petition, (1) a proposal to comprehensively address the CO_2 emissions from the proposed facility, and (2) alternative CO_2 mitigation plans, including likely arrangements for ensuring implementation and verifications of estimated results in order to demonstrate that all cost-effective approaches have been adequately considered. At such time as the Company presents its filing for final approval of the project, the Siting Board will evaluate fully whether the Company has minimized air quality impacts while considering the interactive effects between environmental impacts, and the balance between environmental impacts and cost.

(4) Health Risk Assessment

During the course of this proceeding, both WATER and Weymouth have argued that operation of the proposed facility would have unacceptable health impacts. In this section, the Siting Board reviews these and related Company arguments and supporting documentation to determine if a health risk assessment is appropriate.

BECo asserts that, by complying with the NAAQS, the proposed facility poses no health threats to the nearby population and, as such, a health study should not be required as a condition for approval of the proposed facility (BECo Initial Brief, p. 274; see Exh. BE-86). The Company emphasized that primary NAAQS seek to prevent pollution levels that are known to be harmful, as well as lower pollution levels that could pose an unacceptable risk (Exh. BE-48, summary p. 5-6). BECo added that, in setting the primary NAAQS, the EPA has considered such factors as "the nature and severity of the health effects involved, the size of the sensitive population(s) at risk and the kind and degree of the uncertainties that must be addressed" (id.). In addition, BECo stated that AAL's were established by the MDEP based on potential adverse health effects of chemical substances (Exh. BE-86).

BECo further stated that its position that the proposed facility will not adversely affect public health is further justified by the Company's use of conservative operating assumptions which overestimated facility impacts (Exh. BE-48, summary, pp. 6-7). BECo stated that actual facility emissions will comply to a greater degree with ambient air quality standards than predicted emissions (id.).

Finally, the Company notes that (1) the Secretary of the Executive Office of Environmental Affairs has determined that a discrete health risk assessment "would not provide significant additional information"; (2) the Siting Council did not require a health risk assessment in the case of a proposed coal-fired facility; and (3) BECo has agreed to provide funding for a health study, should the proposed project go forward (BECo Initial Brief, pp. 273-274; see Exhs. BE-73, HO-RR-57A, sec. IV, WEY-21). BECo indicated that even though facility construction has been deferred, it would not be willing to finance a health study prior to receiving construction funding due to the high cost of such a study (Exh. HO-E-99).

WATER asserts that the proposed facility has the potential to adversely impact the health of residents in its vicinity and that therefore, the construction of the proposed facility at the Edgar site should not be approved without a study of (1) the health status of the population around the Fore River Basin, and (2) the relation of existing industries to the health status of the population (Carey Brief, pp. 1, 9).

WATER argued that the record demonstrates that the health status of residents in the vicinity of the proposed site is already burdened due to elevated rates of respiratory illnesses in comparison to statewide averages (id., p. 1). In support, WATER referred to two Massachusetts Department of Public Health studies entered into the record by the Weymouth Board of Health ("WBH") which relate to the health status of Quincy, Braintree and Weymouth residents (Exhs. WBH-1, p. 2, WBH-2, WBH-3). WATER stated that these studies suggest that residents in the vicinity of the primary site have an excess of

respiratory problems (id.).[120]

In response to the Company's position that the proposed facility would not have adverse health impacts because air pollutant emissions would meet standards designed to protect public health, WATER referred to testimony of Dr. Knorr (Carey Brief, pp. 2-3). Specifically, Dr. Knorr stated that although the primary NAAQS were established at a level to protect health within an adequate margin of safety, these standards do not necessarily protect the most sensitive group of individuals against health effects and are not necessarily applicable or sufficient where there is evidence that a burdened or sensitive population would be impacted by pollutant emissions (Tr. 39, pp. 27-30; Exh. BE-81).

In addition, WATER asserts that BECo has not assessed the cancer risk of facility emissions on the residents of the Fore River Basin (Carey Brief, p. 4). WATER argues that a number of air toxins that will be emitted are suspected or known carcinogens and that the effect of exposure to multiple carcinogens is unknown (id., citing Exh. WAT-10). WATER argues that,

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120/ The two studies were (1) a 1990 site suitability study for a proposed Clean Harbors of Braintree, Inc. incinerator ("CHBI Study"), and (2) a 1989 study of lung cancer incidences in Quincy, Weymouth and Braintree ("LCI Study") (Exhs. WBH-2, WBH-3).

The CHBI Study analyzed the health status and demographics of the population in the vicinity of the proposed incinerator site in order to determine the extent of sensitive receptors near the site (Exhs. WBH-1, p. 2, WBH-2). Weymouth witness, Dr. Knorr, explained that sensitivity refers to increased susceptibility to a pollutant, resulting in adverse health effects (Exh. BE-78). The CHBI Study found that residents of Quincy and Weymouth have greater respiratory disease rates than the state as a whole, and that there is a sensitive population living in close proximity to the site of the proposed incinerator (Exh. WBH-2). Dr. Knorr stated that the results of the CHBI Study would be applicable to the Edgar site since it is located within a mile of the CHBI site and the census tract of the proposed facility site was included in the CHBI study (Tr. 39, p. 9).

The LCI Study, which analyzed lung cancer rates in the three municipalities, found that lung cancer rates were elevated in a number of census tracts in each community and that several of these census tracts border the Weymouth Fore River area (Exh. WBH-3).

therefore, the impact of predicted emissions of toxins on the sensitive and general population is not known (Carey Brief, pp. 3-4). WATER further maintains that additional known or suspected carcinogens would be emitted from the proposed facility, such as benzene, arsenic, benzo-a-pyrene and ethylene compounds, but that such emissions have not been quantified by BECo, making it impossible to assess their potential impact (id., p. 4).

As noted above, Weymouth and the Company have entered into an agreement which includes health issues (see Section I.B., above). The agreement stipulates that BECo will provide (1) a maximum of $30,000 for the preparation of a study of options for protocols to determine the health status of residents of the area, prior to receipt of all regulatory approvals and commencement of construction of the proposed facilities at the Edgar site,[121] and (2) $650,000 for the preparation of a health study, after commencement of construction and construction loan funding becomes available (Exh. WEY-21, pp. 7-8).[122] Nonetheless, Weymouth suggests that the Siting Board require the Company to make its gift of $650,000 to Weymouth, at the time construction loan financing is secured, for the purposes of a health study or other

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121/ Weymouth admits that the Company has already provided the funding for the preparation of an options study regarding health study protocols (Weymouth Site Banking Brief, p. 6).

122/ In the Agreement, Weymouth and BECo both acknowledged that: (1) there has been a concern about the health conditions of Quincy, Weymouth and Braintree citizens; (2) BECo has been requested to conduct a health study as a part of the licensing process for the proposed facility; (3) BECo has maintained that a health study would not be necessary since health effects are considered in the formulation of standards and regulations with which the proposed facility would comply;
(4) facility emissions would be below any existing or currently planned fossil fuel electric power plant in New England; (5) the Secretary of Environmental Affairs has found that a discrete health risk assessment would not provide significant additional information; and (6) an accurate representation of the health in the three communities would be of general benefit to the local Boards of Health and that the three communities are unlikely to be able to fund such a study (Exh. WEY-21, pp. 6-7).

appropriate purpose(s) as determined by the WBH (Weymouth Site Banking Brief, p. 6).

The record demonstrates that, based on two previous studies of the health status of the residents of Quincy, Weymouth and Braintree, rates of respiratory illnesses in certain areas of these communities are elevated in comparison to statewide averages. The record also indicates that BECo has agreed to provide Weymouth with substantial funds, for the preparation of a health study in the event the project receives all final approvals and construction loan funding becomes available.

Further, with regard to WATER's concerns relating to the potential emission of toxic pollutants that are suspected or known carcinogens on both the general and sensitive population, the record demonstrates that emissions of such pollutants would result primarily from fuel oil firing and that BECo has proposed significant reductions in fuel oil firing during the course of this proceeding (see Section II.D.1.a.(1)(a), above). The Siting Board recognizes that the level of fuel oil BECo will be permitted to burn will be a function of its final air permit. However, the likely reduction in fuel oil use and the consequent reduction in the potential impact of toxic pollutants should alleviate some of WATER's concerns in this area.

Nonetheless, in light of the evidence regarding the health status of residents in the communities surrounding the proposed facility,[123] the Siting Board recognizes further that a health study would be beneficial to the community. The Siting Board recognizes that a comprehensive health study may require an extended time-frame to complete. However, results of a health study would be most beneficial if they were available as close as possible to the initial operation of the proposed facility. Even though Weymouth has agreed to a delay in BECo's funding of the health study until construction loan financing is secured, the Siting Board finds that it would be more

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123/ The Siting Board notes that, in addition to evidence regarding health status of residents, existing background concentrations of most criteria pollutants in the vicinity of the proposed facility are in excess of 50 percent of NAAQS (see Table I) (see Section II.D.1.a.(1)(a), above).

appropriate for the Company to provide initial funding to Weymouth at the time the Company files its final petition with the Siting Board.

Accordingly, based on the foregoing, the Siting Board requires the Company to provide its share of funding for the preparation of a health study, in a manner consistent with the agreement between BECo and Weymouth, except that BECo shall provide a sufficient portion of such funding in an earlier payment or series of payments, as may be further agreed by BECo and Weymouth, to allow the health study to proceed according to a reasonable schedule beginning at the time BECo files its final petition for construction of the proposed facilities with the Siting Board.

The Siting Board recognizes that, in this instance, we have modified the terms of an agreement reached between BECo and Weymouth. The Siting Board is sensitive to the efforts involved in reaching such settlement, and is supportive of the pursuit of settlement agreements, generally, as a means of resolving conflicting concerns of parties in siting reviews. Here, however, we are persuaded that such modification is appropriate.

(5) Conclusions on Air Quality

With respect to the impacts of facility emissions of PSD-regulated air pollutants, air toxic pollutants and CO_2, the Siting Board has concluded, based on the reasons set forth in the above sections, that it would be premature for the Siting Board, at this time, to determine whether impacts from the facility emissions have been minimized. Therefore, the Siting Board finds that the Company has not provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to air quality for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to air quality.

As part of the Company's final petition, the Siting Board expects that the Company would include a revised air quality analysis which 1) takes into account the most current emission control strategy as well as the air quality regulations and standards in effect at the time of filing, and (2)

provides clear documentation of estimates of offsets related to provision of gas supplies to an LDC. In addition, in order to address minimization of CO_2 emissions in the final petition, the Company shall comply with the condition to include in its final petition, (1) a proposal to comprehensively address the CO_2 emissions from the proposed facility, and (2) alternative CO_2 mitigation plans, including likely arrangements for ensuring implementation and verifications of estimated results in order to demonstrate that all cost-effective approaches have been adequately considered. Finally, with respect to the preparation of a health study, the Company shall comply with the condition to provide Weymouth with funds for the preparation of a health study at the time it files its final petition for construction of the proposed facilities with the Siting Board.

Accordingly, based on the foregoing, the Siting Board makes no finding regarding whether the environmental impacts of the proposed facility at the primary site with respect to air quality have been minimized.

b. Surface Water Quality/Wetlands

(1) Description

The Company indicated that apart from wetlands associated with the immediate shorefront and waters of the Weymouth Fore River, there were no other identifiable wetlands at the immediate primary site (Exh. BE-67, pp. 24-25).[124]

The Company stated that potential impacts of the proposed facility on

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124/ However, BECo indicated that a total of 5.2 acres of wetlands would be impacted in the clearing of a right-of-way ("ROW") for the lateral gas line to the primary site (Tr. 56, p. 135). Of the 5.2-acre total, 3.7 acres would be permanently impacted, and the remaining 1.5 acres would serve as temporary workspace during the laying of the pipeline and be allowed to revert to pre-existing conditions (Tr. 56, p. 135). BECo has obtained an Order of Conditions issued by the Weymouth Conservation Commission (Exh. WEY-15). WATER has asserted that it has filed an appeal with the DEP regarding the Order of Conditions (WATER Site Banking Brief, p. 5).

water quality relate to construction activities, especially dredging, and to cooling water intake and thermal discharge during facility operation (Exh. BE-6, p. 7-12). The Company asserted that dredging activity would not have an adverse impact on water quality (BECo Initial Brief, pp. 247-248). The Company further asserted that the cooling water intake and thermal discharge for the proposed facility would have minor impacts on water quality, based on the proposed engineering design and intake location (id., p. 248).

In support of its waterways analysis, the Company indicated that it had compiled data tracking the history of water quality and aquatic ecology for the Weymouth Fore River, and conducted a one-year sampling program to further identify the type, quality and quantity of aquatic species in the river (Exhs. BE-6, pp. 7-2 to 7-4, BE-59, p. 5.3-1). With respect to water quality, the Company stated that the Weymouth Fore River is designated as Class SB coastal and marine waterway suitable for protection and propagation of fish and other aquatic life (Exh. BE-59, p. 5.3-1). The Company noted, however, that from time to time the river has exceeded applicable water quality limits for its class (id.). With respect to aquatic ecology, the Company stated that investigations of benthic invertebrates, ichthyoplankton and finfish establish that the Weymouth Fore River contains a diverse community of marine organisms typical of a northern coastal estuary (id., p. 5.3-2). The Company further indicated that the Weymouth Fore River is an unsuitable habitat for rare or endangered aquatic species and that no rare or endangered aquatic species were identified during its investigations (id., pp. 5.3-2 to 5.3-9).

The Company stated that it would dredge approximately 8,500 cubic yards of river bottom material and install approximately 325 linear feet of riprap embankment in the vicinity of the new intake structure (Exh. BE-6, p. 7-15). In addition, the Company indicated that additional dredging could be required for installation of the lateral gas pipeline by Algonquin across the Weymouth Fore River (id.; Exh. WEY-36).[125]

125/ Algonquins's filing with FERC set forth two options for the Weymouth Fore River crossing; dredging (trenching and recover) or

The Company stated that the dredge volume removed would represent a minute change in the estuary's tidal volume, while the riprap and intake structure installation would occupy only a small fraction of the Weymouth Fore River tidal flats (id.). The Company indicated that proposed dredging would not extend into the Fore River Basin (Exh. WEY-36). The Company testified that while it expects dredging would affect shellfish beds, it would mitigate any such impacts in accordance with requirements of those state and federal agencies with supervisory authority (Tr. 51, p. 36). The Company expected to complete dredging in three to five months (Exh. HO-E-27).

With respect to water quality impacts of dredging, the Company reported that its sediment sampling established that bottom material in the dredging area are clean, and that therefore the proposed dredging would have no adverse effect beyond a local temporary increase in turbidity (Exhs. BE-6, p. 7-215, BE-48, p. WQ-4). The Company indicated that its sampling showed lower contaminant concentrations than available results of other dredge sample studies because the other studies relied on surface sediment grabs which were heavily influenced by recent historic industrial uses of the Weymouth Fore River (Exh. HO-RR-57A, p. D-1-2). The Company indicated that its own samples mixed surface sediment with deeper sediments, resulting in lower levels of some contaminants (id., Table D-1-1, pp. D-1-1, D-1-2). The Company contended that the samples of its study were more meaningful than were the samples of the surface studies because they reflected both typical clam shell dredging operations in the Weymouth Fore River and the type of dredging to be undertaken for the proposed facility (id., p. D-1-2).

The Company stated that facility effluent would be composed principally of cooling water and boiler blowdown (Exh. BE-48, p. WQ-6). BECo reported that use of chlorine for biofouling control would result in discharge of residual chlorine to the Weymouth Fore River in the cooling water (Exh. HO-RR-54). The Company stated that all facility effluents, including chlorine, would (1) be subject to NPDES permit limitations, and (2) meet EPA

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directional drilling (Exh. HO-E-102, pp. 8, 9).

criteria in the receiving waters (Exh. BE-48, pp. WQ-6, WQ-8).

With regard to other potential effluents, the Company indicated that a multiple system of safeguards would prevent inadvertent release of pollutants from the proposed facility into the Weymouth Fore River (Exhs. BE-59, pp. 3.1 to 3.1-11, HO-E-73). The Company stated that the proposed system would provide treatment of demineralizer regenerant plant waste and equipment and floor drain wastewater, as well as neutralization of HRSG blowdown (id.). The Company noted that the pollutants would then be forwarded to a holding tank for low volume waste where continuous pH and flow monitoring would be provided (id.).

With regard to thermal impact, the Company indicated that the proposed facility would be operated using a once-through cooling system with a flow of 113,000 gallons per minute ("gpm") and a temperature increase of 12 degrees Fahrenheit ("F") (Exh. BE-6, p. 7-12). The Company stated that the mixing zone for the proposed discharge would not intersect with the river bottom or the opposite shore (id.; Exh. HO-E-24).[126]

The Company presented an analysis of the impact of the proposed intake and discharge on aquatic species from the standpoint of susceptibility to entrainment and impingement, as well as thermal stress (Exh. BE-6, pp. 7-13 to 7-14).[127] Based on the expected limits of the mixing zone, the Company stated the discharge plume would not present a thermal barrier to movement of aquatic organisms in the river (id.). However, the Company's analysis indicated that impingement would cause annual mortality losses of from .97 percent to 4.72 percent of the population of impacted aquatic species

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126/ The mixing zone is that portion of the discharge plume in which the temperature increase over pre-existing ambient conditions would be four degrees F or less (Exh. HO-E-24).

127/ Susceptibility to entrainment or impingement for a specific aquatic species is dependent on such factors as its thermal tolerance and natural avoidance of thermal plumes, as well as on individuals' ability to survive if drawn into the facility intake and caught against protective screening.

(Exh. BE-59, pp. 6.2-2 to 6.2-3).[128] The Company noted, however, that the balance of the population of fish and shellfish indigenous to the Weymouth Fore River would be maintained (Exhs. BE-6, Sec. 7, pp. 13-14, HO-RR-78). The Company further indicated that, as part of the water quality certification process under the U.S. EPA, a technical advisory committee had been formed to review the Company's plans for mitigation of impacts on aquatic species (Tr. 50, p. 40; Exh. BE-59A).

Finally, the Company reported that the Edgar site is primarily classified under Federal Emergency Management Agency ("FEMA") regulations as an "Area of Minimal Flooding"; in addition, FEMA has classified a small section abutting the Weymouth Fore River as a zone of "Special Flood Hazard" (Exhs. HO-E-30, BE-59, Fig. 5.9-2). The Company noted that the flood hazard to the portion of the primary site within the floodplain would be mitigated via the construction of a new bulkhead and the use of riprap (Exh. HO-E-30).

(2) Analysis

With respect to surface water quality, the record indicates that generating facility waste treatment systems could be designed at the primary site to ensure that river water quality standards would not be violated. Effluent would be subject to NPDES permit limitations and EPA criteria for discharges into receiving waters. Safeguards would be incorporated into the design of the facility to prevent inadvertent release of pollutants from the proposed facility into the Weymouth Fore River. The record further demonstrates that dredging would not adversely affect water quality beyond a

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128/ The higher figure is the percent impingement of spawning smelt population in the Weymouth Fore River, while the lower percentage provides the same information for the cunner population (Exh. BE-59, pp. 6.2-2, 6.2-3). The figure for spawning smelt represents .38 percent of the annual New England catch (id.). Species studied by the Company include alewife, Atlantic menhaden, rainbow smelt, silver hake, Atlantic tomcod, Atlantic silverside, cunner, windowpane, winter flounder, lobster, and soft-shell clams (id.).

local temporary increase in turbidity.

With respect to aquatic ecology, the record shows that impingement could cause mortality losses of from .97 percent to 4.72 percent of the population of impacted aquatic species. Use of state-of-the-art design in accordance with requirements of the technical advisory committee, however, would ensure that this loss is minimized and that long term population could be sustained without imbalance to the population of fish and shellfish indigenous to the Weymouth Fore River. In addition, the discharge plume would not create a thermal barrier to migration. Further, while there may be temporary displacement of shellfish beds, the Company has shown that it would take measures to mitigate such impacts.

With respect to wetlands, the record indicates that the greatest disturbance to wetland-designated areas would occur along the route of Algonquin's natural gas pipeline, but that such impacts would be temporary.[129]

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to surface water quality and wetlands, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to water resources and wetlands.

The Siting Board expects that the Company will take all measures to ensure minimum impacts on surface water quality and aquatic ecology, including attention to protection of fisheries from impingement and entrainment, to inadvertent contamination of receiving waters, and to mitigation of impacts to shellfishing beds as required by the EPA. The Siting Board notes that the required FERC review of Algonquin's natural gas pipeline should provide for restoration of wetlands temporarily disturbed and mitigation for any damage to wetlands, as well as consideration of measures to minimize impacts of the Weymouth Fore River crossings.

129/ The Siting Board does not have jurisdiction over impacts of Algonquin's natural gas pipeline. Such impacts will be reviewed by FERC in accordance with all applicable regulations.

The record demonstrates that the Company's construction plans with implementation of the aforementioned mitigation measures, as well as FERC's review of Algonquin's proposed natural gas pipeline, adequately ensure a minimum impact on the environment with respect to surface water quality and wetlands.

Accordingly, based on the foregoing, the Siting Board finds that with the implementation of the above mitigation, the environmental impacts of the proposed facility at the primary site would be minimized with respect to surface water quality and wetlands.

c. Land Resources

BECo stated that the overall primary site consists of approximately 56 acres, of which 5.3 acres would be used for the proposed facility (Exhs. BE-6, p. 2-1, BE-59, p. 6.85-1, Table 6.5-1).[130] The Company asserted that the primary site is already industrialized and that no tree clearing would be required (Exh. BE-6, p. 2-1).

The Company indicated that the proposed facility would be interconnected via three underground transmission lines to an existing substation within the primary site, and that there would be no need for off-site transmission improvements (Exh. HO-E-63).

BECo further stated that the cooling water intake and wastewater discharge would occur on-site, without the need for off-site access, and that process water would be obtained from the City of Quincy via an existing pipe under the Weymouth Fore River (Exh. BE-6, pp. 2-2, 2-7; Exh. BE-120).

The Company stated that a 10.7-mile, 24-inch gas pipeline lateral had been proposed to supply natural gas for the proposed facility (id, p. 2-8;

130/ BECo indicated that although 5.3 acres would be dedicated for the proposed facility, approximately 25 acres of additional land would be utilized for construction laydown, construction parking, access and internal roadways (Exh. BE-59, p. 6.5-1, Table 6.5-1).

Exh. HO-E-103).[131] BECo indicated that the pipeline, proposed by Algonquin to serve the proposed facility, would traverse approximately 35 acres of land along a route originating in Avon, Massachusetts and extending through the neighboring Massachusetts towns of Randolph and Braintree and across the Weymouth Fore River to the primary site (Exh. HO-E-102, p. 3, Table G-2; Tr. 56, p. 131).[132]

BECo provided information indicating that the proposed pipeline route would largely parallel existing transmission lines and active and abandoned rail lines, and also extend along new right-of-way ("ROW") including segments passing through the Braintree Town Forest and a section of the Cranberry Brook Area of Critical Environmental Concern ("ACEC") in Braintree (Exh. HO-RR-102; Tr. 56, p. 127). The Company noted that the section of the ACEC traversed by the route includes streets and residences that were built up prior to the area's designation as an ACEC (Tr. 56, p. 127).

BECo's witness, Dr. Morgenstern, testified that, according to Algonquin's FERC filing, Algonquin would clear trees within the Braintree Town Forest to create a new pipeline ROW approximately 50 feet wide with an additional 25 feet of temporary workspace (id., pp. 131-132; Exh. HO-E-103, Attachment A). Dr. Morgenstern added that this ROW would be kept clear of trees thereafter, but that the bordering edges would be allowed to revegetate to a grassed-over condition which would be favorable to wildlife habitat in

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131/ The Company provided information stating that the last action FERC took on this docket was to require preparation of a Federal Environmental Assessment ("EA"); as of August, 1992, the EA has not been prepared (Exh. WAT-30). The Siting Board notes that subsequent to the close of the record it received a FERC notice indicating that Algonquin had withdrawn its application to construct the 10.7-mile Edgar Lateral. The Hearing Officer takes administrative notice of this notice pursuant to 980 CMR. 1.04(5). Algonquin stated that since specific timing for the Edgar project is indefinite, it will refile the application when the timing of the project is more definite.

132/ BECo stated that the pipeline route proposed by Algonquin would permanently affect 29 acres of land, and temporarily affect 6 acres of land (Exh. HO-E-102, Table G-2).

the area (id.).

BECo indicated that a total of 20 acres of forestland along the entire length of the proposed pipeline route would be cleared, and that 3.1 acres of this total would be allowed to revert to forest after construction is completed (Exh. HO-E-102, Resource Report 3, p. 10; Tr. 56, p. 135).

BECo also provided the Siting Board with information on an alternative pipeline route identified by Algonquin which would avoid crossing the center of the Braintree Town Forest, as well as additional route variations suggested during the FERC review process (Exh. EBCA-RR-4; EBCA-RR-7).[133] Noting that Algonquin's alternative route would have greater impacts than the proposed route on sensitive portions of the Cranberry Pond ACEC, Dr. Morgenstern indicated that, in her professional opinion, it would be preferable to avoid such areas in routing the pipeline (Tr. 56, pp. 129-130).

The record demonstrates that the proposed facility would utilize an already cleared site currently used for utility purposes, and would require no new or expanded ROW for transmission, water supply or wastewater discharge purposes. Although a new 10.7-mile long pipeline would be required to supply natural gas, Algonquin's proposed route would largely follow existing ROWs limiting permanent loss of forest to 17 acres. Additionally, a range of alternative routes in the vicinity of the Braintree Town Forest and Cranberry Brook ACEC has been developed as part of FERC's review of the proposed pipeline. FERC has primary responsibility to address siting of the pipeline, and the scope of its review to date provides assurances that issues of forest

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133/ The original Algonquin filing with FERC was updated to reflect additional alternative routes submitted by Algonquin, the Town of Braintree and FERC (Exh. EBCA RR-7). As of October 30, 1991, new documentation filed with FERC reflected eight different routes and route variations: the original preferred Algonquin route, an alternative Algonquin route, three Town of Braintree route variations, and three FERC route variations (id.). The routes vary from 11,175 feet to 14,950 feet in length (id.). Although the alternative routes include variations to avoid portions of the Braintree Town Forest and Cranberry Brook in Braintree, four of the route variations would require the pipeline to be located along town streets for a considerable length (id.).

clearing and routing through sensitive areas will be addressed in detail.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to land resources, including information on FERC's review to date of Algonquin's proposed natural gas pipeline, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to land resources.

The record demonstrates that the Company's construction plans, as well as FERC's review of Algonquin's proposed natural gas pipeline adequately ensure a minimum impact on the environment with respect to land resources.

Accordingly, the Siting Board finds that environmental impacts of the proposed facility at the primary site would be minimized with respect to land resources.

d. Noise

(1) Description

BECo stated that the proposed facility would not generate adverse noise impacts at the nearest residential receptors (Exh. BE-59, p. 2.4-5). BECo also stated that operation of the proposed facility would meet MDEP noise criteria requiring that noise levels not be increased by more than 10 decibels above ambient levels at the site boundaries and the nearest residences (Exh. BE-6, p. 7-19).[134] The Company asserted that the predicted noise levels at the nearest residential receptors would fall below recommended EPA guidelines for avoiding indoor activity interference and annoyance (BECo Initial Brief, p. 241). Finally, the Company stated that the noise impacts of continuous construction activities are expected to be minimal (Exh. BE-59, p. 6.4-2).

The Company delineated five sources that would contribute to

134/ BECo indicated that it will comply with Weymouth's noise regulations as well as with state and federal regulations (Tr. 58, p. 78). However, the Company asserted that the regulations of the City of Quincy are not applicable with respect to noise or any other aspect of the proposed facility (id.).

increases in noise during operation of the facility: (1) combustion turbine engine noise at the HRSG stacks; (2) combustion turbine engine noise at the air intake filter house; (3) noise from the 125 MVA main power transformer; (4) combustion turbine engine noise emanating through the walls of the turbine building; and (5) interior noise of the HRSG and peripherals emanating through the walls of the HRSG building (Exh. BE-6, p. 7-18). BECO stated that the transformers would be the most significant noise contributor to the overall facility noise level at the nearest residence and property line (Tr. 54, p. 126).

With respect to existing background noise, the Company claimed that the primary noise influences at the site are man-made sources related to the urban, commercial/industrial nature of the surrounding area (Exh. BE-59, p. 5.5-1). BECo identified the predominant existing noise source in the site area traffic on route to and from Logan Airport and operation of the nearby Proctor and Gamble facility contribute to the existing noise levels of the area (Exh. BE-59, p. 5.5-1).

The Company selected four representative locations at which to conduct baseline ambient noise measurements (id.). The four locations are as follows: (1) the existing main access drive to the primary site, located on the south side of Bridge Street; (2) the east property line of the primary site abutting Monatiquot Street ("east property line"); (3) Taffrail Road, adjacent to the shoreline of Town River Bay, across the Weymouth Fore River, in the residential community of Germantown in Quincy; and (4) Venus Road, at the intersection of Glenrose Street across the Weymouth Fore River in East Braintree (id., p. 5.5-2).[135] The nearest residence is located 985 feet away from the center of the proposed facility, on Monatiquot Street (id., p. 6.4-2; Tr. 54, p. 143).

For each of the four receptors, BECo conducted ambient noise

135/ In addition to the east property line, Taffrail Road and Venus Road are considered residential receptors. The existing main access drive to the primary site is representative of a property line location only.

measurements for the summer and winter, during weekdays and weekends, broken down by day and night (Exh. BE-59, Tables 5.5-1 and 5.5-2).[136] The Company indicated that existing weekday daytime L_{90} noise levels at the nearest residence range from 46 to 55 decibels (HO-RR-57A, p. N-1-4).

With the operation of the proposed facility, BECo stated that assuming a continuous noise contribution from the facility both day and night, the L_{dn} noise level would be 59 decibels (Exh. HO-E-58). The Company asserted that the EPA Levels Document recommends a L_{dn} level of no more than 60 decibels, based on 45 decibels for outdoor activity interference with a 15 decibel reduction for exterior wall construction for open windows (id.).[137]

The Company developed estimates of future operational noise levels for all of the measurement periods at the three residential receptors -- east property line, Taffrail Road, and Venus Road (Exhs. HO-E-59, HO-E-93).[138] The highest absolute noise increase is predicted to be 7.8 decibels at Monatiquot

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136/ There are different methods to measure ambient sound levels -- L_{90} are those sound levels that are exceeded 90 percent of the time and L_{10} are those sound levels that are exceeded 10 percent of the time (Exh. BE-59, p. 5.5-2). L_{90} is used as the MDEP criterion (id.). The L_{dn} indicator, used in certain EPA noise guidelines, is the day-night equivalent sound level that reflects an average of periodic noise readings over a 24-hour period, with a 10 decibel correction factor added to the readings during normally quiet late-night hours (Exh. WAT-42, p. 9).

137/ WATER provided a copy of the Levels Document which indicated that the EPA outdoor level guideline is an L_{dn} of 55 decibels, based on the fact that outdoor noise levels should be no greater than 60 decibels, with a 5 decibel margin of safety (Exh. WAT-42, p. 20).

138/ BECo stated that although it did not specifically determine the predicted noise increase at the existing main access road to the primary site, it anticipated that the increase would be less than that on the east property line due to the increased distance and higher level of ambient noise at the existing access road (Exh. HO-E-94).

Street, on a winter, weekend night (id.)[139] The noise levels on Taffrail Road are expected to be the same with and without the facility, while the highest predicted increase for Venus Road is 7.0 decibels on a winter, weekend night (id.). BECo indicated that the operation of the proposed facility would result in a day-night noise increase at the receptors (Exh. HO-E-95). However, BECo stated that although the EPA 55 decibel L_{dn} guideline would be exceeded, the existing noise levels at the receptors already exceed 55 decibels, and that all of the increases are below the MDEP 10 decibel guideline (id.).

BECo stated that construction of the facility would be phased over two years and that the maximum construction noise would occur during pile driving, site excavation and grading (Exhs. BE-59, p. 6.4-2, HO-E-29). BECo stated that pile driving, required for generating unit foundations and bulkheading, would last approximately four months, and site excavation and grading would last approximately two months within the four-month pile driving period (id.). The Company acknowledged that pile driving would create an annoying environment for the residential neighborhood adjacent to the east property line as well as for the homes located along Venus Road (Exh. BE-59, p. 2.4-5).[140] The Company projected that the construction noise level at the east property line, would be an L_{10} level of 67 decibels and an average noise level of 63 decibels (Exh. BE-59, p. 6-4.2)[141] The Company stated that

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139/ The Company indicated that the highest future ambient noise level at the east property line would be 57.4 dBA occurring during a weekend day (HO-RR-57A, p. N-1-4).

140/ The Company stated that pile driving for wharf maintenance also would create an annoyance for residents on the east side of Kings Cove and across the Weymouth Fore River in Quincy (Exh. BE-59, p. 2.4-5).

141/ BECo indicated that UE&C developed the construction noise assessments based on experience with similar electric generating facilities (Exh. HO-E-28). UE&C used the following three electric generating facilities as a basis for estimating construction noise: Hoosier Electric Membership Cooperatives Meron Station (two 490 MW units); Somerset Unit No. 1 (one 625 MW unit); and Seabrook

based on the existing average noise levels, there would be an increase of 8 to 10 decibels during construction (id.). BECo indicated that construction work would generally be scheduled during the hours of 6:30 a.m. to 3:45 p.m., to minimize possible noise impact concerns (id.; Tr. 54, pp. 37, 138).[142] However, the Company indicated that it would be necessary to carry out limited nighttime pouring of concrete for structural integrity (id.). Further, BECo indicated that it has agreed not to engage in construction activities at the primary site on Sundays (Tr. 58, p. 73).[143]

The Company also provided information concerning intermittent noise emissions which are associated with start-up activities -- consisting of steam blowing[144] to clean the pipes and un-scheduled safety valve releases (Tr. 56, p. 56). BECo stated that both activities would be of limited duration (id.).[145] However, the Company acknowledged that the intermittent noise activities would be louder than construction noise and that the increase would exceed 20 decibels (id., pp. 56, 57).[146]

Nuclear Generating Station (two 1,100 MW units) (Exh. HO-E-28).

142/ Mr. Schmidt indicated that it may be possible for BECo to schedule construction so that noisier construction tasks would not begin until 8:00 a.m., if so required by Weymouth (Tr. 54, pp. 139-140).

143/ The Company indicated that if Weymouth imposed a requirement prohibiting construction on Saturdays, it would comply with this requirement (Tr. 58, p. 73).

144/ The pipes would be steam blown in order to clean them out prior to start-up of the facility. (Tr. 56, p. 56).

145/ Mr. Schmidt stated that a safety-valve release, which could occur during operation of the facility, could last up to ten minutes (Tr. 54, p. 130).

146/ Weymouth's Code states that noise increases more than 20 decibels over ambient background are considered a nuisance and are subject to ticketing or criminal prosecution (Exh. WAT-41). In response to a request by the Siting Board staff, BECo inquired as to the interpretation by Weymouth regarding the applicability of the Code to different types of noise -- operating, construction and

BECo stated that the proposed facility would incorporate noise mitigation through the use of the following equipment and design features: (1) barrier walls for the main power transformers; (2) sound attenuators for the combustion turbine intakes; (3) exterior sound walls for the turbine and HRSG buildings; and (4) a landscaped "green belt" located along the east property line of the primary site (Exh. BE-59, p. 7.4-1). BECo indicated that the construction of barrier walls at each of the three step-up transformers at the primary site would provide an anticipated sound level reduction of three decibels at each of the receptors (Exh. HO-E-96).[147] BECo also indicated that the landscaped greenbelt also would provide three decibels of noise mitigation at the east property line (id.). The Company stated that the transformer barriers and landscaped greenbelt were not represented in the estimates of facility noise impacts (id.).

Weymouth requested that the Siting Board include a number of conditions addressing construction noise and operational noise (Weymouth Site Banking Brief, p. 10). Weymouth requested that the Siting Board require BECo to (1) prevent the idling of inactive construction equipment at the project site; (2) minimize noise levels before 8:00 a.m.; and (3) limit primary construction activity to between the hours of 6:30 a.m. and 4:45 p.m. except as necessary for structural integrity or safety reasons (id.). Finally, with respect to possible noise citations issued by the WBH, Weymouth requested that BECo be required to respond promptly to any such noise citation, and, if necessary, include appropriate noise mitigation measures, such as temporary

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intermittent (Exh. HO-RR-111). The WBH indicated that no documented policies regarding the enforcement of the Code exist, but noted that the intent of the by-law is to encompass all types of noise, with no indication that various types of noises would be treated differently (Exh. HO-RR-111S).

147/ BECo noted that the placement of localized barrier walls at each of the proposed transformers would be more effective than the placement of a single barrier for the purpose of providing blanket coverage for both the proposed and existing transformers (Exh. HO-RR-103).

sound barriers (id.). Weymouth noted that this requirement would ensure that BECo install effective noise mitigation features as proposed, including barrier walls for the main power transformers, sound attenuators for the combustion turbine air intakes, exterior walls that adhere to minimum sound transmission ratings at turbine and HRSG buildings, and a green belt area to be located along the east property line (id., pp. 10 and 11).

(2) Analysis

In past decisions, the Siting Board has reviewed estimated noise impacts of proposed facilities for general consistency with applicable government regulations, including the MDEP's 10 decibel guideline. Enron, 23 DOMSC at 210; EEC, 22 DOMSC at 375; West Lynn, 22 DOMSC at 100; MASSPOWER, 20 DOMSC at 85; Altresco-Pittsfield, 17 DOMSC at 401. In addition, the Siting Board has considered the significance of expected noise increases 2which, although lower than 10 decibels, may adversely affect existing residences or other sensitive receptors such as schools. EEC, 22 DOMSC at 375; Altresco-Pittsfield, 17 DOMSC at 401; NEA, 16 DOMSC at 402-403.

In this case, the Company has conducted noise analyses for the primary site, encompassing both operational and construction noise levels. BECo asserted that the facility would have no adverse noise impacts at the nearest residential receptors, based on adherence to the MDEP 10 decibel increase criteria. However, the 7.8 decibel increase at the east property line, resulting from operation of the proposed facility, is high in comparison to the residential receptor increases noted in recent reviews of proposed generating facilities. Enron, 23 DOMSC at 210; West Lynn, 22 DOMSC at 100; MASSPOWER, 20 DOMSC at 389. In addition, the estimated future ambient levels are above those in most previous reviews.[148] However the inclusion of barrier walls at the transformers would provide additional mitigation of three

148/ The Enron facility was expected to result in a maximum ambient noise level of 52 dBA; however, the highest noise increase at a residence from operation of that facility was to be 4.8 decibels, based on noise modeling, and 4.0 decibels based on terms of a local zoning approval. Enron, DOMSC 23 at 207-208.

decibels, therefore the total increase with the stated mitigation would be 4.8 decibels.[149]

The Company conducted ambient noise measurements at four receptor points -- three residential points and one at the existing main access drive to the site. However, the second phase of the analysis, which consists of estimating the increases at the receptors due to the operation of the proposed facility, and forms the basis of adherence to MDEP noise criteria, did not include a measurement at the existing main access road to the site. Although BECo provided a rationale for not conducting this measurement, the Siting Board notes that the MDEP guidelines encompass both residential and property line receptors. In addition, it should be noted that the ambient noise measurements at the existing main access drive to the site are quite high, ranging from 46 to 66 decibels in the summer and 52 to 70 decibels in the winter (See Exh. BE-59, Table 5.5-2).

Further, the Siting Board notes that the day-night noise level of 59 decibels, representing the maximum operational noise contribution from the facility, exceeds the EPA outdoor guideline of 55 decibels. The EPA Levels Document provides that the outdoor level guideline is 55 decibels, based on the fact that outdoor noise levels should be no greater than 60 decibels with a five decibel margin of safety. BECo's assertion that the guideline is 60 decibels did not take into account the five decibel safety margin under consideration.

The Siting Board notes that the assertion by the Company that it is acceptable to be above the 55 decibel level as long as the facility does not push the receptor over the guideline, since the ambient measurement is already over 55 decibels, does not fully address our concerns. Rather, the Siting Board is particularly concerned with holding the noise increase down if the

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149/ The Siting Board notes that the Company also did not include the landscaped buffer in its calculation. Moreover, it is unclear whether the estimated decibel decrease would occur throughout the year, including defoliate conditions. Further, the Company did not assert any cumulative reduction resulting from the barrier walls and the landscaped buffer.

existing level is already above the 55 decibel guideline.

Finally, although construction noise levels were estimated, they were not presented in a format to ascertain the increase in decibels from ambient to construction operation noise levels. BECo's analysis of different indicators, including the L_{10} and average noise estimates in the 65 decibel range for the east property line during construction, provides limited insight as to whether the construction noise levels are minimized.[150]

Therefore, in order for impacts to community noise levels to be minimized at the primary site, BECo must meet the following conditions: (1) BECo shall incorporate all proposed mitigation techniques as described herein so that the continuous noise increase from the operation of the proposed facility is no more than five decibels; (2) BECo shall refrain from conducting construction that generates significant noise before 8:00 am; and (3) BECo shall confine all primary construction activity to between the hours of 6:30 a.m. and 4:45 p.m. Monday through Saturday, except as necessary for structural intergrity or safety reasons; and (4) if issued a noise citation by the Weymouth Board of Health or MDEP, BECo shall promptly investigate the potential source of cited noise and, as necessary, provide temporary sound barriers or implement other appropriate measures to mitigate such noise.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to noise impacts, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to noise impacts.

The record demonstrates that the Company's construction plans with implementation of the aforementioned conditions, adequately ensure a minimum impact on the environment with respect to noise impacts.

Accordingly, based on the foregoing, the Siting Board finds that with

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150/ Although the MDEP standard does not apply to construction noise, a potential 20 decibel increase from construction noise may violate Weymouth's local standard.

implementation of the aforementioned conditions, the environmental impacts of the proposed facility at the primary site would be minimized with respect to noise impacts.

e. Water Supply

(1) Description

The Company stated that it expects to pursue use of potable water from the City of Quincy as its preferred water supply for the proposed facility at the primary site ("proposed water supply plan") (Exh. BE-120, p. ii).[151] The Company stated that the City of Quincy obtains water from the Massachusetts Water Resources Authority ("MWRA"), and that the MWRA would need to further review the eligibility and any related requirements for the Company to utilize the City of Quincy water supply (id.).[152] The Company stated that, should its proposed water supply plan prove not to be feasible based on further review, it would utilize a backup water supply involving barge transshipment of treated process water from the Company's New Boston station in South Boston to the primary site ("backup water supply plan") (id.).

In order to develop its proposed and backup water supply plans, the Company stated that it identified and evaluated 12 water supply options,

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151/ BECo indicated that, initially, it had anticipated purchasing potable water from the Weymouth water system to operate the proposed facility, which would require expansion of the Weymouth water system to allow such supply ("Weymouth supply") (Exh. BE-120, p. i). The Company stated that, based on MDEP's rejection of Weymouth's application for an increased water withdrawal permit under the Water Management Act, M.G.L. c. 21G, it no longer considers the Weymouth supply to be a preferred option (id.).

152/ The MWRA has developed a report entitled "Policy and Procedures for MWRA Water Connections Serving Property Partially Located in a Non-MWRA Community," (Exh. HO-E-101, Attachment). The report indicated that one of the criteria for approving a water connection application is whether water may be supplied to the project without jeopardizing MWRA water supplies or the ability of MWRA to meet the legitimate water supply needs of existing MWRA user communities, including those with local sources (id., p. 6).

including various potable water sources, industrial sources, on-site sources and off-site non-potable sources (Exh. BE-120, p. i). The Company stated that it selected four preferred options based on technical screening criteria (id., p. ii).[153, 154] In addition, the Company stated that it identified three water use reduction measures which could be implemented as part of the water supply plan for the proposed facility, including (1) use of dry combustors for NOx control, (2) collection and treatment of on-site process wastewater, and (3) collection and reuse of on-site stormwater runoff (id.).

BECo indicated that it then performed further conceptual design development and detailed economic evaluation of its four preferred water supply options and three identified water use reduction measures (id.).[155] Based on its detailed analysis, the Company (1) determined that it could reasonably implement water use reduction of 215,000 gpd through incorporation of on-site stormwater reuse and use of dry combustor technology with power augmentation,[156, 157] and (2) selected its proposed and backup water supply

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153/ In addition to the proposed and backup water supply plans, the preferred options included two additional options: (1) use of MWRA wastewater with on-site treatment; and (2) on-site desalinization of water from the Weymouth Fore River (Exh. BE-120, p. i).

154/ The criteria included (1) the level of technical feasibility, (2) the quantity of available water, and (3) the complexity of required delivery improvements (Exh. BE-120, p. ii).

155/ The Company also included the Town of Weymouth supply as a fifth supply option in its detailed analysis (Exh. BE-120, pp. ii, 4-8). See n. 153, above.

156/ BECo stated that use of on-site stormwater reuse as part of its water supply would reduce the facility's average water requirements by 80,600 gpd (Exh. BE-120, p. 1-4). The Company also indicated that, while an MDEP determination as to facility design measures required to comply with air quality requirements is pending, the dry combustor technology would avoid use of steam injection to meet NOx emissions limitations and, in the case of the base dry combustor design, thereby further reduce water requirements by

plans (id.). The Company indicated that it based its evaluation and selection of water supply plans on a facility water requirement of approximately 385,000 gpd, assuming the above water use reduction measures and facility operation based on (1) a 100 percent capacity factor, and (2) gas-fired generation for 320 days and oil-fired generation for 45 days with use of SCR (Exh. BE-120).[158] In addition, as part of its revised air quality analysis, BECo estimated facility water requirements for eight alternative design options ranging from 44,600 gpd to 654,300 gpd, assuming in all cases a 100 percent capacity factor and incorporation of on-site stormwater reuse (Exh. HO-RR-93S, Table 5).[159]

135,000 gpd (id.; Exh. HO-RR-93S, Table 5).

157/ The Company indicated that, while the dry combustor technology would provide a nominal water savings of approximately 491,000 gpd at a 100 percent capacity factor, the power output of the facility would be reduced by 22 MW (Exh. BE-120, p. 2-2). The Company further indicated that power augmentation could be incorporated to offset the power output loss, but that power augmentation requires steam injection and, therefore, under the Company's base dry combustor design, net water savings would be reduced to 135,000 gpd (id.).

158/ The 385,000 gpd water requirement is consistent with the Company's proposal as presented in this proceeding. In its recent BACT submission to MDEP, however, the Company recommended that the BACT determination should be based on one of two design options either of which would involve larger water requirements, as follows: (1) an option requiring 654,300 gpd, assuming two 100 MW dry combustors, power augmentation with steam injection, and operation based on 365 days of gas-fired generation without SCR; and (2) an option requiring 650,900 gpd, assuming two 100 MW dry combustors, power augmentation with steam injection, and operation based on 320 days of gas-fired generation and 45 days of oil-fired generation with steam injection and SCR for NOx control (Exh. HO-RR-93S, Table 5) (see Section II.D.1.a.(1)(a), above).

159/ The Company presented three design options involving the minimum water requirement of 44,600 gpd: (1) an option assuming two 100 MW dry combustors and facility operation based on 365 days of gas-fired generation without SCR; (2) an option assuming two 110 MW

In justifying its selection of the proposed water supply plan, the Company stated that its analysis demonstrated that the City of Quincy supply, in addition to being the most economic[160] and reliable water supply source, would pose the least environmental impact to the proposed site vicinity (id., p. ii). The Company stated that it would use an existing Company-owned tunnel, which passes under the Weymouth Fore River between Weymouth and Quincy, to connect the proposed facility to the Quincy water system (id., p. 3-2). The Company added that limited improvements to the Quincy water system would be necessary to serve the proposed facility (Tr. 55, pp. 143-145). The Company indicated that its other identified supply options would involve additional on-site or off-site facilities and associated environmental impacts, as compared to the proposed water supply plan (Exh. BE-120, pp. 3-3 to 3-11).[161]

With respect to the dependence of BECO's proposed and backup water supply plans on the MWRA system, the Company stated that the MWRA has a safe yield supply capability of 300 million gallons per day ("mgd") as compared to

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dry combustors and facility operation based on 365 days of gas-fired generation with SCR; and (3) an option assuming two 110 MW combustors and facility operation based on 320 days of gas-fired generation and 45 days of oil-fired generation with SCR (Exh. HO-RR-93S, Table 5). However, the Company indicated that the above options, which utilize dry combustor technology without power augmentation, would provide net power output levels approximately 22 MW to 38 MW below that of options utilizing two 110 MW conventional combustors (id., Table 4).

160/ The Company estimated a 1994 present value cost of $18,838,000 for the proposed water supply plan (see Section II.D.2., below).

161/ The Company noted that the installation of additional on-site treatment facilities would be required under the desalinization option and the MWRA wastewater reuse option, and the development, expansion or refurbishment of water supply sources in the surrounding area would be required under options involving new private wells, purchase of water from Weymouth, and utilization of the Quincy Reservoir (Exh. BE-120, pp. 3-3 to 3-11).

a current systemwide demand of 279 mgd (Exh. HO-E-89). The Company provided a copy of the 1990 report "MWRA Long Range Water Supply Program" ("LRWSP"), and based on the LRWSP, stated that the MWRA expects its existing supply resources to be adequate until at least the year 2000 and possibly until as late as 2020 (id.).[162] The Company stated that, to help ensure long-term supply adequacy, the LRWSP includes programs to maximize water conservation, both through reduction of existing demand and minimization of future demand, as well as programs to comprehensively protect existing local water supplies in 40 identified member and non-member communities (id.).

To address possible future supply shortfalls, the Company stated that the LRWSP identifies numerous supply options ranging from the enhancement of existing supply resources and the development of new local sources to the development of major new system sources such as diversion of the Connecticut River, Merrimack River or Millers River (Exh. HO-E-90). Despite the inclusion of major new source options in the LRWSP, however, the Company's witness, Mr. Schmidt, maintained that there is a possibility that the MWRA will not need to develop any such sources (Tr. 56, p. 23). Mr. Schmidt further stated that, given the current MWRA surplus of approximately 20 mgd, the addition of the Company's proposed 385,000 gpd water requirement to the MWRA system demand would not be a significant factor in increasing the likelihood that the MWRA would require such a major new source (id., p. 27).[163]

162/ The Company noted that the LRWSP recognizes two significant sources of uncertainty in assessing future supply adequacy: (1) the uncertain long term effectiveness of water conservation efforts; and (2) the potential for added demands on systemwide supplies as a result of possible contamination or other loss of local water supplies in a number of communities, including not only partial-user MWRA communities but also non-MWRA communities that are contiguous to the MWRA service territory (Exh. HO-E-89).

163/ The Company did not address the potential impact on the MWRA system of a water requirement of approximately 650,000 gpd, consistent with recommendations in the Company's revised BACT analysis (see n. 158, above). However, the current 20 mgd surplus would allow the MWRA to meet this higher requirement, as well, without an immediate need for a system expansion.

With respect to mitigating any impact of its water requirement on the Quincy water system and the MWRA, the Company stressed the proposed water conservation measures included in its facility design, which would save 215,000 gpd (Exh. BE-120, p. 1-4). BECo stated that, as part of complying with the Quincy water system's connection requirements, and any MWRA requirements for service to customers in non-member communities, it expects to further support water conservation by contributing between $40,000 and $50,000 for leak detection programs in Quincy (Tr. 56, pp. 14-15). As an additional offsetting consideration, the Company noted that the MWRA revenues resulting from its proposed water purchase would be particularly beneficial to the MWRA in the upcoming several years, given the MWRA's relatively extensive capital improvement schedule and associated expectations for upward pressure on water rates (Tr. 55, pp. 135-136).

With respect to the backup water supply plan, BECo indicated that the logistical difficulty of delivering water to South Boston -- the transfer point for barge transshipment -- would be essentially equal to that of delivering water directly to the Edgar site under the proposed water supply plan (id., pp. 139-146). Specifically, the Company stated that the impacts of the two water supply plans on the MWRA and on local water systems -- the Quincy system under the proposed water supply plan or the City of Boston system under the backup water supply plan -- would be comparable (id., p. 146). BECo did not identify or evaluate any specific environmental impacts of barge transshipment itself, under the backup water supply plan.[164]

WATER and the Attorney General argue that MWRA approval of the proposed water supply plan is by no means assured (WATER Site Banking Reply Brief, pp. 9-10; AG Site Banking Brief, pp. 11-12). The Attorney General argues that the backup water supply plan may also require MWRA approval, and

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164/ The Company stated that the principal difference between the proposed and backup water supply plans is the added cost of barge transshipment, and further stated that there would be no environmental benefits of barge transshipment which might offset the added cost (Tr. 56, pp. 7-8).

that in any event the consistency of such a water supply with applicable water service policies would become unclear after the retirement of BECo's New Boston facility (AG Site Banking Brief, p. 12). Weymouth states that the Company is not seeking Siting Board approval of any water supply alternatives other than the proposed and backup water supply plans, and therefore, argues that the Siting Board should not approve, conditionally or otherwise, any alternative other than the proposed or backup water supply plans as part of the site-banking review (Weymouth Site Banking Brief, p. 3).

(2) Analysis

In the past, the Siting Council has reviewed two proposed generating facilities in recent years that would rely on a public potable water supply for significant portions of process water requirements,[165] but reviewed no such proposal involving an MWRA water supply. The MWRA's LRWSP shows the complexity of assessing the long term adequacy of the MWRA's supply resources, and recognizes the likelihood that new or expanded supply resources with associated costs and environmental impacts may be needed beginning sometime between 2000 and 2020.

In addition, as argued by intervenors, the Company has not established that it has an implementable water supply plan fully in place. The Company acknowledges that additional review is required for its proposed water supply plan. Although insisting that barge transshipment meets all water service requirements, the Company has not pointed to any evidence of such a water use in the past, nor provided any written agreement or opinion from the City of Boston water system or the MWRA to confirm that the backup water supply plan can be implemented.

With respect to water use reduction, the Company has indicated its willingness to incorporate on-site stormwater reuse and use of dry combustor

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165/ The Altresco-Pittsfield facility and the Eastern Energy facility were expected to use approximately 700,000 gpd and 165,000 gpd, respectively, of potable public water supply. Altresco-Pittsfield, 17 DOMSC at 402-403; EEC, 22 DOMSC at 297-299.

technology to reduce water requirements by an estimated 215,000 gpd. However, the Company's air quality analysis identifies design options which would allow the Company to reduce water requirements below the level assumed in its water supply analysis by an additional 351,000 gpd, resulting in a facility water requirement of less than 100,000 gpd.

The record also demonstrates that the MWRA appears to have a policy in place to ensure that service is not extended to users partly located in non-member communities if such service would jeopardize the long term integrity of MWRA supplies in meeting the needs of existing MWRA member communities and customers. In addition, the LRWSP, which has been included as part of the record and discussed at length by the Company, highlights the breadth of programs the MWRA has established to ensure the long term integrity of its water supply system.

The Company currently plans on contributing up to $50,000 for leak protection as a likely step to satisfy any MWRA requirements for a service extension to the proposed facility. In addition, as the Company points out, the expected revenue benefits to the MWRA of supplying the proposed facility may partly or fully offset any potential adverse impacts of such water service on the long term adequacy of MWRA supply resources. Although the Company points to a possible contribution it might provide to the Quincy water system for leak protection, the Siting Board notes that there are numerous other program areas referenced in the LRWSP -- for example, local source protection and local source development -- which BECo might agree to support in addition to supporting leak protection programs, for purposes of obtaining a water service agreement to implement the proposed water supply plan consistent with MWRA policies. Given that there is at least some possibility of a need arising for development of new MWRA supply resources as early as 2000, it is appropriate that, if requested by the MWRA, BECo not only be prepared to support a variety of program areas as identified in the LRWSP, but be prepared to support such programs at levels capable of offsetting a meaningful portion of its proposed usage. With regard to the backup water supply plan, the Company has failed to explicitly consider possible environmental impacts of

barge transshipment, including such factors as air emissions from operating the barge and possible fuel storage and handling risks associated with fueling the barge. In addition, to the extent such environmental impacts should have been identified, the Company has failed to compare any such impacts with the environmental impacts of other water supply options identified in the Company's analysis but not selected as a backup water supply plan.

The Company has provided considerable analysis of possible water requirements under a range of combustor designs, and identified specific options for reducing water requirements. The Company also has addressed the likely impacts of its proposed water supply on the local area and on the City of Quincy and MWRA water systems. Finally, the Company considered a range of water supply options for meeting water requirements of the proposed facility at the primary site, and provided limited information on the impacts of the backup water supply plan and other water supply options.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to water supply, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to water supply. However, the Siting Board finds that, in the event the proposed water supply plan cannot be utilized, the Company did not provide sufficient information for the Siting Board to determine whether the environmental impacts of the proposed facility at the primary site, with implementation of the backup water supply plan, would be minimized with respect to water supply.

In terms of minimizing environmental impact, the Company has identified but not proposed facility design options capable of holding facility water requirements to less than 100,000 gpd under both the proposed and backup water supply plans.

Accordingly, based on the foregoing, the Siting Board finds that the Company has not established that the environmental impacts of the proposed facility at the primary site would be minimized with respect to water supply.

f. Land Use

(1) Description

The Company stated that construction of the proposed facility at the primary site does not conflict with past use of the site (Exh. BE-59, p. 2.5-2). The Company indicated that the site topography is relatively flat, filled land, of which 0.5 acres is tideland (id.). The Company stated that the site, home to the retired Edgar Station, has been used for electric power generating purposes since the 1920's (id., p. 2.2-2). BECo listed the existing on-site features as a retired generating station, discharge canal, switchyard and switch house, transmission towers, fuel storage tanks, and two operating combustion turbine peaking units (id., p. 5.9-1).

The Company stated that Route 3A divides the site into north and south sections, whereby the north section is approximately 16 acres and the south section, where the proposed facility is to be located, consists of 40 acres (id., p. 5.6-1). BECo described the site as being completely bounded by the Weymouth Fore River to the north, south and west, with the east side bounded at the northern end by Kings Cove, at the center by Monatiquot Street and its adjacent residential area, and at the south end by Mill Cove (Exh. BE-6, p. 2-2). The Company stated that the nearest residences are located to the east on Monatiquot Street, approximately 1,000 feet from the facility (id., p. 7-21). BECo categorized the predominant land use of the area surrounding the site as densely populated (Exh. BE-59, p. 3.3-1). The Company characterized the areas in Braintree and Quincy, located directly across the Weymouth Fore River, as highly industrial, citing such facilities as the former General Dynamics Shipyard and the Braintree Electric Light Department's Potter Generating Station (Exh. BE-55, p. 7).

BECo stated that a green belt is proposed to be located along Monatiquot Street, consisting of a 60-foot wide buffer of deciduous and coniferous trees (Exh. HO-E-45; Tr. 54, p. 94). The Company also stated that it would develop the Kings Harbor Walk, an area located along the northeast

portion of the site, by providing public access to the waterfront and outdoor recreation (Exh. HO-E-46).[166] The Company further indicated that this area is part of the Weymouth Waterfront Plan developed in 1988, and that BECo would be working in conjunction with the Waterfront Study Committee to maintain public access (Exh. BE-59, p. 5.9-2). BECo indicated that under a Weymouth Zoning By-law, the site is located in a zone designated as General Industrial District I-2,[167] a zone which does not include electricity generation or public utility use (Exh. BE-59, p. 5.9-2).[168] BECo identified the area immediately to the east of the site as zoned for residential use -- Residential District R-1 (Exh. BE-55, p. 7). The Company stated that in addition to the above zoning issue, it appears that the facility would require a variance or exemption from building height requirements, as the proposed facility is 100 feet in height and the by-law height restriction is 80 feet (id., p. 8; BECo Initial Brief, p. 252).

With respect to transmission access, the Company reported it would need to construct a new natural gas pipeline to the site (See Section II.D.1.c, above) (Exh. BE-6, p. 5-22). However, BECo stated that it had not specifically evaluated the environmental impacts of any routing of the natural gas pipeline in terms of comparing the primary and alternative sites (Tr. 55,

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166/ The Weymouth/BECo Agreement provides for the construction, operation and maintenance of a waterfront park along King's Cove (Exh. WEY-21).

167/ Specifically permitted in the General Industrial District are such uses as dry cleaning, steam laundry, marinas, and broad categories such as assembly, manufacturing, and packaging (Exhs. Water-40, BE-59, p. 5.9-2).

168/ The Company stated that, pursuant to M.G.L. c. 40A, § 3, it had previously applied for a request to the Department for a zoning exemption from Weymouth's zoning by-laws, however the request was withdrawn in May 1992 (Tr. 57, p. 34; Exh. WEY-37). BECo stated that it would refile for the zoning exemption when a new in-service date for the project is determined (Exh. WEY-37).

p. 86).[169] The Company further stated that it did not know the degree of residential impacts that would arise due to the placement of either the proposed or alternative pipeline routes (Tr. 56, p. 140).

With respect to historic significance, the Company described the designation of the existing, retired Edgar Station by the History and Heritage Committee of the American Society of Mechanical Engineers ("ASME") (Exh. BE-48, p. H-1-1). BECo stated that the site is not designated under the National Register of Historic Places, nor does the Company intend to apply for such designation (id.) In addition, the Company noted that inclusion under the ASME designation does not involve restrictive conditions as does the designation under the National Register of Historic Places (id., p. H-1-2). The Company stated that it has chosen materials, colors and siding that would complement the architectural features of the existing, retired Edgar Station (id.).

Weymouth requested that the Siting Board should include a condition stating that BECo would construct, operate and maintain a waterfront park along King's Cove for use by the public (Weymouth Site Banking Brief, p. 6). Weymouth also requested that the condition should include language stating that specific details of the park area, layout, construction methods and materials would be reviewed and coordinated with Weymouth's Waterfront Committee (id.).

WATER argued that the Company has not presented any evidence to support the ability of BECo to obtain the needed zoning exemption from the DPU and points to the withdrawal of BECo's zoning exemption request (WATER Site Banking Reply Brief, p. 3). Further, WATER argued that the actions of Weymouth in regard to amending the zoning by-law, after the Edgar Station was retired in 1978, reflects a negative view by Weymouth to the idea of siting a new generating plant at the primary site (id.). Finally, WATER argued that

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169/ In its filing, Algonquin indicates the proposed route effectively balances environmental, safety and cost considerations, and further provides that Algonquin would be willing to work with the Town of Braintree to minimize impacts to the Town Forest (Exh. EBCA RR-7).

the Kings Cove Harbor Walk would be an unattractive recreation spot due to the park's location adjacent to the proposed facility (id., p. 8).

(2) Analysis

To begin, the Siting Board notes that BECo has not completed the necessary permitting requirements, specifically the steps concerning zoning and site plan review. The facility has not been subject to any local zoning processes.[170]

However, the Siting Board acknowledges that the existing use of the primary site is industrial in nature and concurs with BECo that the proposed facility would not alter the past use of the site. The Siting Board agrees with the Company that the use of this site would minimize land impacts by using presently disturbed land. In addition, the proposed facility is compatible to the heavy industrial areas to the west and south of the primary site. Further, the Company has endeavored to maintain public access via the Harbor Walk, and proposes to provide a 60-foot wide buffer of trees along Monatiquot Street.

A significant component of the facility's overall land use impacts relates to the location of the natural gas pipeline. The final selection of the route that the pipeline will travel has not been resolved, and due to the length of the routes, which range from 11,175 to 14,950 feet, the impacts are likely to be significant. The length and general routing of the gas pipeline through residential communities detracts from the overall merits of siting the proposed facility at the primary site. Until the final route is approved by FERC, the type and degree of land use impacts cannot be fully identified with certainty. Nevertheless, the Siting Board recognizes that the FERC review process and other state and local permitting reviews provide the forum for ensuring that such a pipeline, if approved, would be routed and installed such

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170/ The Siting Board notes that the facility cannot be constructed on the primary site without obtaining either a zoning exemption from the DPU or the appropriate zoning variances or a special permit from the Town of Weymouth.

as to minimize its land use impacts.

In order to demonstrate that land use impacts are minimized at the primary site, BECo shall comply with the following conditions: (1) BECo shall provide the Siting Board with copies of either a zoning exemption from the DPU or a zoning variance from Weymouth (or special permit from Weymouth, whichever is applicable), indicating that the generating facility can be constructed in said location, and (2) BECo shall construct, operate and maintain a waterfront park along King's Cove for use by the public. Specific details of the park area, layout, construction methods and materials shall be reviewed and coordinated with Weymouth's Waterfront Committee.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to land use, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to environmental impacts.

The record demonstrates that the Company's construction plans with implementation of the aforementioned conditions, as well as FERC's review of Algonquin's proposed natural gas pipeline adequately ensure a minimum impact on the environment with respect land to use.

Accordingly, based on the foregoing, the Siting Board finds that, with the implementation of the aforementioned conditions, the Company has established that the environmental impacts of the proposed facilities at the primary site would be minimized with respect to land use.

g. Visual Impacts

BECo stated that at the primary site the proposed facility would be moderately visible from surrounding areas with partial screening (Exhs. BE-6, p. 5-33; BE-48, p. 31). BECo stated that placement of the proposed facility at the primary site would not result in a major change in visual quality because it would be visually compatible with the Weymouth Fore River landscape (Exhs. BE-6, p. 7-24, BE-59, p. 6.7-2; Tr. 22, p. 23).

BECo stated that the proposed facility, whether built at the primary or alternative site, would include two emission stacks 245 feet in height and 17 feet in diameter (Exh. BE-6, pp. 7-6, 7-7). The Company indicated that the proposed facility also would include two 100-foot high auxiliary boiler stacks and two other buildings with heights of over 50 feet -- a 98-foot high turbine generator building and a 83-foot high heat recovery steam generator building (id.; Exh. HO-E-50). BECo indicated that it did not anticipate any design changes that would result in a change in the proposed stack height of 245 feet (Exh. HO-E-49).[171]

The Company stated that views of the new structures would be obscured by the retired, existing facilities on the site (Exhs. BE-6, p. 7-24, BE-59, p. 6.7-2).[172] The Company provided photographs to illustrate the likely visual impacts of the proposed facility at the primary site from five visual receptors: (1) the Idlewell neighborhood in Weymouth, (2) a location approximately one-third mile east of the primary site from the approach on route 3A in Weymouth, (3) a location three-fourths mile west of the primary site, (4) the residential community on Town River Bay in Quincy, and (5) King Oak Hill, 1.5 miles southeast of the primary site in Weymouth (Exh. BE-6, pp. 7-24, Figures 7.3.8-1 to 7.3.8-6).

The Company stated that from Kings Cove and the Fore River Bridge in Weymouth, and Germantown Point in Quincy, views would consist primarily of portions of the proposed facilities not screened by existing facilities (id., p. 7-24). The Company stated that residents of Monatiquot Street in Weymouth, approximately 1,000 feet from the primary site, currently have views of the primary site that are not screened by the existing 60-foot wide buffer

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171/ The Company stated that the stack height was based on the Good Engineering Practices (GEP) height of two and one-half times the generating facility building height (Exh. HO-E-4). BECo stated that MDEP had given no indication that the proposed stack height would need to be modified (Tr. 22, p. 13).

172/ The Company stated that the existing facilities on the site include two 250-foot high stacks (Exhs. BE-6, p. 7-24, BE-59, p. 6.7-2).

(Exh. BE-48, p. 61-B-5).

In order to mitigate visual impacts on Monatiquot Street, the Company proposed a greenbelt of vegetative screening (Exhs. BE-6, p. 7-24, Figure 7.3.8-7, BE-59, p. 6.7-3). The Company proposed to augment the current visual buffer provided by mature deciduous trees by adding evergreen and low deciduous shrubs for on-grade screening and by extending the greenbelt an additional 200 feet beyond the end of Monatiquot Street along the Company's property (Exhs. BE-59, p. 7.7-1, BE-6, Figure 7.3.8-7; Tr. 23, p. 19). In addition, BECo proposed to match the colors of the proposed facilities to those of the retired Edgar Station (Tr. 22, p. 15). The Company has further proposed to build a recreational area near the proposed facility at King's Cove in Weymouth (Exh. BE-59, p. 6.6-2, Figure 6.6-1).[173] See Section II.D.1.f., above.

The record shows that BECo's proposed facility would include two 245-foot high, 17-foot diameter stacks, which would be visible over significant portions of the surrounding area. However, the proposed height would be similar to that of the stacks at the existing Edgar Station, and the Company would match the colors of the proposed facility to those of the retired existing Edgar Station. In addition, the Company would provide greenbelt improvements and augmentation, limiting visual impacts on nearby Monatiquot Street residences to partial views of the proposed facility. Given the proposed mitigation and the industrial nature of much of the surrounding area, the proposed facility would be compatible with, and would not adversely affect the existing visual environment in the vicinity of the primary site. The Siting Board notes that any remaining incremental impact of the proposed

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173/ The Company stated that it also was willing to discuss removal of some structures from the top of the retired facility to present a more even view plane than currently exists (Exh. HO-E-47; Tr. 22, p. 11). The Company indicated that while no formal time line had been discussed with Weymouth officials, it estimated that it would take somewhat less than one year for demolition of stacks and existing roof structures and to rebuild roof sections left open by demolition (Tr. 22, pp. 11, 25-26).

facility could be significantly offset if BECo and Weymouth agree on a plan to remove structures from the top of the retired facility.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to visual impacts, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to visual impacts.

The record demonstrates that the Company proposes to implement the facility design and mitigation measures that adequately ensure a minimum impact on the environment with respect to visual impacts.

Accordingly, based on the foregoing, the Siting Board finds that, with implementation of the proposed mitigation, the environmental impacts of the proposed facility at the primary site would be minimized with respect to visual impacts.

h. Traffic

BECo stated that traffic generated by the construction and operation of the proposed facility at the primary site would not have a significant impact on intersections in the vicinity of the site (Exh. BE-59, p. 6.9-3).

The Company indicated that the primary site is bisected by Route 3A (Exh. BE-48, p. T-1-2). The proposed facility, along with the existing Edgar Station and associated facilities would be located on the south side of Route 3A while the proposed water front park along with one existing fuel oil tank would be located on the north side (id.; Exh. BE-6, Figure 2.3-1). The Company indicated that each portion of the site is accessed by a driveway from Route 3A and that the driveways lead to a site roadway system, connecting both portions of the site via a Route 3A underpass (id.).

In order to assess traffic impacts due to construction and operation of the proposed facility, BECo estimated 1993 and 1994 no-build traffic

volumes and levels of service ("LOS")[174] for morning and afternoon peak hours of 7:30 am to 8:30 am and 4:45 pm to 5:45 pm at intersections in the vicinity of the proposed facility (Exh. BE-48, T-2, T-8). The study area included three intersections and one traffic rotary along Route 3A, to the north and south of the primary site, and the two site driveways (id.).[175] The Company next estimated the maximum number of vehicles that would be required for employees and equipment deliveries during construction and operation of the proposed facility, during morning and afternoon peak hours (Exh. BE-59, pp. 6.9-1, 6.9-2).[176] The Company noted that equipment deliveries to the site would be minimized because most of the heavy equipment would be delivered to the site via barge (id., p. 6.9-1).

BECo then added estimated facility construction traffic to projected 1993 levels and estimated facility operational traffic to projected 1994

174/ The Company explained that an LOS designation describes the traffic flow, volume and speed at an intersection (Exh. BE-59, Table 5.11-1). The Company further explained that LOS designations range from LOS A which describes a condition of free flow, low volumes and relatively high speeds and no delays for side street motorists to LOS F which describes a condition of forced flow or breakdown with queuing along critical approaches and unstable operating conditions (id.).

175/ The Company estimated 1993 and 1994 no-build traffic volumes by applying a 2.6 percent annual growth rate to identified 1989 traffic volumes and adding estimated trips associated with specific developments anticipated in or adjacent to the study area (Exh. BE-59, pp. 5.11-4, 5.11-5).

176/ With respect to construction, the Company estimated that peak construction round trips would include 227 employee vehicles and 25 light and heavy trucks for general deliveries (Exh. BE-6, p. 7-25). The Company assumed that all employee trips would take place during the morning and afternoon peak hours and that nine of the truck trips would occur during the peak hours (id.). With respect to operation, the Company estimated that the proposed facility would generate 43 passenger vehicle round trips over three shifts with 32 trips in the peak morning and afternoon hours as well as five truck trips per day (Exh. BE-59, p. 6.9-2).

levels (id.; Exhs. BE-6, pp. 7-25, 7-26, BE-48, T-2.).[177] The Company's analysis demonstrated that the two site driveways would experience decreases in predicted 1993 LOS due to facility construction traffic (Exh. BE-48, T-2). However, the Company's analysis further demonstrated that facility operation would have no adverse impact on traffic conditions (id.).[178] In order to mitigate traffic impacts, BECo proposed to: (1) schedule construction work force arrival/departure times outside the morning and afternoon commuter peak hours;
(2) institute right turn only restrictions to and from Route 3A from site driveways;[179] and (3) control traffic exiting via the south drive during the afternoon peak hours (id., T-3, Exh. BE-59, p. 7.9-1). The Company stated that enforcement of the off-peak work force travel would be established with the contractors by means of written agreements and monitored by the construction contract management staff (Exh. BE-48, T-7). The Company maintained that such mitigation strategies would eliminate all decreases in LOS at the site driveways (id., T-3).

Weymouth suggested that the Siting Board specifically require the Company to implement the aforementioned mitigation strategies, should it approve the proposed facility as part of the site banking review (Weymouth Site Banking Brief, p. 11).

The record demonstrates that, based on projected 1993 and 1994

177/ In estimating impacts the Company stated that it assumed the construction work force would enter the study area during peak hours (Exh. BE-59, p. 6.9-1).

178/ The Company indicated that conditions at one site driveway would be reduced from LOS A to LOS B, and would be reduced at the other site driveway from LOS D to LOS F (Exh. BE-48, T-2).

179/ The Company maintained that the proposed right turn restrictions would not impact adjacent intersections within the vicinity of the proposed facility (Exh. BE-48, T-10). The Company indicated that motorists who would turn left leaving or entering the site driveways would travel, instead, along the existing internal roadway to reach the opposite driveway (id.).

traffic levels in the vicinity of the proposed facility, vehicles required for the construction of the proposed facility would, without mitigation, impact traffic flows at the two approaches to the site from Route 3A. However, the record further demonstrates that the mitigation strategies proposed by the Company would maintain the existing traffic flows.

Therefore, in order to demonstrate that the traffic impacts are minimized at the primary sites, BECo shall comply with the condition to implement its proposed traffic mitigation strategies during the construction of the proposed facility, including (1) the scheduling of the construction work force arrival/departure times outside the morning and afternoon commuter peak hours of 7:30 AM to 8:30 AM and 4:45 PM to 5:45 PM; (2) the institution of turning restrictions to and from Route 3A from site driveways; and (3) the control of traffic exiting the site during peak afternoon traffic hours, as needed.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to traffic impacts, including adequate consideration of mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to traffic impacts.

The record demonstrates that the Company's construction plans with the aforementioned conditions adequately ensure a minimum impact on the environment with respect to traffic impacts.

Accordingly, based on the foregoing, the Siting Board finds that, with the implementation of the aforementioned conditions, the environmental impacts of the proposed facility at the primary site would be minimized with respect to traffic impacts.

i. Safety

In this section, the Siting Board reviews safety issues related to the existence of any hazardous substances at the primary site, both within the existing Edgar Station and within the site subsurface, as well as the storage

and transport of the hazardous materials that would be required for operation of the proposed facility. BECo asserted that potential impacts to health and safety due to the existence of hazardous substances on the primary site and use of hazardous materials for facility operation would be minimal and that appropriate plans would be implemented to protect public health, safety and the environment (BECo Initial Brief, pp. 261, 266-268, BECo Site Banking Brief, pp. 45-47).

(1) Existing Edgar Station and Site Contamination

The Company indicated that although the existing Edgar Station contains asbestos, the structure would be left in place because the building is structurally sound, poses no danger to the public and would be extremely costly to demolish (Exh. HO-E-47).[180] However, the WBH expressed concern that the asbestos, which it found to be in various stages of deterioration, could be released into the environment due to the deteriorated condition of the building (Exhs. WBH-7, WBH-8, WAT-8). BECo agreed to fully enclose the existing building in accordance with recommendations of the WBH, and later stated that enclosure had been completed (Exh. Wey-21; Tr. 53, pp. 121-122). The Company noted that, although the WBH had inspected the enclosure, it had not confirmed, in writing, that the work had been done to its satisfaction (Tr. 53, pp. 121-122).

In order to determine the extent of hazardous substances within the site, the Company evaluated subsurface conditions within (1) the vicinity of the existing switchyard which was the site of two transformer oil spills in 1988, and (2) the portions of the site that would be utilized for construction of the proposed facility (Exhs. HO-E-35, HO-RR-48).

180/ The Company indicated that avoidance of demolition was a consideration in the determination of the location of the proposed facility within the site (Exh. BE-6, p. 2-3). However, the Company noted that if the capacity of the proposed facility were expanded beyond 600 MW, demolition would be required (id., p. 2-4).

With regard to the existing switchyard area, the Company stated that the two transformer oil spills in 1988 were reported to the MDEP and cleaned up, in accordance with the requirements of the MDEP, including excavation and disposal of soils from the spill area (Exh. HO-E-35; Tr. 26, pp. 49-53). The Company indicated that, subsequent to the clean-up of the spills, a hazardous waste evaluation of soil and groundwater at three test-well sites in the vicinity of the transformer oil spills identified hazardous substances in the groundwater and soils (Exh. HO-E-35, attached Gale Report, p. 6). However, the Company also indicated that, based on the industrial nature of the site, planned future use of the area, restricted public access, and lack of drinking water wells within a 2,500-foot area, the evaluation report concluded that the site did not appear to pose an imminent threat to public health, welfare, safety or the environment (id., p. 7; Tr. 26, p. 43).

BECo stated that there were no traces of transformer oil constituents within the portions of the site that would be utilized for construction of the proposed facility, that no construction work was planned within the switchyard area and that it would restrict access to this area during construction (Exh. HO-RR-48, p. 5-1; Tr. 53, pp. 129). In addition, the Company asserted that no further action was planned unless required by the MDEP and that there was no evidence that either of these spills would impact construction or operation of the proposed facility (BECo Initial Brief, p. 266).

With regard to the construction site, the Company indicated that an environmental site assessment[181] had been prepared in order to characterize the

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181/ The Company noted that the scope of the environmental site assessment was conducted in accordance with the Massachusetts Oil and Hazardous Materials Release Prevention and Response Act, Chapter 21E of the Massachusetts General Laws ("Chapter 21E") (Exh. HO-RR-48, p. 1-2). The Company stated that the site assessment was submitted to the MDEP as part of the Chapter 21E site assessment process and that, as a next step in the process, the Company would submit plans for site clean-up to the MDEP (Tr. 53, p. 123). The Company stated that, in addition, it plans to apply to the MDEP for classification of the site as a nonpriority site and for a waiver of approval from the MDEP which would allow the Company to proceed with site clean-up without the requirement that the MDEP approve each step

soil and groundwater quality conditions within the portions of the site that would be developed for the proposed facility, including the power block[182] and the waterfront park, and to prepare appropriate remediation plans (Exh. HO-RR-48).[183] The Company indicated that contaminants, including polyaromatic hydrocarbons and metals such as lead, arsenic, vanadium and selenium, were detected in the soil and groundwater at both locations (id., p. 5-1, attach. Vol. III, p. ix). However, BECo indicated that the groundwater selenium concentration was the only concentration in excess of promulgated standards and that, in addition, arsenic was detected above naturally occurring levels in the soil at the waterfront park site (id., pp. 4-28, 5-1).[184]

In order to determine if the contaminants detected in the soil would pose a significant risk of harm to human health and the environment, the Company conducted a limited risk characterization of the site (id., attach. Volume III).[185] BECo first identified potential receptors (i.e., construction workers and waterfront park visitors), and potential exposure pathways (i.e.,

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(id., pp. 123-124).

182/ In describing the geographical characteristics of the proposed power block site, the Company indicated that the surface area consists of flyash and bottom ash generated by the retired coal-fired units and that the subsurface area consists of flyash and bottom ash, spoils from the dredging of the Weymouth Fore River channel, and construction fill (Exh. BE-59, p. 5.5-1).

183/ The site evaluation also included an assessment of the portion of the site originally proposed for construction of a new fuel oil day tank (Exh. HO-RR-48). However, the Company indicated that this tank has been deleted from the scope of the project (Tr. 53, p. 132).

184/ The Company indicated that it was not aware of any state or federal standards for soil arsenic content (Exh. HO-RR-112).

185/ The Company indicated that human health risks of compounds in groundwater were not evaluated because there is no current or reasonably foreseeable use of the groundwater at the site (Exh. HO-RR-48, Volume III, p. ix).

soil and air) (id., pp. viii, ix). BECo next estimated average daily doses of contaminants, without any remediation, for identified receptors (id., p. ix). The Company then calculated potential carcinogenic and non-carcinogenic risks for each receptor group and concluded that although the carcinogenic risk to construction workers from inhalation exposure to likely levels of fugitive dust would exceed the currently applicable Massachusetts acceptable limit, the site would pose no risk to any other receptor group (Exh. HO-RR-48, pp. 5-1, 5-2, 5-3, Vol, III, p. x).

BECo explained that the existing contaminants would not pose a significant risk to human health or the environment due to: (1) the relatively low level of contaminants at the sites and low mobility of the contaminants detected; (2) restriction of access to the power block area; (3) the existing industrial land use of surrounding areas; and (4) the direction of groundwater flow away from the nearest residential areas toward the Weymouth Fore River (id.).[186] Further, the Company maintained that any increased risk to construction workers could readily be mitigated by construction procedures that would be developed in accordance with state and federal standards and would be incorporated into the remediation plans submitted to the MDEP under the Chapter 21E site assessment process (id., p. 5-2; Tr. 53, pp. 136-137).[187]

Finally, BECo stated that there is little vegetation on the primary site and that vegetation management on the primary site, as well as the proposed waterfront park, would be performed by mechanical means rather than by utilization of herbicides (Exh. HO-E-36).

(2) Transport and Storage of Materials

186/ In addition, the Company noted that it is unlikely that there is a hydrologic connection between the groundwater at the primary site and the closest wells, which are located more than one mile from the site (Tr. 57, pp. 68-71).

187/ The Company explained that construction procedures to limit worker exposure to fugitive dust would include covering of materials, dampening of excavation areas, wind screens and use of respirator equipment by workers (Tr. 53, pp. 136-137).

The Company asserted that appropriate plans and procedures would be undertaken for the delivery, storage and handling of input materials, including fuel oil, lubricants and process chemicals, to ensure safety and protect the environment (BECo Initial Brief, pp. 267-268). With regard to fuel oil, BECo stated that oil tanks would be surrounded by earthen dikes and that the entire diked area would be protected with a buried liner to prevent oil intrusion into the subgrade in the event of a leakage or spill (Exhs. HO-E-32, HO-E-33, BE-6, p. 2-7). The Company further stated that an oil spill contingency plan would be developed prior to the operation of the proposed facility (Exhs. BE-48, OS-1, HO-RR-57A, SP-1).[188] In addition, BECo indicated that lubricating oils would be stored in tanks within a walled concrete area in order to contain any waste oil (Exh. BE-6, p. 2-7).

With regard to process chemicals, the Company indicated the hazardous substances that would be used during operation of the proposed facility, include (1) aqueous ammonia for control of NOx emissions,[189] and (2) sulfuric acid and sodium hydroxide for water treatment regeneration (Exh. HO-E-31).[190] The Company stated that these substances would be stored in dedicated, closed

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188/ The Company noted that it would become a member of the Tri-Cities Industrial Anti-Pollution Committee which coordinates efforts toward containment and cleanup of any oil spills from member companies into the Weymouth Fore River (Exh. HO-RR-57A, SP-1).

189/ The Company noted that under one proposed BACT scenario, natural gas would be fired for 365 days and NOx emissions would be minimized without SCR and thus, aqueous ammonia would not be required (Exh. HO-RR-93, pp. 9-16). See Section II.D.1.a.(1), above.

190/ The Company stated that sodium hypochlorite, which is also classified as a hazardous substance, would be used for condenser cleaning (Exh. HO-E-31). The Company noted that sodium hypochlorite would be stored on site in smaller quantities than other hazardous substances, and would be stored in a 55-gallon drum container designed to ensure proper storage and handling (Tr. 33, p. 95). The Company noted that additional chemicals, classified as hazardous, would be used to clean the heat recovery steam generators, but that these chemicals would not be stored on site or used to support day to day operation (Exh. HO-E-31).

tanks surrounded by dikes to contain any accidental releases (Exh. HO-E-34).[191] BECo maintained that all storage tanks would be constructed and installed in accordance with applicable federal, state and local standards and regulations (Exh. HO-E-74).

With regard to the transport of process chemicals, the Company indicated that approximately eight, 5,000-gallon tank truckloads of ammonia would be required every two months during gas firing and every two weeks during oil firing (Exh. HO-RR-46). The Company provided that procedures would be developed in conjunction with Weymouth to ensure the safe unloading of the ammonia (Tr. 28, p. 162). BECo indicated that approximately one tank truck of sulfuric acid would be required each week, and that the storage and unloading area would be provided with spill containment as well as protection for personnel, such as eye wash stations (Exh. HO-RR-53). The Company stated that transportation of hazardous substances would be regulated by the U. S. Department of Transportation (Exh. HO-E-31).

BECo indicated that an Emergency Response Plan would be prepared which would delineate all hazardous materials stored onsite, emergency equipment located onsite, and procedures to be implemented in the event of an

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191/ The Company explained that ammonia, should it be used, would be stored in two 20,000-gallon carbon steel tanks that would each be surrounded by a secondary containment dike underlain with an ammonia resistant ground liner (Exhs. HO-DE-2, HO-E-34, HO-E-75; Tr. 28, pp. 158-160). The Company stated that, in addition, the containment dikes site would have completely enclosed roof systems which would prevent the escape of ammonia fumes in the unlikely event of a spill, and also prevent the entrance of rain or snow into the spill containment area (Exh. HO-E-75). The Company noted that the ventilation system proposed for the enclosed dike area and storage tank also would be designed to prevent the release of fumes to the atmosphere (Exh. HO-RR-57A, SP-2). The Company added that the location of the ammonia storage tanks, near the SCR system, would minimize piping and valve requirements (Exh. HO-DE-2).

The Company further explained that sulfuric acid would be stored in a 7,000-gallon carbon steel tank which would be surrounded by a concrete containment wall, and that a layer of crushed limestone would be provided within the containment area to effect immediate neutralization of any leaks or spills (Exh. HO-RR-53).

emergency (Exh. HO-RR-57A, SP-3). In addition, the Company stated that a fire protection system, that would utilize the existing Edgar Station fire protection system to the greatest extent possible including the existing on-site hydrant system, would be installed to comply with all federal, state and local fire codes (Exhs. HO-E-37, BE-6, p. 2-4, WEY-27). The Company stated that 270,000 gallons of water, originating from the City of Quincy, would be held in emergency reserve within the raw water storage tank for fire fighting purposes (Exh. WEY-27). The Company maintained that this amount was sufficient for fire fighting purposes, but that, in the event of a severe fire, adequate supplementary supplies would be available under both the proposed and backup water supply plans (Tr. 54, pp. 12-14).[192] Finally, the Company noted that the spent SCR catalyst material, if required for NOx removal, would be considered hazardous waste but would be disposed of by the catalyst manufacturer (Exhs. HO-E-65, HO-RR-93, p. 15).

Weymouth requested that the Siting Board specifically require the Company to review its plans for the storage, containment and transport of aqueous ammonia with the Local Emergency Planning Committee, prior to finalization of construction design (Weymouth Site Banking Brief, pp. 7-8). In addition, Weymouth requested that the Siting Board specifically require the Company to include Weymouth in the development of the scope of the Emergency Response Plan and to review said Plan, prior to construction and periodically during operation of the proposed facility, with the Local Emergency Planning Committee, the Fire Department and other appropriate local officials (id., p. 8, citing Exh. HO-RR-57A, SP-3). Finally, Weymouth requested that the Siting Board specifically require the Company to review its plans for maintaining an adequate supply of water for fire fighting purposes with the Weymouth Fire Department and to revise such plans as necessary to address any

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192/ The Company indicated that, under the backup water supply plan -- the barge supply option -- an oil tank with an 80,000 barrel capacity would be converted to back-up water storage, while under the proposed water supply plan -- the City of Quincy option -- additional supplies would be obtained from the water pipeline that would extend to the site (Tr. 54, pp. 12-14).

concerns of the fire department (Weymouth Site Banking Brief, p. 11).

(3) Analysis

With respect to the existing Edgar Station, the record indicates that the Company has agreed to completely enclose the building, in accordance with recommendations of the WBH, in order to prevent the release of asbestos into the atmosphere. Although the Company stated that such enclosure is complete, the Siting Board notes that the WBH has not confirmed, in writing, that the enclosure complies with its recommendations. Accordingly, the Company shall comply with the condition to submit written confirmation from the WBH that the existing Edgar Station has been enclosed in accordance with its recommendations at the time the Company submits its final application.

With respect to existing subsurface conditions, the record demonstrates that hazardous substances are present within the site soils and groundwater within the vicinity of two previous oil spills and within proposed construction areas. However, the record also demonstrates that the oil spills have been cleaned up in accordance with MDEP regulations and procedures, that no construction would take place in the vicinity of the oil spills, and that access to this area would be restricted during construction. The record also demonstrates that contaminants would not pose a significant risk to human health or the environment and that site remediation and worker protection plans for the construction areas would be developed in conjunction with the MDEP. However, in light of planned recreational use of the waterfront park, the Siting Board notes its concern regarding the concentration of arsenic in the soil that exceeds naturally occurring concentrations. The Siting Board expects that such contamination of the waterfront park soil would be specifically addressed in the aforementioned site remediation plans.

With respect to the storage and transport of hazardous materials, the record indicates that the off-site transportation and disposal of such materials would be subject to applicable standards, including those of the U. S. Department of Transportation, and that the Company intends to develop contingency plans for accidental release of materials, including an oil spill

contingency plan that would be coordinated with neighboring industries and an Emergency Response Plan.

Weymouth requests that its officials be provided with the opportunity to participate in defining the scope of the Emergency Response Plan and that its Local Emergency Planning Committee, Fire Department and other pertinent local officials be allowed to review the Emergency Response Plan both prior to construction and periodically during operation of the proposed facility. The Siting Board agrees with Weymouth that local participation in defining the scope of the Emergency Response Plan and subsequent review of the Plan by local agencies, prior to construction of the proposed facility and periodically during its operation, would be appropriate. The Siting Board notes that similar plans found to be acceptable in previous Siting Council decisions included provisions for local review. Enron, 23 DOMSC at 214-216; MASSPOWER, 20 DOMSC at 399-401; Altresco-Pittsfield, 18 DOMSC at 406-408. Thus, the Company shall comply with the condition to provide for Weymouth participation in the development of its Emergency Response Plan and for review of the plan, by appropriate local agencies, prior to construction and periodically during operation of the proposed facility.

With regard to the storage, containment and transport of ammonia, the Siting Board agrees with Weymouth that the specific details of the Company's plans for the storage, containment and transport of aqueous ammonia should be reviewed by the Local Emergency Planning Committee prior to finalization of construction design. Thus, the Company shall comply with the condition to provide for the review of its plans for the storage, containment and transport of aqueous ammonia by the Weymouth Emergency Planning Committee. In addition, the Siting Board notes that in previous reviews of generating facilities utilizing ammonia, applicants provided dispersion modeling data which demonstrated that the expected concentration of ammonia at the site boundary would not exceed a level of 500 ppm under worst case conditions of ammonia release or demonstration that mitigation measures included in facility design, such as enclosed containers, would ensure that ammonia concentrations would not exceed 500 ppm at the site boundary under the same conditions. Enron, 23

DOMSC at 221; MASSPOWER, 20 DOMSC at 399-400; Altresco-Pittsfield, 17 DOMSC at 406. Here, the Company has stated its intent to completely enclose the ammonia containment area and include a vent system designed to prevent the release of ammonia fumes into the atmosphere. Nonetheless, the Company should provide a description of the potential for any vent release leaks and the impact of any such leaks on site boundaries, under worst case conditions of ammonia release in its final petition.

Finally, with regard to the adequacy of water supplies for fire fighting purposes, the Siting Board agrees with Weymouth that the Company should review plans with the Weymouth Fire Department and revise plans as necessary. Thus, the Company shall comply with the condition to review its plans for maintaining an adequate supply of water for fire fighting purposes with the Weymouth Fire Department, prior to construction of the proposed facility, and to revise plans, as necessary, to address any concerns raised by the Weymouth Fire Department.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to safety impacts, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to safety impacts.

The record demonstrates that the Company's construction plans, with implementation of the aforementioned conditions and mitigation measures, as well as review and oversight of facility design and construction and transport of hazardous substances by appropriate agencies, adequately ensure a minimum impact on the environment with respect to safety impacts.

Accordingly, based on the foregoing, the Siting Board finds that, with implementation of the aforementioned conditions, the environmental impacts of the proposed facility at the primary site would be minimized with respect to safety impacts.

j. Electric and Magnetic Fields

BECo stated that the electrical transmission interconnect between the proposed facility and the existing switchyard at Edgar Station would be made via three underground connections within the station itself, which would have negligible impact on the electric and magnetic fields ("EMF") off-site or at the edge of any transmission ROW (Exh. HO-E-63).[193]

The Company stated that the electrical power output from the proposed facility would, upon leaving the switchyard, be supplied to the area power system on existing BECo-owned 115 KV overhead transmission lines that extend along BECo's ROW 4 between Edgar Station and Holbrook, Massachusetts (id.).

BECo provided the Siting Board with calculations of expected 60 cycles per second ("Hertz") EMF levels at the edges of the ROW based on: (1) horizontal and vertical dimensional coordinates at the center of the transmission line span;
(2) conductor size; (3) net ampere loading; and (4) phase relations for the individual conductors (id.).[194] The Company's analysis indicated that, at an output level of 300 MW, the highest electric field would be .30 Kilovolts per meter, and that the highest magnetic field would be 8 milligauss.[195] BECo indicated that these levels would be below existing levels (Exh. HO-E-63).

BECo acknowledged the existence of several industry practices utilized to mitigate EMF on transmission lines, such as use of particular line configurations, phase spacing, and rolling of phases on adjacent circuits (id.). The Company indicated that two existing transmission lines located on its ROW 4 utilize partial phase rolling techniques which result in an approximate 30 percent reduction from the field levels that would be

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193/ Electric fields and magnetic fields produced by the flow of electricity are collectively known as electric and magnetic fields or EMF.

194/ Standard U.S. powerline frequency is 60 Hertz.

195/ See Table 2, attached, for complete data regarding the Company's calculations of EMF levels for the primary site.

experienced with standard parallel phase construction (id.)[196]

BECo stated that additional phase reconfiguration could be implemented to reduce EMF levels for circuits expected to carry a portion of the power from the proposed facility (Exh. HO-RR-116). The Company stated that such a reconfiguring of phases would not be a simple task, and that in the specific case of the ROW 4 circuits, modifications would be required not only at both of the affected BECo substations, but also at up to five additional utility substations supplied by these transmission lines (id.).

In a previous review of proposed transmission line facilities which included 345 KV transmission lines, the Siting Board accepted edge of right-of-way levels of 1.8 KV/meter for the electric field, and 85 milligauss for the magnetic field. Massachusetts Electric Company, 13 DOMSC at 119, 228-242 (1985) ("1985 MECo Decision"). Here, the Siting Board notes that the edge of ROW EMF levels for transmission lines serving the primary site (115 KV transmission system) are well below the levels found acceptable in the 1985 MECo decision. In addition, operation of the proposed facility would decrease, rather than increase, the EMF levels along ROW 4 under normal load conditions.

Nevertheless, the Siting Board suggests that BECo further consider implementation of phase arrangements and/or extend all reasonable efforts to utilize any other known cost-effective mitigation techniques to further minimize EMF levels along the affected existing transmission lines.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the primary site with respect to EMF, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect

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196/ The Siting Board notes that BECo's existing transmission lines are not ancillary facilities as defined in G.L. c. 164, § 69G. However, in order to allow comprehensive analysis and comparison of environmental impacts of the proposed facilities at either site, the Siting Board may address any potentially significant effects of such facilities on EMF levels along existing transmission lines.

to EMF.

The record demonstrates that the Company's construction plans include reasonable efforts to implement measures to minimize EMF impacts on portions of the existing transmission system affected by the proposed facility, and adequately ensure a minimum impact on the environment with respect to EMF.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the primary site would be minimized with respect to EMF.

2. Cost of Proposed Facilities at the Primary Site

In this section, the Siting Board evaluates whether the Company has provided sufficient information on the costs of the proposed facility at the primary site to allow the Siting Board to determine if an appropriate balance would be achieved between environmental impacts and cost.[197] The Siting Board also compares the estimated costs of siting the proposed facility at the primary and alternative sites.

The Company estimated a total direct cost of $210,085,606 for materials and labor for the proposed facility at the Edgar site including: $15,722,945 for site work, structures, yard and building services; $32,755,000 for the heat recovery system generator and appurtenances; $103,131,000 for the steam turbine 2and combustion turbine generator sets; $30,599,000 for plant

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197/ In past facility decisions, we have evaluated whether estimates of costs for the construction and operation of proposed facilities are realistic for a facility of the size and design proposed. Enron, 23 DOMSC at 132, EEC, 22 DOMSC at 135. Application of that standard of review is consistent with our statutory mandate to minimize environmental impacts of proposed facilities at the lowest possible cost. In this site banking review, we address estimated costs only to the extent necessary to allow a comparison between the primary and alternative sites based on environmental impacts, reliability and cost. It is likely that estimated costs of the proposed facility will have changed significantly at such time as BECo files a final petition for approval to proceed with the project. At that time, the Siting Board would address the consistency of the estimated costs of the proposed facility with our least-cost standard.

systems and equipment; $5,037,361 for transmission interconnection; $1,231,000 for start-up and testing; $37,411,600 for direct labor costs; and $21,141,300 for scope additions, additional investments and improvements, and labor cost differential (Exhs. HO-RR-120, Table AS-5-2, HO-RR-57A, p. AS-5-9).[198,199]

The Company indicated that certain of these costs would be site dependent, including overall labor costs and costs for six facility elements: (1) site procurement, (2) site preparation and foundations, (3) heat rejection system components, (4) electric power transmission, (5) fuel handling, and (6) municipal improvements (BECo Phase I Brief, p. 197; BECo Site Banking Brief, pp. 28-29; Exh. HO-RR-121, Table AS-5-1).

Specifically, the Company stated that there would be no site acquisition cost for the primary site because the Company already owned the property, but indicated that conditions at the site would require a driven pile type of foundation (Exhs. HO-RR-121, Table 1, BE-6, p. 5-25, HO-RR-57A, p. AS-5-5; BECo Site Banking Brief, p. 29). The Company further indicated that a once-through cooling system would be utilized at the primary site for heat rejection (Exh. HO-RR-57A, p. AS-5-5). The Company stated that it would interconnect to existing transmission lines at the primary site and as

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198/ All costs are given in 1994 dollars and reflect capability for 320 to 365 days of natural gas-fired combustion and SCR for NO_x control.

199/ The Company provided a comparison of costs at the Edgar and Ironstone sites with and without LDC cost sharing of certain capital costs (Exhs. HO-RR-120, HO-RR-121). However, no LDC cost sharing contract has been signed at either site (Exh. HO-RR-98). Furthermore, a determination of the number of days when the proposed facility would be gas-fired versus oil-fired depends on a determination by MDEP of BACT for the reduction of air pollution. (See Section II.D.1.a.(1)(a) above). At least one technology/fuel mix combination currently under consideration by the Company, dry NO_x control without SCR, would be possible only with use of 100 MW combustors and with 365 days natural gas firing (Exh. HO-RR-93, Tables 3, 4). Since a full year of natural gas firing would preclude LDC cost sharing at either the primary or alternative sites, the cost analysis herein has been based on a comparison of differential costs without LDC cost sharing.

necessary utilize an existing 268,000 barrel tank with a 30-day distillate oil storage capability and associated fuel offloading and transfer facilities (Exhs. HO-RR-57A, pp. AS-5-6, AS-5-7, Table AS-5-2, HO-RR-121, Table 1).[200] Finally, the Company estimated a cost of $2,400,000 for municipal improvements associated with locating the proposed facility at the Edgar site, including construction of a waterfront park and commitments to the Town of Weymouth such as funding a health study to be conducted by the WBH (Exhs. HO-RR-121, Table 1, HO-RR-57A, p. AS-5-8). See Section II.D.1.a.(4) above.

The Company also provided estimates of selected operating costs which are expected to be site-dependent, including gas supply costs, costs related to heat rejection and water supply costs (Exhs. HO-RR-57A, Tables AS-5-7 to AS-5-12, BE-120, Tables 4-1 to 4-26, HO-RR-121). With respect to gas costs, the Company estimated that the net present value ("NPV") life cycle gas cost at the Edgar site would be $1,218,827,356 (HO-RR-121, Table 4).[201] With respect to heat rejection costs, the Company explained that the once-through cooling system at the Edgar site would result in a cost advantage relative to the closed-cycle cooling system required at the alternative site, reflecting both a lower heat rate and lower operating costs for internal pumping (Exh. HO-RR-57A, pp. AS-5-12, AS-5-13).

The Company also provided a comparison of NPV costs for four preferred water supply options over the period 1994-2013, under various combinations of water demand reduction measures (Exh. BE-120). See Section II.D.1.e., above. The Company stated that it selected its proposed water supply plan, purchase of water from the City of Quincy, as the most viable, cost effective water source available to the proposed project at the primary

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200/ The UE&C fuel handling system cost estimate was based on construction of a 268,000 barrel fuel oil storage tank, a 1,000,000 gallon fuel oil day tank, railroad track, fuel oil storage tank dike and fire protection system and an unloading facility (HO-RR-57A, p. AS-5-7).

201/ With LDC cost sharing of certain capital costs, the Company estimated its share of life cycle gas supply costs as $1,138,930,163 (Exh. HO-RR-121, Table AS-5-11).

site (Exh. BE-120, pp. 1-3, 5-4).[202,203] The Company also identified (1) use of dry combustors for NO_x control, and (2) the on-site collection and re-use of stormwater as its preferred combination of water use reduction provisions (Exh. BE-120, p. 5-3). See Section II.D.1.e., above.

The Company estimated 1994-2013 NPV costs for its four preferred water supply options, assuming use of dry combustors and on-site stormwater re-use, as follows: $18,837,610 for the proposed water supply plan; $27,482,618 for the backup water supply plan; $25,613,818 for MWRA wastewater reuse; and $50,463,773 for on-site water desalinization (Exh. BE-120, Tables 4-6, 4-11, 4-16, 4-21). The Company indicated that the total NPV costs for the proposed water supply plan include 1994-2003 NPV operating costs of $4,761,175 for water purchase and $3,114,760 for on-site water treatment (Exhs. BE-120, Table 4-6, HO-E-106; Tr. 57, p. 140).[204]

As part of its revised BACT analysis, the Company provided cost differentials to compare the capital costs and levelized annual costs of different facility designs (Exh. HO-RR-93S, Appendix, p. A-2).[205] For the two alternative design options that the Company has recommended as BACT in its

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202/ The Company stated that it identified barge transshipment of water from the Company-owned New Boston Station as its backup water supply plan (Exh. BE-120, p. 1-2 and 1-3). The Company also selected two other sources of water supply, desalinated water from the Weymouth Fore River and wastewater from the MWRA, for detailed evaluation (Exh. BE-120, pp. 1-2 to 1-3).

203/ The Siting Board notes that water requirements may vary depending on BACT determination. Costs are not included for the water use that would be required for either of the BACT alternatives for NOx control. See Section II.D.1.e.(1).

204/ The Company identified the capital costs (1994 dollars) for the water supply options as follows: $7,714,900 for the proposed water supply plan; $8,110,145 for the backup water supply plan; $12,374,089 for MWRA wastewater reuse; and $23,645,700 for on-site water desalinization (Exh. BE-120, Tables 4-11, 4-16 and 4-21).

205/ See Section II.D.1.a.(1)(a), above for discussion of the Company's revised BACT analysis and eight alternative design options.

revised analysis, the Company's cost comparison shows the following differences from the overall facility cost estimates identified above: (1) the natural gas proposal -- 365 days of gas-fired generation using 100 MW dry combustors without SCR -- would reduce capital costs by $8,581,160 but increase levelized annual cost by $8,513,000 per year; and (2) the emission offset proposal -- 320 days of gas-fired generation and 45 days of oil-fired generation using 100 MW dry combustors with SCR for oil-fired generation only -- would increase capital costs by $2,533,500 and increase levelized annual cost by $5,998,000 per year (id.).[206],[207]

The Company has provided estimates of the overall costs of the proposed facility at the primary site, as well as components of capital and operation costs which are site dependent. In addition, the Company has developed cost estimates for a range of combustor and fuel use designs, and for a range of specific options to supply process water at the primary site.

The Siting Board finds that the Company has provided sufficient information on the costs of the proposed facility at the primary site to allow

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206/ The Company's levelized annual cost differentials include net plant output penalties of $4,594,000 per year for the first BACT recommendation and $7,407,000 per year for the second BACT recommendation, relative to the facility design reflected in the Company's overall facility cost estimate (Exh. HO-RR-93, Appendix, p. A-2). The penalties are based on assumed net plant outputs of 315.21 MW for the first BACT recommendation and 312.35 MW for the second BACT recommendation, as compared to 320.42 MW for the design reflected in the overall facility cost estimate (id.).

207/ The Company estimated the cost per ton of NOx and ammonia removed, relative to a conventional combustor design with no NOx controls, as $931 per ton under the natural gas proposal and $562 per ton under the emissions offset proposal (Exh. HO-RR-93, Table 3). With respect to three alternative designs which minimize water requirements, the Company estimated the costs of NOx and ammonia removal as $2,860 per ton for a design based on 365 days of gas-fired generation without power augmentation or SCR, $2,129 for the same design except with SCR, and $901 per ton for a design based on 320 days of gas-fired generation and 45 days of oil-fired generation without power augmentation and with SCR (id.).

the Siting Board to determine whether an appropriate balance would be achieved among environmental impacts and cost.

3. Conclusions on the Proposed Facilities at the Primary Site

In this section, we review the consistency of the proposed facility with our overall review standard, requiring that an appropriate balance be achieved among environmental impacts and costs.[208] Such balancing includes trade-offs among conflicting environmental impacts as well as trade-offs among respective environmental impacts and cost.

The Siting Board has found that, based on the implementation of the facility design and mitigation specified in Section II.D.1., the environmental impacts of the proposed facility at the primary site would be minimized with respect to surface water quality/wetlands, land resources, noise, land use, visual impacts, traffic, safety, and EMF.

In addition, the Siting Board has found: (1) that the Company did not provide sufficient information for the Siting Board to determine whether the environmental impacts of the proposed facility at the primary site would be minimized with respect to air quality; and (2) that the Company did not establish that the environmental impacts of the proposed facility at the primary site would be minimized with respect to water supply.

Finally, the Siting Board has found that the Company provided sufficient information on the costs of the proposed facility at the primary

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208/ The Siting Board notes that, given the information presented by the petitioner at this time, the reliability of BECo's project is comparable at the primary and alternative sites. Therefore, reliability of supply is not addressed in this decision. Further, the issue of reliability is most relevant to the statutory requirement that the Siting Board ensure a necessary energy supply for the Commonwealth. EEC, 22 DOMSC at 315. Need for the facility is not addressed in this decision and is deferred until such time as the Company decides to file with the Siting Board a final petition for the construction of the proposed project. At that time, the Siting Board will evaluate the reliability impacts of appropriate components of the proposed facility.

site to allow the Siting Board to determine whether an appropriate balance would be achieved among environmental impacts and cost.

The record indicates there are no significant issues involving the balance among surface water quality/wetlands, land resources, noise, land use, visual impacts, traffic, safety and EMF, nor between any of these concerns and air quality, water supply or cost. Accordingly, the Siting Board finds that the environmental impacts of the proposed facility at the primary site would be minimized with respect to surface water quality/wetlands, land resources, noise, land use, visual impacts, traffic, safety and EMF, consistent with minimizing cost and other environmental impacts.

To complete its review, the Siting Board must address two further issues: (1) whether environmental impacts with respect to water supply would be minimized, consistent with minimizing cost and other environmental impacts; and (2) whether environmental impacts with respect to air quality would be minimized, consistent with minimizing cost and other environmental impacts. The Company's analyses as discussed in Sections II.D.1.a and II.D.1.e suggest that there are trade-offs between water supply and air quality, as well as trade-offs between the respective environmental concerns and cost. Therefore, the Siting Board must address the balance between water supply, air quality and cost.

As described in Section II.D.1.a(1), above, the Company compared the air quality impacts, water requirements and overall facility costs for a range of fuel/combustion design alternatives, and recommended two such alternatives -- both variations of the base dry combustor design -- as BACT. The Company also compared in detail the environmental impacts and costs of a range of water supply alternatives for meeting a 385,000 gpd water requirement -- reflecting use of the base dry combustor design with on-site stormwater reuse -- and selected two such alternatives as its proposed and backup water supply plans.

With respect to the balance between air quality and cost, the Siting Board was unable to make findings as to whether environmental impacts would be minimized with respect to air quality, even before considering costs. In

making no finding, the Siting Board cited the lack of documentation to support the Company's claims as to the environmental impacts of its emission offset proposal, as well as the Siting Board's expectation that the choice of an appropriate design would continue to be significantly affected by technological advances prior to implementation of the proposed project.

The Siting Board notes further that the cost information provided by the Company regarding the natural gas proposal and the emission offset proposal, while sufficient to allow the Siting Board to determine whether an appropriate balance would be achieved among environmental impacts and costs, is not so disparate as to pose a compelling reason to choose or reject either design pending more definitive evidence of relative environmental impacts.[209] Accordingly, based on this record, the Siting Board makes no findings as to whether the environmental impacts of the proposed facility would be minimized with respect to air quality, consistent with minimizing costs and other environmental impacts.

Nonetheless, we note that the record includes no identified design that would result in smaller air quality impacts than the Company's natural gas proposal, considering facility emissions alone, without offsets. Thus, in the absence of significant further technological changes, should the Company provide sufficient documentation of the emissions reduction potential of the Company's emission offset proposal to support a specific choice between the Company's two BACT proposals, the Siting Board would be able to determine, with respect to emissions of PSD pollutants, whether the environmental impacts of the proposed facility at the primary site would be minimized.

With respect to water supply, our finding that the Company failed to establish that environmental impacts would be minimized was based on the Company's failure to incorporate identified mitigation measures. Specifically, while the Company identified three design alternatives requiring

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209/ The Company's estimated costs of NOx removal under its two BACT recommendations are $931 per ton under the natural gas proposal and $562 per ton under the emission offset proposal (see Section II.D.2)

only 44,600 gpd of water, the Company did not propose any of these designs. The Company's two BACT recommendations, in contrast, involve the highest water requirements of any of the designs considered by the Company -- each over 650,000 gpd. In relative terms, the 385,000 gpd water requirement under the base dry combustor design represents an intermediate level of water supply impact.

The Company provided considerable evidence to support its claim that 385,000 gpd could be supplied by the MWRA system via the City of Quincy system, noting in particular that the MWRA system safe yield provides a 21 mgd surplus relative to current systemwide demand. However, BECo did not address the long-term ability of the MWRA to meet higher water requirements under its BACT recommendations.[210] Thus, the Siting Board is concerned about the identified water requirements of over 650,000 gpd under both BACT recommendations, and the Company's failure to address the environmental impacts of such requirements.

With respect to the balance between water supply and cost, the Siting Board notes that, relative to the three designs that would minimize water requirements, the Company's two BACT proposals would provide lower combined emissions of NOx and ammonia at lower or comparable cost, and the base dry combustor design would provide comparable emissions of NOx and ammonia at a lower cost.[211]

210/ Although those requirements are only a little over three percent of the 21 mgd surplus, the MWRA is the sole or principal supplier of water to a sizable service area, and possible system expansions to meet future demand could involve substantial costs and environmental impacts. In addition, BECo cited a savings of 135,000 gpd in water requirements as the reason for shifting to dry combustor technology in the first place, but now recommends dry combustor designs with larger water requirements than the original conventional combustor design.

211/ One of the three designs that minimize water requirements, based on the 100 MW dry combustors assuming 365 days of gas-fired generation without SCR or power augmentation, would result in facility NOx emission of 2.37 pounds per net kWhr -- a rate second only to the 2.26 pounds per net kWhr of such emissions under the

Considering the combined cost and air quality disadvantages of each of the alternative designs that minimize water requirements, relative to the designs the Company is willing to pursue -- the natural gas proposal, the emission offset proposal, and the base dry combustor design -- the record does not support a conclusion that any of the designs that minimize water requirements is on balance superior. Recognizing that the three designs that minimize water requirements all omit power augmentation, it thus appears that some level of power augmentation may be appropriate to reduce air emissions and costs per unit power output, despite an associated increase in water requirements.

However, the Company failed to establish the basis by which it determined the level of power augmentation under the base dry combustor design and its two BACT recommendations. In the absence of explicit justification for the underlying levels of power augmentation, it is unclear whether the air emissions and costs advantages apparently afforded by these designs justify the relatively high level of water requirements under its BACT recommendations.[212]

Company's first BACT recommendation. However, the NOx removal cost of $2,971 per ton for that design is at least several times greater than the corresponding costs for the base dry combustor design and the Company's two BACT recommendations, all of which are less than $1,000 per ton.

The remaining two designs that would minimize water requirements incorporate 110 MW dry combustors and SCR without power augmentation -- one design including and one design not including 45 days of oil-fired generation. The two SCR-based designs would result in combined emissions of NOx and ammonia of over 2.9 pounds per net kWhr, and would incur NOx removal costs of $901 per ton with 45 days of oil-fired generation and $2,129 per ton without oil-fired generation.

212/ The Siting Board notes that in supporting a water requirement of 385,000 gpd, as part of the base dry combustor design, the Company pointed to its efforts to minimize water requirements through 215,000 gpd of water reduction measures and prospective additional savings stemming from likely Company contributions to leak protection programs. In now advancing its BACT recommendations, the

Based on the foregoing, the Siting Board makes no findings as to whether the environmental impacts of the proposed facility at the primary site would be minimized with respect to water supply, consistent with minimizing cost and other environmental impacts.[213] In its final petition, we would expect the Company to provide additional analysis to support a level of facility water requirements greater than 385,000 gpd, if proposed. Such analysis should describe and evaluate the trade-offs between air quality impacts, water requirements and cost for a range of power augmentation levels, sufficient to justify the level of power augmentation selected. In addition, such analysis should identify specific options for Company participation in water conservation, source protection and source development efforts, in conjunction with the water supply planning of the MWRA and local communities, capable of offsetting a meaningful share of the Company's water requirements.

Company can no longer include the 135,000 gpd portion of water use reduction associated with substitution of dry combustor technology, as that would be more than offset by increased power augmentation. The Company's water use reduction efforts thus would be significantly smaller under the BACT recommendations, both in absolute terms and as a percentage of the higher water requirements under such designs.

213/ In regards to the Company's selection of proposed and backup water supply plans, the record indicates that both plans would rely on MWRA supply resources, which are adequate to meet the needs of the proposed facility and existing water users until at least 2000 and possibly 2020. Based on a 385,000 gpd water requirement, the proposed water supply plan is the least costly and requires only limited off-site improvements.

The backup water supply plan is approximately 50 percent more costly than the proposed plan, and is marginally more costly than one of the other preferred alternatives -- use of MWRA wastewater. Further, the Company failed to address various potential environmental impacts of barging under the backup water supply plan, such as air emissions and fuel handling risks. Thus, the Company failed to develop adequate information to compare the environmental impacts of the backup water supply plan and the alternative of using MWRA wastewater. Therefore, the Company failed to establish that, in the event it cannot proceed with the proposed water supply plan, use of the backup plan would ensure minimization of environmental impacts consistent with minimizing costs.

Should the Company provide the above analysis, in conjunction with use of the proposed water supply plan, the Siting Board would be able to determine whether environmental impacts of the proposed facility at the primary site would be minimized with respect to water supply, consistent with minimizing air quality impacts and cost.

E. Analysis of Proposed Facilities at the Alternative Site

1. Environmental Impacts of Proposed Facilities at the Alternative Site

a. Air Quality

(1) Description

BECo indicated that ambient air impacts would generally be less within the Ironstone site area than the Edgar site area (Exh. HO-RR-109). In order to estimate the air quality impacts at the Ironstone site, the Company performed screening-level analysis using dispersion models and assumptions consistent with the screening level analysis conducted for the Edgar site (id.).[214] The Company then compared the Ironstone screening level analysis to the Edgar screening level analysis and determined that, based on differences in terrain, surrounding land use and existing site structures, maximum impacts at the Ironstone site would be approximately 73 percent of the maximum impacts at the Edgar site (id.). BECo then estimated air quality impacts at the Ironstone site by multiplying Edgar refined modeling results by 0.73 (id.).

With regard to CO and NOx emissions, BECo indicated that its analysis demonstrated that impacts at the Ironstone site would be below significant levels, demonstrating compliance with NAAQS without further modeling (id.). With regard to PM-10 and SO_2 emissions, the Company indicated that impacts

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214/ In conducting screening level analysis for the Ironstone site, the Company utilized the same assumptions regarding meteorology and facility design that were used for the Edgar site, but used differing inputs regarding terrain and urban or rural dispersion coefficients (Exh. HO-RR-109, attach. p. 2). In addition, screening level analysis at the Edgar site included the downwash effects of the existing generating structure at that site (id.).

would exceed significant levels and that therefore, more comprehensive analysis, including interactive source modeling and the addition of ambient background levels, would be required to demonstrate compliance (id.). However, BECo did not evaluate the existing ambient background concentrations at the Ironstone site (id., attach. p. 4). Instead, in order to assess background air quality at the Ironstone site, the Company compared the land use, population density and presence of other major emissions sources within the Ironstone site area to the Edgar site area,[215] and reviewed existing Massachusetts, Connecticut and Rhode Island emissions data for the Ironstone site area (id., p. 2, attach. pp. 5-6). BECo concluded that, based on the rural nature of the Ironstone site area and minimal number of emissions sources in the region, it is highly likely that background concentrations would be lower at the Ironstone site (id.). Thus, the Company further concluded that the Ironstone site region would have a greater air quality margin for growth than the Edgar site region, and that operation of the proposed facility at the Ironstone site would meet all air quality standards (id., attach. p. 6).

Even though air quality impacts would comply with existing standards by a wider margin at the Ironstone site, BECo asserted that the key determinant in comparing the two sites was compliance with NAAQS rather than margin of compliance (BECo Site Banking Brief, p. 17). Thus, BECo maintained that air quality impacts would be equivalent at the two sites (id.). However, BECo maintained that location of the proposed facility at the Ironstone site which is close to the Rhode Island border would likely require Rhode Island as well as Massachusetts permitting, and on this basis, BECo considered the Edgar site to be preferable (id.).

(2) Analysis

215/ The Company noted that the Edgar site was located within a heavily developed urban/industrial area while the Ironstone site area was rural, with less commercial/industrial development and fewer emissions sources (Exh HO-RR-109, attach., p. 5).

The record demonstrates that the Company assessed the air quality impacts of the proposed facility at the alternative site using quantitative and qualitative means. The Company performed the first step of a dispersion modeling analysis -- a screening level analysis -- and then estimated facility impacts by scaling results of the Edgar refined modeling analysis based on a comparison of the screening level analysis for the two sites. BECo compared land use, emissions sources and other characteristics of the two sites and then estimated background concentrations at the Ironstone site. The Company concluded that these concentrations are likely to be less than background concentrations at the Edgar site. BECo then concluded that air quality impacts of the proposed facility would be less at the Ironstone site than at the Edgar site, but that neither site was preferable with regard to air quality since operation of the proposed facility at either site would comply with all air quality regulations.

For the reasons set forth in Section II.D.1.a., above, the Siting Board determined that it would be premature at this time to determine whether air quality impacts of the proposed facility at the primary site have been minimized. Similarly, it would be premature for the Siting Board to determine, at this time, whether the air quality impacts of the proposed facilities at the alternative site have been minimized.

Therefore, the Siting Board finds that the Company has not provided sufficient information on the environmental impacts of the proposed facilities at the alternative site with respect to air quality for the Siting Board to determine whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to air quality.

Accordingly, based on the foregoing, the Siting Board makes no finding as to whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to air quality.

In comparing the two sites, the record demonstrates that, where measured, existing background concentrations of criteria pollutants in the vicinity of the Edgar site are greater than 50 percent of the NAAQS. Further, assuming use of 0.3 percent oil, estimated concentrations with facility

operation could exceed 60 percent of the NAAQS for all averaging periods for PM-10, SO_2 and NOx, and 90 percent of the standards for 24-hour SO_2, one-hour NOx, and annual PM-10 (See Table I).[216] Although there is no evidence in the record specifying the existing background concentrations and total future concentrations with facility operation at the Ironstone site, the record demonstrates that such concentrations would be lower than the primary site.

In comparing the air quality impacts at the two sites, the Siting Board disagrees with BECo that the key determinant is compliance with NAAQS. Where existing concentrations at one site already exceed 50 percent of NAAQS for criteria pollutants and facility operation could increase concentrations of certain pollutants above 90 percent of NAAQS, the margin of compliance must be considered in comparing the two sites. Thus, based on the Company's current analysis of air quality impacts, the Siting Board finds that the air quality impacts at the Edgar site would be greater than the air quality impacts at the Ironstone site.

The Siting Board recognizes that each of the Company's most recent fuel mix proposals would reduce impacts. As noted above in Section II.D.1.a.(1)(a), facility SO_2 and PM-10 impacts would be significantly reduced with increased use of natural gas and use of back-up fuel oil with reduced sulfur content. In addition, the emissions offset proposal has the potential to reduce overall emissions in the Edgar site vicinity. It is therefore possible that facility emissions would be reduced such that increases over background concentrations would be negligible or that overall air quality in the vicinity of the Edgar site would be improved. The Siting Board notes, however, that an emissions offset approach could be implemented at the Ironstone site. Thus, further reductions in air emissions impacts are equally likely to occur at either site.

In sum, the air quality impact analysis in the record demonstrates that construction of the proposed facility at the alternative site would be

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216/ With respect to annual averaging periods, the Company's estimates are based on oil use for the entire year. See n.99, above.

preferable to the primary site, with respect to air quality impacts.[217]

Accordingly, based on the foregoing, the Siting Board finds that the Ironstone site is preferable to the Edgar site with respect to air quality impacts.

b. Surface Water Quality/Wetlands

(1) Description

The Company indicated potential impacts at the alternative site related to surface water quality and wetlands. With respect to surface water quality at the alternative site, the Company stated that the Blackstone River is only in marginal compliance with applicable water quality standards but that water quality is believed to have improved over the past 12 years (Exhs. BE-6,p. 5-30, UX-4, pp. 3-43, 3-44, HO-E-38). Although it has conducted no tests, the Company reported that it anticipated contamination in the form of high levels of chromium and PCBs (Exh. HO-E-38). BECo stated that this would be consistent with past industrial uses of the Blackstone River (Exh. UX-4, pp.3-43). The Company indicated that in spite of possible high chromium and PCB levels, generating facility waste treatment systems could be designed, as at the primary site, to ensure that river water quality standards would not be violated (Exhs. BE-6, p. 5-30, HO-E-38, UX-7). The Company stated that the necessary water treatment technology to meet water quality discharge standards, including acceptable levels of chromium and PCBs, was readily available (Exhs. UX-7, UX-5, p. 37).

The Company also provided an analysis indicating that the water requirements of its proposed facility could be withdrawn from the Blackstone River consistent with criteria established under the Water Management Act

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217/ With regard to BECo's argument that the Edgar site would be preferable because the Ironstone site would require Rhode Island and Massachusetts permitting, the Siting Board notes that it does not consider multiple state permitting requirements in comparing the air quality impacts at two sites.

(Exhs. HO-RR-84, HO-RR-78). (See G.L. c. 21G).[218] The Company indicated concern, however, that if the flow and quality of Blackstone River water was sufficiently marginal, that it might be necessary for the Company to restrict use of river water at the Ironstone site during severe drought periods to protect water quality (Exh. BE-6,p. 5-30).

BECo stated that the Blackstone River does not provide habitat conditions which the Company expects to be suitable for any rare or endangered aquatic species (id. BE-6, p. 5-29). However, the Company indicated that the opportunity exists for sport fishing based on the types of species noted among the river population (id., pp. 5-29, 5-30). The Company also noted that two ponds exist on the alternative site property which provide a suitable habitat and could be stocked for sport fishing (id.).[219]

The Company reported that construction and operation of intake facilities at the alternative site would result in the same potential for impingement as is expected at the primary site, in proportion to the volume of water withdrawn (Tr. 21, pp. 32-36, Tr. 51, pp. 36, 40).[220] The Company indicated that, with the exception of the impacts on clamming, dredging at the alternative site intake would have comparable impacts on aquatic ecology to those at the primary site (id., p. 37).

The Company stated that there would be no hydrothermal impacts at the alternative site due to the installation of a closed loop cooling system with ambient air rather than water as a heat sink (Exh. BE-6, p. 5-31).

218/ The Company indicated that the proposed facility would require withdrawal of 3.6 cubic feet per second ("cfs") while the Water Management Act would allow withdrawal of up to 84 cfs (Exh. HO-RR-84). Low flow was calculated over a range from 67.9 cfs to 95.20 cfs (Exhs. HO-RR-66, HO-RR-78).

219/ The Company noted, that unlike the primary site, use of the alternative site is not expected to result in adverse impacts on clamming (Tr. 51, p. 36).

220/ The ratio of the volume of water withdrawn at the primary site to the volume of water withdrawn at the alternative site is 80:1 (Tr. 51, p. 40).

With respect to wetlands, the Company reported that two brooks and two small ponds had been identified within the approximately 300 acre site, but stated that no detailed wetlands delineation had been performed (id., pp. 5-10 to 5-11; Exhs. UX-22, UX-24, HO-RR-81). The Company indicated that, as a preliminary matter, it had located the footprint of the facility near the center of the site close to the existing gas pipeline and transmission right-of-way to avoid impacting brooks and ponds elsewhere on the alternative site (Exh. UX-23). The Company further stated that an initial review of USGS topographic maps and a land use map completed by the University of Massachusetts indicated the feasibility of constructing and operating a combined cycle generating facility at the alternative site without wetlands encroachment (Exh. HO-RR-81).

The Company identified ROW requirements for gas supply and electric interconnections, as well as water supply and effluent discharge lines between the alternative site and the Blackstone River (Exh. HO-RR-114). Although the Company did not estimate the extent of affected wetlands, the Company's analysis indicated ROW requirements would be 14 acres, and could be as much as 451 acres (id.). The Company's analysis further indicated that the ROW requirements would vary greatly depending on whether or not construction of a combined cycle generating facility at the alternative site precipitated the need for an additional Carpenter Hill-Millbury transmission line (id.). See Section II.E.1.c, below.

Uxbridge presented a number of arguments with respect to Boston Edison's analysis of surface water quality impacts at the alternative site (Uxbridge Initial Brief, p. 30). Uxbridge asserted that the Company relied almost exclusively on the Ocean State Power ("OSP") DEIS for its analysis of cumulative water impacts at the Ironstone site (id., p. 30, citing Tr. 21, pp. 43, 148, 149). Uxbridge further asserted that the Company did not supplement the information derived from the OSP DEIS with its own investigation or analysis in several critical areas, including the area of water quality (id., p. 32-33). Uxbridge contended that this failure to conduct needed supplemental analysis was made evident by the Company's responses during

testimony (id.,
p. 33, citing Tr. 21, pp. 50, 55, 91, 97, 98). Similarly, Uxbridge argued, the responses provided by the Company during discovery examined the effect of water withdrawals on water quantity but not on water quality or aquatic life (id., p. 33; Exhs. UX-28, UX-6).

Uxbridge also noted that the Company, while considering the alternative site for an energy facility in 1984, had itself recommended that further analysis of the site was warranted with regard to water quality (Uxbridge Initial Brief, p. 36, citing Exh. UX-3, p. 1-6; Tr. 21, pp. 32-35). Uxbridge asserted that no such additional studies were performed (Uxbridge Initial Brief, p. 36). It therefore contended that the Company's water quality analysis was incomplete and deficient even by its own standards (id., citing Exh. UX-3, p. 1-6; Tr. 21, pp. 32-35).

With respect to wetlands, Uxbridge claimed that the Company's consideration of wetlands impacts at Ironstone was inadequate in several respects, including the failure to delineate wetlands and examine potential impacts of the facility on wetlands (Uxbridge Initial Brief, p. 36, citing Tr. 27,
pp. 44-45; Exhs. UX-22, UX-23, UX-24; Tr. 22, pp. 36-37).

(2) Analysis

With respect to surface water quality, the Company has argued that generating facility waste treatment systems could be designed at the alternative site to ensure that river water quality standards would not be violated. The record indicates that applicable criteria would allow BECo to withdraw the 3.6 cfs of water required for the proposed facility from the Blackstone River. However, river flow and surface water quality is sufficiently marginal that BECo might need to limit its use of river water during severe drought periods. The Siting Board notes that OSP was required to adhere to minimum flow criteria. Here, the Company has not conducted any water quality analysis concerning the different flow levels of the Blackstone River.

Furthermore, we agree with Uxbridge that the Company's analysis of potential impacts at the Ironstone site is incomplete and inadequate in regard to water quality. In one previous review of a proposed 1.35 cfs wastewater effluent diversion for a generating facility in the Charles River basin, extensive analysis of stream flow, water quality and riverine ecology was provided to support the proposed diversion. See Enron, 23 DOMSC at 140-181. The Siting Board reiterates that all developers of proposed facilities are obligated to provide detailed information regarding the impacts of the proposed facility at both the primary and alternative site(s). Enron, 23 DOMSC at 212.

With respect to wetlands, the Company relied on the site observations of its witnesses and a land use map developed by the University of Massachusetts to support its position that it would be possible to site the proposed facility on the alternative site without encroaching on wetlands. However, the map does not appear to be focused on wetlands or other natural resources, and includes a limited number of relatively large wetlands. We agree with Uxbridge that the Company's delineation of wetlands and analysis of wetland impacts is not based on a detailed site investigation. In sum, the Company did not conduct an adequate analysis of water quality nor did it provide evidence to allow an evaluation of the likelihood of wetlands encroachment at the alternative site.

The Siting Board finds that the Company has not provided sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to surface water quality and wetlands for the Siting Board to determine whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to surface water quality and wetlands.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would not be minimized with respect to surface water quality and wetlands.

In comparing the primary and alternative sites, the Company has argued that dredging impacts on aquatic ecology at the alternative site would

be the same as those at the primary site. The Company has acknowledged, however, that the rate of withdrawal at the alternative site would be one-eightieth the rate at the primary site. A reduced rate of withdrawal at the alternative site suggests that less dredging for intake purposes may be required with proportionately less impact on aquatic ecology. Additionally, there would be no impact on shellfishing at the alternative site.

Further, with respect to impingement of fisheries, the record indicates that the potential for impingement at the intake structure at the alternative site would be the same as that at the primary site, in proportion to the volume of water withdrawn. Again, as the rate of withdrawal at the primary site would be eighty times that at the alternative site, the associated impacts on aquatic ecology at the primary site would be greater than those at the alternative site. In addition, the record indicates there would be no hydrothermal impacts at the alternative site due to the installation of a closed loop cooling system which would use ambient air rather than water as a heat sink.

Nevertheless, the record also demonstrates the potential for significant water quality impacts at the alternative site associated with low flow conditions on the Blackstone River. Further, the record indicates the potential for impacts to wetlands at the alternative site in excess of those at the primary site.

Accordingly, based on the foregoing, the Siting Board finds that the primary site is preferable to the alternative site with respect to surface water quality and wetlands impacts.

c. Land Resources

(1) Description

BECo stated that the alternative site consists of approximately 300 acres, of which 20 to 25 acres would be cleared and used for the proposed facility (Exh. BE-6, p. 5-10; Tr. 55, p. 133). The Company also indicated that it expects that use of the alternative site would require approximately

one mile of local road improvements (Exh. BE-48, AS-1, p. 10).[221]

BECo indicated that an additional area of approximately 426 acres would be required for new and expanded ROW in conjunction with siting the proposed facility at the alternative site (Exh. HO-RR-114). Specifically, BECo's estimates for these ROW's include four acres for the natural gas lateral pipeline, six acres for water supply and discharge, four acres for transmission interconnection, and an additional 412 acres for transmission reinforcement (id.).[222]

BECo stated that, based on its review of an aerial photograph of the alternative site, the areas that would be occupied by the natural gas pipeline and the electric power transmission interconnection are entirely wooded, and would therefore need to be cleared of existing trees (id.; Exh. BE-6, Fig. 5.6.3-1). The Company also claimed that areas adjacent to public ways which would be followed for the purpose of routing water supply and effluent lines are also heavily wooded, requiring tree clearing from these areas (Exh. HO-RR-114). BECo further stated that based on the rural nature of the towns traversed by the Millbury to Carpenter Hill 345 KV ROW, most of the 412 acres of land necessary to establish a new 345 KV circuit for transmission reinforcement -- as required for operation of the proposed facility at the alternative site -- would also need to be cleared of trees (id.).

221/ BECo provided a map indicating that the site could be accessed from State Route 146 by using a section of Elmwood Avenue, approximately one mile in length (Exh. BE-6, Fig. 5.6.2-1). BECo did not provide the Siting Board with an estimate for the width of any additional tree clearing necessary for local road improvements.

222/ BECo indicated that the proposed facility at the alternative site would be interconnected to BECo's transmission line 336, which extends between BECo's West Medway, MA substation and Eastern Utility Associates ("EUA") Sherman Road substation in Rhode Island (Exh. HO-RR-125). However, the Company indicated that the required transmission reinforcement would involve improvements on a different segment of the regional transmission system -- specifically, the addition of a new 17-mile 345 kV circuit extending between the Millbury, MA substation and the Charlton, MA substation (id.; Exh. HO-RR-114).

Mr. Schmidt explained that cooling and process water would be obtained via a pipeline which would run from an intake structure located on the bank of the Blackstone River to the proposed facility (Tr. 32, p. 53-54). Mr. Schmidt further stated that no detailed pipeline routing had been developed (id.). Although estimating that six acres would be cleared for the water supply and effluent pipelines, BECo stated it would endeavor to follow public streets and ROW's as much as possible (id.; Exh. HO-RR-114). Dr. Morgenstern added that comparison of the impacts of cooling water facilities at the primary site and the alternative site was difficult because the actual intake location and pipeline route was not yet determined at the alternative site (Tr. 32, pp. 57-58).

With respect to transmission, BECo noted that the transmission reinforcement along the Millbury, MA to Charlton, MA ROW would be required with operation of the proposed facility at the alternative site, based on analyses of regional power flows (Exhs. HO-RR-124, HO-RR-125).[223] However, BECo stated that the transmission reinforcement may be required in the future to accommodate power flows on the regional transmission system, even without installation of the proposed facility at the alternative site (Tr. 56, pp. 151-152).

(2) Analysis

The Company's overall estimate of the extent of tree-clearing required for siting the proposed facility at the alternative site -- approximately 0.7 square mile -- is well above that identified for siting

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223/ BECo acknowledged that the transmission reinforcements which it claims are necessary between Millbury, MA and Carpenter Hill in Charlton, MA if the proposed facility is constructed at the alternative site, are identified as a planned transmission improvement on behalf of the Massachusetts Municipal Wholesale Electric Company in schedule 4 of the New England Power Pool 1992 Report on Capacity, Energy, Load and Transmission (Exh. HO-RR-124).

other generating facilities in previous Siting Council reviews.[224] We note, however, that based on BECo's analysis, most of the forestland displacement would occur as a result of clearing 412 acres for the transmission reinforcement between Millbury and Charlton.

As recognized by the Company, the transmission reinforcements could be required due to future load growth and/or future New England Power Pool ("NEPOOL") dispatching requirements, even if the proposed facility is not constructed at the alternative site. Thus, depending on when BECo might proceed with its project, installation of the proposed facility at the alternative site may or may not be the determining factor relating to need for the identified transmission reinforcement. In addition, we note that the transmission reinforcement, if pursued, would be the subject of a separate Siting Board review. Such a review would include consideration of project alternatives, siting alternatives, design alternatives and other possible mitigation for the transmission reinforcement, any of which could significantly reduce the tree clearing requirement estimated by the Company. Thus, the importance of the transmission reinforcement's environmental impacts as part of the evaluation of the alternative site for the proposed facility are somewhat diminished.

Regarding BECo's estimate that six acres would be cleared for the water supply and effluent pipelines, the Siting Board notes that use of existing ROWs may reduce the area cleared. We also note, however, that BECo expects use of the alternative site would require approximately one mile of local road improvements
-- an additional factor that could result in tree clearing. Considering both the water supply/effluent pipeline ROW requirement and the local road improvement requirement, we conclude that it is reasonable to expect 25 feet of roadside tree clearing for a distance of at least a mile -- an area of

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224/ The largest estimate of total tree clearing requirements in a previous generating facility review was approximately 50 acres. EEC Compliance, 25 DOMSC at 350.

three acres.[225] Therefore, for the purposes of this review, the Siting Board accepts an estimate of three to six acres of forestland displacement for purposes of local road improvements and installation of the water supply/effluent pipeline.

Thus, at a minimum, direct tree clearing requirements of between 31 and 39 acres would be required for construction of the proposed facility at the alternative site, including transmission interconnection, fuel supply, and water supply/effluent connections. Within that range, the Company would endeavor to minimize tree clearing for water supply/effluent pipelines by maximizing use of existing ROWs.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to land resources, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to land resources.

The record demonstrates that the Company would implement facility design and mitigation measures that adequately ensure a minimum impact on the environment with respect to land resources.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would be minimized with respect to land resources.

In comparing the primary and alternative sites, the record indicates that the land resource impacts would be significantly greater at the alternative site, regardless of whether BECo's 412-acre estimate of necessary ROW expansion for the transmission reinforcement is included. With respect to the primary site, a permanent displacement of approximately 17 acres of forestland would occur as a result of the proposed 10.7-mile natural gas pipeline. However, no additional tree clearing would be required as a result

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225/ The utility ROW out of the site to Elmwood Avenue and continuing along Elmwood Avenue represents over half of the likely water supply/effluent pipeline route.

of the construction and operation of the proposed facility at the primary site.[226] In contrast, the alternative site would require that between 31 and 39 acres be cleared and used for construction of the proposed facility, including the facility site and ROWs for the transmission interconnection, fuel supply, and water supply/effluent connections.

Accordingly, based on the foregoing, the Siting Board finds that the primary site is preferable to the alternative site with respect to land resource impacts.

d. Noise

(1) Description

BECo stated that it would limit the increase in noise from the proposed facility at the nearest residence to within 10 decibels above existing site area ambient sound levels by providing silencing equipment at major sources of facility noise (Exh. HO-E-62). Further, the Company stated that the size and wooded nature of the alternative site would provide a significant attenuating effect on noise impacts at the nearest residences (id.).

BECo stated that the alternative site is surrounded by a predominantly rural environment consisting of residential, agricultural and vacant areas with light traffic (Exh. BE-48, p. 22). The Company indicated that the nearest residence is located 1,460 feet from the center of the facility, on East Ironstone Road (Exhs. HO-RR-86, HO-RR-107). The Company stated that there are no stationary noise sources on or near the site, but noted that there is daytime noise from a quarry operation located to the east of the site (Exh. BE-49, p. 37).

The Company stated its noise analysis was based on background noise levels from the OSP FEIS, which BECo considered to be a good approximation of

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226/ Although, as previously noted by BECo, a total of 20 acres of forestland would be initially cleared along the entire length of the proposed natural gas pipeline route, 3.1 acres would be allowed to revegetate after construction is completed (Exh. HO-E-102, Resource Report 3, p. 10; Tr. 56, p. 135).

ambient sound levels in the vicinity of the alternative site (Exh. HO-RR-108).[227] BECo indicated that the highest predicted increase at Elmwood Avenue, a residential receptor located a distance of 1,760 feet from the center of the proposed facility, would be 6.0 decibels (id.). The Company also indicated that the highest predicted increase at the nearest property line, a distance of 1,000 feet, would be 9.1 decibels (Exhs. HO-RR-108 Rev.).

The Company stated that it would utilize mitigation methods for the alternative site similar to those proposed for the primary site (see Section II.D.1.d, above) (Tr. 54, p. 146).

(2) Analysis

The Company's noise attenuation estimates for the alternative site are based on a piecemeal analysis which includes some internal inconsistencies.[228] The Siting Board reiterates that all developers of proposed facilities are obligated to provide detailed information regarding the impacts of the proposed facility at both the primary and alternative site(s). Enron, 23 DOMSC at 212.

In regard to mitigation techniques for the alternative site, the Company indicated that it would incorporate mitigation methods on the order of those proposed for the primary site. The Siting Board notes, however, that the Company did not identify which mitigation would be considered and that the

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227/ OSP is located in Burrillville, Rhode Island. The Company indicated that the close proximity of OSP and the similarity of surroundings are appropriate for use as ambient noise measurements (Exh. HO-RR-106). The Company had estimated the night time noise level at the alternative site to be 30 decibels, and found that the minimum noise levels at OSP were comparable (id., Exh. BE-48, p. 22).

228/ The Company stated that the closest residence was at East Ironstone Street. However, BECo based its noise analysis on a residence located approximately 300 feet further away on Elmwood Avenue. The increase at East Ironstone Street, the closest residential receptor, likely would fall somewhere between the 6.1 decibels estimated at Elmwood Avenue and 9.1 decibels estimated at the nearest property line to the site.

specific measures proposed for the primary site may not be the most effective measures for the alternative site. Therefore, the Company has provided minimally sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to noise. The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to noise impacts, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to noise.

The record demonstrates that the Company would implement facility design and mitigation measures that would ensure a minimum impact on the environment with respect to noise impacts.

Accordingly, based on the foregoing, the Siting Board finds that with the implementation of mitigation measures, the environmental impacts of the proposed facility at the alternative site would be minimized with respect to noise impacts.

With respect to comparing the primary and alternative sites, the Company asserted that although MDEP guidelines could be met at either site, nighttime ambient noise levels surrounding the alternative site are lower than those surrounding the primary site, therefore the proposed facility would provide a better acoustical fit at the Edgar site (Exh. BE-48, p. 37; Tr. 54, p. 158).

The Siting Board notes that the increase in noise levels at the residential receptors are similar for the primary and alternative sites. The Siting Board also notes that while the wooded nature of the alternative site would help buffer noise emissions to the nearest residences, the primary site would have a 60-foot wooded buffer adjacent to the nearest residence. Further, the Siting Board notes that mitigation techniques would be applied at either site. Therefore, based on the foregoing, the Siting Board finds that the primary site is comparable to the alternative site with respect to noise impacts.

e. Water Supply

(1) Description

The Company stated that it would obtain cooling and process water from the Blackstone River to operate the proposed facility at the alternative site (Exh. HO-RR-84). The Company indicated it would utilize 3.6 cubic feet per second ("cfs") of water, based on a nominal 300 MW combined cycle generating facility with closed cooling (id.). The Company stated that it would incorporate water demand reduction measures at the alternative site, similar to those at the primary site, including use of dry combusters and reuse of an average of 29,000 gpd of on-site stormwater runoff (Tr. 55, pp. 134-135).

The Company stated that adequate water would be available from the Blackstone River for the proposed project (Exh. HO-RR-84). In support, the Company presented an analysis indicating that, based on generally applicable criteria for ensuring minimum stream flow under the Water Management Act, M.G.L. c. 21G, a maximum of 84 cfs could be withdrawn at the expected alternative site intake location on the Blackstone River (id.). The Company noted the recent installation of the OSP project, which utilizes approximately 7 cfs from a downstream location on the Blackstone River, and stated that an adjustment for the OSP withdrawal still would result in a remainder of 77 cfs available for withdrawal consistent with Water Management Act criteria (id.).

With respect to possible conflict between required withdrawals for the alternative facilities and those for the existing OSP project, the Company provided information indicating that the OSP project is subject to permit conditions requiring that withdrawals be reduced or discontinued under certain circumstances when flow in the Blackstone River is less than 102 cfs (Exh. UX-85).[229] The Company also stated that the OSP project has no backup water

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229/ The Company indicated that since the OSP project went on-line, Blackstone River flow has dropped below 102 cfs on several occasions (Tr. 51, pp. 16-17). However, the Company cited newspaper accounts indicating that such flow conditions may have resulted from unauthorized flow interruptions by upstream dam owners, and concluded that the low flow conditions may not occur with the same frequency in

supply, and therefore must cease operations if Blackstone River withdrawals are discontinued (Exh. HO-RR-85).

The Company asserts that the expected withdrawal of 3.6 cfs (2.3 mgd) from the Blackstone River for the alternative facilities would represent only a fraction of the amount of water available from the river under applicable state criteria (BECo Site Banking Brief, p. 20). However, the Company acknowledges that, based on the experience of Weymouth in unsuccessfully seeking approval under the Water Management Act to expand its water system to serve the proposed facilities at the primary site, as well as intervenor opposition to use of the alternative Ironstone site, some uncertainty must be accorded to the prospects of obtaining necessary approval to utilize the Blackstone River for facility water requirements (id., pp. 20-21). Therefore, the Company asserts that, based on the potential uncertainty of obtaining a water supply at the alternative site, in comparison with the certainty of the availability of the proposed or backup water supply plan at the primary site, the primary site is preferable to the alternative site (id., p. 22).

Uxbridge argues that the alternative site is not acceptable for the facility because the required water withdrawals would significantly and adversely affect the Blackstone River (Uxbridge Initial Brief, p. 40). Uxbridge's witness, Mr. Cohen, stated that the Blackstone basin contains a low proportion of stratified drift deposits, so that the river is subject to extreme drought conditions in periods of low rainfall (Exh. UX-66, p. 4-5). Uxbridge also argues that BECo has not analyzed the possibility of obtaining alternative water supply sources should it be unable to withdraw water from the Blackstone River (Uxbridge Initial Brief, p. 33).

(2) Analysis

The record demonstrates that the proposed withdrawal of 3.6 cfs from the Blackstone River for the proposed facilities at the alternative site would be consistent with generally applicable criteria under the Water Management

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future years (id., pp. 17-19).

Act. However, the Company acknowledges some uncertainty about its prospects for obtaining Water Management Act approval.

For a similar, albeit somewhat larger withdrawal at the downstream OSP project in Rhode Island, low flow withdrawal restrictions were deemed necessary by regulators. The Siting Board notes that, in its previous review of a proposed 1.35 cfs wastewater effluent diversion for a generating facility in the Charles River basin, extensive analysis of stream flow, water quality and riverine ecology was provided to support that proposed diversion. Enron, 23 DOMSC at 140-181. The Siting Board reiterates that all developers of proposed facilities are obligated to provide detailed information regarding the impacts of the proposed facility at both the primary and alternative site(s). Enron, 23 DOMSC at 212.

In addition to raising uncertainties with regard to low flow impacts on the river itself, the alternative site water supply raises the prospect of water use conflict with the downstream OSP project. Given the applicability of a low flow withdrawal restriction and the absence of a backup supply for the OSP project, any sizable upstream withdrawal for consumptive purposes would increase the potential for temporary OSP project shutdowns. In order to ensure that the potential for water use conflict would be minimized, additional information on existing and expected future stream flow, as well as any existing and possible additional arrangements for coordinating management of stream flows among major withdrawers and dam operators along the Blackstone River, would be necessary.

With respect to the level of water use, the Company has indicated its willingness to incorporate water use reduction measures corresponding to those at the primary site, including on-site stormwater reuse and use of dry combustor technology (see Section II.D.1.e., above). However, as discussed in the analysis of the primary site, the Company has identified design options which would allow the Company to reduce water requirements below the level assumed in its water supply analysis by an additional 351,000 gpd.

The Siting Board finds that the Company has not provided sufficient information on the environmental impacts of the proposed facility at the

alternative site with respect to water supply for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to water supply.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would not be minimized with respect to water supply.

With respect to comparison of the primary and alternative sites, there are regulatory uncertainties and the long term potential for conflict with the interests of other water users at both sites. In addition, the Company's revised BACT analysis recommends use of 100 MW dry combustor designs that require substantially more water than the base dry combustor design, which the Company assumed in its analysis of the environmental impacts of the proposed facility with respect to water supply at both the primary and alternative sites.

However, the proposed and backup water supply plans at the primary site would rely on MWRA supply resources, which appear adequate to meet the needs of the proposed facility and existing water users until at least 2000 and possibly 2020. Further, the Company would need to comply, under its proposed water supply plan, with City of Quincy and MWRA water service connection requirements that appear to ensure some level of contribution by the Company to help maintain the integrity of system supplies. In contrast, the alternative site water supply would rely on withdrawals from the Blackstone River, resulting in potential water supply conflicts with the OSP project which could arise at any time after the proposed facility comes on-line. Further, the record identified no existing mechanisms for coordination among major river water users on the Blackstone River.

Accordingly, based on the foregoing, the Siting Board finds that the primary site is preferable to the alternative site with respect to water supply.

f. Land Use

(1) Description

BECo stated that the alternative site consists of over 300 acres, located in a rural setting (Exh. BE-6, pp. 5-10, 5-11). The Company indicated that the site consists of a second growth forest which comprises 84 percent of the site and agricultural lands which comprise 15 percent of the site area (Exhs. BE-6, p. 5-11, UX-56). BECo asserted that, based on the undeveloped character of the alternative site and the existing power generation development at the primary site, the proposed facility would have a significantly lesser land use impact if located at the primary site rather than at the alternative site (BECo Initial Brief, p. 204). However, the Company indicated that while power generation and operation at the alternative site would represent a change from the current use, no economic loss would result (Exh. BE-6, p. 5-32).

BECo stated the alternative site is bounded on the south by the Massachusetts/Rhode Island state line, on the north by a residential strip development along Elmwood Avenue and on the east by South Street (Exh. BE-6, p. 5-10). The Company stated that the western site boundary extends to within 800 feet of a residential development along Glendale Street (id.). The Company stated that surrounding land uses within a one-mile radius of the alternative site are approximately 65 percent vacant and 35 percent residential/agricultural (id., p. 5-11).

The Company indicated that the site is zoned for agricultural use, and that the surrounding land is also zoned as agricultural, with the exception of an area zoned for business and industrial to the east and northeast (id.). The Company noted that Uxbridge amended its Zoning By-laws in January 1989, to specifically prohibit the "commercial manufacture of electricity through the use of an electrical generating facility or cogeneration facility as a principal activity" in Uxbridge (id.). The Company stated that it would apply to the DPU to seek an exemption from local zoning requirements, thus addressing both regulatory zoning issues and the by-law amendment, on the grounds that the facility is needed to serve the public interest (Exh. HO-RR-57A, p. AS-2-3).

BECo indicated that ROW requirements would include interconnections

to a 345 kV transmission line and a Tennessee pipeline located approximately 100 feet and 1,400 feet, respectively, from the northwest point of the alternative site (Exh. BE-6, p. 5-11). In addition, the Company asserted that it would have to undertake a 17-mile 345 kV electric transmission reinforcement project along existing ROW extending from Millbury to Charlton, Massachusetts (Tr. 56, p. 144). See Section II.E.1.c., above.

With respect to historic preservation, the Company noted that the site includes the Richardson Farm and a portion of the BRVNHC (Exh. UX-38). The Company asserted that the location of the facility at the primary site would have far less impact since locating the facility at the alternative site would have some degree of impact on historic and archeological resources (BECo Initial Brief, p. 214). However, the Company asserted that the alternative site does not contain any historical or cultural factors which would preclude the siting of the facility (id.). Further, the Company argued that Federal law establishing the BRVNHC does not prohibit power plants (id.).[230] BECo noted that the Richardson Farm is not located in a historic district, nor is it listed on the Register of Historic Places (Tr. 28, pp. 61-62). Uxbridge's witness, Mr. Pepper, stated that the site contains an old Georgian Farmhouse, an active sawmill, and several other old, but actively used buildings (Exh. UX-38, p. 4). Mr. Pepper also stated that approximately 245 acres of the site are classified as active forest land and 25 acres are classified as active farmland (id.)

Mr. Pepper raised concerns about the effects on the nationally significant character of the Blackstone River Valley, and stated Uxbridge's opposition to building the facility without additional information from the Company (Tr. 28, p. 54). Mr. Pepper stated that the Company has not addressed pertinent national policies or the consistency questions concerning the historic nature of the Richardson Farm and the Blackstone River Valley (id.,

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230/ Public Law 99-647 created the BRVNHC to preserve the unique and significant contributions to the national heritage of certain historic and cultural lands, waterways and structures within the Blackstone River Valley (Exh. UX-38, p. 2).

p. 84). Mr. Pepper admitted that neither the BRVNHC Commission nor anyone else, had yet ascertained the historic value of the Richardson Farm, but he maintained that the BRVNHC Commission believes that it is potentially historically significant (id., pp. 63, 95). Pointing to the recognition by the Company that the site is located in a national heritage corridor, Mr. Pepper emphasized the failure of the Company to analyze how the proposed facility would impact the site (id., p. 100).

Finally, Uxbridge argued that BECo did not analyze the overall impact that construction at the alternative site would have on historic preservation (Uxbridge Initial Brief, p. 34).

(2) Analysis

The record demonstrates that the development of the alternative site would alter presently undisturbed forested and agricultural lands. However, the Siting Board recognizes that the size of the alternative site would present opportunities to buffer the proposed facility from surrounding land uses. Further, the Siting Board notes that the site is presently zoned for agricultural use and that the By-Laws of Uxbridge prohibit the construction of generation facilities in Uxbridge. However, the Siting Board agrees with the Company that the Town of Uxbridge By-law amendment prohibiting generating facilities should not be a deciding regulatory factor. The Company could seek zoning variances or exemptions from the appropriate agencies.

While we recognize the importance of the BRVNHC and the federally authorized efforts to protect the Blackstone River Valley, we cannot conclude that the alternative site is a historical and cultural land which the BRVNHC Commission was designed to protect. In fact, the alternative site would not displace historically significant features, and mitigation of visual and other impacts could preserve any unique features of the alternative site.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to land use, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine

whether the environmental impacts of the proposed facility would be minimized with respect to land use.

The record demonstrates that the Company would implement the facility design and mitigation measures that adequately ensure a minimum impact on the environment with respect to land use.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would be minimized with respect to land use. In comparing the primary and alternative sites, based on the undeveloped character of the alternative site and the existing power generation development at the primary site, the Siting Board finds that the primary site is preferable to the alternative site with respect to land use.

g. Visual Impacts

BECo stated that the proposed facility would be only moderately visible to areas surrounding the alternative site, with potential screening (Exhs. BE-6, p. 5-33; BE-48, p. 39). BECo further stated that due to the good landscape quality at the alternate site, the proposed facility would result in a moderate degree of change in visual quality (id.).

The Company stated that existing trees would heavily screen views of the proposed facility at the alternative site (Tr. 22, p. 18-21; Tr. 23, p. 9). The Company provided photographs of a balloon at an elevation of 250 feet to simulate the likely visibility of the stack from nine locations near the alternative site (Exh. HO-RR-44).[231] The photographs showed that viewers

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231/ The photographs were taken from the following locations: (1) in front of the Richardson farmhouse on East Ironstone Road, (2) behind the Richardson farmhouse approximately 250 feet from East Ironstone Road, (3) King Street approximately 1000 feet west of Glendale Street, (4) King Street approximately 2000 feet west of Glendale Street, (5) the intersection at Glendale Street and Elmwood Avenue, (6) South Street approximately 2000 feet north of East Ironstone Road, (7) South Street approximately 1300 feet north of east Ironstone Road, (8) King Street approximately 1500 feet north of the Douglas Pike, and (9) the Douglas Pike approximately 500 feet

would see a significant portion of the stacks from one location -- a section of South Street (id., Plate 7). In addition, the Company stated that there would be views of the proposed facility from some portions of Route 146 to the east of the alternative site (Tr. 22, pp. 18-19).

The Company stated that despite the fact that the alternative site and surrounding area is heavily treed providing good screening, any views of the proposed facility would be an extreme change from the current viewshed (Tr. 22, p. 23).

BECo asserted that the proposed facility would have a less severe visual impact at the primary site than at the alternative site (BECo Initial Brief, p. 205). The Company explained that, although the proposed facility would be more visible at the primary site than at the alternative site, it would be visually compatible at the primary site and visually incompatible at the alternative site (Exhs. BE-6, p. 7-24, BE-59, p. 6.7-2; Tr. 22, p. 23).

The Company has shown that the visibility of the proposed facility at the alternative site would be limited given the size of the site and the natural buffer of trees. Nonetheless, the two 245-foot high, 17-foot diameter stacks would be visible from some locations and would represent a significant change in the otherwise largely rural landscape. The Siting Board also notes that the visibility of the proposed facility at the alternative site, although limited based on the Company's photographs, likely would be greater during leaf-off conditions in the fall and winter.

Despite the possibility of significant visual changes in some locations, the record demonstrates that the proposed facilities would not have a major overall visual impact at the alternative site.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to visual impacts, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would

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west of the King Street intersection (Exh. HO-RR-44).

be minimized with respect to visual impacts.

The record demonstrates that the Company would implement facility design and mitigation measures that ensure a minimum impact on the environment with respect to visual impacts.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would be minimized with respect to visual impacts.

In comparing the proposed and alternative sites, BECo's analysis shows that location of the proposed facility at the primary site is likely to involve greater visibility than at the alternative site. In contrast to the rural nature of the alternative site, however, the industrial nature of the viewshed at the primary site would minimize the incremental visual impacts of the proposed facility at the primary site. Additionally, existing screening and BECo's proposed mitigation would further minimize visual impacts at the primary site. Therefore, the proposed facility would have a greater net impact on visual resources at the alternative site than at the primary site.

Accordingly, based on the foregoing, the Siting Board finds that the primary site is preferable to the alternative site with respect to visual impacts.

h. Traffic

The Company indicated that the alternative site is bordered on the south by the Massachusetts/Rhode Island state line and Elmwood Avenue, South Street and Glendale Avenue to the north, east and west, respectively, all single lane secondary roadways containing residential development (Exh. BE-48, AS-1, p. 10). The Company stated that the likely route of site access would be Interstate Highway 495 to State Route 16, then eleven miles west along State Route 16, four miles south along State Route 146 and one mile west along Elmwood Avenue (id.). The Company noted that construction of the proposed facility at the alternative site would require improvement of approximately one mile of local off-site roadway (id., p. 31).

The Siting Board notes that the Company did not provide a description

of the existing and estimated future traffic flow on any of the roadways leading to the alternative site or analyze potential impacts to traffic resulting from construction and operation of the proposed facility at the alternative site. Here again, the Company has failed to provide adequate analysis for the Siting Board to determine whether or not impacts would be adequately minimized at the alternative site. The Siting Board reiterates that all developers of proposed facilities are obligated to provide detailed information regarding the impacts of the proposed facility at both the primary and alternative site(s). Enron, 23 DOMSC at 212.

The Siting Board finds that the Company has not provided sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to traffic impacts for the Siting Board to determine whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to traffic impacts.

Accordingly, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site have not been minimized with respect to traffic.

In comparing the primary and alternative sites, the Siting Board notes that barge delivery of most of the heavy equipment, which would minimize truck deliveries to the primary site, would not be an option at the alternative site. Thus, construction at the alternative site would require a greater number of truck deliveries than would construction at the primary site and would have a greater potential to impact local traffic. Additionally, construction of the necessary improvements to Elmwood Avenue would, itself, cause some traffic disruption. Accordingly, based on the foregoing, the Siting Board finds that construction of the proposed facility at the primary site would be preferable to construction at the alternative site with respect to traffic impacts.

i. Safety

With respect to existing site conditions at the alternative site, the Company indicated that the site has been used for farming for at least 200

years and that it was not aware of any contamination problems at the site (Tr. 53, pp. 120-121). However, the Company noted that no hazardous waste investigations had been performed at the alternative site (Exh. HO-E-35). The Company further stated that required clearing of the construction areas at the alternative site also would be performed by mechanical means rather than by the use of herbicides (Exh. HO-E-36).

With respect to transport and storage of hazardous materials, the Company indicated that the same safety considerations that would be incorporated into facility design and operation at the primary site, including enclosure of ammonia tanks, would be incorporated into facility design and operation at the alternative site (Exhs. HO-E-74, HO-E-75, HO-RR-119). Finally, the Company stated that the fire protection system would be essentially the same at both sites (Exh. HO-E-37).

The record demonstrates that there are no apparent contamination problems at the alternative site but that no investigation of the soil and groundwater has been conducted. The Siting Council notes however, that, due to the farming use of the property for the past 200 years, it is unlikely that significant contamination, as that found on an industrial site, would exist at the alternative site. The record further demonstrates that safety considerations in the design and operation of the proposed facility would be the same at both sites.

The Siting Board finds that the Company has provided minimally sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to safety, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized with respect to safety.

The record demonstrates that the Company would implement facility design and mitigation measures that ensure a minimum impact on the environment with respect to safety.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would

be minimized with respect to safety.

In comparing the primary and alternative sites with regard to safety impacts, the Siting Board notes that, although it has found that the safety impacts can be adequately minimized at both sites, safety concerns differ at the two sites due to existing site conditions, and would be greater at the primary site. Subsurface soil and groundwater contamination, due to previous industrial uses, has been documented at the primary site, while contamination, to the same extent, would be unlikely at the alternative site. Construction and operation of the proposed facility could likely proceed at the alternative site without the site remediation requirements and worker protection precautions that would be required at the primary site.

Accordingly, based on the foregoing, the Siting Board finds that construction of the proposed facility at the alternative site is preferable to the primary site with respect to safety impacts.

j. Electric and Magnetic Fields

BECo indicated that the electrical power output from the proposed facility at the alternative site would be supplied to the area power system at BECo ROW 13 via a double circuit overhead transmission line interconnect approximately 1300 feet in length (Exh. HO-E-64).[232]

BECo provided the Siting Board with calculations of 60 Hertz EMF levels along the edges of its ROW 13, both northeasterly and southwesterly of the proposed tap, based on: (1) horizontal and vertical dimensional coordinates at the center of the transmission line span; (2) conductor size; and (3) net ampere loading for the individual conductors (id.). The Company's analysis indicated that, at an output level of 300 MW, the highest electric field would be 1.246 kV per meter, and that the highest magnetic field would

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232/ BECo indicated that it would extend a 345 KV loop from BECo transmission line 336 on ROW 13 to the Ironstone site and back to ROW 13 by utilizing a double circuit pole (Exh. HO-E-64). After rejoining ROW 13, the loop line would extend southwesterly, parallelling existing transmission lines for approximately 1.5 miles to the Sherman Road substation (Tr. 56, p. 144).

be approximately 48 milligauss.[233]

BECo stated that it has no programs presently underway to reduce EMF on existing transmission lines, and that future mitigation programs would be dependent upon on-going research and debate concerning actual limits on exposure to magnetic fields (Exh. HO-RR-116).[234] BECo acknowledged the existence of several industry practices utilized to mitigate EMF on transmission lines, such as the use of particular line configurations, phase spacing, and rolling of phases on adjacent circuits (id.).

In a previous review of proposed transmission facilities which included 345 kV transmission lines, the Siting Board accepted edge of right-of-way levels of 1.8 kV/meter for the electric field, and 85 milligauss for the magnetic field. 1985 MECo Decision, 13 DOMSC at 119, 228-242. Here, the Siting Board notes that the edge of ROW EMF levels associated with the alternative Ironstone site (345 kV transmission system) are well below the levels found acceptable in the 1985 MECo decision.

Nevertheless, the Siting Board expects that BECo would implement phase arrangements and/or extend all reasonable efforts to utilize any other known mitigation techniques to minimize EMF levels along its loop line as well as along affected existing transmission lines.

The Siting Board finds that the Company has provided sufficient information on the environmental impacts of the proposed facility at the alternative site with respect to EMF, including adequate consideration of facility design and mitigation measures, for the Siting Board to determine whether the environmental impacts of the proposed facility would be minimized

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233/ See Table 2 for complete data regarding the Company's calculations of EMF levels for the alternative site.

234/ The Siting Board notes that BECo's existing transmission lines are not ancillary facilities as defined in G.L. c. 164, § 69G. However, in order to allow comprehensive analysis and comparison of environmental impacts of the proposed and alternative generating facilities, the Siting Board may address any potentially significant effects of such facilities on EMF levels along existing transmission lines.

with respect to EMF.

The record demonstrates that the Company's construction plans, including possible future use of reasonable measures to minimize EMF impacts on portions of the existing transmission system affected by the proposed facility, adequately ensure a minimum impact on the environment with respect to EMF.

Accordingly, based on the foregoing, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would be minimized with respect to EMF.

In comparing BECo's calculated edge of ROW EMF levels at the primary and alternative site, the Siting Board notes that both analyses demonstrate that EMF levels would be well below the levels accepted in the 1985 MECo Decision, both for the existing 115 kV transmission lines serving the primary site, and the proposed 345 kV transmission line interconnect at the alternative site. However, in comparing the Company's EMF data (see Table 2, attached), regarding predicted EMF levels at the primary and alternative sites, the Siting Board finds that, based on the foregoing, the primary site is preferable to the alternative site with respect to EMF impacts.

2. Cost of the Proposed Facilities at the Alternative Site

In this section, the Siting Board evaluates whether the Company has provided sufficient information to allow the Siting Board to determine if the Company has achieved the appropriate balance among environmental impacts and cost. The Siting Board then compares the estimated costs of constructing and operating the proposed facilities at the primary and alternative sites.

With respect to direct capital cost at the Ironstone site, the Company estimated total costs of materials and labor at $246,032,768, including: $19,256,353 for site acquisition, site work, structures, yard and building services; $32,755,000 for the heat recovery system generator and appurtenances; $103,131,000 for the steam turbine and combustion turbine generator sets; $38,495,812 for plant systems and equipment; $36,807,303 for transmission interconnection; $1,231,000 for start-up and testing; and

$14,188,300 for scope additions and additional investments and improvements (Exhs. HO-RR-120, Table AS-5-2, HO-RR-57A, p. AS-5-9; Tr. 58, pp. 141-143). The Company indicated that its overall direct cost estimate includes a total labor cost of $32,858,600 (Exh. HO-RR-57A, p. AS-5-9).

The Company asserted that the Edgar site is preferable to the Ironstone site with respect to cost, noting that the lower cost at the Edgar site was principally accounted for by two cost components, site procurement cost and transmission reinforcement costs (BECo Site Banking Brief, p. 29; Exhs. HO-RR-120, HO-RR-121). The Company noted the difference in costs relative to the primary site also reflect overall labor costs[235] and costs for: (1) site procurement, (2) site preparation and foundations, (3) heat rejection system components, (4) electric power transmission, (5) fuel handling, and (6) municipal improvements (Exh. HO-RR-121, Table AS-5-1). See Table 4, attached.

The Company estimated a cost of approximately $8,756,457 for procurement of the Ironstone site, as compared with a zero cost for site acquisition at the primary site (Exh. HO-RR-121, Table 1). However, the Company estimated that foundations at the alternative site would cost $1,074,000 less than at the primary site, assuming use of a shallow spread footing foundation system without soil densification at the Ironstone site (Exhs. BE-6, p. 5-25, HO-RR-57A, p. AS-5-5, Table AS-5-3).

With respect to heat rejection costs, the Company indicated that a closed-cycle cooling system would be utilized at the Ironstone site (Exh. HO-RR-57A, p. AS-5-5). Based on a figure developed by Stone and Webster and verified by UE&C, the Company estimated a cost of $8,006,104 for major cooling system components (Exh. HO-RR-57A, p. AS-5-5, HO-RR-121, Table 1).

The Company estimated a cost of $36,807,303 for transmission improvements at the alternative site, $31,769,942 more than at the primary site (Exhs. HO-RR-57A, p. AS-5-6, AS-5-7, Exh.

235/ Specifically the Company indicated that the estimated direct labor costs of $32,858,600 for the alternative site would be $4,553,000 less than that for the Edgar site (Exh. HO-RR-57A, pp. AS-5-8, AS-5-9).

HO-RR-121, Table 1). The Company reported that, of the aforementioned $36,807,303, $27,264,668 represents estimated costs for substantial transmission improvements which would be required along a 17-mile segment of the Millbury-Carpenter Hill transmission line (Exhs. HO-RR-57A, pp. AS-5-6, AS-5-7,
HO-RR-123, HO-RR-124). With respect to fuel handling, the Company estimated costs of $11,929,708 at the Ironstone site, as compared to $6,882,000 at the Edgar site (Exh. HO-RR-120, Table AS-5-2).

With respect to municipal improvements, the Company estimated a zero cost at the Ironstone site, as compared to $2,400,000 at the primary site (id.; Exh. HO-RR-121, Table 1). The Company noted, however, that additional municipal improvements would likely be required at the Ironstone site if local approval were sought (Exh. HO-RR-57A, p. AS-5-8).[236] The Company asserted that any extra costs for municipal improvements at the Ironstone site would only increase the already significant advantage of the Edgar site against the Ironstone alternative with regard to cost (BECo Site Banking Brief, p. 28).

With respect to operating costs at the alternative site, the Company estimated NPV life cycle gas supply costs of $1,191,390,741 (Exh. HO-RR-121, Table 4).[237] The Company noted that use of the Ironstone site would require less gas pipeline construction than use of the primary site, reducing gas supply costs (Exh. HO-RR-57A, p. AS-5-11, AS-5-12). However, the Company stated that the Edgar site allows greater fuel efficiency based on use of the once-through cooling system, as compared to the closed-cycle cooling system at Ironstone (Exh. HO-RR-57A,
pp. AS-5-12, AS-5-13). In addition, the Company stated that the closed-cycle

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236/ The Company also noted that more detailed engineering and site assessment had been performed for the Edgar site than the Ironstone site and that comparable analysis for the Ironstone site would likely identify site work and costs beyond those already tabulated (Exh. HO-RR-57A, p. AS-5-8).

237/ With LDC cost sharing of certain capital costs, the Company estimated its share of life cycle gas supply costs at Ironstone as $1,120,374,006 (Exh. HO-RR-121, Table AS 5-11).

cooling system at the Ironstone site would result in an incremental capability cost advantage for the Edgar site, reflecting differences in internal pumping requirements (Exh. HO-RR-57A, p. AS-5-13).[238] The Company estimated a net NPV operating cost advantage of $8,746,178 for the Edgar site, considering together the differences in life cycle gas costs and incremental capability costs (Exh. HO-RR-121, Table 1).[239]

With respect to water supply costs, the Company indicated that there would be no water purchase costs at the Ironstone site compared to $4,761,175 at the Edgar site (Exh. HO-RR-122).[240] However, the Company estimated a 1994-2013 NPV cost of $4,036,836 for water treatment at the Ironstone site, $922,076 greater than at the Edgar site (id.).

The Company has provided estimates of the overall costs of the proposed facility at the alternative site, as well as components of capital and operation costs which are site dependent. The Siting Board finds that the Company has provided sufficient information on the costs of the proposed facility at the alternative site to allow the Siting Board to determine whether an appropriate balance would be achieved among environmental impacts

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238/ The Company explained that power generated is used internally to drive closed cooling system equipment components, affecting the amount of power available for sale (Exh. HO-RR-57A, p. AS-5-13).

239/ This figure balances an advantage of $27,436,615 in NPV life cycle gas costs at the Ironstone site against an advantage of $36,182,793 in NPV incremental capability costs at the Edgar site (Exhs. HO-RR-121-1, Table HO-RR-121-1, HO-RR-57A, Table AS-5-12).

240/ Incorporating either of the Company's two preferred BACT options would increase water supply requirements of the proposed facilities at either site. Consequently, associated water costs at the primary site would also increase. However, with either BACT option, the increase in water supply needs would less than double. (See Section II.D.1.e). Thus while water supply costs at the primary site would likely increase under either BACT option, the Siting Board notes that such costs would double at the most and would more probably be lower.

and cost.

With respect to comparison of the primary and alternative sites overall, the Company's analysis shows a total cost advantage of $40,854,241 for the Edgar site over the Ironstone site, including a $35,947,162 capital cost advantage and a $4,907,079 NPV operating cost advantage (Exh. HO-RR-121, Table 1).

However, the Company provided oil storage for 45 days of oil-fired generation, based on LDC cost-sharing at Ironstone 2(Exh. HO-RR-57A, p. AS-5-11). The Siting Board notes that with 365 days of gas-fired operation an option under consideration, costs for oil storage tank construction at the Ironstone site, presently calculated at $5,047,708, could be considerably reduced if not avoided altogether (Tr. 57, p. 112). Eliminating the cost of oil storage tank construction at Ironstone would reduce the total cost advantage at the Edgar site to $35,806,533.

The Siting Board also notes that the Company assumed a $27,264,668 expenditure for 17 miles of transmission improvements along the Millbury-Carpenter Hill line (Exh. HO-RR-57A, Table AS 5-5). The Company acknowledged, however, that the Millbury-Carpenter Hill transmission improvements might be required at some date in the future to accommodate power flows on the regional transmission system, even without installation of the proposed facilities at the alternative site (Tr. 56, pp. 148-152). (See Section II.E.1.c.(1) above). Thus it is uncertain that the $27,264,668 expenditure for these transmission reinforcements would be required for siting of the proposed facility in Uxbridge. Eliminating the cost for transmission reinforcements on the Millbury-Carpenter Hill line would further reduce the total cost advantage of the Edgar site over the Ironstone site to $8,541,865.

Based on the above, the Siting Board finds that the Company has demonstrated that the cost of constructing and operating the proposed facility at the primary site would be less than the cost at the alternative site, even in the event that transmission reinforcements along the Millbury-Carpenter Hill line are not required in conjunction with use of the alternative site.

Accordingly, the Siting Board finds that construction of the proposed

facility at the primary site is preferable to construction of the proposed facility at the alternative site with respect to cost.

3. Conclusions on the Proposed Facilities at the Alternative Site and Site Comparison

In this section, we review the consistency of the proposed facility at the alternative site with our overall review standard, requiring that an appropriate balance be achieved among environmental impacts and costs. Such balancing includes trade-offs between conflicting environmental impacts as well as trade-offs between respective environmental impacts and cost.

The Siting Board has found that, based on the implementation of the facility design and mitigation specified in Section II.E.1 above, the environmental impacts of the proposed facility at the alternative site would be minimized with respect to land resources, noise, land use, visual impacts, safety, and EMF.

Further, the Siting Board has found that the Company did not establish that the environmental impacts of the proposed facility at the alternative site would be minimized with respect to surface water quality/wetlands, water supply, and traffic. The Siting Board made no finding regarding whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to air quality.

Finally, the Siting Board has found that the Company provided sufficient information on the costs of the proposed facility at the alternative site to allow the Siting Board to determine whether an appropriate balance would be achieved among environmental impacts and cost.

The record indicates that there are no significant issues involving the balance among land resources, noise, land use, visual impacts, safety and EMF, nor between any of these concerns and air quality, water supply, water quality/wetlands or cost. Accordingly, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would be minimized with respect to land resources, noise, land use, visual impacts, safety and EMF, consistent with minimizing cost and other environmental

impacts.

As discussed in Section II.E.1.h above, the Company failed to provide an analysis of traffic impacts and related mitigation for either the construction or operation of the proposed facility at the alternative site. Accordingly, the Siting Board finds that the environmental impacts of the proposed facility at the alternative site would not be minimized with respect to traffic, consistent with minimizing cost and other environmental impacts.

To complete its review, the Siting Board must address whether environmental impacts with respect to each of the remaining issues -- air quality, surface water quality/wetlands, water supply -- would be minimized, consistent with minimizing cost. The Company's analyses as discussed in Sections II.E.1.a., II.E.1.b., and II.E.1.e., suggest that trade-offs among air quality, surface water quality and water supply are a factor, as well as trade-offs between the respective environmental concerns and cost. Therefore, the Siting Board must address the balance among air quality, surface water quality/wetlands, and water supply.

In Section II.D.3 above, regarding the primary site, the Siting Board addressed the three-way trade-off among air quality, water supply and cost, based on the Company's analysis of air emissions, water requirements, and costs under alternative combustor and fuel mix designs. The trade-offs between air emissions and costs at the alternative site would correspond to those at the primary site, although the net emissions under the emissions offset proposal could differ. With respect to water supply, the Company's proposed reliance on the Blackstone River for its water supply requirements at the alternative site, although apparently consistent with Water Management Act criteria, could affect long-term competition among water users, involving trade-off issues similar to those raised by the Company's proposed reliance on limited MWRA supplies for its process water requirements at the primary site.

Thus, for the same reasons set forth in Section II.D.3 above regarding the primary site, the Siting Board makes no findings as to whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to air quality, consistent with minimizing

costs and other environmental impacts. Similarly, the Siting Council makes no findings as to whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to water supply, consistent with minimizing costs and other environmental impacts.

In addition to potentially affecting competing users of water from the Blackstone River, the water requirements of the proposed facility at the alternative site could affect the water quality and riverine ecology of the Blackstone River. Thus, there are potential trade-offs between surface water quality and both air quality and cost, similar to the trade-offs between water supply and both air quality and cost.

As discussed in Section II.E.1.e.(2) above, the Company failed to provide any analysis of the possible impacts of its proposed water withdrawals from the Blackstone River on surface water quality, or on riverine ecology as affected by water quality. Without such analyses, the Company is unable to establish the basis by which it determines the appropriate level of power augmentation and associated water requirements at the alternative site, assuming use of the dry combustor technology consistent with the Company's proposed facility designs.

Accordingly, the Siting Board makes no findings as to whether the environmental impacts of the proposed facility at the alternative site would be minimized with respect to surface water quality/wetlands, consistent with minimizing costs and other environmental impacts.

With respect to the comparison of the primary and alternative sites, the Siting Council has found: (1) that the primary site is preferable to the alternative site with respect to surface water quality, land resources, water supply, land use, visual impacts, traffic, and EMF; (2) that the primary and alternative sites are comparable with respect to noise; and
(3) that the alternative site is preferable to the primary site with respect to air quality and safety.

The primary site was found to be preferable with respect to the majority of environmental issues. Most notably, the primary site was clearly preferable with respect to surface water quality/wetlands and land resources,

given that the primary site is already transformed for utility purposes, while use of the alternative site would require transforming a natural, wooded area and also potentially contribute to a need to clear up to 412 acres for transmission reinforcements.

Although the alternative site was found to be preferable with respect to air quality, we note that this finding was based on differences in existing background conditions at the two sites, not on the extent of expected facility emissions at the primary site. In fact, the expected facility emissions under the natural gas proposal would be well below those reflected in the Company's ambient air quality modelling analysis, which nonetheless shows compliance with all applicable standards. Moreover, the apparent justification for further pursuit of the emission offset proposal by the Company is that net area emissions would be even less than those under the natural gas proposal. Thus, the preferability of the alternative site with respect to air quality is a limited one.

Based on the foregoing, the Siting Board finds that the primary site is preferable to the alternative site with respect to environmental impacts.

The Siting Board has found that the primary site is preferable to the alternative site with respect to cost.

Accordingly, the Siting Board finds that the primary site is superior to the alternative site.

III. DECISION

The Energy Facilities Siting Board hereby CONDITIONALLY APPROVES Boston Edison Company's primary site in Weymouth, Massachusetts for possible, future use as a site for a 306 megawatt, gas-fired, bulk electric generating facility and ancillary facilities. The CONDITIONS set forth in this decision are as follows.

(A) In order to address minimization of CO_2 emissions in the final petition, the Company shall include in its final petition, (1) a proposal to comprehensively address the CO_2 emissions from the proposed facility, and (2) alternative CO_2 mitigation plans, including likely arrangements for ensuring implementation and verification of estimated results in order to demonstrate that all cost-effective approaches have been adequately considered.

(B) The Company shall provide its share of funding for the preparation of the health study, in a manner consistent with the agreement between BECo and Weymouth, except that BECo shall provide a sufficient portion of such funding in an earlier payment or series of payments, as may be further agreed by BECo and Weymouth, to allow the health study to proceed according to a reasonable schedule beginning at the time BECo files its final petition for construction of the proposed facilities with the Siting Board.

(C) In order to demonstrate that impacts to community noise levels are minimized, BECo shall: (1) incorporate all proposed mitigation techniques as described in Section II.D.1.d., above, so that the continuous noise increase from the operation of the proposed facility is no more than five decibels; (2) refrain from conducting construction that generates significant noise before 8:00 am; and (3) confine all primary construction activity to between the hours of 6:30 a.m. and 4:45 p.m. Monday through Saturday; except as necessary

for structural integrity or safety reasons; and (4) if issued a noise citation by the Weymouth Board of Health or MDEP, promptly investigate the potential source of cited noise and, as necessary, provide temporary sound barriers or implement other appropriate measures to mitigate such noise.

(D) In order to demonstrate that land use impacts are minimized, BECo shall: (1) provide the Siting Board with copies of either a zoning exemption from the DPU or a zoning variance from Weymouth (or special permit from Weymouth, whichever is applicable), indicating that the generating facility can be constructed in said location, and (2) construct, operate and maintain a waterfront park along King's Cove for use by the public. Specific details of the park area, layout, construction methods and materials shall be reviewed and coordinated with Weymouth's Waterfront Committee.

(E) In order to demonstrate that the traffic impacts are minimized, BECo shall implement its proposed traffic mitigation strategies during the construction of the proposed facility, including (1) the scheduling of the construction work force arrival/departure times outside the morning and afternoon commuter peak hours of 7:30 am to 8:30 am and 4:45 pm to 5:45 pm; (2) the institution of turning restrictions to and from Route 3A from site driveways; and (3) the control of traffic exiting the site during peak afternoon traffic hours, as needed.

(F) The Company shall submit written confirmation from the Weymouth Board of Health that the existing Edgar generating station has been enclosed in accordance with its recommendations at the time the Company submits its final application.

(G) The Company shall provide for Weymouth participation in the

development of its Emergency Response Plan and for review of the Plan by appropriate local agencies, prior to construction and periodically during operation of the proposed facility.

(H) The Company shall provide for the review of its plans for the storage, containment and transport of aqueous ammonia by the Weymouth Emergency Planning Committee.

(I) The Company shall review its plans for maintaining an adequate supply of water for fire fighting purposes with the Fire Department, prior to construction of the proposed facility, and to revise plans, as necessary, to address any concerns raised by the Weymouth Fire Department.

The Siting Board notes that all findings in this decision are subject to modification based upon new information such as significant changes in the project, site conditions, applicable law or relevant technology and science. The Siting Board also notes that the Company is required to submit another filing with the Siting Board before its proposed project can be constructed. At that time, the Siting Board will review all new facts and information, including a complete analysis of air quality impacts and water supply issues and related costs as discussed herein, as well as significant changes that have occurred which would modify any of the findings contained herein.

In addition to the review of any changes in project design, site conditions, applicable law, or other relevant facts, and a showing that all conditions specified herein are addressed, final approval of the Edgar project will require a showing of need on reliability or economic efficiency grounds. The Company will also have to compare its proposed project with other energy resource alternatives, and establish that the project is viable. Further, the Siting Board will conduct its final balancing of need, cost and environmental impacts before a final decision on the project is made.

Robert W. Ritchie
Hearing Officer

Dated this 5th day of August, 1993

Unanimously APPROVED by the Energy Facilities siting Board at its meeting of August 5, 1993 by the members and designees present and voting. Voting for approval of the Tentative Decision as amended: Kenneth Gordon (Chairman, EFSB/DPU); Barbara Kates-Garnick (Commissioner, DPU); Mary Clark Webster (Commissioner, DPU); Robert Levite (for Stephen Tocco, Secretary of Economic Affairs); Andrew Greene (for Trudy Coxe, Secretary of Environmental Affairs; Joseph Faherty (Public Member); William Sargent (Public Member).

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Kenneth Gordon

Chairman

Dated this 5th day of August, 1993

TABLE I

PREDICTED MAXIMUM AMBIENT CONCENTRATIONS AND AMBIENT STANDARDS

Pollutant	Averaging Period	Facility Emissions	Background Concentrations	Total Concentrations	NAAQS % of NAAQS	Background % of NAAQS	Total
PM-10	Annual	3.63	42.00	45.63	50	84.00	91.26
	24-Hour	41.40	91.00	132.40	150	60.67	68.73
SO_2	Annual	7.88	59.95	68.83	80	74.94	86.04
	24-Hour	83.90	273.20	357.10	365	74.85	98.05
	3-Hour	136.00	678.00	814.00	13,000	52.15	62.62
NOx	Annual	.999			100		
	1-Hour	114.00	177.00	291.00	3,200	55.31	90.90
CO	8-Hour	40.00			10,000		
	1-Hour	377.00			40,000		

NOTES:

Facility emissions based on the use of 0.3% fuel oil for the entire year.

All NAAQS, with the exception of the 3-hour SO_2 standard and the 1-hour NOx standard, are primary NAAQS. There is not primary NAAQS for 3-hour SO_2 concentrations -- 1,300 represents a secondary NAAQS. There are no primary or secondary NAAQS for 1-hour NOx concentrations -- 3,200 represents the MDEP 1-hour ambient NOx policy limit.

SOURCES: Exh. HO-RR-94, BE-48 pp. AP 29-1, 29-2.

TABLE 2

ELECTRIC AND MAGNETIC FIELDS

PRIMARY SITE

Output (MW)	Electric Field - KV/m (Kilovolts per meter) Southside	Northside	Magnetic Field - mG (milligauss) Southside	Northside
0	0.30	0.15	15	20
150	0.30	0.15	3	7
300	0.30	0.15	8	6

ALTERNATIVE SITE

Ironstone Output (MW)	Electric Field (KV/m) Westside	Eastside	Magnetic Field (mG) Westside	Eastside
EXISTING ROW 13 SOUTHWEST OF TAP				
0	.091	1.246	5.95	36.34
150	.091	1.246	6.94	42.40
300	.091	1.246	7.93	48.46
EXISTING ROW 13 NORTHEAST OF TAP				
0	.091	1.246	5.95	36.34
150	.091	1.246	5.29	32.31
300	.091	1.246	4.63	28.27
LOOP FROM EXISTING ROW 13 TO FACILITY				
0	.339	.339	16.1	16.1
150	.317	.362	23.5	14.0
300	.317	.362	30.9	12.1

TABLE 3

SIGNIFICANT SITE-DEPENDENT OPERATING COSTS
(1994 NET PRESENT VALUE)

	Edgar	Ironstone
Life Cycle Gas Cost	1,218,827,356	1,191,390,741
Incremental Generation Cost	0	36,182,793
Water Purchase	4,761,175	0
Water Treatment	3,114,760	4,036,836
Total Operating Costs	1,226,703,291	1,231,610,370
Operating Cost Advantage, Edgar Over Ironstone:		1,231,610,370
		- 1,226,703,291
		4,907,079

TABLE 4

SIGNIFICANT CAPITAL COSTS
(1994 $)

	Edgar	Ironstone
Site Procurement	0	8,756,457
Site Prep and Foundations	8,300,000	7,226,000
Heat Rejection System Components+	5,157,000	8,006,104
Electric Power Transmission	5,037,361	36,807,303 * 9,542,635 **
Fuel Handling	6,882,000	11,929,708
Municipal Improvements	2,400,000	0
Labor	37,411,600	32,858,600
Total Direct Cost	210,085,606	246,032,768 * 218,768,100 **

\+ i.e., cost of steam cycle systems and equipment

* includes $27,264,668 cost for 17-mile segment of Millbury-Carpenter Hill transmission line

** excludes cost, 17-mile segment, Millbury-Carpenter Hill transmission line ($27,264,668)

Appeal as to matters of law from any final decision, order or ruling of the Siting Council may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the order of the Siting Council be modified or set aside in whole or in part.

Such petition for appeal shall be filed with the Siting Council within twenty days after the date of service of the decision, order or ruling of the Siting Council, or within such further time as the Siting Council may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the clerk of said court. (Massachusetts General Laws, Chapter 25, Sec. 5; Chapter 164, Sec. 69P).