

COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Board

In the Matter of the Petition of)
Southern Energy Canal II, L.L.C. for Approval)
to Construct a Bulk Generating Facility in) EFSB 98-9
in the Town of Sandwich, Massachusetts)

FINAL DECISION

William H. Stevens, Jr.
Hearing Officer
June 15, 2001

On the Decision:
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FIGURE 1: SITE MAP

LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Explanation</u>
AALs	Allowable Ambient Limits
Local 51	The United Association of Plumbers and Pipefitters Local 51/AFL-CIO
<u>Altresco Decision</u>	<u>Altresco-Pittsfield, Inc.</u> , 17 DOMSC 351 (1988)
<u>ANP Bellingham Decision</u>	<u>ANP Bellingham Energy Company</u> , 7 DOMSB 39 (1998)
<u>ANP Bellingham Decision on Compliance</u>	<u>ANP Bellingham Energy Company - Compliance</u> 9 DOMSB 211 (1999)
<u>ANP Blackstone Decision</u>	<u>ANP Blackstone Energy Company</u> , 8 DOMSB 1 (1999)
AOD	Ammonia on Demand
Army Corps	U.S. Army Corps of Engineers Cape Cod Canal Field Office
ASTs	Above-ground storage tanks
BACT	Best available control technology
<u>1993 BECo Decision</u>	<u>Boston Edison Company</u> , 1 DOMSB 1 (1993)
<u>Berkshire Power Decision</u>	<u>Berkshire Power Development, Inc.</u> , 4 DOMSB 221 (1996)
Bourne DPW	Cornelius W. Andres, Superintendent of Public Works, Town of Bourne
Bourne Fire Chief	Steven Philbrick, Fire Chief, Town of Bourne Fire/Rescue and Emergency Services
<u>Brockton Power Decision</u>	<u>Brockton Power L.L.C.</u> , 10 DOMSB 157 (2000)
Campaign	Campaign to Clean up Polluting Power Plants
Canal-Bourne ROW	Two transmission lines that extend along a right-of-way beginning southwest of Canal Station and running to the Bourne-switching station
Canal redevelopment project	The repowering of existing Canal Unit 2 and other non- Jurisdictional changes at Canal Station
Canal Walk	A recreational walkway maintained by the U.S. Army Corps of Engineers, located adjacent to the Cape Cod Canal and north of Canal Station
Cape Cancer Incidence	Massachusetts Department of Public Health study of cancer

Report	incidence in the upper Cape Cod area
Cape Cancer Incidence Study	1997 Aschengrau and Ozonoff: Upper Cape Cancer Incidence Study
CCA	Cape Clean Air
CISR	Cape and Islands Self Reliance Corporation
Citizen Groups	Massachusetts Public Interest Research Group, Clean Water Action, and the Campaign to Clean Up Polluting Power Plants
CO	Carbon monoxide
CO ₂	Carbon dioxide
Commonwealth Electric Company	Commonwealth Electric Company Mirant Canal II, L.L.C.
CTGs	Combustion Turbine Generators
CWA	Clean Water Action
CZM	Office of Coastal Zone Management
dBA	Decibel (A-weighted)
<u>Dighton Power Decision</u>	<u>Dighton Power Associates, 5 DOMSB 193 (1997)</u>
DOMSB	Decisions and Orders of Massachusetts Energy Facilities Siting Board
Duke Energy	Duke Energy Company
DRI	Development of Regional Impact
eastern Tupper Road/6A intersection	Intersection of Tupper Road and Route 6A in Sandwich, Mass.
EMF	Electric and magnetic fields
EPA	United States Environmental Protection Agency
EPC	Engineering, procurement, and construction
FEMA	Federal Emergency Management Agency
GE Study	1998 Mostardi-Platt and General Electric study: Inhalation Risk Assessment of Air Toxic Emissions from Large Combustion Turbine Power Projects
gpd	Gallons per day

gpy	Gallons per year
greenfields ambient level	Hypothetical sound levels assuming Canal Units 1 and 2 were not present
HAPs	Hazardous Air Pollutants
HAPs Study	1998 EPA Report: Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units-Final Report to Congress
HRSGs	Heat recovery steam generators
Hz	Hertz
ICF Kaiser Study	ICF Kaiser Consulting study that examined the health-related impacts of Canal Station.
<u>IDC Bellingham Decision</u>	<u>IDC Bellingham, L.L.C., 9 DOMSB 225 (1999)</u>
IND	Industrial Limited Use Zone
ISCST3	Industrial Source Complex Short-term air dispersion model version 3
ISO-NE	Independent System Operator, New England
kV	Kilovolt
kV/m	Kilovolts per meter
kW	Kilowatt
L ₉₀	The level of noise that is exceeded 90 percent of the time
L _{dn}	EPA's recommendation of a maximum day-night noise levels incorporating a 10 dBA penalty for noise at night
LAER	Lowest Achievable Emission Rate
Levels Document	1994 EPA Report: Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety
LOS	Levels of service, a measure of the efficiency of traffic operations at a given location
MAAQS	Massachusetts Ambient Air Quality Standards
MDEM	Massachusetts Department of Environmental Management

MDPH	Massachusetts Department of Public Health
MASSPIRG	Massachusetts Public Interest Research Group
MCP	Massachusetts Contingency Plan
MDEP	Massachusetts Department of Environmental Protection
MDMF	Massachusetts Division of Marine Fisheries
<u>1985 MECo/NEPCo Decision</u>	<u>Massachusetts Electric Company et al.</u> , 13 DOMSC 119 (1985)
MEPA	Massachusetts Environmental Policy Act Unit
mG	Milligauss
mgd	Million gallons per day
<u>Millennium Power Decision</u>	<u>U.S. Generating Company</u> , 6 DOMSB 1 (1997)
Mirant Canal II	Mirant Canal II, L.L.C., formerly known as Southern Energy Canal II, L.L.C.
Mirant Canal	Mirant Canal, L.L.C., formerly known as Southern Energy Canal, L.L.C.
MOU	Memorandum of Understanding between the Cape Cod Commission and the Massachusetts Environmental Policy Act Unit
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NCI	National Cancer Institute
<u>NEA Decision</u>	<u>Northeast Energy Associates</u> , 16 DOMSC 335 (1987)
NEP	New England Power Company
<u>Nickel Hill Decision</u>	<u>Nickel Hill Energy L.L.C.</u> , 11 DOMSB 83 (2000)
NML	Noise monitoring locations
NO _x	Nitrogen oxide
NPDES	National Pollution Discharge Elimination System
NRC	National Research Council

NSPS	New source performance standards
NSR	New source review
NTEL	Non-threshold effects exposure limit
O ₂	Oxygen
OSHA	U.S. Occupational Safety and Health Administration
PM-10	Fine particulates
ppm	Parts per million
proposed project	The Canal Redevelopment Project that requires the repowering of existing Canal Unit 2 at Canal Station
project site	A 9.4 acre site within the northeast quadrant of the 87-acre Canal Station where the repowered Unit 2 structures would be located
PSD	Prevention of significant deterioration
RAO	Response Action Outcome
repowered Unit 2	The upgraded Canal Unit 2 with a generating capacity of 1225 megawatts
Request for Comments	Requests for Comments issued by Energy Facilities Siting Board on March 19, 1999, on proposed standards of review
Restructuring Act	Chapter 164 of the Acts of 1997
ROW	Right-of-way
Sandwich	Town of Sandwich
Sandwich Marina	Sandwich Town Marina
SCR	Selective Catalytic Reduction System
SE Canal II	Southern Energy Canal II, L.L.C.
SE Canal III	Southern Energy Canal III, L.L.C.
Sigma	Sigma Consultants Inc.
Silent Spring Study	1997 Silent Spring Institute: Cape Cod Breast Cancer and Environment Study

SILs	Significant impact levels
<u>Silver City Decision</u>	<u>Silver City Energy Limited Partnership</u> , 3 DOMSB 1 (1994)
<u>Sithe Edgar Decision</u>	<u>Sithe Edgar Development, L.L.C.</u> , 10 DOMSB 1 (2000)
<u>Sithe Mystic Decision</u>	<u>Sithe Mystic Development, L.L.C.</u> , 9 DOMSB 101 (1999)
<u>Sithe West Medway Decision</u>	<u>Sithe West Medway Development, L.L.C.</u> , 10 DOMSB 274 (2000)
Siting Board	Energy Facilities Siting Board
SO ₂	Sulfur dioxide
<u>Southern Kendall Decision</u>	<u>Southern Energy Kendall, L.L.C.</u> , 11 DOMSB 255 (2000)
SWPPP	Stormwater Pollution Prevention Plan
SPCC	Spill Prevention, Control, and Countermeasure
TELs	Threshold Effects Exposure Limits
Town	Town of Sandwich
TPS	Technology Performance Standards
tpy	Tons per year
Tupper Road well	An off-site well owned by Sandwich
USGen	U.S. Generating Company
USGenNE	U.S. Generating Company New England, Inc.
Verbon Trust	Soozen Tribuna and Steven Striar, Trustees of Verbon Trust
VOCs	Volatile organic compounds
Wells No. 2 and 3	Two existing wells on-site at Canal Station
Well No. 4	A new well to be developed on-site at Canal Station
western Tupper Road/6A intersection	Intersection of Route 6A/Route 130 with Tupper Road in Sandwich, Massachusetts

The Energy Facilities Siting Board (“Siting Board”) hereby APPROVES, subject to conditions, the petition of Mirant Canal II, L.L.C. for approval to upgrade generating facilities at the existing Canal Station in Sandwich, Massachusetts. This upgrade would increase the electrical generating capacity of Unit 2 at Canal Station from 560 megawatts to 1225 megawatts.

I. INTRODUCTION

A. Description of Proposed Project, Site and Interconnections

Mirant Canal II, L.L.C. (“Mirant Canal II” or “Company”),¹ proposes to repower Canal Unit 2, one of two existing generating units at the 87-acre Canal Station in the Town of Sandwich Massachusetts (“proposed project”) (Exh. SEC-1, at 1-1).² Canal Station is owned by Mirant Canal L.L.C. (“Mirant Canal”), which acquired the property from Commonwealth Energy in 1998 (*id.* at 2-4).³ It is bounded on the north by the Cape Cod Canal and an adjacent recreational walkway maintained by the U.S. Army Corps of Engineers (“Canal Walk”) (*id.* at 1-5, 1-19, 1-22 (Figs. 1-7, 1-8)). The Sandwich Town Marina (“Sandwich Marina”) lies to the east of Canal Station (*id.*). Residential and commercial properties are located to the south and west of

¹ The Company informed the Siting Board by letter dated February 9, 2001 that Southern Energy Canal II, L.L.C. had changed its name to Mirant Canal II, L.L.C. The February 9, 2001 letter also stated that the name change would be reflected in the names of other Mirant Corporation subsidiaries.

² The other generating unit at Canal Station, called Unit 1, is fired with oil and has a winter peak capacity of 560 megawatts (“MW”) (Exh. SEC-1, at 1-19).

³ Southern Energy Inc., a subsidiary of the Southern Company based in Atlanta, Georgia, successfully bid for the assets at Canal Station under the divestiture of generating assets pursuant to the 1997 Massachusetts Electric Utility Restructuring Act (St. 1997 c. 164) (Exh. SEC-1, at 1-5 (Fig. 1-4)). Southern Energy Canal, L.L.C., now operating as Mirant Canal, was formed to own and operate the two existing units at Canal Station (*id.*). Mirant Canal II, an affiliate of Mirant Canal, will own and operate the proposed project (*id.*). Southern Energy Inc. is now known as Mirant Corporation. The Company informed the Siting Board by letter dated April 13, 2001 that Mirant Corporation is now a fully independent, publicly traded company, after the completion of a spin-off from its parent, Southern Company.

Canal Station (id.).

As part of the proposed project, the Company would deactivate the existing Unit 2 steam boiler, which currently is fueled primarily by oil, and repower this unit with four natural gas-fired combustion turbines with a total capacity output of 1,225 MW (“repowered Unit 2”) (id.). To maintain output during periods of high ambient temperature, repowered Unit 2 would incorporate evaporative inlet coolers and would be able to augment power by firing additional fuel in the heat recovery steam generators (“HRSGs”) (id. at 1-8). The proposed project would make use of much of the existing Unit 2 equipment, including its steam turbine/generator, water intake and discharge systems, steam condenser, control room, electrical switchgear, transmission interface equipment, and maintenance shop (id. at 1-1, 1-8). Major new equipment would include: four GE Frame 7241 FA combustion turbine generators (“CTGs”); four HRSGs; and one 230 foot stack with four flues (id. at 1-1, 1-9 (Fig. 1-3)). This equipment, together with minor facilities including two urea pellet silos,⁴ a 1,000,000 gallon demineralized water tank, and step-up transformers, would be located on a 9.4 acre site (“project site”) within the northeast quadrant of Canal Station, adjacent to the existing Unit 2 (id. , at 1-5, 1-9, 1-10, 1-19, 1-22 (Figs. 1-7, 1-8)).

The Company proposes to use natural gas as the primary fuel for the project and to use No. 2 low sulfur distillate oil as a back-up fuel for up to 30 days a year (id. at 1-10, 1-12). Gas would be delivered to the repowered Unit 2 via Duke Energy Company’s (“Duke Energy”) gas pipeline originating in Mendon, Massachusetts (Exh. EFSB-L-3). Two existing oil storage tanks, currently used for No. 6 fuel oil, would be refurbished to contain No. 2 fuel oil for the proposed project (id. at 1-9). The Company stated that a new transmission line would be constructed to interconnect the project with the existing Commonwealth Electric Company (“Commonwealth Electric”) 345-kilovolt (“kV”) transmission substation located at Canal Station just south of Unit 1 (Exh. SEC-1, at 1-10, 2-6).

The Company proposes to use an open loop cooling system with cooling water to be taken from the Cape Cod Canal through a new intake structure that would be installed in the canal bank (id.

⁴ The Company stated that urea pellets would be used to provide ammonia for the selective catalytic reduction (“SCR”) system (id. at 1-9). See Section III.B below.

at 1-16 (Fig. 1-5)). Additional non-potable water requirements of the project would be met by use of existing and new ground water wells (id. at 1-19). Wastewater from the project would be discharged into the existing wastewater system at Canal Station (id.).

B. Procedural History

On December 3, 1998, Southern Energy Canal III, L.L.C. (“SE Canal III”) filed with the Siting Board a petition for approval to construct a new 525 MW combined cycle power plant in the Town of Sandwich. The Siting Board docketed the matter as EFSB 98-9.

On February 2, 1999, the Siting Board conducted a public hearing in Sandwich. In accordance with the direction of the Hearing Officer, SE Canal III provided notice of the public hearing and adjudication.

Timely petitions to intervene were filed by the Town of Sandwich (“Sandwich” or “Town”); Soozen Tribuna and Steven Striar, Trustees of Verbon Trust (“Verbon Trust”); and Steven Philbrick, Fire Chief, Town of Bourne Fire/Rescue & Emergency Services (“Bourne Fire Chief”). A timely joint petition to intervene was filed by Massachusetts Public Interest Research Group, Inc. (“MASSPIRG”), Clean Water Action, Inc. (“CWA”), and The Campaign to Clean Up Polluting Power Plants (“Campaign”) (collectively “Citizen Groups”). Timely petitions to participate as interested persons were filed by Cornelius W. Andres, Superintendent of Public Works, Town of Bourne (“Bourne DPW”); The United Association of Plumbers and Pipefitters Local 51/AFL-CIO (“Local 51”); U.S. Generating Company (“USGen”); U.S. Army Corps of Engineers Cape Cod Canal Field Office (“Army Corps”); Sigma Consultants, Inc. (“Sigma”); and jointly by New England Power Company (“NEP”) and USGen New England, Inc. (“USGenNE”). SE Canal III filed opposition to the petition of the Citizen Groups and the joint petition of NEP and USGenNE.

The Hearing Officer granted the petitions to intervene filed by Sandwich, the Verbon Trust and the Bourne Fire Chief. Southern Energy Canal III, L.L.C., EFSB 98-9, Hearing Officer Procedural Ruling, March 5, 1999, at 10. With respect to the Citizen Groups, the Hearing Officer allowed MASSPIRG and CWA to intervene as joint petitioners but denied intervention status to the Campaign

(March 11, 1999 Tr. at 9-11). The Hearing Officer granted the petitions to participate as interested persons of the Bourne DPW; Local 51; USGen; the Army Corps; Sigma; and NEP/USGenNE.⁵

Southern Energy Canal III, L.L.C., EFSB 98-9, Hearing Officer Procedural Ruling, March 5, 1999, at 10. Thereafter, the Hearing Officer granted three successive motions by SE Canal III that resulted in the procedural schedule being suspended until September 23, 1999. Southern Energy Canal III, L.L.C., Hearing Officer Procedural Rulings, April 26, June 16, and August 9, 1999.

On October 29, 1999, Southern Energy Canal II, L.L.C. (“SE Canal II”) filed with the Siting Board an amended petition stating that it was no longer seeking approval to construct a 525 MW generating unit, but instead would seek approval to repower Unit 2. Due to the changes in the project, the Siting Board conducted a second public hearing in Sandwich on December 14, 1999. In accordance with the direction of the Hearing Officer, SE Canal II provided notice of the public hearing and adjudication.

A joint late-filed petition (“Joint Petition”) to intervene was submitted by Cape Clean Air (“CCA”); the Cape and Islands Self-Reliance Corporation (“CISR”); and six individuals: Jane E. Estey, P.E.; Anna Manatis-Lornell, M.D.; Paul Gannett; Charles Kleekamp; Kathryn Kleekamp; and Matthew Patrick (“Individual Petitioners”).⁶ CCA, CISR and the Individual Petitioners requested leave to intervene as one group or individually. SE Canal II opposed the late-filed petitions for leave to intervene of CCA, CISR and the Individual Petitioners. On February 3, 2000, the Hearing Officer denied the joint petition filed by CCA, CISR and the Individual Petitioners for leave to intervene as a group or as individuals. Southern Energy Canal II, EFSB 98-9, Hearing Officer Procedural Ruling, February 3, 2000.

The Siting Board conducted eight days of evidentiary hearings, commencing on April 12, 2000 and ending on May 1, 2000. The Company presented the testimony of the following witnesses:

⁵ On March 23, 2000, the Hearing Officer granted the joint motion of NEP and USGenNE to withdraw from this proceeding.

⁶ CCA provided documentation showing that the Individual Petitioners were also CCA members (Joint Petition at 1-5).

Norman E. Cowden, P.E., Project Director at Southern Energy New England, L.L.C., who testified as to land use, solid waste, site selection, visual, air, water and wetland issues; Donald B. Hooks, Environmental Manager at Southern Energy Inc., who testified as to water and wetland issues; Glenn Harkness, P.E., Principal-in-Charge at TRC Environmental Corporation, who testified as to land use, traffic, site selection and visual issues; Charles Cooper, Director of Environmental Permitting and Planning at TRC Environmental Corporation, who testified as to water and wetland issues; Laurence A. Labrie, Senior Air Quality Scientist with TRC Environmental Corporation, who testified as to air issues; Gary L. Ritter, C.I.H., C.S.P., C.H.M.M., Senior Industrial Hygienist at TRC Environmental Corporation, who testified as to solid waste and health issues; David E. Schafer, P.E., Water Resources Engineer at TRC Environmental Corporation, who testified as to water and wetland issues; William H. Bailey, Ph.D., Principal Scientist in the Exponent Health Group, who testified as to electric and magnetic fields (“EMF”); James D. Barnes, Senior Engineering Consultant at Acentech, Inc., who testified as to noise issues; Warren F. Diesl, Registered Professional Geologist with Metcalf & Eddy, Inc., who testified as to water and wetland issues; Michael D. Scherer, Ph.D., President of Marine Research, Inc., who testified as to water issues; and Dr. Peter A. Valberg, Senior Scientist at Cambridge Environmental, Inc., who testified as to health issues.

On May 31, 2000, SE Canal II submitted its initial brief.⁷ The record includes approximately 257 exhibits, consisting primarily of Company responses to Siting Board information requests and Siting Board record requests.

C. Jurisdiction

As a unit designed to increase existing generating capacity at Canal Station by 665 MW, from

⁷ On April 9, 2001, the Hearing Officer granted the Company’s motion to reopen the record for the limited purpose of incorporating into the record of this proceeding the Company’s seventh and eighth supplemental responses to Exhibit EFSB-W-12. Subsequently, on May 17, 2001, the Hearing Officer granted the Company’s motion to reopen the record for the limited purpose of incorporating into the record of this proceeding the Company’s updated Air Plan Application with the Massachusetts Department of Environmental Protection, and also admitted into the record updates to two corresponding exhibits.

560 MW to 1,225 MW, the Company's proposed project falls within the first definition of facility set forth in G.L. c. 164, § 69G, which states in pertinent part that a facility is defined as:

any generating unit designed for or capable of operating at a gross capacity of 100 megawatts or more, including associated buildings, ancillary structures, transmission and pipeline interconnections that are not otherwise facilities, and fuel storage facilities.

D. Scope of Review

1. Background

On November 25, 1997, the Governor signed into law Chapter 164 of the Acts of 1997, entitled "An Act Relative to Restructuring the Electric Utility Industry in the Commonwealth, Regulating the Provision of Electricity and Other Services, and Promoting Enhanced Consumer Protection Therein" ("Restructuring Act"). Sections 204 and 210 of the Restructuring Act altered the scope of the Siting Board's review of generating facility proposals by amending G.L. c. 164, § 69H and by adding a new section, G.L. c. 164, § 69J¹/₄, which sets forth new criteria for the review of generating facility cases.

On March 19, 1999, the Siting Board issued a request for comments on Siting Board staff's four draft standards of review for generating facility cases ("Request for Comments"). The draft standards of review addressed the four major elements of the generating facility review set forth in G.L. c. 164, §§ 69H and 69J¹/₄: the site selection process, the environmental impacts of the proposed facility, consistency with the policies of the Commonwealth, and the generating technology comparison (required only in cases where the expected emissions from a proposed generating facility exceed the levels specified in 980 CMR § 12.03).

In its Request for Comments, the Siting Board stated that parties in pending generating facility cases would have an opportunity to brief the standards of review to be applied in their specific case (Request for Comments at 2). On June 14, 1999, staff issued revised standards of review. On May 12, 2000, parties and interested persons in EFSB 98-9 were invited to submit comments on both versions of the standards of review. Southern Energy Canal II, L.L.C.

EFSB 98-9, Hearing Officer Memorandum, May 12, 2000.

2. Position of the Company

The Company supports the Siting Board staff's June 14, 1999 revised standards of review for site selection, environmental impacts and consistency with the policies of the Commonwealth (Company Brief at 5-6, 17-19, 112-116). However, the Company recommended that, just as the Siting Board in past decisions has deferred to the expertise of other agencies in reviewing environmental impacts, the Siting Board should recognize that a project's compliance with other agency standards demonstrates that health impacts have been minimized (id. at 18-19).

3. Analysis

As discussed in Section III.L below, the Siting Board recognizes that its analysis of the health impacts of a proposed generating facility is necessarily closely related to its review of specific environmental impacts that may also be subject to review by other agencies. The Siting Board has given significant weight to compliance with health standards established by another agency with a greater level of expertise in this area. However, in order to properly fulfill its legislative mandate, it is the Siting Board's practice to make a comprehensive review of all aspects of a proposed project that might affect public health, and not rely entirely on a proponent's compliance with standards that may have been established in a particular area by another agency. The Siting Board sees no reason to change this practice here.

The Company has proposed no further amendments to the June 14, 1999 revised standards of review for generating facilities. The Siting Board therefore finds that the revised standards of review with respect to the site selection process, environmental impacts, and consistency with the policies of the Commonwealth issued on June 14, 1999, comply with the requirements of G.L. c. 164, §§ 69H and J¼ and will govern the scope of review in this proceeding.

In Section II., below, the Siting Board considers the Company's site selection process. In Section III., below, the Siting Board considers the environmental impacts of the proposed facility. In

Section IV., below, the Siting Board addresses whether the plans for construction of the proposed facility are consistent with current health and environmental protection policies of the Commonwealth, and with such energy policies as are adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board.⁸

II. SITE SELECTION

A. Standard of Review

G.L. c. 164, § 69J¼ requires the Siting Board to determine whether an applicant's description of the site selection process used is accurate. An accurate description of a petitioner's site selection process shall include a complete description of the environmental, reliability, regulatory, and other considerations that led to the applicant's decision to pursue the project as proposed at the proposed site, as well as a description of other siting and design options that were considered as part of the site selection process.

The Siting Board also is required to determine whether a proposed facility provides a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. G.L. c. 164, § 69H. To accomplish this, G.L. c. 164, § 69J¼ requires the Siting Board to determine whether "plans for the construction of a proposed facility minimize the environmental impacts consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility". Site selection, together with project design and mitigation, is an integral part of the process of minimizing the environmental impacts of an energy facility. The Siting Board therefore will review the applicant's site selection process in order to determine whether that process contributes to the minimization of environmental impacts of the proposed project and the costs of mitigating, controlling, and reducing such impacts. In making this determination, the Siting Board also will consider, consistent with its broad mandate under G.L. c. 164,

⁸ As set forth in Section III.B, below, the Siting Board finds that the expected emissions from the proposed generating facility do not exceed the technology performance standard specified in 980 CMR § 12.00. Therefore, a generating technology comparison is not required in this case.

§ 69H, the reliability, regulatory, and other non-environmental advantages of the proposed site.

B. Description

The Company stated that Mirant Corporation⁹ decided to pursue a position in the New England generation market in early 1997, because of conditions created by electric deregulation and restructuring in New England (Exh. EFSB-S-1). The Company stated that Mirant Corporation's goals were to develop a portfolio of generating assets using existing generation in the region, and to develop new generation using the newer combined cycle technology, which has higher energy efficiency and lower emissions than existing generating units in the region (Exh. SEC-1, at 2-3). The Company asserted that, as a result of restructuring, some existing generating facilities became attractive for potential redevelopment (Exh. EFSB-S-1).

The Company stated that the objective of Mirant Corporation's site selection process was to choose sites: (1) where development would have minimal impact on the environment; (2) which had access to existing infrastructure services, particularly water supply, gas supply, and electric transmission services; (3) where a level of community support for development existed; and (4) where development would be consistent with the policies and objectives of the Restructuring Act (*id.*; Exh. SEC-1, at 2-1, 2-2). The Company stated that Mirant Corporation assessed the Canal Station site and determined that it measured favorably when considering these factors (Exh. EFSB-S-2). Mirant Corporation therefore bid for the non-nuclear generating assets of Commonwealth Energy and acquired the assets in December, 1998 (Exh. SEC-1, at 2-3 to 2-4).¹⁰

⁹ Throughout this decision, the Siting Board will use "Mirant Corporation" to refer to both Southern Energy Inc. and to Mirant Corporation, and will use "Mirant Canal II" to refer to both SE Canal II and to Mirant Canal II.

¹⁰ The Company stated that it has pursued other development projects in the Northeast region,
(continued...)

The Company indicated that the Mirant Corporation owns a number of plants of over 500 MW in the United States, and that it tries to develop new projects of at least that size, consistent with existing development and community development objectives (Exh. EFSB-S-14). The Company asserted that of all the sites it acquired from Commonwealth Energy, only Canal Station possessed adequate land and associated infrastructure for the development of a generating facility over 500 MW without significant land use impacts (id.; Exh. SEC-1, at 2-3). Once Canal Station was identified as being suitable in terms of size, the site was then evaluated based on environmental impacts, transmission access, natural gas supply, ability to incorporate existing structures, and cost-competitiveness (Exhs. SEC-1, at 2-5 to 2-9; EFSB-S-7; EFSB-S-8; EFSB-S-9).

The Company stated that Mirant Corporation evaluated the sites that it purchased from Commonwealth Energy for their potential to be further developed while minimizing environmental impacts, including: local and regional land use, water resources, wetlands, air quality, solid waste and hazardous waste, local and regional health impacts, EMF, visual impacts, noise, traffic impacts, and cultural resources (Exh. EFSB-S-5; Tr. 3, at 226 to 227). The Company noted that although it did not formally rank or compile field observations on the sites that it purchased, it visited and evaluated each of the sites on numerous occasions (Exh. EFSB-S-3).

The Company stated that the configuration of the proposed project was dictated by the existing equipment and the size of the property (Exhs. EFSB-S-10; EFSB-S-11; Tr. 3, at 255). The Company also indicated that a primary consideration was to minimize visual impacts on the local community (Exh. SEC-1, at 2-2, 2-5, 2-6). The Company stated that input from the community on matters including building bulk, orientation, façade, color, and stack height influenced the design of the proposed project (id. at 2-9 to 2-11; Exh. EFSB-S-10).

The Company argued that, as a brownfield site, the Canal Station offered the Company the

(...continued)

including the ownership of several existing generating facilities in New York State, and had proposed to develop a new 525 MW facility on an industrial site in New Hampshire, which it subsequently sold (Exh. EFSB-S-2). The Company indicated that it bid for other generating assets in the region but that these bids were not accepted (Tr. 3, at 226 to 227).

potential to expand existing generating facilities while minimizing environmental impacts (Exhs. SEC-1, at 2-5 to 2-6; EFSB-S-2; Tr. 3, at 228). In particular, the Company asserted that generating capacity at the site could be increased while reducing emissions of all criteria pollutants (Exhs. EFSB-A-2, Bulk Att. at 3-2; SEC-1, at 1-25 (Table 1.4-1)). The Company explained that it also expected less acute visual impacts and impacts to wetlands due to the brownfields nature of the site (Exh. SEC-1, at 2-2, 2-5, 2-6). The Company stated that the Canal Station site could be redeveloped with less tree-clearing impacts or increases in impervious surface areas than would be the case at a greenfield site (*id.* at 2-3). Further, in addition to the continued use of the existing Unit 2 turbine, some infrastructure such as the once-through cooling system, oil handling and unloading areas, administrative areas, and water treatment equipment would be reused, reducing the project's footprint (*id.* at ES-5 to ES-6).

The Company asserted that, following repowering, noise levels in the area would remain the same or decrease slightly from current levels (*id.* at 1-25 (Table 1.4-1)). The Company also testified that traffic impacts would be less than expected at a greenfield site, because the new facility would not result in an increase in workers during operation and that during construction, workers would be brought to the site by bus from satellite parking areas (Tr. 3, at 225 to 226).

The Company stated that interconnections were an important part of its site selection process and discussed the advantages and disadvantages of the site with respect to gas and electrical interconnections (Exhs. EFSB-S-7; EFSB-S-8; EFSB-S-9). The Company noted that the Canal Station is adjacent to a Commonwealth Electric substation, and that an existing interconnection to an interstate gas pipeline lateral runs beneath the Cape Cod Canal (Exhs. EFSB-L-3; EFSB-L-11; Tr. 1, at 75). However, the Company stated that the site's location, more than 50 miles away from the nearest interstate mainline gas facility in Mendon, Massachusetts, could make delivery of natural gas more expensive and less reliable (Exhs. EFSB-L-3; EFSB-L-11; Tr. 1, at 75; Tr. 4, at 458, 465, 467).

The Company also noted that Canal Station is in a highly visible location (Tr. 3, at 290). For example, the site is visible from the Scusset Beach Reservation, which had over 557,000 visitors between July 1998 and June 1999 (Exh. EFSB-RR-10). Other locations from which the proposed

facility would be visible include the Cape Cod Canal, the Canal Walk, the Sandwich Marina, Merchant Square shopping area, and the Sagamore Bridge (Tr. 3, at 290).

C. Analysis

The Company has described Mirant Corporation's development strategy for the Northeast, which focuses on the purchase and redevelopment of existing generating assets, and which resulted in the purchase of existing generation assets from Commonwealth Energy. The Company has provided information on the sites Mirant Corporation pursued in the Northeast and the assets it bought from Commonwealth Energy. The Company also has provided information on how it determined the site layout, generating capacity, and cooling and other technologies for its repowering project. The Siting Board finds that the Company's description of the site selection process used is accurate.

The Company asserted that its proposal minimizes environmental impacts in part through the use of a "brownfield approach" to development. In previous cases, the Siting Board has reviewed the development of new generation on sites currently or previously used for power generation. In these decisions, the Siting Board has noted that the redevelopment and reuse of previously disturbed sites and the use of existing infrastructure can limit many of the environmental impacts that may be associated with industrial development. Additionally, where an industrial character and the presence of industrial support infrastructure are already evident, there often is the potential to develop additional facilities such as a generating plant, consistent with consideration of land use compatibility for such development. The Siting Board encourages such "brownfield" development where appropriate. However, the Siting Board notes that the benefits of such an approach are necessarily site and facility-specific. A review of any such site must take into account the scale, nature and physical attributes of any existing or recent use on the site, the existing character of the surrounding area, and the impacts which the specific proposed use would have on the surrounding area. See Southern Energy Kendall, L.L.C., 11 DOMSB 255, at 275-276 (2000) ("Southern Kendall Decision"); Sithe Mystic Development, 9 DOMSB 101, at 123 (1999) ("Sithe Mystic Decision"); Sithe West Medway Development, L.L.C., 10 DOMSB 274, at 296 (2000) ("Sithe West Medway Decision").

Here, the Company is proposing the installation of new equipment to be integrated into a repowered Unit 2. The record demonstrates that the proposed project has the potential to improve local air quality by significantly reducing Canal Station's emissions of all criteria pollutants, and to reduce noise levels in some locations. The record also demonstrates that there are cost and environmental advantages to the reuse of the existing Unit 2 turbine, once-through cooling structures, oil handling and unloading areas, and other existing structures. In addition, the site has certain advantages directly related to the use of existing onsite facilities, the availability of existing trained emergency services, and the site's proximity to the Cape Cod Canal and the Commonwealth Electric substation.

However, the proposed use of the groundwater sources underlying the site for process water raises issues related to wetland impacts, saltwater intrusion, and possible impacts on municipal water supplies. Furthermore, the distance from the Canal Station to the nearest interstate gas mainline is over 50 miles, which could affect the reliability of gas supply at the proposed facility. Additionally, the proposed project is located in a developed area, with seasonal tourist activity and commercial and residential use in the surrounding community. Therefore, incremental visual and safety impacts could affect a significant number of people.

The record reflects the advantages and disadvantages of redevelopment at the Canal Station site. On balance, the advantages contribute to the creation of certain environmental benefits and to the minimization of environmental impacts; however, the disadvantages create the potential for environmental impacts which would need to be minimized by the Company through design or mitigation. Any disadvantages which could create environmental impacts are reviewed in Section III, below, to ensure that any such impacts would be minimized by the Company through design or mitigation. Accordingly, the Siting Board finds that the Company's site selection process resulted in the selection of a site that contributes to the minimization of environmental impacts of the proposed project and the costs of mitigating, controlling, and reducing such impacts.

III. ENVIRONMENTAL IMPACTS

A. Standard of Review

G.L. c. 164, § 69J¼ requires the Siting Board to determine whether the plans for construction of a proposed generating facility minimize the environmental impacts of the proposed project consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility. In order to make this determination, the Siting Board assesses the impacts of the proposed project in eight areas prescribed by its statute, including air quality, water resources, wetlands, solid waste, visual impacts, noise, local and regional land use, and health, and determines whether the applicant's description of these impacts is accurate and complete. G.L. c. 164, § 69J¼.¹¹

The Siting Board also assesses the costs and benefits of options for mitigating, controlling, or reducing these impacts, and determines whether mitigation beyond that proposed by the applicant is required to minimize the environmental impacts of the proposed project consistent with the minimization of costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility. Compliance with other agencies' standards does not establish that a proposed project's environmental impacts have been minimized.

Finally, the Siting Board assesses any tradeoffs that need to be made among conflicting environmental impacts, particularly where an option for mitigating one type of impact has the effect of increasing another type of impact. An assessment of all impacts of a facility is necessary to determine whether an appropriate balance is achieved both among conflicting environmental concerns and between environmental impacts and cost. A facility proposal which achieves this balance meets the Siting Board's statutory requirement to minimize environmental impacts consistent with minimizing the costs associated with the mitigation, control, and reduction of the environmental impacts of the proposed generating facility.

B. Air Quality

This Section describes the air quality impacts of the proposed project, the mitigation proposed

¹¹ The Siting Board also reviews in this decision the safety, traffic and EMF impacts of the proposed project in Sections III.H, I, and J, below.

by the Company, and the costs and benefits of any additional mitigation options.

1. Applicable Regulations

The Company indicated that regulations governing air impacts of the project include National Ambient Air Quality Standards (“NAAQS”) and Massachusetts Ambient Air Quality Standards (“MAAQS”);¹² Massachusetts Best Available Control Technology (“BACT”) regulations, and Siting Board Technology Performance Standards (“TPS”) (Exhs. EFSB-A-2, Bulk Att. at 3-7; EFSB-RR-28). The Company asserted that, because the Canal Redevelopment Project would be a modification to an existing source and would result in net reductions in estimated emissions, the proposed project would not be subject to the United States Environmental Protection Agency’s (“EPA”) New Source Performance Standards (“NSPS”)¹³ for criteria pollutants, Prevention of Significant Deterioration (“PSD”)¹⁴ and non-attainment New Source Review (“NSR”)¹⁵ requirements, Massachusetts 1-hour

¹² The Massachusetts Department of Environmental Protection (“MDEP”) has adopted the NAAQS limits as MAAQS (Exh. EFSB-G-5-C at 4.2-3).

¹³ The Company stated that Massachusetts has adopted the EPA’s NSPS for pollutants, including NO_x and sulfur dioxide (“SO₂”), which may be emitted from combustion turbines (Exh. SEC-1, at 4.2-6). The Company stated that anticipated emissions of NO_x and SO₂ from Unit 2 following the repowering would fall significantly below the levels set by NSPS (Exh. EFSB-A-2, Bulk Att., at 6-6 to 6-11).

¹⁴ Federal PSD requirements stipulate that modifications to existing sources are subject to PSD review if: 1) the source is within 100 km of Class I (wilderness) areas; and/or 2) such modifications result in a net increase in criteria pollutants (Exhs. SEC-1, at 3.5-5; EFSB-G-5-C at 4.2-6). The proposed project is more than 100 km from the nearest Class I (wilderness) area, and would result in net reductions, rather than net increases, of all criteria pollutants (Exhs. SEC-1, at 3.5-6; EFSB-G-5-C at 4.2-6; EFSB-A-2, Bulk Att. at 3-4, 3-5, 3-7).

¹⁵ Because Massachusetts is classified as “non-attainment” for ozone, new major sources or major modifications to existing sources of NO_x and Volatile Organic Compounds (“VOCs”) are subject to Non-Attainment NSR requirements (Exhs. EFSB-G-5-C at 4.2-5; SEC-1, at 3.5-5). However, the addition of new power generation equipment and the shutdown of the Unit 2 power boiler would result in a net decrease in the emissions of all pollutants which are

(continued...)

nitrogen oxide (“NO_x”) Ambient Standards¹⁶, or the Massachusetts Air Toxics Program¹⁷ (Exh. EFSB-A-2, Bulk Att. at 3-4, 3-5, 3-7).

The Company indicated that, under NAAQS, all geographic areas are classified and designated as attainment, non-attainment or unclassified for six criteria pollutants: SO₂, fine particulates (“PM-10”)¹⁸, NO_x, carbon monoxide (“CO”), ground level ozone, and lead (id.). The Company indicated that, although the Sandwich area is classified as “attainment” or “unclassified” for SO₂, PM-10, NO₂, CO, and lead, the entire Commonwealth of Massachusetts is in serious non-attainment for ozone (Exh. SEC-1, at 3.5-4).

The Company asserted that because of the emissions reductions proposed, the proposed project would be exempt from Federal BACT and Lowest Achievable Emissions Rate (“LAER”) review of criteria pollutants (Exh. EFSB-A-2, Bulk Att. at 3-7). However, the Company indicated that the proposed project would be subject to Massachusetts BACT regulations, which govern all new sources producing more than one ton per year of NO_x, VOCs, CO, SO₂, and PM-10, regardless of any net emissions reductions (id.).

(...continued)

precursors to ozone formation and therefore potentially subject to Non-Attainment NSR requirements (Exh. SEC-1, at 3.5-6).

¹⁶ Massachusetts has established a 1-hour ambient standard for major new sources of NO_x emissions, and for modifications to existing sources that result in net emissions increases in excess of 250 tons per year (“tpy”) (Exh. SEC-1, at 3.5-4). The Company noted that the proposed project would result in a reduction, rather than an increase, in NO_x emissions (id.).

¹⁷ MDEP’s Air Toxics Policy establishes Threshold Effects Exposure Limits (“TELEs”) and annual Allowable Ambient Limits (“AALs”), regulating allowable emissions of over 100 toxic air pollutants (Exhs. EFSB-G-5-C at 4.2-8; SEC-1, at 3.5-3). The Company stated that the proposed project was not subject to this program because the proposed changes to the facility represent a minor modification under the governing regulations (Exh. EFSB-A-2, Bulk Att. at 3-7).

¹⁸ The EPA promulgated a Fine Particle (PM-2.5) NAAQS on July 18, 1997. EPA is in the process of establishing a monitoring network for PM-2.5 (Exh. EFSB-A-28 Att.). In the interim, EPA has indicated that PM-10 should continue to be used as a surrogate (id.).

The Company indicated that the proposed facility would meet the TPS for air emissions from new electric generating facilities set forth in 980 CMR 12.00 (Exh. SEC-1, at 3.5-4). The Company provided documentation indicating that its project would meet the TPS for both criteria and non-criteria pollutants (id. at 3.5-4).¹⁹

2. Emissions and Impacts

The Company asserted that the proposed project would result in major reductions of all pollutants of concern at Canal Station (Exhs. SEC-1, at 3.5-1 to 3.5-9; EFSB-G-5-C at 4.2-2). The Company asserted that the air quality impacts of the repowered Unit 2 would be minimized through the shutdown of the Unit 2 boiler, and through the use of efficient combustion technology, advanced pollution control equipment, natural gas as the primary fuel for the new CTG/HRSG system, and 0.05% low-sulfur oil as the back-up fuel (Exh. SEC-1, at 3.5-2 to 3.5-9). The Company also asserted that dispatch of the proposed project in preference to older generating resources in the region would result in further displacement of NO_x, SO₂ and CO₂ emissions (id. at 3.5-12).

The Company stated that while Unit 2 has been technically capable of operating at up to 60% load using natural gas since the mid-nineties, it has done so on only a very limited basis because of the price of natural gas and the unit's inability to operate at full load on gas (Exh. EFSB-A-23; Tr. 4, at 457). Following the repowering, Unit 2 would operate primarily on natural gas, with a maximum of 30 days operation using No. 2 low sulfur distillate oil as backup fuel. The Company stated that as a result of this fuel change and the installation of more efficient equipment, emissions of criteria pollutants from

¹⁹ Because the Company provided documentation indicating that its project would meet TPS for both criteria and non-criteria pollutants, the Company is exempt from the requirements of 980 CMR 12.00 to provide data comparing its project to alternative fossil-fuel generating technologies (Exh. SEC-1, at 3.5-4 (Table 3.5-4)). Provision of such information is intended to enable the Siting Board to determine whether the project would contribute on balance to "a reliable, low-cost, and diverse regional energy supply with minimal environmental impacts." M.G.L. c. 164, § 69J¼. Exempting projects which meet the TPS streamlines Siting Board review of proposed facilities which incorporate "state-of-the art" environmental performance characteristics.

Canal Unit 2 would significantly decrease following the repowering, as set forth in Table 1, below:

TABLE 1
Unit 2 Annual Emissions

Pollutant	Existing Unit 2¹	Repowered Unit 2²	Reduction %, Unit 2	Reduction %, Canal Station³
NO _x	3817 tpy	342 tpy	91%	60%
SO ₂	14291 tpy	340 tpy	98%	46%
CO	5623 tpy	360 tpy	94%	62%
PM-10	322 tpy	216 tpy	33%	16%
VOCs	81 tpy	46 tpy	43%	20%

¹ Based on 1998-1999 actual average emissions.

² Assuming 100% load firing for 8760 hours, 335 days gas, 30 days oil.

³ Includes Unit 2 repowering and Unit 1 SCR retrofit, compared to 1998-1999 Canal Station emissions.

(Exh. EFSB-A-2-S at 2 to 4).

The Company estimated the quantity of pollutants that would be emitted from repowered Unit 2 on the basis of information from manufacturers and vendors of plant equipment and from government data centers (Exh. SEC-1, at 3.5-1). The Company provided calculations of air emissions from Canal Units 1 and 2 that could be expected following the repowering²⁰ (*id.* at 3.5-10). The Company stated that its air modeling results were based on conservative assumptions and overstated the expected impacts; consequently, the Company argued that these results represent a worst-case scenario rather than expected annual impacts (Tr. 4, at 495-499).

The Company stated that the project would incorporate BACT for NO_x, SO₂, VOCs, CO, and PM-10, as well as for other non-criteria pollutants and air toxics that are regulated as part of the

²⁰ This calculation was based on the maximum pollutant emissions rate at full load assuming natural gas firing for 335 days per year and low sulfur distillate oil firing for 30 days, including startups, with BACT emissions controls (Exh. SEC-1, at 3.5-10).

MDEP air plans approval process (Exh. EFSB-A-2, Bulk Att. at 6-5 to 6-11). The Company asserted that proposed BACT for the facility includes the use of natural gas as the primary fuel source (id.). The Company indicated that the proposed project would include General Electric GE 7241 FA combustion turbines using a dry low- NO_x combustion system and SCR to limit NO_x emissions to 2 parts per million (“ppm”)²¹ when firing natural gas (Exh. EFSB-A-2, Bulk Att. at 2-1, 6-9, 6-11). The Company stated that the ammonia required for the SCR process would be manufactured on-site using an ammonia-on-demand (“AOD”) system, which uses solid urea pellets as an ammonia source, and that ammonia slip would be limited to 2 ppm (Exhs. EFSB-A-2, Bulk Att. at 6-11; EFSB-G-5-C at 4.2-21).

The Company stated that: (1) VOCs would be controlled using good combustion practices and an oxidation catalyst (Exhs. EFSB-A-2, Bulk Att. at 6-11; EFSB-G-5-C at 4.2-21); (2) CO would be controlled using an oxidation catalyst (Exhs. EFSB-A-2, Bulk Att. at 6-11; EFSB-G-5-C at 4.2-21); (3) SO₂ would be controlled by the use of low-sulfur fuels (Exhs. EFSB-A-2, Bulk Att. at 6-6; EFSB-G-5-C at 4.2-21); and (4) PM-10 emissions would be controlled by the use of clean fuels and use of combustion turbine technology which reduces incomplete combustion (Exhs. EFSB-A-2, Bulk Att. at 6-7; EFSB-G-5-C at 4.2-21).

The Company indicated that although the primary combustion fuel for the facility would be natural gas, the repowered facility would operate for up to 30 days on low sulfur distillate No. 2 fuel oil (Exhs. SEC-1, at 3.5-1 to 3.5-9; EFSB-G-5-C at 4.2-2; EFSB-A-2, Bulk Att. at App. B). The Company’s witness, Mr. Cowden, stated that use of a backup fuel is proposed to maintain the facility’s

²¹ Alternative NO_x control technologies which do not require ammonia as a catalyst are under development at this time. The Company identified two such technologies, Xonon and SCONO_x. Xonon was eliminated from consideration because it provides a lower level of NO_x control than SCR (Exh. EFSB-A-2-S-A at 6-2). The Company included SCONO_x in its BACT analysis, but asserted that SCONO_x is an emerging, unproven technology that would not reduce NO_x emissions below 2 ppm (Exhs. SEC-1, at 3.5-23 to 3.5-27; EFSB-A-2-S-A at 6-2). The Company estimated that the levelized cost per ton of NO_x removal using SCONO_x would be eight times that of using SCR, and asserted that the cost of SCONO_x is well above the MDEP’s economic threshold per ton (Tr. 4, at 508 to 509).

ability to provide reliable electric generation at a low cost with the minimum environmental impacts (Tr. 4, at 455 to 458). Mr. Cowden stated that the Company plans to secure a contract for 335-day firm delivery of natural gas, but that a 365-day firm delivery contract would be cost-prohibitive (*id.*). The Company asserted that the ability to burn low sulfur distillate No. 2 fuel oil increases the reliability of the project, especially during the winter, by allowing continued operation of the facility in case of a natural gas supply disruption (Exh. EFSB-A-19; Tr. 4, at 464 to 469). The Company stated that oil firing would occur when the supply of natural gas is interrupted, during times when the price of natural gas exceeds the price of low sulfur distillate, and for purposes of maintenance and training (Exh. EFSB-A-7; Tr. 4, at 464 to 469). The Company stated that the use of low sulfur distillate No. 2 fuel oil in the generating equipment proposed for the facility would meet NAAQS/MAAQS, and Massachusetts BACT requirements (Exh. EFSB-A-2, Bulk Att. at 6-2 to 6-11).

The Company stated that it conducted dispersion modeling of Unit 2 for the ambient air quality which would result from anticipated emissions of SO₂, NO_x, CO, and PM-10 from the project, considered separately and together with emissions from the existing Canal Station Unit 1 and background air quality (Exh. SEC-1, at 3.5-14 to 3.5-15). The Company's modeling generated data using a radial receptor grid extending out to a 15 kilometer radius from the proposed facility. Meteorological data was obtained from T.F. Green Airport in Providence, Rhode Island; upper air recording data was obtained from Chatham, Massachusetts (Exhs. SEC-1, at 3.5-11 to 3.5-14; EFSB-A-2, Bulk Att. at 4-9; EFSB-G-5-C at 4.2-11).

The Company stated that the results of its screening level modeling indicated that the maximum concentrations of criteria pollutants would be below significant impact levels ("SILs"), which represent a small percentage of NAAQS, in all cases except for short-term concentrations of SO₂ and PM-10 when firing distillate oil (Exh. SEC-1, at 3.5-3, 3.5-14 to 3.5-15). The maximum modeled concentrations of criteria pollutants resulting from emissions of the proposed facility are set forth in Table 2, below.

TABLE 2**Modeled maximum ground-level concentrations (in Fg/m^3) from Unit 2, compared with SILs**

Pollutant / Time	Modeled concentrations	SIL
NO _x Annual	0.24	1
SO ₂ 3-hour	122	25
SO ₂ 24-hour	41	5
SO ₂ Annual	0.22	1
PM-10 24-hour	8	5
PM-10 Annual	0.18	1
CO 1-hour	48	2000
CO 8-hour	15	500

(Exh. EFSB-A-2-S-A, at 4-10, 4-11)

The Company stated that, because modeled short-term concentrations of SO₂ and PM-10 from the repowered Unit 2 exceeded SILs, it was required to conduct a combined source impact analysis to demonstrate the proposed project's compliance with NAAQS for these two pollutants (Exh. SEC-1, at 3.5-14 to 3.5-15). The Company indicated that it used the EPA-approved Industrial Source Complex Short-Term version 3 ("ISCST3")²² atmospheric dispersion model to calculate short-term ground-level concentrations of SO₂ and PM-10 with the proposed facility in operation (Exh. EFSB-G-5-C at 4.2-15 to 4.2-21). The Company stated that evaluation of predicted ambient air quality impacts from the project followed prescribed EPA and MDEP procedures (Exh. SEC-1, at 3.5-10 to 3.5-14).

²² The Company stated that the ISCST3 model is the latest version of the EPA's dispersion model and is appropriate for modeling point sources such as the proposed project and the existing Canal Station Units (Exh. SEC-1, at 3.5-12).

The Company stated that when modeled emissions levels of SO₂ and PM-10 were combined with emissions from Unit 1 and background air quality levels, the resulting concentrations were well below the limits established by NAAQS/MAAQS, as shown in Table 3, below (id. at 3.5-14 to 3.5-15).

TABLE 3
Cumulative Maximum Impacts of Unit 1, Repowered Unit 2, and background, compared with NAAQS.

Pollutant / Time	Unit 2 predicted maximum Contribution (Fg/m ³)	Canal Station predicted air permit contribution		Background (Fg/m ³)	Cumulative Impact (Fg/m ³) / percentage of NAAQS	NAAQS (Fg/m ³)
		Unit 1 (Fg/m ³)	Unit 2 (Fg/m ³)			
SO ₂ 3-hour	122	0	91.3 ¹	183	274 / 21%	1300
SO ₂ 24-hour	41	0	26.9 ¹	68	95 / 26%	365
PM-10 24-hour	18	0	4.5 ²	44	48.5 / 32%	150

¹ Measures the highest second-high data over five years. Highest second-high measurements are the MDEP-approved method for air quality modeling of SO₂ cumulative impacts. Meteorological conditions from the previous 5 years are used to model the air quality impacts of the facility's projected emissions. The second-worst day's resulting air quality from each year are compared, and the worst year's data is used to assess cumulative impact.

² Measures highest sixth-high data over five years. Highest sixth-high measurements are the MDEP-approved method for air quality modeling of PM-10 cumulative impacts. Meteorological conditions from the previous 5 years are used to model the air quality impacts of the facility's projected emissions. The sixth-worst day's resulting air quality from each year are compared, and the worst year's data is used to assess cumulative impact.

(Exhs. EFSB-A-2-S-A at 4-10 to 4-11; EFSB-RR-27-S)

The Company also indicated that maximum predicted contributions of the project to ambient air quality would fall within the applicable MDEP limits for all non-criteria pollutants and air toxics (Exh. EFSB-G-5-C at 4.3-3, 4.2-8, 4.2-15 to 4.2-21).

The Company indicated that it examined a range of stack heights and associated air quality impacts in selecting the stack height for the project (Exh. SEC-1, at 3.5-12). The Company testified that its selected stack height for the project, 230 feet, would be just above the height of the existing roofline of Canal Station (*id.* at 1-1). The Company argued that a stack height of 230 feet would best balance existing regulatory requirements with the minimization of the visual impact of the stack in the community (Tr. 3, at 314 to 315).

The Company asserted that operation of the project would cause economic displacement of older generating units with higher emissions rates, and therefore would result in significant regional air quality benefits (Exh. EFSB-SEC-1, at 1-23 to 1-25; Tr. 4, at 435-436). In support of its assertion, the Company used data from the “1997 Marginal Emission Rate Analysis” (September 1998) to compare operations and emissions characteristics of the proposed project with those of other electric generators in the region (Exh. SEC-1, at 1-25, Table 1.4-1-S). The Company’s analysis indicated that, by displacing the generation of an existing average 1,225 MW NEPOOL facility, operation of the new equipment would reduce New England emissions of NO_x, SO₂ and CO₂ by approximately 10,867 tpy, 39,639 tpy and 2,509,526 tpy, respectively (*id.*)²³

3. Offset Proposals

As described above, the Company asserted that the proposed project would be exempt from most emissions offset requirements, including SO₂, NO_x, and VOCs offset programs (Exh. EFSB-A-2-S-A, at 5-1 to 5-3). The Company explained that these offset requirements would not apply to the

²³ The Company assumed that the new equipment would operate for 80% of its annual capacity, or 8,545,800 MW-hours, and would produce emissions based on a mix of firing on oil (30 days) and natural gas (335 days) (Exh. SEC-1, at 1-25, Table 1.4-1-S).

proposed project because the new equipment would reduce emissions from Unit 2 by 98% for SO₂, by 91% for NO_x, and by 43% for VOCs (id.).

The Company indicated that the proposed new equipment would emit a maximum of 4,723,970 tpy of CO₂ (Exh. SEC-1, at 3.5-27). The Company stated, based on 1997 and 1998 operations, that existing Unit 2 emits 2,750,050 tpy of CO₂, which would be avoided through the shutdown of the Unit 2 power boiler as part of the proposed project (id.). Therefore, with operation of the proposed project, the maximum net added emissions of CO₂ would be 1,973,910 tpy (id.). The Company stated that, to meet the Siting Board's CO₂ offset requirement, it would choose from among the three options set forth in the Sithe Mystic Decision (id.).²⁴ The Company stated that, although it has not as yet selected the option that it would pursue, it would submit a proposal as part of a compliance filing to the Siting Board (id. at 3.5-27, Tr. 4, at 429-439).

The Company discussed the potential for the proposed project to require on-site or off-site tree clearing, which could affect CO₂ assimilation.²⁵ The Company asserted that because the area proposed for the project is developed, no on-site tree clearing would be required (Exh. SEC-1, at 3.5-28). However, the Company indicated that some improvements to Duke Energy's existing Algonquin Gas Transmission "G" lateral, extending from the project area to Mendon, Massachusetts, would be required to allow delivery natural gas for the project (id. at 2-7; Exh. EFSB-L-3). The Company indicated that these improvements are expected to include installing additional pipeline capacity and additional compression equipment. The Company noted that Duke Energy was developing plans for such improvements, and had not provided the Company with information regarding the extent of tree-

²⁴ In the Sithe Mystic Decision, the Siting Board outlined three approaches to offsetting CO₂ emissions from a new generating facility when emissions from one or more existing generating facilities were to be reduced contemporaneously (Exh. SEC-1, at 3.5-27).

²⁵ In response to a Siting Board request, the Company provided a 1996 study titled Exchange of Carbon Dioxide by a Deciduous Forest: Response to Interannual Climate Variability conducted by Michael Goulden, William Munger, Song-Miao Fan et al. (Exh. EFSB-SRR-63 Att.). The study shows that the average sequestration rate of deciduous trees on a site in Central Massachusetts over five years was equivalent to 3.6 tons of CO₂ per acre per year (id.).

clearing impacts that could be expected (Exhs. EFSB-L-3; EFSB-L-11; Tr. 1, at 76). With respect to electrical interconnection, the Company stated that ISO New England and Commonwealth Electric were conducting an interconnect study to determine the extent of any transmission system upgrades needed to support the proposed project (Exh. SEC-1, at 2-6). The Company did not provide information regarding the potential for tree-clearing impacts resulting from possible transmission system upgrades for the line connecting Canal Station to the bulk transmission system.

4. Analysis

The record indicates that the proposed facility would consist of four combustion turbines and four HRSGs using natural gas as their primary fuel and low sulfur distillate No. 2 fuel oil as backup fuel, and incorporating advanced pollution control equipment including SCR. The Company proposes to achieve BACT for CO, PM-10, SO₂, lead, NO_x and VOCs.²⁶ The Company provided information regarding facility emissions which demonstrates that the proposed facility would meet TPS for both criteria and non-criteria pollutants. Consequently, the Siting Board finds that no alternative technologies assessment is required for the proposed project.

²⁶ With regard to the use of SCR versus a zero ammonia technology to achieve BACT, the Siting Board is of the opinion that, due to its primacy of jurisdiction and to its greater expertise in emissions control technologies, MDEP is the agency best suited to determine whether and when to introduce new emissions control technologies into the Commonwealth. See IDC Bellingham Decision, 9 DOMSB 225, at 270 (1999) (“IDC Bellingham Decision”). As a result, the Siting Board will not require use of such technology (id.). The Siting Board also notes that MDEP in a recent gas facility permit effectively has allowed the use of SCR rather than a zero ammonia technology at this time, with a review of the cost-effectiveness of retrofitting a zero ammonia technology to be conducted within five years. ANP Bellingham Energy Company - Compliance Decision, 9 DOMSB 211, at 221 (1999) (“ANP Bellingham Decision on Compliance”). The Siting Board therefore concludes that by incorporating the control technology that MDEP determines to be BACT for NO_x, the Company will have minimized its NO_x emissions and ammonia slip consistent with minimizing the cost of mitigating and controlling such technologies.

The Company's emissions analysis demonstrates that repowering Unit 2, which would include the shutdown of the existing Unit 2 power boiler and the addition of the new CTGs and HRSGs, would produce significant reductions in emissions of all criteria pollutants. Specifically, Unit 2 annual NO_x emissions would decrease by 91%, Unit 2 annual SO₂ emissions would decrease by 98%, Unit 2 annual CO emissions would decrease by 94%, Unit 2 annual PM-10 emissions would decrease by 33%, and Unit 2 annual VOC emissions would decrease by 43%. At the same time, Unit 2's generating capacity would increase from approximately 560 MW to 1,225 MW.

The Company has used MDEP-approved air modeling techniques to model both the air quality impacts of emissions from repowered Unit 2, and the cumulative air quality impacts of the combined emissions from Unit 1 and repowered Unit 2, for certain pollutants. This modeling demonstrates that, assuming maximum firing of all turbines using natural gas for 335 days and low sulfur distillate oil for an additional 30 days, pollutant concentrations would be below SILs for all criteria pollutants except for short-term SO₂ and PM-10, and within applicable limits for other hazardous or toxic air pollutants. The Company's cumulative impact analysis indicated that modeled emissions from the proposed facility, combined with modeled emissions from Unit 1 and background ambient conditions, would result in short-term concentrations of SO₂ and PM-10 that are no more than 32% of the NAAQS/MAAQS limits.

The Company has applied for an air quality permit from MDEP that would allow it to fuel Unit 2 with low sulfur distillate oil for up to 30 days each year, without any seasonal restriction on oil-firing. The Company argues that it needs to retain the ability to burn oil in Unit 2 due to the difficulty and cost of acquiring a 365-day supply of natural gas for Canal Station, and states that it intends to use oil when natural gas is unavailable due to supply emergencies, when the use of natural gas is undesirable due to its higher relative cost, and as needed for maintenance and training.

The Siting Board recognizes that economic and reliability arguments may favor allowing reasonable flexibility in the use of oil in situations where air quality conditions would be improved or held well within applicable standards. Here, the record shows that the Company's proposed air emissions are higher than they would be if Unit 2 used only natural gas, and that SILs would be

exceeded for some pollutants over short-term periods. However, the Company's cumulative impact modeling demonstrates that air quality would remain well within applicable regulatory standards. Perhaps more important, because the repowered Unit 2 would run primarily on natural gas, rather than occasionally as at present, and because No. 2 low sulfur distillate, rather than No. 6 fuel oil, would be used for backup fuel, the proposed project would significantly improve regional air quality for much of the year. The record also shows that the proposed facility, when burning oil, would have emissions below those of existing marginal units, and that it therefore has the potential to contribute to regional air quality improvements through displacement, even when burning oil. Further, because Canal Station has existing infrastructure for oil deliveries by barge, the traffic impacts normally associated with the delivery of oil would be minimized through barge deliveries.

Given the significant reductions in emissions across all pollutants associated with the repowering of Unit 2, the wide margin by which air quality standards would be met even during oil-firing, the improvements in local air quality during the significant percentage of the year when the repowered Unit 2 would run on natural gas, and the potential for regional air quality improvements, the Siting Board finds that the Company's proposal to burn oil as a backup fuel for a maximum of 30 days annually minimizes environmental impacts consistent with minimizing the cost of mitigation, control and reduction of such impacts.

The record indicates that the Company has modeled air pollutant emissions with a variety of stack heights and that the proposed stack height was arrived at by balancing the visual impacts of a greater height with the corresponding air quality improvements. When viewed against the reduced emissions and against local pollutant concentrations discussed above, the additional air quality improvements that would result from a taller stack would likely be outweighed by the increased visual impacts of the taller stack.

The Siting Board has set forth a general approach to the mitigation of CO₂ emissions that requires generating facility applicants to make a monetary contribution, based on offsetting 1% of

annual facility CO₂ emissions at \$1.50 per ton,²⁷ to cost-effective CO₂ offset programs selected in consultation with the Siting Board staff. Nickel Hill Energy, L.L.C., 11 DOMSB 83, at 143-144 (2000) (“Nickel Hill Decision”); Brockton Power L.L.C., 10 DOMSB 157, at 192-193 (2000) (“Brockton Power Decision”); Dighton Power Decision, 5 DOMSB 193, at 239-240. The Siting Board also recently has approved a non-monetary approach to CO₂ mitigation based on the shutdown or curtailment of an existing source of CO₂ emissions. Sithe Edgar Development, LLC, 10 DOMSB 1, at 136-140 (2000) (“Sithe Edgar Decision”); Sithe Mystic Decision, 9 DOMSB at 136-140.

In the Sithe Mystic Decision, the Siting Board accepted for the first time a non-monetary CO₂ mitigation program based on voluntary curtailment of operations at an existing source, subject to conditions precluding collateral use of the curtailed operations for offsetting other pollutant emissions. Sithe Mystic Decision, 9 DOMSB at 136-140. In that decision, the Siting Board also outlined two alternative approaches: (1) Sithe could make the standard monetary contribution, based on offsetting 1% of CO₂ emissions from its proposed facility at \$1.50 per ton; or (2) Sithe could base its monetary contribution on the net increase in CO₂ emissions at the Mystic Station site, provided that it did not use CO₂ reductions from its existing units as offsets for CO₂ emissions from any other source. Id. at 140. The Company has indicated its intention to meet the Siting Board’s CO₂ offset requirement by one of the three approaches set forth in the Sithe Mystic Decision, but has deferred the choice of approach to a compliance filing. However, the Company has provided estimates of the maximum annual CO₂ emissions from its proposed new equipment, and the maximum net increase in annual CO₂ emissions from the proposed project and the shutdown of existing Unit 2; these data are sufficient to allow the Siting Board to determine the level of CO₂ offsets required under each approach.

²⁷ The Siting Board notes that, in future reviews, evidence may be developed that supports use of a different assumed cost of providing CO₂ offsets, or use of a range of monetary values, or a greater or sole use of a non-monetary basis, in determining the appropriate level of CO₂ mitigation. Future applicants are put on notice that the Siting Board may seek to develop evidence relating to the appropriateness of the review standards set forth in the Dighton Power Associates, 5 DOMSB 193 (1997) (“Dighton Power Decision”) or other reviews, and that the Siting Board may adjust its existing monetary standard to account for inflation or other similar changes based on the passage of time.

The Siting Board has required in recent cases that CO₂ mitigation plans be adjusted to include offsets for significant net tree-clearing impacts resulting from the construction of bulk generating facilities, including both on-site and off-site project-related impacts. IDC Bellingham Decision, 9 DOMSB at 268, 274-275, 335; ANP Blackstone Energy Company, 8 DOMSB 1, at 126-127, 129-130, 181 (1999) (“ANP Blackstone Decision”); ANP Bellingham Energy Company, 7 DOMSB 39, at 154, 156-157, 212 (1998) (“ANP Bellingham Decision”). Here, the record indicates that no on-site tree clearing would be required for the construction of the proposed project. However, the planned gas supply and electrical transmission upgrades required to support the proposed project may require tree-clearing; if so, the Company’s CO₂ mitigation filing also should include information indicating the extent of tree-clearing associated with interconnections for the project and should adjust the level of CO₂ mitigation provided to account for tree-clearing impacts.²⁸

Accordingly, the Siting Board directs Mirant Canal II to develop, in consultation with the Siting Board staff, a plan to provide CO₂ mitigation beginning no later than the end of the first year following commencement of commercial operation of the proposed project. Consistent with the Siting Board’s rulings in recent cases, Mirant Canal II shall either: (1) by the end of the first year of operation, make a monetary contribution of \$1,134,498²⁹ (plus an adjustment for tree-

²⁸ The Siting Board notes that here, as in past cases, it will use a single time period of 30 years to account for loss of carbon sequestration associated with project-related tree-clearing impacts. See IDC Bellingham Decision, 9 DOMSB at 274-275. In future cases, the Siting Board may consider whether it is more appropriate to include two time periods in calculating sequestration loss; a period of time to account for sequestration lost as a result of the removal of trees, and a period of time to account for loss of annual carbon uptake associated with the loss of a growing forest over the life of the proposed facility. Id.

²⁹ The contribution is based on offsetting 1% of facility CO₂ emissions over 20 years, at \$1.50 per ton, yielding a contribution of \$1,417,191. The 20-year amount is first distributed as a series of payments over the first five years of project operation, then adjusted to include an annual cost increase of 3%, and finally discounted at 10% per year. See IDC Bellingham Decision, 9 DOMSB at 273; Sithe Mystic Decision, 9 DOMSB at 140; U.S. Generating Company, 6 DOMSB 1, at 128-129 (1997) (“Millennium Power Decision”). If the Company chooses, the CO₂ offset requirement also would be satisfied by a monetary contribution of \$1,504,823, to

(continued...)

clearing) to a cost-effective program or programs for CO₂ mitigation to be selected upon consultation with the staff of the Siting Board; or (2) by the end of the first year of operation, make a monetary contribution of \$474,050³⁰ (plus an adjustment for tree-clearing), if it can establish that it will make no additional use of the CO₂ emissions reductions from existing equipment to provide offsets for CO₂ emissions from other sources; or (3) provide offsets for 1% of the proposed project's maximum net CO₂ emissions (plus an adjustment for tree-clearing) based on voluntary curtailment of operations of other existing equipment at Canal Station, or of equipment at another existing source, subject to conditions that the curtailment of operations be based on enforceable and verifiable limits and that there be no collateral use of the curtailment of operations to satisfy or avoid emissions offset requirements relating to other air pollutants emitted from Canal Station and/or to provide emissions offsets for any air pollutants emitted by other sources. If the Company elects one of the monetary contribution options, it should provide the Siting Board with detailed information regarding the program or programs to which the contribution will be made.

Accordingly, the Siting Board finds that, with implementation of the foregoing mitigation for CO₂ impacts, the air quality impacts of the proposed project would be minimized.

C. Water Resources

(...continued)

be paid in five annual installments during the first five years of facility operation. See IDC Bellingham Decision, 9 DOMSB at 273; Sithe Mystic Decision, 9 DOMSB at 140; Millennium Power Decision, 6 DOMSB at 128-129.

³⁰ The contribution is based on offsetting 1% of the net increase in maximum CO₂ emissions from Canal Station facility CO₂ emissions over 20 years, at \$1.50 per ton, yielding a contribution of \$592,173. The 20-year amount is first distributed as a series of payments over the first five years of project operation, then adjusted to include an annual cost increase of 3%, and finally discounted at 10% per year. See IDC Bellingham Decision, 9 DOMSB at 273; Sithe Mystic Decision, 9 DOMSB at 140; Millennium Power Decision, 6 DOMSB 1, at 128-129. If the Company chooses, the CO₂ offset requirement also would be satisfied by a monetary contribution of \$628,790, to be paid in five annual installments during the first five years of facility operation. See IDC Bellingham Decision, 9 DOMSB at 273; Sithe Mystic Decision, 9 DOMSB at 140; Millennium Power Decision, 6 DOMSB at 128-129

In this section, the Siting Board addresses the water-related impacts of the proposed facility, including: (1) the water supply requirements of the facility and related impacts on affected water supply systems and on other water resources; and (2) the water-related discharges from the facility, including heated effluent, wastewater discharges and storm water discharges.

1. Description

Mirant Canal II stated that Canal Station currently is permitted to withdraw 164 million gallons per year (“gpy”) of groundwater, and requires a maximum of 198 million gpy for process water, 11 million gpy of potable water, and 518 million gallons per day (“mgd”) of canal water for once-through cooling. The Company estimated that, after repowering, Canal Station would require 305 million gpy for process water, 8.4 million gpy of potable water, and 620 mgd of canal water for once-through cooling (Exhs. SEC-1, at 3.3-13 to 3.3-14, 3.3-40; EFSB-W-29; Tr. 8, at 952, 754).

The Company provided a breakdown of its process water needs, indicating that after repowering, Canal Station would require approximately 452,000 gallons per day (“gpd”), or 314 gallons per minute (“gpm”), of water to meet normal base load water needs while burning natural gas (Exh. EFSB-W-29-A). The Company stated that additional process water would be needed for: (1) steam augmentation (553,000 gpd, 384 gpm) for a maximum of 1,000 hours per year; (2) evaporative cooling (104,000 gpd, 72 gpm) for approximately 2800 hours per year; and (3) NO_x control (644,000 gpd, 447 gpm) during oil firing for a maximum of 30 days per year (Exhs. EFSB-W-25; EFSB-W-29 A to E; SEC-1, at 3.3-15). The Company noted that these other water uses could elevate Canal Station water use to a maximum of 1.1 mgd (763 gpm) on a short term basis (Exh. EFSB-SRR-64; Tr. 8, at 953).³¹

The Company stated that it currently uses 11 million gpy of potable water from Sandwich to refill the potable water tanks of ships delivering oil to its Esco Terminal, to meet the sanitary needs of its

³¹ The Company noted that, while these figures indicate consumption under normal loads and conditions, it does not expect its water use to vary by more than 10% under other operating scenarios (Exh. EFSB-W-32).

employees, to supply high-quality process water for the facility's water treatment plant, and to refill the facility's raw water tank (Exh. SEC-1, at 3.3-14; Tr. 8, at 965-966). Following repowering, the Company would use well water rather than potable water for its raw water tank, reducing potable water use to 8.4 million gpy (Exh. SEC-1, at 3.3-14).

The Company indicated that it evaluated alternatives to once-through cooling for Unit 2, including cooling ponds and spray canals, freshwater and saltwater cooling towers, and air cooled condensers, but concluded that these alternatives were generally inferior to once-through cooling in light of the unique hydraulic advantages of the site (Exh. EFSB-G-5-C at 3-2 to 3-25). Specifically, the Company determined that: (1) cooling ponds and spray canals would require at least 1250 acres of land, would create a significant consumptive fresh water use, and would be unreliable in winter; (2) freshwater cooling towers would require up to 10.5 mgd of freshwater, would have higher capital and operating costs, would reduce plant efficiency, and would result in unacceptable noise and visual impacts; (3) saltwater cooling towers would have many of the same disadvantages as freshwater cooling towers and additionally would result in salt deposition that could create corrosion and severe damage to vegetation; and (4) air cooled condensers would reduce plant efficiency,³² require significant additional space, and result in increased visual, wetlands, noise and safety impacts (id.).

The Company stated that wastewater would include intake screen sluice and discharge flume flushing water, equipment blowdown, chemical wash water, and neutralized demineralizer regenerant water (id. at 4.6-54, 4.6-59). The Company stated that its existing waste water treatment system would be largely unchanged and that it would continue to discharge waste water to the Cape Cod Canal with water used for once-through cooling (Exhs. EFSB-W-2; EFSB-WL-11; Tr. 6, at 801). The Company stated that its discharge system would be subject to oversight by the EPA as part of its National Pollution Discharge Elimination System ("NPDES") permit (Exhs. EFSB-G-5-C at 4.6-54, 4.6-59; EFSB-WL-11).

³² The Company noted that the drop in efficiency resulting from this alternative would result in the facility producing added NO_x, SO₂ and CO₂ emissions of 151 tpy, 542 tpy and 86,211 tpy, respectively. (Exh. EFSB-G-5-C at 33-21).

2. Impacts of Groundwater Withdrawals

The Company stated that following the repowering, Canal Station's groundwater withdrawal requirements would increase by over 100 mgd, and that its peak daily withdrawal rate would rise to approximately 770 gpm (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). The Company proposed to withdraw this water from two existing on-site wells ("Wells No. 2 and 3") which currently deliver a combined total of 0.54 mgd, or approximately 375 gpm³³, and from a new well to be developed on-site ("Well No. 4") (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). The Company stated that Well No. 4 would be located on the north side of the Canal Station access road, approximately 500 feet west of the Freezer Road entrance, 1200 feet southwest of an existing well used by a fish processing plant, and 450 feet east of a wetlands area (Exh. EFSB-W-12-S3). The Company stated that, at this location, the groundwater exhibits tidal fluctuations despite being approximately 1000 feet from the Cape Cod Canal (id.).

Mirant indicated that, if necessary, it could also withdraw groundwater at an inactive well site owned by the Sandwich Water District ("Tupper Road well site").³⁴ Existing wells at this site operated at approximately 0.37 mgd (260 gpm) from 1948 to 1978; however, in 1978 a flood damaged the pumping equipment and the wells were never returned to service (Exh. EFSB-W-12-S7; Tr. 8, at 963 to 964). The Company stated that the existing wells required rehabilitation from a buildup of iron deposits and from breached or collapsed screens, and that a new supply well would need to be developed at this site if it were to be used for process water by the Canal Station (Exh. EFSB-W-12-S7; Tr. 8, at 963 to 964). The Company stated that the Tupper Road well site is located approximately 2000 feet to the southeast of Wells 2 and 3 and 2000 feet to the south of the fish processing plant's well (Exh. EFSB-W-90). The Company identified a wetland area immediately adjacent to the Tupper Road well site (Exh. EFSB-W-12-S3). The Company stated that it plans to list

³³ The Company noted that a 1979 pump test revealed that Wells No. 2 and 3 could deliver a combined volume of approximately 530 gpm (Tr. 8, at 945).

³⁴ The Company stated that Sandwich can no longer use the Tupper Road well site as a municipal water supply because the Water District does not own the land within a 400 foot radius of the well as required by MDEP Zone 1 wellhead protection regulations (Tr. 6, at 688).

both Well No. 4 and the Tupper Road well site on its Water Management Permit as authorized withdrawal points, although it would develop the Tupper Road well site only in the event of the failure of another of its supply wells (id.; Exh. EFSB-W-90; Tr. 8, at 944).

The Company conducted pump tests at the Tupper Road well site and at the proposed site of Well No. 4 in order to assess their ability to provide process water for Canal Station (Exh. EFSB-W-90). The Company stated that its pump tests were performed using protocols developed in consultation with the MDEP, the Cape Cod Commission, and the Sandwich Conservation Commission (id.; Tr. 6, at 682 to 683; Tr. 9, at 1024 to 1025). The Company's pump tests involved the installation and monitoring of observation wells and piezometers in the vicinity of the proposed wells (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). These wells and piezometers recorded the drawdown and recovery of nearby surface water and wetlands during pumping at each well (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). The Company provided analyses of the pump test results ("pump test reports") which focused on the impact that additional withdrawals would have on the aquifer, and the likelihood that saline or contaminated water in the area could migrate to local water supplies (Exhs. EFSB-W-12-S7; EFSB-W-12-S8).

The Company proposed that, following the repowering, it would operate Well No. 2 at up to 370 gpm and Well No. 3 at up to 400 gpm (Exh. EFSB-W-12-S8; Tr. at 1021). The Company stated that a third well capable of producing 400 gpm would be needed in order to provide redundancy in the event of a failure of either Well No. 2 or Well No. 3 (Exh. EFSB-W-12-S8; Tr. at 1021). The Company reported that, during the pump test, Well No. 4 yielded 400 gpm (Exh. EFSB-W-12-S8). The Company initially planned to test the Tupper Road well site to 400 gpm; however following input from local and state authorities, the Company tested the ability of the well to yield 770 gpm (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). The pump test of the existing Tupper Road well indicated that it would yield 457 gpm; however the Company noted that the Tupper Road well is over 50 years old, and argued that a new well or wells, with a more efficient pump, could yield 770 gpm (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). The pump tests indicated that with the proposed withdrawals, drawdown

would be 4 feet or less at 100 to 1000 feet from Well No. 4, and drawdown would be 2 feet or less at 100 to 1000 feet from the Tupper Road Well, with a gradient moving from the aquifer towards the saline water (Exhs. EFSB-W-12-S7; EFSB-W-12-S8).

The Company stated that the nearest known water supply wells were 2000 feet from the Tupper Road well site and 1200 to 1400 feet from the proposed Well No. 4 site (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). The Company stated that no significant drawdown would occur at these wells due to distance and relative location above the aquifer (Exhs. EFSB-W-12-S7; EFSB-W-12-S8). The Company provided maps of the recharge areas of wells in the Upper Cape Cod area which indicated that the recharge areas of town wells and of existing and proposed process water wells would not intersect (Exh. SEC-1, at 3.3-10, Fig. 3.3-4).

The Company asserted, based on geological data and its pump tests, that the proposed use of groundwater wells to provide process water would not result in drawdown or other impacts to wetlands due to the presence of underlying layers of clay and silt, which isolate the wetlands' groundwater supply from the deeper waterbearing unit from which the wells would draw water (Exhs. SEC-1, at 3.4-15; EFSB-WL-10; EFSB-W-12-S7; EFSB-W-12-S8; Tr. 8, at 994-995). The Company provided geological profiles, based on borings taken in the vicinity of Canal Station and the Tupper Road well site, that showed the location and extent of these layers (Exhs. EFSB-WL-10, Att.; EFSB-W-12-S8). The Company stated that in one set of borings it encountered clay layers 10 to 30 feet thick at depth of 50 to 70 feet; other borings going down 100 feet encountered clay throughout the bottom 70 to 90 feet (Exhs. EFSB-WL-10, Att.; EFSB-W-12-S8). The Company stated that USGS data indicates that fine-grained soils predominate between bedrock at 220 feet deep and more-permeable soils at approximately 150 feet deep (Exhs. EFSB-WL-10, Att.; EFSB-W-12-S8).

The Company noted that its on-site wells have been in use for over 20 years, and that monitoring of these wells has shown no evidence of any impacts to wetlands (Exh. SEC-1, at 3.3-1; Tr. 6, at 723). The pump tests indicated that the wetlands adjacent to the Tupper Road well site would not be affected by the proposed use of this well site (Exh. EFSB-W-12-S7). The pump test reports recommended that the permanent observation wells installed during the pump tests be monitored to

allow further evaluation of the impacts of water withdrawals on neighboring wetlands and surface water bodies (Exhs. SEC-1, at 3.4-15; EFSB-WL-10, EFSB-W-12-S-8).

Subsurface geological data provided in the pump test reports indicated that the saltwater/freshwater interface at the depth of the proposed wells is beyond the shoreline of the Cape Cod Canal (Exh. EFSB-W-12-S8). The Company noted that the clay lens discussed above, coupled with the distances and relative locations of drinking water sources and contaminated areas, would prevent existing near-surface contamination at or near the Canal Station site from reaching the groundwater used for water supply (Exh. EFSB-W-12-S8; Tr. 6, at 748).³⁵

The Company asserted that, based on the 20 year operating record of its on-site wells, the groundwater aquifer would be able to supply sufficient water for the facility even during periods of very low rainfall (Tr. 6, at 698). The Company stated that roughly 190 mgd of recharge enters the western lobe of the Cape Cod aquifer (Exhs. EFSB-W-3-B; EFSB-W-29-S Att. D; Tr. at 1021).

3. Impacts on the Cape Cod Canal

The Company stated that Canal Station currently uses once-through cooling for Units 1 and 2. Cooling water is withdrawn from the Cape Cod Canal via two intake structures 10 to 15 feet below mean sea level; after use, the heated water is combined with treated process wastewater and discharged back into the Canal via a discharge flume connected to a slot diffuser located in the Canal approximately 30 feet below mean sea level (Exh. SEC-1, at 3.3-29 to 3.3-39). The existing intake and outfall structures were installed with the original Canal Units 1 and 2, and as part of the repowering project, a third intake structure would be installed between the two existing intakes (*id.* at 3.3-29, 3.3-38). The Company stated that following the repowering, use of the existing Unit 2 intake would cease and be replaced by the new Unit 2 intake and that combined circulating water discharge for both Unit

³⁵ Contamination at the site consists of heavy metals in the area between existing Unit 1 and Unit 2 and small concentrations of petroleum at other locations (Tr. 6, at 741 to 744). Due to the low levels of contamination, MDEP has not required the Company to clean up these areas (*id.*). See Section III.H, below.

1 and the repowered Unit 2 would be routed through the existing slot diffuser (id. at 3.3-38; Tr. 8, at 975).

The Company stated that, following the repowering of Unit 2, water withdrawals from the Canal would increase by 19% to 620 mgd (Exh. EFSB-W-51-S; Tr. 6, at 679). However, the Company calculated that the maximum increase in discharge water temperature over intake temperature would remain at the current level of 32 degrees Fahrenheit (Tr. 6, at 754 to 756). The Company also projected that the maximum discharge temperature would remain within its current permitted level of 86 degrees Fahrenheit in the upper 15 feet of the water column above the discharge diffuser (id.).

The Company asserted that, following the repowering of Unit 2, the thermal plume from the Canal Station would not cause significant impacts to the aquatic environment, since the maximum discharge temperature would remain below the critical value of 90 degrees necessary to protect fisheries from thermal impacts (Exh. EFSB-W-62; Tr. 6, at 795).³⁶ The Company noted that observational data suggests that thermal discharges from the existing facility have not resulted in fish kills at the diffuser, although previous diffuser designs resulted in thermal impacts to Atlantic Menhaden (Tr. 6, at 796, 798 to 799).

The Company performed several studies to assess the amount of larvae that currently are entrained in the cooling water intake (Exhs. SEC-1, at 3.3-52 to 3.3-60; EFSB-W-56). These studies included sampling of both ichthyoplankton and lobster larvae in the Canal intake (Exhs. SEC-1, at 3.3-52 to 3.3-60; EFSB-W-56).³⁷ Based on its studies, the Company estimated that less than 1% of the

³⁶ The Company provided a detailed list of all the fish species that inhabit or pass through the Canal and their tolerance for thermal effects (Exh. EFSB-W-62). The Company concluded that the project would not affect these species due to the 86 degree temperature limit in the upper 15 feet of the water column above the diffuser that would be imposed by the NPDES permit (Exh. EFSB-W-62; Tr. 6, at 795). The Company noted that thermal studies of its existing discharge indicate that temperatures above the diffuser have not exceeded 81 degrees Fahrenheit (Tr. 6, at 761).

³⁷ The Company argued that the effects of entrainment of phytoplankton would be negligible, as phytoplankton populations are replaced every 24 hours in Cape Cod Bay and Buzzards Bay (Exh. EFSB-W-63).

larvae in the Canal would be entrained at the higher water withdrawal levels, and argued that a 1% loss would be negligible in terms of larvae survival (Exh. EFSB-G-5-C at 4.6-77 to 4.6-78; Tr. 6, at 799 to 800). The Company stated that it also modeled larval densities using data from Buzzards Bay and Cape Cod Bay, as well as the Cape Cod Canal (Exh. EFSB-RR-47-S, Bulk Att. #4, at 4-3). The Company stated that it would update both sets of analyses using data collected over a one-year sampling period (Exh. EFSB-RR-47-S, Bulk Att. #4, at 4-3).

With respect to fish impingement, the Company stated that both a 1978 fish impingement Study by Hall and Morrow and impingement sampling by the Company's consultant, Marine Research Inc., found that generally, impingement losses at Canal Station range from 1 to 3 fish per hour and are among the lowest of any large-volume once-through cooling power plant in the Northeast (Exh. EFSB-G-5-C at 4.6-75). The Company noted that on two occasions, a malfunction in the chlorine handling system resulted in significantly higher fish mortality rates (*id.*). The Company indicated that it has monitored the facility's intake screens and has not found any occurrences of impingement of marine mammals or sea turtles (*id.* at 4.6-89).

The Company stated that, to reduce impingement impacts, it engineered its proposed intake structure to incorporate the best available technology for withdrawals from surface water bodies as required by EPA, the Massachusetts Division of Marine Fisheries, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (Tr. 8, at 1026).³⁸ Special design components of the intake structure include: (1) minimization of approach velocities to the screen; (2) using a modified Ristroph traveling screen design; (3) improvements to the design of the chlorine feed system; (4) positioning the Unit 2 replacement intake screens to be as close as possible to "flush" with the edge of the Canal; and (5) inclusion of a new fish return system for occurrences of fish impingement on screens

³⁸ The Company noted that both EPA and MDEP would review the design of the project's intake and outfall structures and the characteristics of its thermal discharge for compliance with Section 316a and 316b of the Clean Water Act (Exh. EFSB-G-5-C at 4.6-50; Tr. 6, at 770). Section 316a requires that the discharge result in the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife in and on the body of water receiving the discharge; Section 316b requires that the intake use the "Best Technology Available" to minimize adverse environmental impacts (Exh. EFSB-G-5-C at 4.6-50).

(Exhs. EFSB-G-5-C at 4.6-49 to 4.6-50, 4.6-79; EFSB-W-51-S; Tr. 8, at 1026). The intake design also includes a low wall situated below the intake to prevent benthic organisms from becoming entrained, fish passages to encourage fish to stay away from the intake, and revolving fish screens (Tr. 8, at 1026). The Company stated that these improvements would reduce current impingement losses by at least 20% to 50% and that as a result, the project would have a net positive impact on the number of surviving adults of commercial/recreational species compared to conditions at the existing Canal Station (Exh. EFSB-G-5-C at 4.6-79; Tr. 8, at 1032).

4. Analysis

Mirant Canal II has proposed to repower the existing Unit 2 at Canal Station. The proposed project would require water for three primary purposes: for process water, for potable and sanitary use, and for cooling. The Company intends to withdraw its process water from groundwater in Cape Cod's underlying aquifer via two existing on-site wells and one new on-site well; if necessary, the Company could also develop a water supply at the Tupper Road well site. The Company intends to rely on potable water from the Town for sanitary uses; the record shows that the Company is developing an agreement with the Town specifying that it would not use Town water for any other process needs, with the possible exception of addressing a short term water emergency.

The proposed project, like the existing Units 1 and 2, would be cooled by water withdrawn from, and discharged to, the Cape Cod Canal. The record demonstrates that, although the Company analyzed cooling technologies other than once-through cooling, each would present substantial environmental and technical disadvantages relative to once-through cooling. Furthermore, none of these alternate technologies would be feasible given the constraints of the Canal Station site. Most wastewater would be discharged to the Cape Cod Canal in combination with its once-through cooling discharge, although stormwater would be discharged through an upgraded stormwater management system. In order to determine whether the water impacts of the proposed project would be minimized,

the Siting Board considers below the impacts of: (1) groundwater withdrawals on surface- and groundwater bodies and nearby wetlands; (2) potable water use on the Sandwich municipal water supply; and (3) once-through cooling on water quality and fisheries in the Cape Cod Canal and surrounding bays.

The record shows that following the proposed repowering, Canal Station would require a maximum of 305 mgd for process water, an increase of approximately 105 mgd over current requirements. The record shows that the proposed facility would require 0.452 mgd (314 gpm) of water to meet normal base load water needs while burning natural gas. In addition, the record shows that the proposed facility would use additional water for steam augmentation, evaporative cooling, and NO_x control, and that these additional uses would increase the proposed facility's peak water use to a maximum of 770 gpm on a short term basis.

The Company has provided evidence that it can meet its process water needs through the use of groundwater. Specifically, the record shows that 190 mgd enters the western lobe of the Cape Cod Aquifer, and that during peak usage, the repowered Canal Station would use 1.1 mgd, or approximately 770 gpm. The record shows that Canal Station currently withdraws approximately 375 gpm from existing Wells No. 2 and 3, and that 1979 pump tests indicate that these two wells could provide a combined volume of approximately 530 gpm using existing pumps. In addition, the Company's pump tests demonstrate that it could obtain at least 400 gpm from Well No. 4. The Company's plans to meet peak water demand from three on-site wells therefore are reasonable. The record also demonstrates that the Company could develop wells at Sandwich's Tupper Road well site in the event that it encountered problems with its on-site wells. The Company's pump tests show that the existing Tupper Road well could yield 457 gpm, and that with a more efficient well, this site could yield 770 gpm.

The record indicates that the proposed increase in groundwater withdrawals would not affect local drinking water supplies or prevent Sandwich from meeting its future water needs.³⁹ The record

³⁹ The record shows that, to date, no other municipality has requested the use of the Sandwich
(continued...)

indicates that the relative location and distance between existing and proposed Company wells and any other Town or private wells make it highly unlikely that Town or private wells would be affected by the proposed increase in groundwater withdrawals. The Company has provided a map showing that the recharge areas for Wells No. 2, 3, and 4 and the Tupper Road well should not interfere with the recharge areas of existing and proposed Town wells. The Metcalf and Eddy Study also demonstrates that the Town's existing water supply system is adequate to meet maximum daily demand in the year 2020 assuming 24-hour pumping capacity. Thus, the Company's proposed withdrawals should not interfere with the Town's use of its water supply.

With respect to potential salinization of groundwater, the record shows that the interface of salt water and fresh water is highly likely to be located beyond the banks of the Cape Cod Canal. The record indicates that the location of this interface is unclear, and changes in the piezometric surfaces during the pump tests indicate that, with the proposed withdrawals, the interface would likely move landward. However, these tests also indicate that it is highly unlikely that salt water could enter the groundwater aquifer due to the relative levels and gradients of the groundwater aquifer and the saline water in the canal.

With regard to migration of contaminants into drinking water supplies, the record shows that the recharge areas of the facility's proposed wells are not located within the contaminated areas associated with the Massachusetts Military Reservation, and thus the additional pumping of water by the Company would not cause contaminated plumes to move toward the facility. With respect to on-site contamination, the record indicates that there is an underground clay lens at the site that would prevent contamination on-site from being pulled down into the well aquifer.

The record indicates that underlying layers of clay and silt also would protect wetlands near Canal Station and the Tupper Road well site from drawdowns caused by new or increased groundwater withdrawals. At the Canal Station site, this geological evidence is supported by observational evidence indicating that withdrawals from the existing Wells No. 2 and 3 have not

³⁹ (...continued)
water supply to help meet its future needs.

significantly affected a nearby wetlands area. Similar observational evidence for the Tupper Road well site is not available, and concern about the impact on wetlands is greater at this location, both because a wetland directly abuts the well site, and because the potential increase in water withdrawal rates is greater.

The Company's pump test report calls for long-term monitoring of the effect of water withdrawals both on nearby wetlands and on salt intrusion. The Siting Board notes that the need for, and design of, long-term monitoring protocols are best determined in consultation with affected regulatory bodies – in this case, the MDEP, the Cape Cod Commission, and the Sandwich Conservation Commission. Consequently, the Siting Board directs the Company to consult with these agencies concerning the need for, and design of, well monitoring for any part of the operational lifetime of the facility, in order to assess the impact of groundwater withdrawals on salinization of groundwater and on water levels in nearby wetlands, and to file with the Siting Board a description of any plans that result from this consultation for monitoring salinization and wetland impacts.

Overall, the record indicates that the Company would be able to meet its increased process water needs by withdrawing water from Wells No. 2, 3, and 4 and, as necessary, the Tupper Road well, without affecting the Town's ability to serve its residents and without adversely affecting neighboring groundwater or wetlands. The Siting Board therefore finds that, with the implementation of the above condition, the impacts of the Company's proposed groundwater withdrawals would be minimized.

With respect to potable water use, the record shows that, following the repowering of Unit 2, Canal Station's potable water requirements would be reduced by 2.6 million gpy, to 8.4 million gpy. As discussed above, the Metcalf and Eddy Study, which incorporated existing industrial uses into its water projections, found that the Town's existing water supply system would be adequate to meet maximum daily demand in the year 2020. The Siting Board finds that the repowered Canal Station's potable water requirements would not prevent the Town from serving its commercial and residential water customers.

With respect to the impacts of once-through cooling, the record shows that, following the repowering of Unit 2, Canal Station would increase its water withdrawals from the Cape Cod Canal by 19% to 620 mgd. The difference in temperature between water entering the facility and water exiting the facility would remain at the current level of 32 degrees Fahrenheit. In addition, the maximum discharge temperature would remain within its currently permitted level of 86 degrees Fahrenheit in the upper 15 feet of the water column above the discharge diffuser, four degrees below the critical value of 90 degrees which thermal impact studies suggest is necessary to protect fisheries from thermal impacts. In addition, the record indicates that no fish kills from thermal discharges have been recorded since the current diffuser design came into operation at Canal Station. The record indicates that the Company's existing submerged slot diffuser would dissipate heat in the thermal plume as quickly as possible. Thus, the record indicates that the thermal plume from Canal Station would not cause significant impacts to the aquatic environment.

With respect to larvae and phytoplankton entrainment, the record shows that less than 1% of the larvae in the Canal would be entrained. With respect to entrainment of phytoplankton, the Company has asserted that the effects of entrainment of phytoplankton would be negligible based on their rapid replacement rate. The Company has provided information to satisfy concerns regarding its modeling and analysis, which will be supplemented by further data in its NPDES permit application.

With respect to fish impingement, the record includes a summary of both the 1978 fish impingement study by Hall and Morrow and impingement sampling by the Company's consultant, Marine Research Inc. The results indicate that impingement losses at Canal Station generally range from 1 to 3 fish per hour and were among the lowest of any large-volume once-through cooling power plant in the Northeast. The Company noted that there were two episodes where there were significantly higher fish mortality rates due to a malfunction of the Company's chlorine handling system, and stated that the Company would redesign this system to prevent similar episodes in the future.

The record shows that in order to reduce impingement impacts, the Company has engineered its proposed intake structure to incorporate the best available technology for withdrawals from surface water bodies as required by EPA, the Massachusetts Division of Marine Fisheries, the National Marine

Fisheries Service and the U.S. Fish and Wildlife Service. The Company asserted that these improvements would reduce current impingement losses by 20% to 50% and that as a result, the project would cause an overall net positive change in the number of surviving adults of commercial/recreational species of between 0% and 50%, depending on the species. Finally, the record shows that the Company has monitored the facility's intake screens and has not found any occurrences of impingement of marine mammals or sea turtles at the intakes.

The record shows that both EPA and MDEP must review the proposed intake and thermal discharge for compliance with Section 316a and 316b of the Clean Water Act. The Siting Board notes that these regulatory requirements will help to minimize the environmental impacts to the aquatic environment that could be associated with the intake and discharge of cooling water from the Canal. Accordingly, the Siting Board finds that the impacts of the proposed project associated with the use of once-through cooling have been minimized.

Based on the review of evidence presented, the Siting Board concludes that the Company's plan to use canal water for once-through cooling, groundwater from its existing and proposed wells for process needs, and the Sandwich municipal system for its potable water needs, would minimize the water resource impacts of the proposed facility consistent with minimizing other potential environmental impacts and cost. Accordingly, the Siting Board finds that, with the implementation of the condition set forth above regarding the submission of its long-term groundwater and wetland monitoring plans, the water resource impacts of the proposed facility would be minimized.

D. Wetlands

This section describes the wetland impacts of the proposed facility, the mitigation proposed by the Company, and the costs and benefits of any additional mitigation options.

1. Description

The Company stated that Canal Station is located on a developed site bounded to the north by the Cape Cod Canal (Exhs. SEC-1, at 3.4-2; EFSB-WL-6; EFSB-WL-15; EFSB-WL-16). The

Company indicated that the banks of the Cape Cod Canal are regulated as wetlands (Exh. SEC-1, at 3.3-39, 3.4-6). The Company also delineated narrow bands of freshwater wetlands associated with an existing drainage channel to the immediate north and south of the railroad tracks at the southern boundary of the Canal Station property (*id.* at 3.4-2). The Company added that there are forested wetlands and salt marsh present within the Canal Station property (*id.* at 3.4-2; Exhs. EFSB-WL-6; EFSB-WL-15; EFSB-WL-16).

The Company provided a detailed topographic survey of the Canal Station site (Exhs. EFSB-WL-4; EFSB-WL-5A, SEC-1, at 3.4-9 Fig. 3.4-3). This survey indicated that the elevation of all interior portions of the Canal Station site, including the project site, ranges between 11.6 and 16 feet above sea level, above the 10-foot contour line designating the 100-year flood level (Exhs. EFSB-WL-5A, EFSB-WL-13). The Company therefore asserted that the 100-year floodplain does not encroach upon interior portions of the site (Exh. EFSB-WL-13).⁴⁰

The Company stated that the project site is already disturbed, consisting of paved areas, compacted soil, and small buildings interspersed with small areas of scrub brush (Exhs. EFSB-G-5-C at 4.5-1; SEC-1, at 3.4-1). The Company indicated that installation of the proposed turbine building, stack, and HRSGs would not affect any wetland resource area or buffer zone (Exhs. EFSB-G-5-C at 4.5-1; SEC-1, at 3.4-2). However, the Company noted that the new cooling water intake structure would extend through the banks of the Cape Cod Canal, and would thus be subject to oversight by the EPA, MDEP, the Sandwich Conservation Commission, and the Army Corps (Exh. SEC-1, at 3.3-39, 3.4-6). The Company stated that the new intake structure would be designed and located in a manner which would minimize wetland impacts (*id.* at 3.4-13; Exhs. EFSB-WL-11A, B, C, D; EFSB-G-5-C at 4.5-1). In order to limit construction impacts on wetlands, the Company would: (1) install a sheet pile cofferdam to prevent communication between surface water and the excavation; (2) put in place

⁴⁰ The Company submitted a Federal Emergency Management Agency ("FEMA") map for the Canal Station site which appears to show that portions of the Canal Station are within the 100-year floodplain (Exh. EFSB-WL-4). The Company provided more detailed topographical information which demonstrated that the project site is outside of these areas (Exhs. SEC-1, at 3.4-8-9, Fig. 3.4-3; EFSB-WL-13).

physical barriers to silt and sediment migration, such as hay bales and silt fencing, within and surrounding the cofferdam; and (3) control groundwater flow using a well point dewatering system (Exh. EFSB-WL-11).

The Company stated that, as part of the proposed project, it would upgrade the existing Canal Station stormwater management system, resulting in a reduction in the rate of runoff discharge (Exh. EFSB-WL-3). The Company stated that the existing Canal Station Stormwater Pollution Prevention Plan (“SWPPP”) would be updated to reflect changes resulting from construction of the proposed project (Exhs. SEC-1, at 3.6-5; EFSB-G-5-C at 4.6-60 to 4.6-61). The Company stated that the upgraded stormwater management system would maintain a minimum distance of 100 feet between stormwater discharges and waterways and wetland resource areas (Exhs. EFSB-G-5-C at 4.5-5; EFSB-WL-2). The Company stated that infiltration basins would be located 500 feet from the nearest wetland and that all runoff would be treated prior to discharge into wetlands (Exhs. SEC-1, at 3.4-1; EFSB-WL-2). The Company noted that the upgraded water management system would require approval by the Sandwich Conservation Commission (Exh. EFSB-WL-14).

The Company indicated that the transmission line that would interconnect the proposed facility to the Commonwealth Electric substation would cross a forested wetland area and buffer zone (Exh. SEC-1, at 4.4-11). The Company contended that no route avoiding this wetland area is available (id.). The Company stated that it would be necessary to remove the tops of some overstory trees in this area to provide clearance for the transmission lines (id.; Exh. EFSB-WL-9; Tr. 8, at 988-989). However, the Company asserted that no clearing or grading within wetland areas would be required, that the topography and water flow within the wetland would not be affected, and that the Company would restore any damage caused to buffer zones (Tr. 8, at 988-989). The Company provided a copy of the wetland restoration plan which it had submitted to the Sandwich Conservation Commission, describing its plans for mitigating the impacts of tree-topping along the transmission route (Exh. EFSB-G-5-H at 1 to 7). This proposal details a plan to eliminate an existing stand of invasive alien reed within a 10,400 square foot emergent portion of the wetland, and subsequently to plant native shrubs (id.).

The Company submitted letters from the US Fish and Wildlife Service and the Massachusetts Natural Heritage and Endangered Species Program indicating that these agencies anticipate no impacts to federal- or state-listed rare and endangered species of plants or animals, vernal pools, or exemplary natural communities as a result of the proposed project (Exh. SEC-1, App. at 3.4).

2. Analysis

The record shows that the proposed facility would be constructed on a previously-disturbed portion of the Canal Station site, and that construction of the proposed turbine building, HRSGs, and stack would take place entirely outside of wetland resource areas and buffer zones. However, the construction of a new cooling water intake structure to serve the proposed facility could result in impacts to the banks of the Cape Cod Canal, which are regulated as wetlands. The Siting Board notes that the design, construction, and operation of the new intake structure would be subject to review and approval by regulatory authorities including the Sandwich Conservation Commission, MDEP, EPA, and Army Corps and that the Company has developed plans to minimize the wetlands impacts of the construction of the new intake structure. The Siting Board also notes that the wetland impacts would consist of modifications to the man-made banks of the Cape Cod Canal at a point between two existing intakes. The Siting Board concludes that the adoption of a discharge design agreed upon by the Company and appropriate federal, state, and local regulatory authorities would minimize the wetland impacts associated with this element of the proposed project.

The record also indicates that construction of a new electrical interconnection to serve the proposed facility would result in the topping of overstory trees within a forested wetland area. The Company plans to mitigate any wetland disturbances resulting from the construction of the transmission line interconnect by eradicating an invasive alien reed and restoring indigenous vegetation to the site. This mitigation plan also will require the approval of the Sandwich Conservation Commission.

Overall, the record demonstrates that the Company has taken reasonable measures to reduce the wetlands impacts associated with the construction and operation of the proposed facility, and that the anticipated impacts are necessitated by the location of existing electrical facilities and the proposed

use of once-through cooling. The record also shows that, as part of the development of the proposed project, stormwater treatment at the Canal Station will be improved. Consequently, the Siting Board finds that the wetlands impacts of the proposed facility would be minimized.

E. Solid Waste

This Section describes the solid waste impacts of the proposed facility, the mitigation proposed by the Company, and the costs and benefits of any additional mitigation options.

1. Description

The Company estimated that construction of the proposed facility would generate approximately 55.5 tons of waste and debris, including general waste, scrap metals and wood and paper products (Exh. EFSB-HZ-11). In addition, 2500 cubic yards of asphalt, brick, and concrete would be generated (Tr. 2, at 141). The Company stated that it was committed to recycling all recyclable waste generated during construction (Exh. EFSB-HZ-11; Tr. 2, at 115, 141). The Company indicated that its construction contractor, under the supervision of a Company representative, would be responsible for developing plans to reduce, reuse, and recycle construction-related wastes and for disposing of any material which is not recyclable or reusable off-site in an appropriate landfill (Exhs. EFSB-HZ-1; EFSB-HZ-11; Tr. 2, at 126 to 127, 139).

The Company indicated that the major solid wastes produced by operation of the proposed facility would include spent catalyst from the NO_x and CO removal systems, spent condensate polisher resin, and general plant refuse (Exhs. EFSB-G-5-C at 4.7-1 to 4.7-3; EFSB-HZ-5; EFSB-HZ-6). The Company indicated that office and other facility wastes would be recycled and that non-recyclable materials would be disposed of by a licensed contractor (Exh. EFSB-HZ-1). Spent catalyst from the NO_x control system would be sent to a reclamation facility, returned to the supplier for reclamation or, if reclamation were not an option, sent to an appropriate disposal facility; spent catalyst from the CO removal system would be reclaimed or disposed of by the Company's supplier of replacement catalyst

(Exh. EFSB-HZ-5).⁴¹ The Company noted that the switch from oil to natural gas firing for Unit 2 would essentially eliminate flyash production in Unit 2, and would reduce the total quantity of flyash generated at Canal Station by 50% (Exh. EFSB-G-5-C-1, at 4.7-4). The Company indicated that, when burning oil, Unit 2 would generate a small quantity of residual ash film, which would require periodic onsite cleaning (Exh. EFSB-HZ-10).

Mirant Canal II indicated that it would update the existing Canal Station solid waste management program, which includes the recycling of office waste, plastic, scrap metal, and other recyclable materials, to encompass waste reduction, composting, and on-site end-use of materials, and that it would expand its recycling plan to include potential waste streams from construction and start-up of the proposed facility (Exh. SEC-1, at 3.6-9 to 3.6-10). Mirant Canal II noted that its former parent company, the Southern Company, is an EPA WasteWi\$e⁴² partner, with programs in place to recycle coal ash, prevent pollution, recycle office waste, and purchase recycled materials (Exh. EFSB-RR-14; Tr. 2, at 115-116). The Company stated that it would implement as appropriate recycling and waste reduction strategies used at other Mirant Corporation facilities (Exh. SEC-1, at 3.6-9 to 3.6-10).

The Company provided a copy of the Massachusetts Solid Waste Master Plan 1997 Update, which sets a state-wide goal of recycling 46% of municipal solid waste, including residential and commercial waste (Exh. EFSB-RR-14; Tr. 2, at 115-116). The Company stated that it is committed to following the Commonwealth's recycling guidelines for commercial facilities, and that it would work to achieve or exceed the current overall recycling rate for commercial facilities at Canal Station (Tr. 2, at 115 to 116). The Company stated that it is not currently engaged in recycling program partnerships with Sandwich, and that it is not aware of any local recycling program run by Sandwich (Tr. 2, at 218).

⁴¹ The Company estimated that 565 cubic meters of spent catalyst from the NO_x control system and 128 cubic meters of spent catalyst from the CO system would require disposal once every three years (Exh. EFSB-RR-17).

⁴² WasteWi\$e is a voluntary EPA-sponsored program aimed at reducing municipal solid waste by working with partners to set recycling goals and report on waste reduction strategies (Exh. EFSB-RR-14; Tr. 2, at 115-116).

The Company stated that Canal Station currently is a Small Quantity Generator of federally-regulated hazardous wastes, and a Large Quantity Generator of state-regulated waste (Exh. SEC-1, at 3.6-6; Tr. 2, at 115). The Company stated that hazardous wastes would be separated from normal wastes and stored in properly labeled containers in a segregated storage area (Exh. EFSB-HZ-11). The Company noted that federally-regulated wastes currently are stored in a building to the east of Unit 2; as part of the proposed project, storage for all hazardous wastes would be consolidated inside the Unit 2 building (Exhs. EFSB-HZ-8; SEC-1, at 3.6-7 to 3.6-8; Tr. 2, at 135). The Company stated that it attempts to recycle both state- and federally-regulated wastes whenever possible (Exh. SEC-1, at 3.6-7).

2. Analysis

The record demonstrates that, where possible and cost-effective, solid waste from construction and operation of the proposed facility would be recycled, reclaimed or reused. The record also shows that the Company or its licensed contractor(s) would dispose of all remaining solid waste from construction and operation of the proposed facility at appropriate disposal sites in a manner consistent with applicable governmental regulations.

Mirant Canal II has indicated that it would attempt to follow the Commonwealth's recycling guidelines for commercial facilities, and would work to reduce construction and demolition debris during construction. The Siting Board encourages Mirant Canal II to work with Sandwich to develop a program with the goal of attaining a 46% recycling rate for operational wastes (the target recycling rate for solid waste set forth in the Massachusetts Solid Waste Master Plan) and to work with its contractor to attain the maximum feasible recycling of construction and demolition debris. The Siting Board directs Mirant Canal II, prior to the commencement of operation, to file a copy of its updated recycling plan with the Siting Board, and to report on its recycling rate for construction and demolition debris and its anticipated recycling rate for operational wastes.

The record shows that hazardous wastes would be segregated from normal wastes and disposed of appropriately. In addition, the record indicates that the switch from oil to natural gas firing

for Canal Unit 2 will significantly reduce flyash and other solid wastes resulting from combustion. The record further demonstrates that the Company's existing plans for handling, storage, and disposal of solid wastes at Canal Station can be modified to accommodate the proposed project.

The Siting Board finds that, with the implementation of the above condition, the solid waste impacts of the proposed facility would be minimized.

F. Visual Impacts

This section describes the visual impacts of the proposed facility, the mitigation proposed by the Company, and the cost and benefits of any additional mitigation options.

1. Description

The Company submitted an evaluation of the potential visual impacts of: (1) the proposed facility and related structures, (2) exterior lighting, and (3) the facility plume. The Company stated that the principal new structures associated with the proposed facility include a new turbine building, 503 feet long, 115 feet wide and 96 feet tall, which would enclose four new combustion turbines, and a 230-foot penthouse-like stack with four flues ("stack structure") (Exh. SEC-1, at 1-9). Four new HRSGs would be located in a "courtyard" bounded by a proposed compressor building to the north, the new turbine building to the east, a wall extending from the new turbine building to the south, and the existing Unit 2 building to the west (*id.* at 1-9, Fig. 1-2). The Company stated that it designed the new buildings to be harmonious with the existing site and noted that at 230 feet, the new stack structure would be only 20 feet above the roof line of the current Unit 2 power block building, and less than half the height of the existing 498 foot stack (*id.* at 3.9-1).⁴³ The Company indicated that the proposed

⁴³ The Company argued that its use of once-through cooling also helped minimize visual impacts (Exhs. EFSB-W-47; EFSB-W-100). The Company noted that the use of either closed-loop or dry cooling would require the construction of large, highly visible cooling structures that would enlarge the facility footprint (Exhs. EFSB-W-43; EFSB-W-47; EFSB-W-99; EFSB-W-100). The Company also stated that water evaporation from the two cooling towers required for a closed-loop cooling system would result in visible plumes on cold days (Exh.

(continued...)

facility layout was oriented to minimize views of the new structures from the Sagamore Bridge, and that the forested areas spread throughout Sandwich generally limit views of Canal Station from other areas (id. at 3.9-1 to 3.9-2).

The Company stated that the northwest portion of Sandwich is an area of mixed visual character, with the existing Canal Station Units 1 and 2 as a major visual element (id. at 3.9-1). The Company noted that the Cape Cod Canal, Sandwich Marina and Scusset Beach establish a recreational character, while single family homes and historic landmarks are interspersed with recreation-oriented commercial and retail establishments along Route 6A (id.). Nearby recreational facilities include the marina, a state forest, and bike trails on both sides of the canal (id.). The Company noted that, while the north side of Canal Station is in full view from the bike trail on the far side of the canal, the view from the Canal Walk is blocked to a large extent by a berm supporting a fence and vegetation (id.).

In order to assess the visual impacts of the proposed facility, the Company conducted a comprehensive viewshed analysis of the area (id. at 3.9-1 to 3.9-40). In consultation with Town officials, Cape Cod Commission members, and local residents, the Company identified 14 locations that potentially could have views of the proposed facility (id. at 3.9-3, Fig. 3.9-2A-15b; Tr. 3, at 289).⁴⁴ The Company indicated that it selected these locations based on an evaluation of the site using topographic maps and other mapping techniques, site visits, and the experience of its landscape architect (Exh. EFSB-V-1). Photographs looking toward the Canal Station site were taken from each identified location; where foliage conditions were a factor, photographs were either taken or simulated in both leaf-on and leaf-off conditions (Exh. SEC-1, at 3.9, Fig. 3.9-8d, 3.9-8f). The Company then

⁴³ (...continued)
SEC-1, at 1-16).

⁴⁴ The receptor locations were: Scusset Beach; the Sandwich Marina; the Sandwich boardwalk; the Marshland Restaurant; Spring Hill Beach; the intersection of Jarves Street and Route 6A; the parking lot of Daniel Webster Inn; Route 130 before the Route 6 Overpass; the Canal Walk; the Sagamore Bridge; the Bourne/Sandwich town line; the Merchant's Square shopping plaza; Oyster Hill (residential); and High View (residential) (Exh. SEC-1, at Fig. 3.9-1).

developed a computer-generated perspective of the proposed facility as it would appear from each location and superimposed the perspective on the associated photograph to present a visual depiction of the proposed facility and stack (*id.* at 3.9-3). The Company later analyzed three additional viewsheds at the request of Siting Board staff (Exh. EFSB-V-2).⁴⁵

The Company's visual analysis indicated that much of the new stack structure and the new turbine building would be visible from the Sandwich Marina, located just to the east of the proposed facility (Exh. SEC-1, at 3.9-4; Company Brief at 74). The Company's analysis also suggested that much of the stack structure and a portion of the new turbine building would be visible from the Merchants Square shopping plaza, located directly south of Canal Station off Tupper Road; however, the Company asserted that the Cape Cod Commission has recently permitted the expansion of a neighboring Stop and Shop, which should reduce the visual impact of the project from that location (Exh. SEC-1, at 3.9-4; Figs. 3.9-13b and 13c; Tr. 3, at 284-285). Portions of the stack structure and the new turbine building also would be visible against the backdrop of the existing Canal Station buildings from Scusset Beach, located approximately 2000 feet from Canal Station on the opposite side of the Cape Cod Canal, and, distantly, from the adjoining Phillips Road neighborhood (Exhs. SEC-1, Figs. 3.9-2A and 3.9-2b; EFSB-V-2).

The Company's visual analysis indicated more limited visual impacts from other locations. From one location, the Daniel Webster Inn, there would be no view of the new facility structures (Exh. SEC-1, at 3.9-4). The Sagamore Bridge would provide a distant view of the top of the stack structure above existing Canal Station buildings, with the new turbine building visible against the existing buildings (*id.* at Fig. 3.9-11A, B). From the High View neighborhood, the top of the stack structure would be visible above existing Canal Station buildings, and the top of the new turbine building would be visible above trees (*id.* at Fig. 3.9-15A, B). Finally, from eight other mid-range to distant locations,⁴⁶ views of

⁴⁵ The Siting Board requested additional viewshed analyses from Phillips Road (located across the canal, to the north of the Scusset Beach area), Dillingham Road in the "Town Neck" area of Sandwich, and the Sandwich Motor Lodge parking area (Exh. EFSB-V-2).

⁴⁶ These include: the Sandwich boardwalk; the Marshland Restaurant; Spring Hill Beach; the
(continued...)

the new facility would be limited to the top of the stack structure above either trees or existing Canal Station structures (Exhs. SEC-1, at Figs. 3.9-4, 3.9-5, 3.9-6, 3.9-7, 3.9-11, 3.9-13; EFSB-V-2).

The Company stated that it would minimize the visual impacts of the facility by minimizing building and stack heights, by maintaining the existing mature tree cover along the site boundary, and by implementing a landscaping plan (Exh. SEC-1, at 3.9-38). The Company stated that it would select colors for buildings and other facility structures that blend with the background, and that a final color scheme would be chosen in cooperation with the local community through its workshop and community input efforts (*id.* at 3.9-38; Tr. 3, at 304).

The Company also initially proposed on-site landscaping to reduce near-field impacts along the Canal Walk, at the Sandwich Marina, and along Freezer Road (Exhs. SEC-1, at 3.9-4; EFSB-G-5-C at 4.4-75). Specifically, the Company proposed to install a vegetative buffer along the Canal Walk and on the eastern side of the site adjacent to the public access to the Canal Walk and the marina (Exh. EFSB-G-5-C at 4.4-75). The Company stated that existing stone areas would be replanted with indigenous meadow grasses, and that a combination of moderately sized conifers, native deciduous trees and shrubs, and herbaceous plants would be planted along the Canal Station fence line (*id.* at 4.4-75, Figs. 4.4-16, 4.4-17). The Company asserted that this mixed planting would help screen the near views of the proposed facility and would divert attention away from the large structures towards the low to mid-level environment (*id.* at 4.4-75).

On March 24 and 25, 2000, the Company hosted a Community Character Workshop to help establish community priorities for addressing “Historic Preservation/Community Character” as defined in the Cape Cod Commission’s Regional Policy Plan (Exh. EFSB-RR-23-S at 1). The workshop was attended by 28 invitees, including town officials, abutters, members of the Cape Cod Commission and other local committees, elected officials, merchants, and state and federal officials (*id.* at 2).

Participants first developed a list of approximately 50 projects that could enhance Canal Station and

(...continued)

intersection of Jarves Street and 6A; Route 130; the Bourne/Sandwich town line; the Oyster Hill neighborhood; and Dillingham Road (Exhs. SEC-1, at sec. 3.9-4; EFSB-V-2).

nearby areas, including the Sandwich Marina; these projects ranged from short-term visual improvements, such as painting and landscaping at Canal Station, to long-term recreational, transportation, and infrastructure improvements (*id.* at 2-3, Fig. 1). Subsequently, the participants prioritized these projects, in groups and individually (*id.* at 3). Participants expressed support for a variety of landscaping options (including gateway enhancements and Canal Walk plantings); for painting the facility to blend with its surroundings; for expanding sidewalks and bikeways in the area; for burying overhead wires in the Town's historic district; and for building a desalinization plant to meet the area's water needs (*id.* at 22, Fig. 4B). The Company stated that it would attempt to focus its visual impact mitigation on priorities identified by the workshop members, and that while it likely would paint the facility, it might substitute improvements to bike and pedestrian access for some of the initially-proposed site edge landscaping (Tr. 3, at 311-312, 349).

The Company stated that, while the existing facility is illuminated, additional exterior lighting would be required for the new access road and the pedestrian entrance to the new turbine building (Exh. SEC-1, at 3.9-39). The Company proposed to use a lighting system which would direct light downward (*id.*). The Company noted that the new stack structure would not be tall enough to require aviation lights (*id.*).

With respect to visible emissions, the Company stated that vapor plumes from combustion turbine exhaust are typically wispy and translucent in nature and do not extend for great distances downwind (*id.*). The Company argued that the repowered Unit 2 would burn natural gas and low sulfur distillate fuel for backup, fuels which minimize any plume opacity (Tr. 3, at 320). The Company asserted that visible plumes would occur only in cold weather, and that for over 95% of the time that plumes are visible, they would be less than 200 meters long (Exh. SEC-1, at 3.9-39; Tr. 3, at 317 to 322).

2. Analysis

The Company has proposed to repower Unit 2 at its existing Canal Station, resulting in the construction of a new turbine building 503 feet long, 115 feet wide and 96 feet tall, and a new 230-foot

stack structure containing four flues. The record indicates that the Company's proposed facility design incorporates building sight lines, structure height, construction materials, and lighting which would serve to minimize its visual impacts. Specifically, the proposed facility was sited to optimize the buffering effect of existing on-site buildings, and the new stack would be only 20 feet taller than the existing Unit 2 power block building and would be enclosed in a penthouse structure. The Company intends to work with Sandwich and the local community to choose colors for the exterior of the proposed structures.

The record demonstrates that the Company analyzed the potential visual impacts of the proposed facility at 17 receptor locations in the surrounding area by superimposing computer-generated views of the new structures on photographs showing the current view from each location. Where appropriate, visual impacts in leaf-off conditions also were analyzed. The Company's analysis indicates that, from most mid-range to distant viewpoints, views of the proposed facility would be limited to the top of the stack structure. From two distant locations -- the Sagamore Bridge and the High Point neighborhood -- portions of the new facility structures would be viewed against the backdrop of larger existing Canal Station structures, but would not expand the length of visible building mass. Visible exhaust plumes from the new stack would be present mostly during colder months and would appear wispy and translucent.

However, the record also demonstrates that the proposed project would result in the addition of significant new building mass east of the existing Canal Station equipment. The viewshed analysis for the Sandwich Marina demonstrates that this additional building mass would result in significant new visual impacts for open areas in close proximity to the eastern portion of the Canal Station site, including the Sandwich Marina, Freezer Road, and the segment of the Canal Walk which borders the eastern end of the site.

The record indicates that the Company has been pursuing the input of the community in determining strategies for minimizing and mitigating the visual impacts of both the existing and new facilities at Canal Station. Specifically, the Company hosted a Community Character Workshop to help establish community priorities for mitigation. Following the workshop, the Company suggested

that it would put most of its resources for visual impact mitigation into painting the facility, and that it might spend money originally intended for on-site landscaping on other priorities of the workshop members. While the Siting Board believes that the Company should be responsive to community concerns, we note that the impacts of the proposed project on the Sandwich Marina, and on the segment of the Canal Walk that directly abuts the new facility structures, would be significant enough to require some level of mitigation regardless of any other commitments which the Company intends to make to the community. The Siting Board therefore directs the Company, in conjunction with appropriate local and regional authorities, to develop and implement a landscaping plan for the eastern boundary of the Canal Station site, and for the northern boundary in the vicinity of the proposed new structures, to reduce the visual impacts of the project at the Sandwich Marina and Freezer Road and along the Canal Walk.

In addition, as reflected in the viewshed analyses for Scusset Beach and Merchant Square, construction of the proposed project could significantly enlarge the visible mass of Canal Station from areas with open mid-range views of the eastern end of Canal Station. In two recent reviews involving urban sites already occupied by electric generation or transmission facilities, the Siting Board has required off-site tree planting in neighboring residential areas where the added mass of the new facility structures was of special concern. Sithe Edgar Decision, 10 DOMSB at 82-83; Sithe Mystic Decision, 9 DOMSB at 159. Consistent with this precedent, the Siting Board directs the Company to provide reasonable off-site mitigation of visual impacts, including shrubs, trees, window awnings, or other mutually-agreeable measures, that would screen views of the new turbine building or compressor building at affected residential properties, roadways and other locations within one-half mile to the east of the proposed facility, or within one-half mile to the southeast or south of the proposed facility east of the Commonwealth Electric substation, as requested by individual property owners or appropriate municipal officials. In implementing this requirement, the Company: (1) shall provide shrub and tree plantings, window awnings, or other reasonable mitigation on private property, only with the permission of the property owners, and along public ways, only with the permission of the appropriate municipal officials; (2) shall provide written notice of this requirement to appropriate officials and to all potentially

affected property owners 30 days prior to the commencement of structural work on either the new turbine building or compressor building, whichever occurs first; (3) may limit requests for mitigation measures from local property owners and municipal officials to a specified period ending no less than twelve months after initial operation of the plant; (4) shall complete all agreed-upon mitigation measures within one year after completion of construction, or if based on a request filed after commencement of construction, within one year after such request; and (5) shall be responsible for the reasonable maintenance and replacement of plantings, as necessary to ensure that healthy plantings become established.

The Siting Board finds that, with the implementation of the above conditions, the visual impacts of the proposed facility would be minimized.

G. Noise

This section describes the proposed project's noise impacts and mitigation proposed by the Company.

1. Description

The Company asserted that, with the use of its proposed noise mitigation, the proposed project would leave noise levels near Canal Station essentially unchanged (Exh. SEC-1, at 3.10-21). The Company stated that noise mitigation for the proposed project would meet all statutory and regulatory noise guidelines⁴⁷ (*id.* at 3.10-1 to 3.10-21; Exhs. EFSB-G-5-C at 4.3-1 to 4.3-8; EFSB-A-2, Bulk Att. at 7-1 to 7-32).

The Company stated that the repowered Unit 2 would operate essentially continuously and produce steady noise levels (Exh. SEC-1, at 3.10-18). The Company noted that the existing Canal

⁴⁷ The Company indicated that noise is regulated in Massachusetts under 310 CMR 7.10, which prohibits increases in broadband sound levels of 10 dBA or higher and "pure tone" conditions at new sources. A pure tone is defined as a sound pressure level in any given octave band which exceeds the levels in adjacent bands by 3 decibels or more (Exh. SEC-1, at 3.10-3 to 3.10-4).

Units 1 and 2 have been in operation for over 20 years and contribute to noise levels of about 50 decibels (A-weighted) (“dBA”) in the community near the plant (id. at 3.10-21). The Company stated that no noise-related complaints have been filed with Sandwich or the MDEP against Canal Station within the last three years (Exh. EFSB-N-14).

The Company stated that it employed an industry-standard noise modeling methodology⁴⁸, previously accepted by the Siting Board, to model the potential noise impacts from the proposed facility (Exhs. SEC-1, at 3.210-1 to 21; EFSB-G-5-C at 4.3-1 to 8; EFSB-A-2, Bulk Att. at 7-31 to 7-32). The Company stated that its modeling was based on information from equipment vendors, in-house information and standard climatic conditions and attenuation assumptions, but excluded any allowance for absorption of noise by vegetation or ground cover (Exh. SEC-1, at 3.10-18).

To determine existing background noise levels, the Company monitored daytime and nighttime noise levels at seven noise monitoring locations (“NMLs”) near the proposed facility⁴⁹ (id. at 3.10-5 to 3.10-16) (see Table 4). The Company stated that it used continuous noise monitoring at four of these NMLs and short-term monitoring at the remaining NMLs (id.). Based on its noise monitoring data, the

⁴⁸ The Company stated that its noise model has been used in performing noise assessments for over 25 electrical generating station projects similar to the proposed facility (Exh. EFSB-N-6).

⁴⁹ These locations were Freezer Road, Briarwood Road, the Canal Station fenceline nearest to the Town Marina, Tupper Road, the parking lot across the Cape Cod Canal from Canal Station, Dexter Avenue, and the Canal Walk at a point 400 feet from the Canal Station fenceline (Exh. SEC-1, at 3.10-7). The Company stated that an additional location at the Town Marina, further away from the Canal Station fenceline location included in the monitoring program, was added for purposes of modelling noise impacts at the Marina (Exh. EFSB-A-2-S-A at 7-28). The Company also stated that it did not model noise impacts at the Canal Walk monitoring location because (1) this point was not close to the project site; (2) it was shielded from facility noise by on-site structures; and (3) there were no residences in the vicinity (Tr. 7, at 872).

Company modeled ambient L_{90} noise levels⁵⁰ at the seven NMLs at levels ranging from 43 to 51 dBA (id. at 7-30 (Table 7-7)) (see Table 4)⁵¹.

The Company noted that its noise monitoring data reflected noise currently generated by Canal Units 1 and 2 (Exh. SEC-1, at 3.10-7). The Company also modeled the hypothetical ambient levels which would exist if Units 1 and 2 were not present (“greenfields ambient level”) (Exh. EFSB-A-2-S-A at 7-30, (Table 7-7)). The Company stated that this greenfields ambient level was calculated to represent average nighttime noise levels excluding noise from Units 1 and 2, but including the noise generated by the two electric substations located adjacent to Canal Station⁵² (Exh. SEC-1, at 3.10-16). The modeled greenfields ambient levels ranged from 39 to 40 dBA at the seven NMLs (Exh. EFSB-A-2-S-A, at 7-30, (Table 7-7)) (see Table 4).

The Company noted that, following the repowering of Unit 2, total noise levels (including noise from Unit 1 and Unit 2) would be lower than current ambient noise levels (including noise from existing Units 1 and 2) (id. at 7-30, (Table 7-7); Exh. EFSB-N-2). The Company stated that anticipated nighttime L_{90} sound following the repowering of Unit 2 would be 3 to 8 dBA over the modeled greenfields ambient levels (Exh. EFSB-N-2; Tr. 7, at 858-861).

TABLE 4

⁵⁰ The Company stated that L_{90} measurements refer to the sound level that is exceeded 90 percent of the time during the measurement period (Exh. SEC-1, at 3.10-5).

⁵¹ Existing ambient L_{90} levels measured in September 1998 at the seven NMLs ranged from 42 to 50 dBA (Exh. EFSB-A-2-S-A at 7-20 (Table 7-4)). However, the Company’s most recent noise analyses are based, not on the measured ambient noise levels, but on modeled ambient noise levels. Because these modeled ambient noise levels are similar to the measured ambient noise levels, the Siting Board accepts the modeled noise levels as a basis for analyzing noise impacts in this case and reports them in Table 4, below.

⁵² The Company stated that, after consultation with MDEP, it determined that noise from the electric transformers at the Commonwealth Electric substation should be included in the greenfields ambient calculations because a transmission substation would be needed at this location even if Canal Station did not exist (Exh. EFSB-RR-52; Tr. 7, at 851 to 855).

Comparison of modeled nighttime L_{90} in the vicinity of Canal Station in the absence of a facility, with the current facility, and with the repowered facility (in dBA)

Location	Greenfields ambient (excluding existing Units 1 and 2)	Current ambient (including existing Units 1 & 2)	Projected Ambient (including Unit 1 & repowered Unit 2)
Freezer Rd.	40	49	48
Briarwood Rd.	40	51	48
Marina	40	48	47
Tupper Rd.	39	44	43
Parking lot across the Canal	40	45	44
Dexter Ave.	39	43	42

(Exhs. EFSB-N-2; EFSB-A-2-S-A at 7-30, (Table 7-7)).

The Company also provided estimates of day-night noise levels (L_{dn})⁵³ under existing conditions, under greenfields conditions and following repowering (see Table 5). The Company's data indicated that, following the repowering of Unit 2, L_{dn} levels would remain the same or decrease slightly from current conditions at all NMLs (Exh. EFSB-N-4). The data also indicated that, following the repowering of Unit 2, L_{dn} levels would be 1 to 4 dBA higher than greenfields ambient levels (id.).

⁵³ L_{dn} refers to a measurement of the day-night average sound level, with a 10 dBA penalty added to sounds occurring between 10:00 p.m. and 7:00 a.m. (Exh. EFSB-A-2 Bulk Att., App. G at 13). The Company provided a 1974 EPA document titled "Information On Levels Of Environmental Noise Requisite To Protect Public Health And Welfare With An Adequate Margin Of Safety" ("Levels Document"), which states that L_{dn} levels of up to 55 dBA are protective of human health and welfare with an adequate margin for safety (Exh. EFSB-A-2 Bulk Att., App. G at 17 to 24).

TABLE 5
Comparison of L_{dn} noise levels in the vicinity of Canal Station in the absence of a facility, with the current facility, and with the repowered facility (in dBA)

Location	Greenfields ambient (excluding existing Units 1 and 2)	Current ambient (including existing Units 1 & 2)	Projected Ambient (including Unit 1 & repowered Unit 2)
Freezer Rd.	53	57	57
Briarwood Rd.	53	58	57
Marina	53	56	56
Tupper Rd.	52	53	53
Parking lot across the Canal	53	54	54
Dexter Ave.	52	53	53

(Exh. EFSB-N-4)

The Company provided noise sampling data which indicated that a pure tone condition in the 63 Hertz (“Hz”) range was measured at three NMLs (Exh. SEC-1, at 3.10-13; Tr. 7, at 882 to 884). The Company testified that this tone was not audible to the field team dispatched to perform noise sampling; notes from the field team indicate several potential sources of the apparent tonal quality⁵⁴ (Exhs. EFSB-N-5; EFSB-N-13; Tr. 7, at 883). The Company stated that the proposed project has been designed to prevent any tonal quality to its noise emissions (Exh. EFSB-N-13; Tr. 7, at 882).

The Company also modeled the noise impacts which could result from additional electrical transmission lines. This modeling indicated that, under worst-case scenarios, the transmission lines would create a 1 dBA increase in noise levels at Freezer Road and the Sandwich Marina (Exh. EFSB-RR-56).

The Company stated that the repowering of Unit 2 would eliminate a number of existing noise sources at the Canal Station site (Exh. EFSB-G-5-C at 1-7 to 1-8). In addition, the Company proposed to incorporate extensive noise mitigation measures into the design of the proposed facility, including the use of specially designed acoustic buildings for the turbines and auxiliary equipment, the

⁵⁴ The Company stated that, in addition to Canal Station, significant noise sources in the area included vehicular traffic, boat traffic in the Cape Cod Canal, aircraft overflights, and insects (Exh. SEC-1, at 3.10-7).

gas compression system, and the water circulation pump system (*id.*). The Company also stated that it would employ mufflers and casing treatment on equipment, (including turbine inlet and exhaust systems, building and equipment ventilation systems, and steam relief and vent valves) that would produce noise during start-up and shut-down of the facility (*id.*). In addition, the Company proposed to use low noise transformers, barriers to noise at specific locations, and acoustic lagging and vibration isolation of steam piping (Exhs. EFSB-N-2; SEC-1, at 3.10-20; EFSB-G-5-C at 4.3-8; EFSB-A-2, Bulk Att. at 7-31). The Company stated that the total cost of its proposed noise mitigation (“Case A”) would be **\$10.6 million (Exh. EFSB-A-2-S-A at 7-31)**.

The Company presented three options for additional noise mitigation, Cases B, C, and D. Case B would reduce the noise impacts of the Canal Station (calculated as the increase in L₉₀ noise levels over the greenfields noise levels) at Briarwood Road, the receptor location closest to the proposed project, from 8 dBA to 6 dBA above the modeled greenfields level at an incremental cost of \$12.5 million (Exh. EFSB-A-2-S-A at 7-31). Case C would reduce the post-repowering noise impact of the Canal Station at Briarwood Road from 8 dBA to 3 dBA above the modeled greenfields level at an incremental cost of \$13.7 million (*id.*). Case D would reduce the post-repowering noise impact of the Canal Station at Briarwood Road from 8 dBA to 0 dBA above the modeled greenfields level at an incremental cost of \$41.2 million (*id.*). The Company stated that these incremental costs represent the net present value of the capital cost of additional control measures,⁵⁵ but do not include added fuel cost from losses in thermal efficiency, and the value of lost plant capacity (Exh. EFSB-N-11). The Company asserted that these additional costs would render the proposed project non-competitive in the deregulated New England electric generation market (Exhs. EFSB-A-2, Bulk Att., at 7-31; EFSB-N-11).

⁵⁵ Additional noise mitigation measures could include: turbine and HRSG building walls; additional levels of muffler equipment, roof and ventilation fans; vent silencers; gas turbine stack baffles or silencers; gas turbine air intake filter and silencers; cooling tower noise barriers on intake and exhaust; building enclosures, and step-up transformer noise barriers (Exhs. EFSB-N-11; EFSB-A-2-S-A at 7-29 to 7-31). More extensive measures would be required for Unit 1 equipment as well as new equipment in order to reach higher levels of noise reduction (Exh. EFSB-A-2-S-A at 7-29 to 7-31).

The Company stated that it expects that construction-related noise impacts would be limited by the developed nature of the site, which eliminates the need for extensive clearing or grading in the early stages of project construction (Exh. EFSB-RR-54; Tr. 7, at 894-895). The Company stated that construction would last for 24 months, and that noise produced during construction would be intermittent and limited in duration (Exh. SEC-1, at 3.10-17; Tr. 7, at 894-897). The Company stated that project construction hours would generally be from 6:00 a.m. to 4:00 p.m., Monday through Friday, although some work would occur at night and on Saturdays (Exhs. EFSB-T-4; EFSB-T-17). The Company stated that nighttime construction work would be limited to quieter activities such as welding, interior work and equipment installation (Exh. EFSB-RR-55).

The Company stated that construction noise impacts would vary at different stages of construction, but would be most intense during the first seven months of work (Exh. EFSB-RR-54). The Company stated that the noise generated by typical construction equipment, including trucks, cranes, bulldozers, backhoes, loaders, generators, welders, and other equipment, ranges between 35 and 47 dBA, on average, at 800 feet (Exhs. SEC-1, at 3.10-18; EFSB-N-7). The Company indicated that pile-driving, which can produce noise levels of 75 to 101 dBA at 100 feet, would take place during the early stages of construction (Exh. EFSB-N-8). The Company stated that pile driving would be limited to extended weekday daytime hours, which the Company stated would be 10 hours per day, and would last for 6 to 9 weeks (Exh. EFSB-N-8).

The Company stated that steam blows, which can produce noise levels of up to 140 dBA at 100 feet, would be limited to daytime hours, and that the Company would employ a muffler to attenuate steam blows by at least 40 dBA (Exhs. EFSB-N-10; EFSB-N-16; EFSB-N-17; EFSB-RR-53). The Company indicated that it would notify local police and fire departments prior to any steam blows (Exh. EFSB-RR-53).

The Company stated that construction-related noise impacts would be governed by Sandwich's Zoning By-Law, which restricts the hours during which noise audible at 400 feet from the property line may occur (Exh. EFSB-RR-1). The Company stated that a Company representative would be assigned to monitor and be directly responsible for the oversight of noise mitigation efforts by the

construction contractor (Exh. EFSB-RR-55). The Company indicated that the contractor would be responsible for providing and ensuring the effectiveness of mufflers on construction equipment and for compliance with EPA construction noise regulations (Exhs. SEC-1, at 3.10-17; EFSB-RR-55).

2. Analysis

In prior decisions, the Siting Board has reviewed the noise impacts of proposed generating facilities for general consistency with applicable governmental regulations, including the MDEP's 10 dBA standard. Sithe West Medway Decision, 10 DOMSB at 322; Brockton Power Decision, 10 DOMSB at 217; Altresco Pittsfield, Inc., 17 DOMSC 351, at 401 (1988) ("Altresco Decision"). In addition, the Siting Board has considered the significance of expected noise increases which, although lower than 10 dBA, may adversely affect existing residences or other sensitive receptors. IDC Bellingham Decision, 9 DOMSB at 311; Sithe Mystic Decision, 9 DOMSB at 164; Northeast Energy Associates, 16 DOMSC 335, at 402-403 (1987) ("ANEA Decision").

The record demonstrates that the current measured nighttime L_{90} noise levels at the residential NMLs with Canal Station in operation range from 42 dBA to 50 dBA, while modeled nighttime L_{90} noise levels at these NMLs range from 43 dBA to 51 dBA. Current L_{dn} noise levels at residential NMLs range from 53 dBA to 58 dBA, levels that approach or are slightly above the 55 dBA guideline identified by EPA as requisite to protect public health and welfare with an adequate margin of safety. Thus, there is reason for the Company to use all cost-effective noise mitigation to limit noise increases at residential receptors closest to the Canal Station site.

Here, the Company has committed to installing noise mitigation that would reduce modeled L_{90} noise levels by 1 to 3 dBA at all NMLs. These anticipated levels represent a maximum increase of 8 dBA above modeled greenfield ambient levels. The Company also provided three options for further noise mitigation which would significantly reduce noise from current levels. The record reflects that these options, Cases B, C, and D, would further reduce existing noise levels by 2 to 8 dBA, resulting in maximum increases above modeled greenfields levels of 6 dBA, 3 dBA, and 0 dBA, at an additional cost of \$12.5 million, \$13.7 million, and \$41.2 million, respectively.

The Siting Board notes that in two recent decisions concerning projects proposed for brownfield sites in areas with comparable or louder background noise levels, it approved expansion proposals which were expected to result in maximum residential receptor noise increases of up to 2 dBA above measured ambient levels at residential receptors. Sithe Mystic Decision, 9 DOMSB at 160-166; Southern Kendall Decision, 11 DOMSB at 337-345. Here, it is significant that while Mirant Canal II likewise proposes to increase generating capacity at a brownfield site, it would reduce noise levels at all residential receptors as part of replacing existing Unit 2 with higher capacity equipment.

In addition, the record demonstrates that, even if evaluated against the modeled greenfield noise levels, the maximum residential noise impact of the post-repowering Canal Station would be an increase of 8 dBA, which falls within the range of noise increases that have been accepted by the Siting Board for projects at greenfield sites.⁵⁶ The Siting Board notes that a “greenfields” analysis of noise at a brownfields site such as Canal Station cannot be directly compared with its prior analyses of noise at actual greenfields sites, both because the “greenfields” baseline is modeled rather than measured, and because it represents conditions that have not obtained in the area for several decades. Community perception of a new source of noise, resulting in an increase of 8 dBA over actual existing ambient noise levels, is likely to be very different from community perception of a longstanding existing source of noise which, although clearly detectable, has been present for some time and would be slightly reduced. Nonetheless, in this case the greenfields analysis provides evidence that the overall noise impact of

⁵⁶ In general, the Siting Board considers noise increases at an already noisy location to be more significant than noise increases in other areas. See Sithe West Medway Decision, 10 DOMSB at 327-328. In cases where measured background and calculated facility noise levels at the most affected residential receptors were neither unusually noisy, (e.g., noise levels substantial exceeding the USEPA’s 55-dBA guideline), nor unusually quiet, the Siting Board has accepted or required facility noise mitigation which was sufficient to hold residential L₉₀ increases to maximums of 5 to 8 dBA. IDC Bellingham Decision, 9 DOMSB at 311; ANP Bellingham Decision, 7 DOMSB at 190; Berkshire Power Development, Inc., 4 DOMSB 221, at 404 (1996) (“Berkshire Power Decision”); Silver City Energy Limited Partnership, 3 DOMSB 1, at 331, 367-368, 413 (1994) (“Silver City Decision”); NEA Decision, 16 DOMSC at 402-403.

Canal Station on nearby residences is acceptable, and that the Company's proposed level of mitigation is therefore appropriate.⁵⁷

The Siting Board therefore concludes that the options for additional noise mitigation, Cases B, C, and D, would not provide cost-effective mitigation of noise impacts. The Siting Board finds that with the implementation of the Company's proposed level of noise mitigation, the operational noise impacts of the proposed facility would be minimized.

With respect to construction noise impacts, the Siting Board agrees that adherence to the construction site practices proposed by the Company would help minimize construction-related noise impacts. The Siting Board notes that such practices are consistent with approaches to construction noise mitigation that it has reviewed in recent generating facility cases.

The Company has stated that, although construction generally would occur between 6:00 a.m. and 4:00 p.m., some construction activities may take place in the evenings and on Saturdays. The Company has agreed to limit evening work to relatively quiet activities, and to limit steam blows and pile driving to "extended daytime hours". However, the record is not clear as to the types of activities which the Company considers suitable on weekends, or as to the precise definition of "extended daytime hours". The Siting Board recognizes that extended construction hours may be necessary at times, either due to the nature of the tasks to be completed (e.g., concrete pouring) or to minimize the period during which Unit 2 is off-line and unable to provide electricity to the Commonwealth. However, such work must be carefully planned so as to minimize the noise impacts at neighboring residences.

The Siting Board therefore directs Mirant Canal II to consult with local authorities prior to undertaking pile driving, steam blows, or other noisy construction activity outside the hours of 6:00 a.m. to 4:00 p.m., Monday to Friday, and to provide advance notice of such activities to any neighborhood

⁵⁷ The Siting Board notes that, in cases where background noise levels are relatively high, and a "greenfields" analysis indicates that existing facilities owned and operated by a proponent are a primary contributor to those high background levels, the Siting Board would expect the proponent to aggressively pursue measures to reduce overall noise impacts from its existing and proposed facilities.

representatives that request such notice. The Company shall provide the Siting Board with a copy of its protocol for consultation and advance notification regarding construction outside of normal hours prior to commencement of construction. The Siting Board also anticipates that the Company will abide by local noise ordinances governing construction activities. The Siting Board finds that, with the implementation of this condition, the construction noise impacts of the proposed facility would be minimized.

Accordingly, the Siting Board finds that, with the implementation of the above condition, the noise impacts of the proposed project would be minimized.

H. Safety

This section describes the safety impacts of the proposed facility, the mitigation proposed by the Company, and the costs and benefits of any additional mitigation options.

1. Construction and Access

The Company indicated that it would take appropriate security measures to prevent unauthorized access to the site during construction and operation of the proposed facility (Exh. EFSB-HS-11). The Company noted that the Canal Station site is surrounded by a security fence and is monitored at all times (Exhs. EFSB-T-16; EFSB-G-5-C at 5-12). During construction, safety would be ensured by requiring contractors to comply with all applicable federal, state and local regulations; by including safety-related performance criteria in contracts; by requiring contractors to have an emergency response plan in place for any construction activities that may result in a spill or release of any hazardous materials or wastes; and by managing and containing chemicals in an appropriate manner (Exh. SEC-1, at 3.7-8; Tr. 5, at 633 to 640, 657 to 659). The Company and its engineering, procurement, and construction (“EPC”) contractor would consult with Sandwich to ensure that construction equipment and deliveries are safely directed to and from the site during construction (Exhs. EFSB-T-2; EFSB-T-14; EFSB-T-17). The Company indicated that construction and plant equipment

too large or too heavy to transport across the Cape Cod Canal bridges or by rail would be brought in by barge, under the supervision of the Army Corps (Exh. EFSB-HS-13).

The Company stated that safe navigation within the Cape Cod Canal would not be affected by activities related to the normal operation of the proposed facility (Exhs. EFSB-HS-6; EFSB-HS-10). The Company indicated that it would take measures to ensure that, with temporary exceptions, the Canal Walk and the canal itself would remain accessible for existing uses during construction and operation of the proposed facility (Exhs. EFSB-HS-14; EFSB-RR-37; Tr. 5, at 651 to 654).

2. Materials Handling and Storage

The Company stated that it currently stores approximately 50,000,000 gallons of No. 6 fuel oil at Canal Station in six aboveground storage tanks (“ASTs”) and two smaller “day tanks” (Exh. SEC-1, at 3.7-8). As part of the proposed project, one of the large ASTs and one of the day tanks will be modified to store No. 2 fuel oil (*id.* at 3.6-6; Exh. EFSB-HZ-5). The Company stated that the proposed changes in status of the two storage tanks would require approval by local and state authorities (Exh. SEC-1, at 3.6-5).

The Company stated that it would use a urea-based AOD system to generate the ammonia used as a catalyst for the proposed SCR NO_x controls for Unit 2 (*id.* at 1-9, 3.6-4). The Company stated that urea is a stable, non-volatile, environmentally benign material commonly employed as a fertilizer (*id.* at 3.6-4). Urea pellets would be stored onsite in silos located adjacent to the Unit 1 and 2 buildings (*id.* at 1-9). The Company stated that the urea pellets would be combined with a catalyst and with steam, producing the ammonia required for the SCR process (*id.* at 3.5-4, 3.6-4). The Company stated that the urea is immediately converted into ammonia and would be completely consumed in the SCR process, leaving no waste (Exh. EFSB-HZ-4; Tr. 5, at 640 to 643). The Company asserted that the use of AOD would eliminate the need for the transportation, handling, and storage of aqueous ammonia (Exh. SEC-1, at 3.5-4, 3.6-4).

The Company stated that chemicals used for water treatment, HRSG, and cooling processes would be stored on site in accordance with applicable regulations (*id.* at 3.7-7, Table 3.6-1 and 3.6-2;

Exh. EFSB-RR-17; Tr. 2, at 154 to 161). The Company noted that most of these chemicals are currently used and stored on site (Exh. EFSB-RR-17; Tr. 2, at 154 to 161).

3. Deliveries of Oil

The Company stated that fuel oil for the proposed facility would be delivered by ocean-going tank barges to an existing on-site berthing and fuel-unloading facility (Exhs. EFSB-G-5-C at 5-11; SEC-1, at 3.7-8; Tr. 1, at 40 to 42). The Company indicated that the fuel unloading area would be upgraded to accommodate low sulfur distillate No. 2 fuel oil (Exh. EFSB-G-5-C at 5-11). The Company indicated that Canal Station is currently accessible to barge traffic via a well-dredged navigational route (Exhs. SEC-1, at 1-19, 2-8; EFSB-G-5-C at 4.7-4). The Company stated that barge deliveries of oil and of heavy equipment would take place in compliance with all applicable federal, state, and local regulations and standards (Exhs. EFSB-HS-10; EFSB-HS-13; EFSB-HS-14; EFSB-SRR-60; EFSB-T-9; EFSB-T-18). The Company stated that the existing terminal operator, ESCO Terminals, would schedule all barge deliveries in advance and would not permit delivery of oil during unsafe conditions (high waves or strong winds) (Exh. EFSB-HS-10).

The Company stated that barged fuel oil would be unloaded and stored in accordance with Canal Station's Facility/Emergency Response Action Plan ("ERP") and Spill Prevention, Control, and Countermeasure ("SPCC") Plan (Exhs. SEC-1, at 3.6-5; EFSB-G-5-C at 5-11; EFSB-SRR-60; EFSB-HS-3; EFSB-WL-8). The Company indicated that back-up fuel would be stored on-site in bulk storage tanks, equipped with secondary containment, leak monitoring systems, level gauges, and high-level alarms (Exh. EFSB-G-5-C at 4.9-8). The Company stated that during operation, all storage areas, secondary containment areas, tank piping valves, pipe supports, expansion joints, and pumping equipment would receive daily visual inspections for deterioration, leaks, or malfunctions (*id.* at 4.9-9).

The Company stated that the existing Canal Station SPCC Plan would be updated to reflect changes resulting from construction of the proposed project (Exhs. SEC-1, at 3.6-5; EFSB-G-5-C at 4.6-60 to 4.6-61). The Company stated that EPA regulations require the submission of an updated SPCC Plan, which would address the storage and handling of oil and other hazardous chemicals (Exh.

EFSB-HS-3; Tr. 5, at 634 to 635). The Company stated that it had committed to filing its SPCC Plan within 30 days of any upgrades (Tr. 2, at 204; Tr. 5, at 634). The Company noted that it did not anticipate that the repowering of Unit 2 would require major changes to its existing SPCC Plan (Tr. 2, at 204; Tr. 5, at 634).

4. Fogging and Icing

The Company testified that the repowered Unit 2 would not cause ground level fogging and icing (Tr. 5, at 649 to 650). The Company stated that fogging and icing impacts are generally associated with cooling towers, which would not be required at Canal Station, where once-through cooling is used (id.). The Company argued that the exhaust stack would not present a fogging or icing hazard because of the height of the stack and the low level of water vapor emissions (id.).

5. Emergency Response

The Company stated that the proposed facility design incorporates surveillance and automatic shutdown systems (Exhs. EFSB-G-5-C at 5-12 to 5-13; EFSB-A-17; Tr. 5, at 628 to 629, 642), that designated structures and equipment would be constructed of fire-retardant materials (Exh. SEC-1, at 3.7-6), and that the design and layout of the facility would ensure safe access for fire, emergency response, and other vehicles (id.; Exh. EFSB-HS-9). The existing on-site fire suppression system would be upgraded and a large volume raw water storage tank suitable for firefighting needs would be incorporated as part of the facility design, with municipal water available as a backup source (Exh. EFSB-G-5-C at 5-12, 5-13). The Company stated that its employees would be trained in the use of emergency response equipment, Federal Occupational Safety and Health Administration (“OSHA”) safety procedures, emergency first aid, cardiopulmonary resuscitation, and basic fire prevention (id. at 5-13; Exh. SEC-1, at 3.7-7). The Company added that safety and training procedures would comply with all Federal, state, and local laws and regulations (Exh. EFSB-G-5-C at 5-12, 5-13).

The Company stated that historically, the Canal Station owners have worked in close cooperation with local emergency management agencies, including the Sandwich Fire Department (Tr.

5, at 628 to 631, 638), and that Sandwich and Bourne have developed an evacuation plan for the Cape Cod Canal area (id. at 638). The Company stated that it would continue to work with the local emergency management agencies to provide adequate training and equipment (id. at 638).

6. Existing Hazardous Conditions

The Company stated that the Canal Station site historically has been used for oil-fired electric generation, and that this long-term use has resulted in the presence of hazardous substances on portions of the property (Exh. EFSB-G-5-D at 10-12). The Company stated that ten past releases of hazardous materials at Canal Station have warranted issuance of tracking case numbers under the Massachusetts Contingency Plan (“MCP”), 310 CMR 40.000. While nine of the releases have been attenuated, one case remains active due to a single site (“MW-8”), where nickel, arsenic, and lead, have been identified in a localized area near an existing wastewater pond (id. at 10-13, 10-14, Fig. 10-1). The Company stated that it is monitoring MW-8 as required by the MCP, and that contaminant concentration levels are nearing natural attenuation (id. at 10-15; Tr. 5, at 609-617; Tr. 2, at 195 to 196).

7. Analysis

The Company has demonstrated that it would properly store non-fuel chemicals in accordance with applicable public safety standards and that it would have in place secondary or tertiary systems to contain chemical spills. The record demonstrates that the Company has arranged for the proper storage, use, and secondary containment of hazardous materials associated with the construction and operation of the proposed facility and that emergency training would be provided concerning the safe handling of those chemicals. The record also demonstrates that the Company would manage construction traffic and activities in a manner consistent with federal, state, and local regulations.

The Company proposes to use an emerging ammonia-on-demand technology to generate aqueous ammonia for its SCR system on site from urea pellets. The Siting Board notes that the Company’s proposed use of this technology would eliminate many of the concerns raised in prior

proceedings regarding the transportation, storage, and handling of aqueous ammonia, while retaining the benefits of the SCR NO_x-control technology. The Siting Board commends the Company for its willingness to explore and implement new technologies in response to public safety concerns, and notes that success with this innovation could lead to improved safety at future generating facilities.

The record indicates that Canal Station currently receives deliveries of No. 6 fuel oil, and that the fuel unloading area would be upgraded to accommodate deliveries of No. 2 distillate by barge to be used as back-up fuel for Unit 2. The record demonstrates that the Company has in place procedures to ensure the safe delivery and storage of oil, and to ensure appropriate response to accidental spills; these procedures are documented in the Company's ERP and SPCC plans. The Company has indicated it will file an updated SPCC plan for Canal Station with the EPA within 30 days of commercial operation. The Siting Board directs the Company to consult with the appropriate Sandwich officials in preparing its updated SPCC plan.

The record indicates that the municipalities of Sandwich and Bourne have emergency response plans for the Cape Cod Canal area, and that the Company would continue to work with the Sandwich Fire Department to increase its ability to handle emergencies. The Company intends to update existing emergency procedures and response plans for the repowered Canal Station within 30 days of commercial operation. The Siting Board notes that certain elements of the ERP may require revisions to reflect procedures to be followed during the construction period. Consequently, the Siting Board directs the Company to update the construction section of its ERP in consultation with appropriate Sandwich officials and file it with Sandwich before facility construction begins in order to cover possible emergencies related to construction accidents.

The record contains no evidence that ground level fogging or icing would result from the operation of the proposed facility.

The record shows that the Canal Station has been assessed for the presence of hazardous materials, and that several contaminated areas, known as MCP sites, have been identified. All but one of these sites have achieved a permanent resolution under state regulations. The Company is monitoring the remaining site, designated MW-8, in accordance with MDEP requirements; the

monitoring suggests that contamination at the site is nearing natural attenuation. The Siting Board notes that MW-8, a localized contaminated area near wastewater pond D, is located away from the 9.4-acre area that would be affected by construction of the proposed facility, and is therefore unlikely to be disturbed by the construction of the proposed facility. Further, as discussed in Section III.C., above, the Company will continue to monitor the site to ensure that contamination does not migrate as a result of increased use of on-site wells for process water. Consequently, the Siting Board finds that the safety concerns associated with existing on-site contamination would be minimized.

Accordingly, the Siting Board finds that with the implementation of the proposed mitigation and the above condition, the safety impacts of the proposed facility would be minimized.

I. Traffic

This Section describes the impacts to local traffic conditions of the construction and operation of the proposed facility, and the costs and benefits of any additional mitigation options.

1. Description

The Company asserted that traffic associated with the proposed project would not adversely affect local traffic conditions and would be minimized in accordance with Siting Board standards (Company Brief at 89). In support of its position, the Company submitted an analysis of 1998 traffic volumes and future traffic impacts (Exhs. SEC-1, at 3.11-4 (Fig. 3.11-2); RR-EFSB-3; RR-EFSB-4). The Company asserted that during project construction, the Company would require its EPC contractor to provide a satellite parking facility and to transport its workers to the site in order to mitigate potential roadway impacts (Exh. SEC-1, at 3.11-1).

The Company stated that to reach the Canal Station site from the north, vehicles would proceed over the Sagamore Bridge to Exit 1 (Route 6A) (*id.*). Approximately 1.5 miles from the Route 6A exit ramp, vehicles would turn left onto Tupper Road and travel 0.8 mile to Freezer Road and the

access drive to Canal Station (id.). Vehicles approaching from the southeast on Route 6A would turn right at the intersection of Tupper Road and proceed to Freezer Road and the access drive (id.).⁵⁸

The Company performed a traffic capacity and level of service (“LOS”) analysis of the intersections of: (1) Route 6A with Tupper Road/Route 130 (“western Tupper Road/6A intersection”); (2) Tupper Road with Freezer Road; and (3) Tupper Road with Route 6A (“eastern Tupper Road/6A intersection”) (id. at 3.11-4, 3-11-5 (Figs. 3.11-1, 3.11-2)).⁵⁹ To establish baseline traffic conditions, the Company recorded traffic counts at these locations on August 26, 1998 from 6:30 a.m. to 9:30 a.m. and from 3:00 p.m. to 6:30 p.m. (id. at 3.11-4).

The Company’s data indicated that existing traffic conditions at the three intersections range from LOS A to LOS C during the morning peak hour and LOS A to LOS F during the evening peak hour (id. at 3.11-7, 3.11-8).⁶⁰ The analysis indicated that during the evening peak hour, LOS F conditions occur at both the eastern and western Tupper Road/6A intersections (id. at 3.11-7 (Tables 3.11-1, 3.11-3)). The Company stated that the worst-case traffic conditions are confined to the peak summer months of

⁵⁸ Freezer Road is a north/south roadway with one lane per direction (Exh. SEC-1, at 3.11-2, Fig. 3.11-2). Tupper Road is a two-lane east-west roadway that affords access to Route 6A in two locations (id.). Route 6A is an east/west roadway with one lane in each direction (id. at 3.11-4). Route 130 is a two-lane undivided roadway that intersects with Tupper Road and Route 6A (id.).

⁵⁹ A capacity analysis is a method by which traffic volumes are compared to the calculated roadway and intersection capacities to evaluate future conditions (Exh. SEC-1, at 3.11-5 (App. 3.11)). LOS is classified from best to worst operating conditions from A to F (id.). LOS A, B and C represent an under capacity of traffic, LOS D and E represent near capacity and LOS F represents over capacity (id. at 3.11-5). For example, LOS A represents an under capacity of traffic (less than 1,400 vehicles per hour) with an average delay of less than 5.0 seconds (id. at 3.11-5 (App. 3-11)). LOS F represents an over capacity of traffic (more than 2,000 vehicles per hour) with an average delay in excess of 45.0 seconds (id.).

⁶⁰ The Company stated that the morning peak traffic hour is from 8:30 a.m. to 9:30 a.m. and the evening peak traffic hour is from 4:15 p.m. to 5:15 p.m. (Exh. SEC-1, at 3.11-4). The Company added that the second highest morning and evening traffic volumes occur between 7:30 a.m. and 8:30 a.m., and 3:15 p.m. and 4:15 p.m. (Exh. RR-EFSB-3).

July and August; however, it did not analyze traffic flow for off-peak months (Exh. SEC-1, at 3.11-8; Tr. 1, at 20).

To evaluate traffic impacts from operation of the proposed facility, the Company projected traffic volumes for the same intersections in 2003, the first full year of operation (Exh. SEC-1, at 3.11-8 (Tables 3.11-4 through 3.11-6)). The Company assumed that baseline traffic would increase at a rate of 2% per year, but that the number of workers at Canal Station would remain at the current level of 115 employees (Exhs. SEC-1, at 3.11-8; EFSB-T-16). The Company also assumed that there would be one urea truck delivery per week, and that a limited number of diesel fuel and liquid magnesium deliveries would be made (Exhs. SEC-1, at 3.11-8; EFSB-T-19). The Company stated that fuel oil would be delivered by barge (Exh. EFSB-T-10).

The Company's analysis projected that in 2003, absent any traffic improvements, morning peak traffic conditions on Tupper Road southbound would deteriorate from LOS C to LOS D at the western Tupper Road/6A intersection (Exh. SEC-1, at 3.11-7, 3.11-10 (Tables 3.11-1, 3.11-4)). Similarly, morning peak traffic conditions on Tupper Road northbound would deteriorate from LOS C to LOS D at the eastern Tupper Road/6A intersection (*id.* at 2.11-7, 3.11-10 (Tables 3.11-3, 3.11-6)). Further, evening peak traffic conditions on southbound Tupper Road would deteriorate from LOS B to LOS C at the eastern Tupper Road\6A intersection, while Tupper Road northbound traffic would remain at LOS F (*id.* at 3.11-7, 3-11-10 (Tables 3.11-3, 3.11-6)).

The Company noted that the Town of Sandwich Comprehensive Plan concluded that the eastern Tupper Road/6A intersection needs traffic control improvements (*e.g.*, traffic signals) (*id.* at 3.11-11). The Company's analysis indicated that with a traffic signal, evening peak traffic conditions at this intersection would be LOS B instead of LOS F (*id.*).⁶¹ However, the Company noted that Sandwich had no firm plans for upgrading this intersection (Tr. 1, at 19-22).

⁶¹ The Company noted that because Route 6A would be stopped temporarily with traffic signals, it would operate at LOS B instead of LOS A in the morning (Exh. SEC-1, at 3.11-11).

The Company anticipated that the total construction period for the proposed project would be 24 months, with a three-month peak construction period (*id.* at 3.11-12). During the peak construction period, the Company expects to employ a maximum of 465 construction workers (*id.* at 3.11-13, Fig. 3.11-4). The Company argued that construction worker traffic would not have an impact on peak traffic conditions because the standard construction shift would be from 6:00 a.m. to 4:00 p.m., Monday through Friday (Exhs. SEC-1, at 3.11-13; EFSB-T-1). The Company stated that it would require its EPC contractor to provide a satellite parking facility⁶² for construction workers and bus service to transport workers to the project site (Exh. SEC-1, at 3.11-13; Tr. 1, at 22-23). The Company also stated that it would encourage construction workers to carpool to the satellite parking area (Exh. EFSB-T-14).⁶³ The Company noted that construction workers would be unlikely to take public transportation to the project because public transportation in the vicinity is limited (Exh. EFSB-T-12).

The Company stated that during construction, it expects an average of 25 to 30 trucks per day (excluding cement trucks) and asserted, based upon this number, that no traffic control officers would be necessary (Exh. RR-EFSB-7). The Company asserted that the majority of trucks arrivals and the delivery of very large equipment would occur during non-peak traffic periods (Exhs. SEC-1, at 3.11-13; EFSB-T-2). The Company stated that it would attempt to deliver large equipment by barge (Exhs. EFSB-T-2; EFSB-T-9).

2. Analysis

⁶² The Company identified possible areas for satellite parking at: (1) the Route 3 rotary by the Sagamore Bridge; (2) the intersection of Route 28 with Route 6 by the Bourne Bridge; and (3) a parcel of land on the Massachusetts Military Reservation by Exit 1, off of Route 3 (Exh. EFSB-T-17). The Company stated that it has not secured any of the sites because the EPC contractor would be responsible for providing the satellite parking (Exhs. EFSB-T-8; EFSB T-17; Tr. 1, at 24-25).

⁶³ The Company stated that, based upon current ride-sharing level for workers installing SCR equipment at Canal Station, it anticipates the overall vehicle occupancy rate for the construction phase of the project to be 1.11 occupants per vehicle (Exh. RR-EFSB-5).

The Company has provided an analysis of traffic conditions at intersections in the vicinity of the proposed project in 1998 and in 2003, after Unit 2 has been repowered. The Company's analysis predicts that, by 2003, absent traffic control improvements, (1) morning peak traffic conditions would deteriorate from LOS C to LOS D on two sections of Tupper Road, and (2) evening peak traffic conditions at the eastern Tupper Road/6A intersection would deteriorate from LOS B to LOS C on Tupper Road southbound and would remain at LOS F on Tupper Road northbound. However, this projected deterioration in traffic conditions is driven by expected increases in general traffic, and is not associated with the proposed project. The Company does not intend to increase operational staff at Canal Station as a result of the proposed project, and projected truck deliveries would be relatively infrequent, since fuel oil would be delivered by barge. Given these factors, it seems likely that the proposed changes to Unit 2 would have minimal impact on Tupper Road traffic conditions. The Siting Board therefore finds that the traffic impacts of the operation of the proposed project would be minimized.

The record demonstrates that the Company has proposed a number of measures to minimize traffic impacts from the construction of the proposed facility, including:

(1) scheduling worker arrivals and departures for the off-peak hours of 6:00 a.m. and 4:00 p.m.; (2) requiring its EPC contractor to provide satellite parking and bus transportation from the satellite parking area to the project site; (3) encouraging carpooling; (4) delivering large equipment by barge; and (5) to the extent practicable, scheduling truck deliveries during off-peak hours. The Siting Board therefore finds that the impacts of construction traffic in the immediate vicinity of Canal Station would be minimized.

The Siting Board notes, however, that the Company does not yet know the location of the satellite parking area(s) and the availability of and costs related to shuttle bus service from the satellite parking area(s) to the project. Consequently, the Siting Board does not have a sufficient record to determine whether traffic impacts near the satellite parking area(s) would be minimized. Therefore, the Siting Board directs the Company, prior to construction, to file with the Siting Board final plans for

satellite parking for construction workers, including a supporting analysis of LOS and other traffic impacts near the satellite parking area(s) and specific measures (e.g., carpooling) to mitigate any traffic impacts during construction of the project. In developing final plans for satellite parking and other traffic mitigation measures, the Siting Board directs the Company, together with its EPC contractor, to coordinate with appropriate municipal authorities concerning procurement of satellite parking and to identify and implement appropriate measures to address traffic impacts and ensure pedestrian safety in the vicinity of the satellite parking area(s) and the related bus route(s) to the project site. The plan should allow the Company to maintain communication with local officials and safety departments to address any traffic impacts arising from construction of the proposed facility, and to ensure smooth passage of safety and emergency vehicles at all times. The Siting Board will expeditiously review the Company's filing to determine whether traffic impacts at the satellite parking area(s) would be minimized.

The Siting Board finds that, with the development of a satellite parking traffic analysis and mitigation plan and acceptance of such plan by the Siting Board, the Company will have established that the traffic impacts of the proposed facility would be minimized.

J. Electric and Magnetic Fields⁶⁴

This Section describes the electric and magnetic field impacts of the proposed facility, the mitigation proposed by the Company, and the costs and benefits of any additional mitigation options.

1. Description

The Company indicated that operation of the proposed facility would produce magnetic fields associated with increased power flows on certain existing transmission lines (Exh. SEC-1, at 3.8-7).⁶⁵

⁶⁴ Electric fields produced by the presence of voltage, and magnetic fields produced by the flow of electric current, are collectively known as EMF.

⁶⁵ The Siting Board notes that Commonwealth Electric Company-s and other utilities' existing transmission lines are not ancillary facilities as defined in G.L. c. 164, § 69G. However, in

(continued...)

The Company indicated that the proposed facility would interconnect with two 345 kV transmission lines and two 115 kV transmission lines that extend along a right-of-way (“ROW”) beginning at a point just southwest of the facility and running to the Bourne switching station (“Canal-Bourne ROW@) (*id.* at 3.8-5).

The Company modeled magnetic field strengths along the Canal-Bourne ROW assuming year 2001 demand levels (Exh. SEC-1, at 3.8-15). The Company’s modeling indicated that edge-of-ROW magnetic fields would range from 16 to 65 milligauss (“mG”) assuming that the existing Canal Station facility operates at peak loading, and would range from 22 to 83 mG assuming the Canal Station, with the proposed facility, was running at peak loading (*id.*).⁶⁶ The Company stated that the closest residence to the Canal-Bourne ROW is located 178 feet from the ROW edge and indicated that operation of the proposed facility would increase maximum magnetic field levels at that residence from 3 mG to 4 mG (Exh. EFSB-E-15).⁶⁷ The Company stated that predicted magnetic field levels along the ROW are consistent with the EFSB guideline of 85 mG (Exh. SEC-1, at 3.8-17). The Company stated that because the voltages on the Canal-Bourne ROW would not change due to operation of the

(...continued)

order to allow comprehensive analysis of environmental impacts associated with the construction and operation of the proposed generating facility, the Siting Board may identify and evaluate any potentially significant effects of the facility on magnetic field levels along existing transmission lines. See Sithe Mystic Decision, 9 DOMSB at 178; ANP Blackstone Decision, 8 DOMSB at 183-186; Boston Edison Company, 1 DOMSB 1, at 148, 192 (1993) (“1993 BECo Decision”).

⁶⁶ The Company noted that during light loading conditions, magnetic field levels at the edges of the Canal-Bourne ROW in the year 2001 would range from 8 to 47 mG with the existing facility operating, and would range from 22 to 65 mG when Unit 2 is repowered (Exhs. SEC-1, at 3.8-15; EFSB-E-9).

⁶⁷ The Company provided a table that shows magnetic field strength rapidly drops off with distance from the edge of the Canal-Bourne ROW (Exh. EFSB-E-15). For instance, the Company’s data show that the maximum magnetic field level with the repowered facility during peak conditions would drop from 83 mG at the edge of the ROW to 39 mG at a location 25 feet from the edge of the ROW (*id.*).

proposed facility, edge-of-ROW electric fields would remain at their current level of 0.65 kV/m, well below the Siting Board guideline level for electric fields of 1.8 kV/m (*id.* at 17).

The Company stated that the proposed project would affect load flows, and hence magnetic fields, on transmission line rights-of-way other than the Canal-Bourne ROW (Exh. SEC-1, at 3.8-15). The Company stated that during off-peak load periods, increases in load flows would occur along the 345 kV circuits that leave the Cape for the Carver substation and the Jordan Road Tap to the north (*id.*). The Company noted that for the peak load scenario, increases in load flows would occur along both the 115 kV and 345 kV circuits beyond the Bourne switching station, although increases on the 115 kV lines would be less than 100 amperes (*id.*). The Company did not attempt to quantify these impacts in terms of increased magnetic fields (*id.*).

The Company stated that existing magnetic fields levels along the Canal Station property line range from 2 mG to 38 mG, with the highest level occurring near the transmission line interconnect (Tr. 5, at 544). The Company asserted that magnetic field levels at the Canal Station property line would not increase following the repowering of Unit 2, due to the relatively large area of the site (Exh. SEC-1, at 3.8-15).

The Company indicated that it did not expect that the Canal-Bourne ROW would need to be reconducted to support the proposed project (Tr. 5, at 546). The Company noted that Commonwealth Electric is in the process of performing a system impact study to assess the need for transmission upgrades to support the proposed project, and that upon completion of the study, Commonwealth Electric would explore cost-effective design changes that could lower magnetic field levels along transmission lines requiring upgrades (Exh. EFSB-E-1).

2. Analysis

In a previous review of proposed transmission line facilities, the Siting Board accepted edge-of-ROW levels of 1.8 kV/meter for the electric field and 85 mG for the magnetic field. Massachusetts Electric Company, et al., 13 DOMSC 119, 228-242 (1985) (“1985 MECo/NEPCo Decision”). Here, off-site electric and magnetic fields would remain below the levels found acceptable in the 1985

MECo/NEPCo Decision. Although consistent with edge-of-ROW levels previously accepted by the Siting Board, the estimated worst case magnetic fields along the Canal-Bourne ROW would range from 22 to 83 mG once the proposed facility is in operation. These levels represent a substantial increase above the current maximum field levels of approximately 16 to 65 mG at the edge of the ROW. The Siting Board notes that, in past transmission line reviews, applicants have recognized that some members of the public are concerned about magnetic fields and for that reason, design features have been incorporated into proposed transmission lines that would reduce magnetic fields at little or no additional cost. See, e.g., New England Power Company - Uxbridge, 4 DOMSB 109, at 148 (1995). The Siting Board has held that, as part of pursuing interconnection plans that require upgrades to the regional transmission system, generating facility applicants should work with transmission providers to seek inclusion of practical and cost-effective transmission designs to minimize magnetic field levels along affected ROWs. Sithe Mystic Decision, 9 DOMSB at 181; ANP Blackstone Decision, 8 DOMSB at 188; Silver City Decision, 3 DOMSB at 353-354.

Here, the Company has committed to request that Commonwealth Electric consider potential magnetic field reductions and costs associated with different electrical phasing arrangements, as well as their feasibility, environmental impact and safety implications, in selecting the final design for any required upgrades. As in previous reviews, the system interconnection study for the proposed facility had not been completed as of the close of the record. The Siting Board therefore does not have complete information as to the extent or design of transmission upgrades required to support the proposed facility and the related ability to minimize EMF impacts. The Company's commitment to work with transmission providers is similar to that of previous generating facility applicants, and the Siting Board accepts that approach as meeting its standard of review for EMF. However, the Siting Board seeks to remain informed as to the progress and outcome of transmission upgrade designs related to interconnecting the proposed project. Therefore, the Siting Board directs Mirant Canal II to provide the Siting Board with an update on the extent and design of any required transmission upgrades, and the measures incorporated into such transmission upgrade designs to minimize magnetic

field impacts, at such time as the Company reaches final agreement with all transmission providers regarding transmission upgrades.

The Siting Board finds that, with the implementation of the above condition, and with the Company's pursuit of cost-effective designs for decreasing magnetic fields along any affected transmission lines that require upgrades, the electric and magnetic field impacts of the proposed facility would be minimized.

K. Land Use

This section describes the land use impacts of the proposed facility, the mitigation proposed by the Company, and the costs and benefits of any additional mitigation options.

1. Description

The Company asserted that the development of the proposed facility at the Canal Station site would be compatible with current land use characteristics and zoning for the site, and would be consistent with the development objectives of Sandwich and the region (Exh. SEC-1, at 3.2-2, 3.2-8, 4-40, 4-42 to 4-43). The Company further asserted that the proposed project would be compatible with surrounding land uses and would provide economic benefits to the region during both construction and operation of the proposed facility (id. at 3.2-11 to 3.2-12).

The Company stated that the proposed facility would be located on 9.4 acres in the northeast quadrant of the Company's 87-acre Canal Station in Sandwich, Massachusetts, which is now principally occupied by approximately 1,200 MW of oil and natural gas-fired electric generation facilities (id. at 3.2-1 to 3.2-2, ES-1 to ES-3). The Company stated that the project site is located adjacent to the existing Unit 2 building, and is primarily undeveloped, with gravel and scrub grass cover (id. at 3.2-1, 3.2-10).

The Company indicated that the project site is abutted to the east by Freezer Road, which forms Canal Station's eastern boundary; the Sandwich Town Marina and assorted commercial establishments predominate as land uses to the east (id. at 3.2-2). Immediately to the south of the

project site are the tracks of the New York, New Haven, and Hartford Railroad, which are currently in use for passenger and freight traffic (*id.* at 3.2-2; Tr. 1, at 68). Commonwealth Electric retains the ownership of an undeveloped parcel of land located between the railroad tracks at the project site boundary and Tupper Road to the south (Exh. SEC-1, at 3.2-6). To the west of the project site are the existing Unit 1 and 2 buildings, fuel storage tanks, and a Commonwealth Electric substation, which forms the western border of the Canal Station site (Exh. EFSB-G-5-C at 4.10-8). To the north of the project site are the Cape Cod Canal and an adjacent Canal Walk used by pedestrians, cyclists, and fishermen, both maintained by the Army Corps; the Scusset State Beach Reservation is located on the opposite side of the canal (Exhs. SEC-1, at 3.2-2; EFSB-G-5-C at 2-3; Tr. 1, at 66). The Company stated that it would take measures to ensure that, with temporary exceptions, the Canal Walk and the canal itself would remain accessible for existing uses during construction and operation of the proposed facility (Exhs. EFSB-HS-14; EFSB-RR-37; Tr. 5, at 651 to 654).

The Company stated that land use within a one-half mile radius of the project is: 33% industrial, 23% water, 13% recreation, 13% woody perennial, 9% low-density residential, and 9% commercial (Exh. SEC-1, at 3.2-6, Table 3.2-1). Within a one mile radius, land use is: 12% industrial, 23% water, 9% recreation, 28% woody perennial, 5% low-density residential, 3% medium-density residential, and 14% commercial (*id.*). The closest residence is located 60 feet from the Canal Station fenceline and approximately 420 feet from the nearest existing or proposed on-site structure. The next closest residences to the Canal Station are located between 480 and 520 feet from the fenceline and 560 and 620 feet from the nearest existing or proposed on-site building (Exh. EFSB-L-5). The Company indicated that sensitive receptor locations within a one-half mile radius of the plant include the Sandwich and Sandcatcher recreation areas, the Sandwich Marina, and the Cape Heritage Rehabilitation Facility (Exh. EFSB-L-8).

The Company indicated that the Canal Station site is zoned for Industrial Limited Use (“IND”) (Exh. SEC-1, at 3.2-8 to 3.2-9). The purpose of the IND zone is “to preserve uniquely serviced areas for exclusive industrial or commercial use, while providing a visually pleasing area compatible with the town’s history” (*id.* at 3.2-8 to 3.2-9; Exh. EFSB-G-5-C at 4.10-7). Electric generation is an

approved principal use in the IND district with a Special Permit from the Town of Sandwich Zoning Board of Appeals (Exhs. EFSB-G-5-C at 4.10-7; EFSB-RR-9; Tr. 1, at 60 and 69). However, the Company indicated that the proposed project may require an additional Special Permit or a height variance (Exh. SEC-1, at 3.2-8 to 3.2-9; Tr. 1, at 69).

The Company stated that, pursuant to applicable provisions of the Cape Cod Commission Act (Chapter 716 of the Acts of 1989), the proposed project is considered a Development of Regional Impact (“DRI”), and as a result requires a DRI permit from the Cape Cod Commission. The Company stated that the project would undergo a joint review by the Cape Cod Commission and by the Massachusetts Environmental Policy Act Unit (“MEPA”) office, consistent with a Memorandum of Understanding (“MOU”) between the Commission and MEPA (Exhs. EFSB-L-1; EFSB-L-2). Following the issuance of the DRI permit, local permitting agencies would review the project (*id.*). Permits required from local agencies include a Special Permit, and if necessary, a variance, from the Sandwich Zoning Board of Appeals; an Order of Conditions from the Sandwich Conservation Commission under the provisions of G.L. c. 131, § 40; a Certificate of Appropriateness from the Old King’s Highway Historic District Committee pursuant to Section 6 of Chapter 470 of the Acts of 1973; a septic permit from the Board of Health; and a building permit (Exh. EFSB-L-2).

The Company stated that in evaluating the land use impacts of the project, it considered issues related to physical relocation of existing land uses, compatibility with existing onsite and adjacent land uses, and conformity with the objectives of the Town of Sandwich’s Comprehensive Plan (Exh. SEC-1, at 3.2-10). The Company stated that it would minimize the land use impacts of the proposed project through the use of an existing industrial site, designing the proposed facility to blend in to the existing facility to the greatest degree possible, visual impact mitigation, and use of local construction workers for construction and currently employed station workers during operation of the existing facility (*id.* at 2-8; Exh. EFSB-G-5-C at 4.10-1). The Company asserted that the proposed facility would be consistent with the goals of the Sandwich Comprehensive Plan to encourage sustainable development in

the industrially zoned districts⁶⁸ (Exh. SEC-1, at 3.2-11). The Company noted that it organized a community input process to determine the best methods to enhance the aesthetics of the development and to provide a ground-level buffer from nearby site locations (Exhs. EFSB-G-5-C at 4.10-8; EFSB-RR-23-S).

The Company asserted that construction and operation of the proposed facility would have no impacts on any historical or archeological resource areas, or on the habitat of any federally- or state-listed rare or endangered species (Exh. SEC-1, at 4-31, 4-48). In support of its assertion, the Company provided letters from the relevant jurisdictional authorities (*id.* at Apps. 3.4, 3.12).

The Company stated that its gas supply would be delivered to Canal Station from Duke Energy's Algonquin AG lateral, originating in Mendon, Massachusetts (*id.* at 2-7). The Company indicated that the existing line would need to be upgraded for some sections of the route between Mendon and Canal Station (*id.*; Exh. EFSB-L-3). The Company testified that some expansion of the ROW would be required for this upgrade; however, because the project would be conducted by Duke Energy, the Company was unable to provide any information regarding the nature or extent of environmental impacts that could result from the expansion of the G lateral (Exhs. EFSB-L-2; EFSB-L-11; Tr. 1, at 76).

The Company proposed to locate the transmission line interconnect to the Commonwealth Electric substation by crossing over an intercepting forested wetland area and buffer zone (Exh. SEC-1, at 4.4-11). The Company stated that this interconnection would result in limited impacts to wetland areas, as discussed in Section III.D, Wetland Impacts, above (Tr. 8, at 988-989). In order to mitigate these impacts, the Company submitted a wetland restoration plan to the Sandwich Conservation Commission (Exh. EFSB-G-5-H at 1 to 7). In addition, as discussed in Sections III.D and III.J,

⁶⁸ The Company provided the Open Space and Recreation Element of the Comprehensive Plan (Exh. EFSB-RR-11; Tr. 1, at 73). Among the stated goals of the plan is the encouragement of "sustainable development that is consistent with the carrying capacity of the Town's natural, historic, and social environments, and supports economic health and quality of life" (Exhs. EFSB-RR-11; SEC-1, at 3.2-10). The Company argued that the proposed facility would be consistent with the goals of this plan due to the brownfields nature of the site (Exhs. EFSB-RR-11; SEC-1, at 3.2-10).

above, the Company stated that ISO New England and Commonwealth Electric are conducting an interconnect study to determine the need for, and extent of, any transmission line upgrade requirements along the Canal-Bourne ROW (Exhs. SEC-1, at 2-6; EFSB-E-1). The Company did not provide information regarding the potential for land use impacts resulting from this electric interconnect.

2. Analysis

As part of its review of land use impacts, the Siting Board considers whether a proposed facility would be consistent with existing land uses, and state and local requirements, policies or plans relating to land use and terrestrial resources.

Here, the record demonstrates that the existing Canal Units 1 and 2 have established the character of the site. The undeveloped land comprising the project site is suited for electric power generation given its proximity to the existing station and the availability of supporting infrastructure, including fuel storage and delivery equipment, support buildings, and electrical transmission facilities. The record shows that neighborhoods characterized by residential and commercial use, with some recreational space, lie to the east, west, and south of the Canal Station site, while the main use to the north is the Cape Cod Canal and the Canal Walk. The record also shows, however, that construction of the proposed facility is consistent with the present use of the Canal Station site, and that operation of the proposed facility would not result in an additional incursion of industrial use beyond the existing Canal Station boundary.

Based on the record, the proposed project is an allowed use under the Sandwich zoning ordinances. However, the project will require approval from several other local bodies, including the Cape Cod Commission and the Old King's Highway Historic Commission. The Company has stated that it intends to apply for variances to construct structures for the proposed facility as required. The Siting Board notes that the Company would be required to submit written notification to the Siting Board in the event that denial of any variance for onsite structures required redesign of the proposed facility.

The record shows that pedestrian and cyclist access to the Canal Walk adjacent to the Cape Cod Canal and Canal Station would not be permanently affected by construction or operation of the proposed facility due to the relative location of the walkway to the construction site for the proposed facility. The record indicates that the Company has committed to preserving access to the walkway with only the possibility of temporary restrictions during construction.

Because of the extent of seasonal tourist activity in the area and the proximity of several recreational areas to the project, the potential visual impacts and land use impacts of the proposed project are closely linked. Due to the existing industrial nature of the site, and the design of the facility to minimize visual impacts from the near- and far-fields, the Siting Board finds that the visual character for sensitive receptor locations, such as the Sandcatcher Recreational Area and the Scusset State Beach Reservation, would not be adversely affected by the construction of the proposed project. The Siting Board has considered the visual impacts of the proposed facility in Section III.F, above, and has imposed conditions to mitigate such impacts. The Siting Board notes that these conditions address, to a significant degree, the issue of consistency with land use objectives.

The Company has adequately considered the potential impacts of the proposed facility with respect to wildlife species and habitats, as well as to historic and archaeological resources. Based on its review of information submitted by the Company, the Siting Board concludes that no impacts to these resources are likely to occur as a result of construction or operation of the proposed facility.

The record indicates that the project site is already developed and no tree-clearing mitigation would be required. However, the record provides no indication of the nature or extent of environmental impacts related to the interconnection of gas or transmission lines that could result from the project. In Section III.B above, the Siting Board has directed the Company to adjust its CO₂ offset calculation to account for any carbon sequestration losses resulting from tree-clearing impacts associated with any upgrades to gas and electric transmission interconnections. The record indicates that the Company has set forth a wetland restoration program to mitigate overstory impacts to trees in a wetland transversed by the electric interconnection between the Canal Station and the adjacent Commonwealth Electric property.

Accordingly, the Siting Board finds that the land use impacts of the proposed facility would be minimized.

L. Cumulative Health Impacts

This section describes the cumulative health impacts of the proposed project. The Siting Board considers the term “cumulative health” to encompass the range of effects that a proposed project could have on human health through emission of pollutants over various pathways, as well as possible effects on human health unrelated to emissions of pollutants (e.g., EMF or noise effects). The Siting Board considers these effects in the context of existing background conditions, existing baseline health conditions, and, when appropriate, likely changes in the contributions of other major emissions sources.

The analysis of the health impacts of a proposed generating facility is necessarily closely related to the analysis, in sections above, of specific environmental impacts which could have an effect on human health. This section sets forth information on the human health effects that may be associated with air emissions, including criteria pollutants and air toxics; emissions to ground and surface waters; the handling and disposal of hazardous wastes; EMF; and noise; describes any existing health-based regulatory programs governing these impacts; and considers the impacts of the proposed project in light of such programs.

1. Baseline Health Conditions

The Company provided information from four reports produced within the last ten years documenting health conditions in the Sandwich area. The Company identified a Massachusetts Department of Public Health study of cancer incidence in the upper Cape (“Cape Cancer Incidence Report”) which examined cancer incidence rates by census tract between 1990 and 1995 (Exh. EFSB-RR-39; Tr. 5, at 583). The Company stated that the Cape Cancer Incidence Report compared the incidence rate of 22 types of cancer for each Cape Cod town with the state-wide average for males, females, and the total population, and noted statistically significant deviations (Exh. EFSB-RR-39; Tr. 5, at 583, 664). The Company testified that in Sandwich, the Cancer Incidence Report found no

statistically significant elevations in cancer occurrences (Tr. 5, at 584). In the neighboring town of Bourne, elevated rates of bronchus and lung cancer were found (significant at $p \leq 0.05$)⁶⁹ (*id.* at 584).

In addition to the Cape Cancer Incidence Report, the Company identified a 1997 report published by Silent Spring Institute entitled the Cape Cod Breast Cancer and Environment Study (“Silent Spring Study”), and the 1997 Aschengrau and Ozonoff Upper Cape Cancer Incidence Study (“Cape Cancer Incidence Study”) (Exh. EFSB-HS-1, Tr. 5, at 581 to 584). The Company stated that these studies found elevations in some types of cancer on Cape Cod; however, neither study found an identifiable environmental cause for these elevated rates, and both recommended further study as to whether demographic differences exist between the population of women on the Cape versus populations of women elsewhere in Massachusetts (Tr. 5, at 578).

The Company also provided data generated by a 1999 study conducted by ICF Kaiser Consulting which examined the health-related impacts which could be attributable to the existing Canal Station (“ICF Kaiser Study”) (Exh. EFSB-G-5-C at App. 4.9; Tr. 5, at 575 to 577). The ICF Kaiser Study was a multimedia, multipathway risk assessment for Canal Station’s primary emissions sources, Units 1 and 2 (Exh. EFSB-G-5-C at App. 4.9). The Company stated that the ICF Kaiser Study concluded that elevated cancer rates on Cape Cod were unlikely to be the result of emissions from the existing Canal Station (Tr. 5, at 575 to 582).

2. Criteria Pollutants

As discussed in Section III.B, above, the MDEP regulates the emissions of six criteria pollutants under NAAQS: SO₂, PM-10, NO₂, CO, ozone, and lead. The Company indicated that SO₂, NO_x, and VOCs are primarily respiratory irritants, which could lead to edema at high enough concentrations; that PM-10, and particulate matter in general, are associated with increases in mortality or hospital admission from respiratory diseases such as chronic bronchitis; that CO would be expected

⁶⁹ The term statistically significant at $p \leq 0.01$ means that there is at most one chance in 100 that the excess of observed cancer cases is due to chance alone (Exh. EFSB-H-1, Bulk Att.). Similarly, the term statistically significant at $p \leq 0.05$ means that there is at most one chance in 20 that the excess of observed cancer cases is due to chance alone (*id.*).

to aggravate heart disease conditions; that SO₂ might increase sensitivity to asthma; and that lead is a neurotoxin (Tr. 5, at 589 to 590).

The Company's witness, Dr. Valberg, provided an overview of how the EPA determines NAAQS for each criteria pollutant. Dr. Valberg indicated that EPA develops a standard that is protective of public health with an adequate margin for safety, and that protects sensitive subgroups (id. at 587 to 588). The Company asserted that, when a geographical area is in compliance with NAAQS for a particular pollutant, there would be no discernable health effects in that area from that pollutant (id. at 586).

The Company asserted that its air modeling demonstrated that the predicted cumulative impacts from Canal Station would meet NAAQS/MAAQS with regard to NO_x, SO₂, PM-10, and CO (Exh. EFSB-A-2, Bulk Att., at 4-10, 4-11). The Company also noted that the proposed Canal Redevelopment, including the repowering of Unit 2 and other non-jurisdictional improvements at Canal Station, would lead to a 60% annual reduction in NO_x emissions, a 46% annual reduction in SO₂ emissions, a 62% annual reduction in CO emissions, a 16% annual reduction in PM-10 emissions, and a 20% annual reduction in emissions of VOCs from Canal Station (Exh. EFSB-A-2-S at 2 to 4).

The record indicates that the EPA sets NAAQS for six criteria pollutants -- SO₂, PM-10, NO₂, CO, ozone, and lead -- which are designed to be protective of human health, including the health of sensitive subgroups, with an adequate margin for safety. The Siting Board gives great weight to these standards as indicators of whether incremental emissions of criteria pollutants will have a discernable impact on public health.

The record also shows that MDEP has set procedures for reviewing the compliance with NAAQS of proposed new sources of criteria pollutants, such as the proposed project. Specifically, new sources are not permitted to cause or contribute significantly to a violation of NAAQS. In addition, MDEP requires major new sources to meet BACT (when the area is in attainment or is unclassifiable for a particular pollutant) or LAER (when the area is in non-compliance for a particular pollutant), and to obtain offsets greater than 100% of emissions when the area is in non-compliance for a particular pollutant. The Siting Board notes that MDEP's new source program balances

environmental impacts and costs when an area is in compliance with NAAQS, but requires stronger measures, including emissions offsets, when an area is in non-attainment. The Siting Board finds that this approach is consistent with its own mandate to minimize both the environmental impacts and costs of proposed generating facilities. The Siting Board therefore gives great weight to compliance with MDEP air quality programs as an indicator of whether the health impacts of a proposed facility have been minimized.

The Company stated that the Sandwich area is “unclassified” or “in attainment” for SO₂, PM-10, NO_x, CO, and lead, but is categorized, with the rest of Massachusetts, as “non-attainment” for ozone. In addition, the record indicates that for all criteria pollutants except ozone, regional background levels are well below standards set by NAAQS.

As discussed in Section III.B, above, the proposed repowering of Unit 2 would result in significant reductions in annual emissions of criteria pollutants, including ozone precursors NO_x and VOCs. While short-term concentrations of SO₂ and PM-10 would exceed SILs, the Company’s cumulative impact analysis makes it clear that the resulting air quality would be well within applicable health-based standards. The Siting Board therefore concludes that there is no evidence that the project’s emissions of SO₂, PM-10, NO_x, and CO would have a discernable impact on public health. In addition, because the repowering of Unit 2 would significantly reduce the number of days per year that Unit 2 would run on oil, the proposed project should significantly improve regional air quality for much of the year, and could have a net positive impact on health by reducing emissions of ozone precursors during a significant part of the year.

Finally, the record indicates that repowered Unit 2 would incorporate BACT or LAER, as applicable, for each criteria pollutant. Based on the stated compliance with MDEP emissions standards, and the proposed reductions in annual emissions of criteria pollutants from Unit 2, the Siting Board finds that the cumulative health impacts of criteria pollutant emissions from the proposed facility would be minimized.

3. Air Toxics

Air toxics, or hazardous air pollutants, are pollutants known or suspected to cause cancer or other serious health effects such as birth defects or reproductive effects (Tr. 5, at 587). Toxics include chemicals such as arsenic, beryllium, lead, mercury, nickel, dioxins, and formaldehyde (Exh. SEC-1, at 3.7-5 (Table 3.7-1)).

The MDEP has in place an air toxics program, the primary purpose of which is to protect public health (*id.* at 3.7-5; Tr. 5, at 586). The program sets a Threshold Effects Exposure Limit (“TEL”) which is protective of public health from threshold effects, and a Non-threshold Effects Exposure Limit (“NTEL”), the lower of which is selected as the Allowable Ambient Limit (“AAL”) (Exhs. SEC-1, at 3.7-5; EFSB-G-5-C, at 4.9-5). Where carcinogenicity is the most sensitive effect, and adequate data are available to derive a cancer unit risk, the AAL is set to correspond to an incremental lifetime risk of developing cancer of one in one million (Tr. 5, at 586). The Company asserted that AALs and TELs were designed to ensure that contributions from a single source would have an insignificant impact on public health (Exh. SEC-1, at 3.7-5). The Company also asserted that because repowered Unit 2’s predicted emissions of regulated air toxics would be below AALs and TELs, the health impacts which could result from these emissions have been minimized (*id.* at 3.7-5; Exh. EFSB-G-5-C, at 4.9-5 to 4.9-6).

The Company provided the results of a 1998 EPA study titled “Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units – Final Report to Congress” (“HAPs Study”). The HAPs Study assessed emissions of 67 hazardous air pollutants (“HAPs”) from 52 fossil fuel generating units, and used this data to model human inhalation exposures to HAPs from all 684 fossil fuel plants nation-wide (Exh. EFSB-G-5-C, at 4.9-2 to 4.9-6). The HAPs Study included a detailed analysis of inhalation exposures and risks for 14 priority HAPs, and conducted multipathway assessments for the four highest-priority HAPs: arsenic, mercury, dioxins, and radio nuclides (*id.*). The HAPs Study eliminated gas-fired power plants from its analysis at the screening stage, noting that “[t]he cancer risks for all gas-fired plants were well below one chance in one million ... and no non-cancer hazards were identified” (Exh. SEC-1, at 3.7-2). Based on the EPA’s findings, the Siting Board

concludes that, in the absence of project-specific evidence to the contrary, the air toxics emissions from a gas-fired generating facility should be considered to have no discernable public health impacts.

The Company also provided the abstract and summary of a 1998 Mostardi-Platt and General Electric Company study entitled “Inhalation Health Risk Assessment of Air Toxic Emissions from Large Combustion Turbine Power Projects” (“GE Study”) which concluded that neither cancer nor non-cancer risks could be expected from ground-level exposure in the vicinity of combined-cycle combustion turbine plants firing either natural gas or low sulfur distillate (Exh. SEC-1, at 3.7-3).

Although the Company proposes to use natural gas as the primary fuel for repowered Unit 2, it does intend to seek permits to use oil as a back-up fuel for its new equipment for up to 720 hours per year. However, as noted in Section III.B, above, even when operating on oil, Unit 2’s emissions of all regulated air toxics would be below TELs and AALs, which are designed to be protective of public health. In addition, there is no evidence in the record indicating that the proposed project would emit any specific air toxic at levels which would affect public health. Consequently, the Siting Board finds that the health impacts, if any, of the air toxics emissions from the proposed project would be minimized.

4. Impacts to Ground and Surface Waters

The Company identified two water-linked pathways by which substances hazardous to human health could theoretically reach the local population: through stormwater discharges and construction dewatering that infiltrate groundwater used to supply potable water, and through wastewater discharges to surface water bodies (Exhs. EFSB-RR-36). In addition, as discussed in Section III.C, above, the record indicates that there are contaminants in the area which could affect public health were they to migrate into local drinking water supplies as a result of the project.

The Company indicated that groundwater quality is protected by MDEP through the establishment of drinking water standards which limit the levels of specific contaminants that may be present in drinking water sources (Exh. EFSB-RR-36; Tr. 5, at 566, 619). The Company asserted

that the Canal Station site is not located over an area of the underlying aquifer used as a source of drinking water, and that hydrologic properties of the site and its underlying aquifer make it highly unlikely that runoff from the site would contaminate drinking water (Exh. EFSB-RR-36; Tr. 4, at 429). The Company identified measures that would prevent the release of any pollutants to groundwater during the construction and operation of the proposed facility (Exhs. EFSB-G-5-C at 4.6-60; SEC-1, at 3.3-46 to 3.3-47). The Company stated that sanitary wastewater at the site would be managed in an on-site subsurface disposal system, a procedure used throughout the Town of Sandwich, which the Company stated has resulted in no adverse impacts to human health within the past 25 years (Exh. EFSB-RR-36). The Company stated that the facility will be designed in compliance with its NPDES permit and with MDEP's Stormwater Management Policy, which is designed to control non-point source pollution (Exhs. SEC-1, at 3.3-46 to 3.3-47; EFSB-RR-36).

As discussed in Section III.H, above, a single contaminated area, known as MW-8, is located directly beneath the existing Canal Station (Exh. EFSB-G-5-D at 10-5). The site is currently being monitored due to the presence of nickel at 120 micrograms per liter, which exceeds the MCP standard of 100 micrograms per liter (Tr. 5, at 610). The Company asserted that pump tests conducted for Sandwich had established that there is no hydrologic connection between groundwater associated with the active MCP site and any drinking water sources (*id.* at 613 to 615). The Company also stated that monitoring and remediation, as appropriate, would continue in accordance with the MCP until contamination at the site has reached levels below the MCP standard (*id.*).

As discussed in Section III.C, above, the construction and operation of the proposed facility would not draw on-site contaminated groundwater into groundwater adjacent to the Canal Station site, and the proposed withdrawals would not affect groundwater recharge areas associated with portions of the underlying aquifer used for public or private potable wells. Consequently, the Siting Board finds that the proposed project poses no health risks related to contamination of potable groundwater. As discussed in Section III.C, above, wastewater would be pretreated prior to being discharged to the Cape Cod Canal and all applicable state and local guidelines will be met. Consequently, the Siting

Board finds that the proposed project poses no health risks related to the disposal of cooling water and other wastewater.

5. Handling and Disposal of Hazardous Materials

As discussed in Section III.H, above, the Company stated that it would store and use fuel oil and chemicals for water treatment, HRSG, and cooling processes (Exh. SEC-1, at 3.7-7). The Company stated that most of these chemicals were already in use and stored at the existing facility, and that hazardous materials would be handled in accordance with federal, state, and local laws and regulations (*id.* at 3.6-6 to 3.6-9, 3.7-6 to 3.7-8). Additionally, the Company noted that its planned use of urea, which it identified as non-hazardous, as the source of ammonia for NO_x control for the proposed facility would obviate the need for on-site storage and transportation of aqueous ammonia (*id.* at 3.5-4, 3.6-4; Tr. 5, at 646-649).

The Company has demonstrated that it has in place procedures for the proper handling, storage, and disposal of hazardous materials during construction and operation of the proposed project. The Siting Board notes that the Company's use of urea as a source of ammonia for NO_x control would virtually eliminate any health concerns associated with aqueous ammonia. Consequently, the Siting Board finds that the health risks related to the handling and disposal of hazardous materials at the proposed project would be minimized.

6. Noise

As discussed in Section III.G, above, Canal Station currently produces noise that is noticeable in some surrounding community areas. These noise levels are expected to remain unchanged or to decrease slightly following the repowering of Unit 2. The Company has assessed the current and anticipated noise impacts of Canal Station in relation to applicable criteria for acceptable ambient noise, including the MDEP standard which limits allowable noise increases from new sources.

With respect to the health effects of noise, the Company asserted that human health is affected by noise primarily when noise is loud enough to damage the ear and reduce hearing acuity (Tr. 5, at

622-623). The Company noted that studies have been conducted of the long-term effects of noise annoyance on health; however, it argued that the noise created by Canal Station during normal operation is below the levels that cause such health impacts (*id.* at 623). The Company also stated that impulse noises produced by the construction and operation of the proposed facility would fall below the levels established by federal and state regulations both onsite and offsite (Tr. 7, at 902 to 904). The Company provided the EPA Levels Document, which recommends that noise exposure not exceed an average of 75 dBA over 8 hours, or 70 dBA over 24 hours in order to prevent hearing loss, and which suggests that an outdoor L_{dn} of 55 dBA likely would result in indoor nighttime noise levels of approximately 32 dBA, which should, in most cases, protect against sleep interference (Exh. EFSB-A-2 Bulk Att., App. G at 3, 4, D-34).

The record demonstrates that, following the repowering of Unit 2, L_{dn} noise levels at Briarwood Road would decrease from 58 dBA to 57 dBA, while noise at all other receptors would remain at current levels, which range from 53 dBA to 57 dBA. The resulting noise levels are well below thresholds where hearing loss from long-term noise exposure could occur, although both existing and anticipated noise marginally exceed the 55 dBA standard at one residential and two commercial locations. The Siting Board has found that the Company's noise mitigation proposals would minimize the operational noise impacts of the proposed project, and has imposed conditions on particularly noisy construction activities which should serve to minimize disruptions during the construction period. Consequently, the Siting Board finds that the health effects, if any, of noise from the proposed project would be minimized.

7. Electromagnetic Fields

As discussed in Section III.J, above, the repowered Unit 2 would require the construction of a new transmission interconnection to the adjacent Commonwealth Electric substation; from the substation, power would flow along two existing 115 kV and two existing 345 kV transmission lines to the Bourne switching station. This interconnection would consist of two 115 kV and two 345 kV transmission lines. The Company stated that the closest residence to the Canal-Bourne ROW lies 178

feet northwest of the ROW edge, substantially reducing the peak magnetic field level at that location (Exh. EFSB-E-1). At this residence, magnetic fields would increase from 3 mG to 4 mG (id.).

The Company stated that the highest projected magnetic field level at the edge of the Canal-Bourne transmission line ROW would be 83 mG (id.; Exh. EFSB-E-15). This represents a substantial increase above the maximum level of the existing facility of approximately 65 mG at the edge of the ROW (Exh. EFSB-E-15). The Company stated that Commonwealth Electric is in the process of performing the system impact study for the proposed project, and that upon completion of the study, Commonwealth Electric would explore cost-effective design changes that could lower magnetic field levels (Exh. EFSB-E-1).

The possible health effects of exposure to EMF have been a subject of considerable debate. In a 1985 case involving the construction of the 345 kV overhead HydroQuebec line, the Siting Board heard expert testimony, reviewed the existing literature, and concluded that there was no affirmative evidence that the proposed facilities, which had edge-of-ROW levels of 85 mG, would produce harmful health effects. 1985 MECo/NEPCo Decision, 13 DOMSC at 240. In this case, the Company has provided a summary of existing state and non-regulatory guidance regarding exposure to EMF (Exh. SEC-1, at 3.8-4). The Company indicated that other states have adopted EMF guidelines which are generally based on levels in existing transmission corridors (id.). The Company stated that the International Commission on Non-Ionizing Radiation Protection recommends that occupational exposure to 60 Hz magnetic fields be limited to 833 mG (id.). The Company stated that the International Radiation Protection Association recommends that occupational exposure be limited to magnetic fields below 5000 mG; that routine exposure for the general public be limited to 1000 mG; and that general public exposure to fields between 1000 and 10,000 mG be limited to a few hours per day (Tr. 5, at 555 to 557). The Company also stated that the American Conference of Governmental Industrial Hygienists had established a Threshold Limit Value (a level to which nearly all workers may be exposed repeatedly without adverse health effects) of 10,000 mG (id. at 556 to 557).

The Company also provided a 1997 report by the National Research Council, which provides a comprehensive review of research up to that date on the biologic effects of exposure to power-

frequency electric and magnetic fields, including cellular and molecular studies, studies on whole animals, and epidemiological studies (Exh. EFSB-E-16). The report concludes that the current body of evidence does not show that exposure to such fields presents a human health hazard (*id.*). With respect to epidemiological studies, the report indicates that the aggregate evidence does not support an association between magnetic field exposure and adult cancer, pregnancy outcome, neurobehavioral disorders, and childhood cancers other than leukemia (*id.*). With respect to *in vitro* studies, the report finds that exposure to 50-60 Hz fields induces changes in cultured cells only at field strengths 1000 to 100,000 times the levels typically found in residences (*id.*). With respect to animal studies, the study finds no convincing evidence that exposure to power-frequency fields causes cancer or has any adverse effects on reproduction or development in animals (*id.*). The report finds evidence of behavioral response to fields “considerably larger than those encountered in a residential environment”; however, there was no demonstration of adverse neurobehavioral impacts (*id.*).

The Company also provided an update on research published since the 1997 report (*id.*). The Company’s witness, Dr. Valberg, discussed two recent epidemiological studies which focused on a potential link between EMF levels and childhood leukemia. Dr. Valberg indicated that the first study, conducted by the National Cancer Institute (“NCI”), found no correlation between exposure to present-day measured fields of over two mG and leukemia (Tr. 5, at 550 to 552). He noted that the researchers later regrouped the study data and found statistically significant correlations for some groups with higher levels of exposure, but could not conclude that there was a consistent pattern that would support a dose response effect (*id.* at 555 to 556). Dr. Valberg also noted that recent animal studies, including a recent Japanese study, where field exposure of up to 50,000 mG was assessed upon animals, did not support a relationship between field exposure and excess cancer (*id.*).

Overall, although there are some epidemiological studies which suggest a correlation between exposure to magnetic fields and childhood leukemia, and some evidence of biological response to exposure to magnetic fields in animal studies, there is no evidence of a cause-and-effect association between magnetic field exposure and human health. Thus, the record in this case does not support a conclusion that the EMF levels anticipated as a result of the proposed project would pose a public

health concern. Nonetheless, the Company has agreed to pursue an interconnection plan that minimizes edge-of-ROW magnetic fields. Accordingly, the Siting Board finds that the health effects, if any, of electric and magnetic fields associated with the proposed project would be minimized.

8. Conclusions

In the sections above, the Siting Board has reviewed the proposed project's potential for effects on human health resulting from emissions of criteria pollutants, emissions of air toxics, emissions to ground and surface waters, handling and disposal of hazardous materials, noise, and electric and magnetic frequencies. The Siting Board has found that: (1) the cumulative health impacts of criteria pollutant emissions from the proposed project would be minimized; (2) the health impacts, if any, of the air toxics emissions from the proposed project would be minimized; (3) the proposed project poses no health risks related to contamination of potable groundwater; (4) the proposed project poses no health risks related to the disposal of cooling water and other wastewater; (5) the health risks of the proposed project related to the handling and disposal of hazardous materials at the proposed project would be minimized; (6) the health effects, if any, of noise from the proposed project would be minimized; and (7) the health effects, if any, of electric and magnetic fields associated with the proposed project would be minimized.

The Siting Board notes that the only indication of potential pre-existing public health problems in the communities surrounding Canal Station is the existence of statistically elevated levels of bronchus and lung cancers. However, there is no evidence in the record suggesting that the pollutants which the repowered Unit 2 would emit are linked to these types of cancer. Moreover, the record shows that the proposed project would result in significant reductions in the emissions of criteria pollutants and would emit air toxics, including carcinogens, at levels below TELs and AALs. The Siting Board concludes that there is no evidence that the repowering would exacerbate any existing public health problems in the communities surrounding the proposed project. Consequently, the Siting Board finds that the cumulative health impacts of the proposed project would be minimized.

M. Conclusions

Based on the information in Sections II and III, above, the Siting Board finds that the Company's description of the proposed project and its environmental impacts is substantially accurate and complete.

In Section III.B, the Siting Board has found that, with the implementation of CO₂ mitigation, the air quality impacts of the proposed project would be minimized.

In Section III.C, the Siting Board has found that, with the implementation of the condition directing the Company to submit a description of its plans for long-term monitoring of water withdrawal impacts on groundwater and wetlands, the water resource impacts of the proposed project would be minimized.

In Section III.D, the Siting Board has found that the wetlands impacts of the proposed project would be minimized.

In Section III.E, the Siting Board has found that, with the implementation of the condition directing the Company to file a copy of its updated recycling plan and report on its recycling rate, the solid waste impacts of the proposed project would be minimized.

In Section III.F, the Siting Board has found that, with the implementation of the conditions relating to on-site landscaping and off-site mitigation of visual impacts, the visual impacts of the proposed project would be minimized.

In Section III.G, the Siting Board has found that, with the implementation of the condition relating to consultation and advance notification regarding construction outside of normal hours, the noise impacts of the proposed project would be minimized.

In Section III.H, the Siting Board has found that with the implementation of the conditions directing the Company to revise and update its Emergency Response Plan and Spill Prevention, Control, Countermeasure Plan, the safety impacts of the proposed project would be minimized.

In Section III.I, the Siting Board has found that with the development of a satellite- parking traffic analysis and mitigation plan, and acceptance of such plan by the Siting Board, the Company will have established that the traffic impacts of the proposed project would be minimized.

In Section III.J, the Siting Board has found that, with the implementation of the condition to provide an update on the extent and design of any required transmission upgrades, the EMF impacts of the proposed project would be minimized.

In Section III.K, the Siting Board has found that the land use impacts of the proposed project would be minimized.

In Section III.L, the Siting Board has found that the cumulative health impacts of the proposed project would be minimized.

Accordingly, the Siting Board finds that, with the implementation of the above-listed conditions, Mirant Canal II's plans for the construction of the proposed generating facility would minimize the environmental impacts of the proposed project consistent with the minimization of costs associated with the mitigation, control and reduction of the environmental impacts of the proposed generating facility.

IV. CONSISTENCY WITH THE POLICIES OF THE COMMONWEALTH

A. Standard of Review

G.L. c. 164, § 69J¹/₄ requires the Siting Board to determine whether the plans for construction of a proposed generating facility are consistent with current health and environmental protection policies of the Commonwealth and with such energy policies of the Commonwealth as are adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board. The health and environmental protection policies applicable to the review of a generating facility vary considerably depending on the unique features of the site and technology proposed; however, they may include existing regulatory programs of the Commonwealth relating to issues such as air quality, water-related discharges, noise, water supply, wetlands or riverfront protection, rare and endangered species, and historical or agricultural land preservation. Therefore, in this section, the Siting Board summarizes the health and environmental protection policies of the Commonwealth that are applicable to the proposed project and discusses the extent to which the proposed project complies with these policies.⁷⁰

⁷⁰ The Siting Board notes that its Technology Performance Standard at 980 CMR, § 12.00 could
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B. Analysis

In Sections II and III, above, the Siting Board has reviewed the process by which the Company sited and designed the proposed project, and the environmental and health impacts of the proposed project as sited and designed. As part of this review, the Siting Board has identified a number of Commonwealth policies applicable to the design, construction, and operation of the proposed project. These are briefly summarized below.

As discussed in Section III.B, above, the MDEP extensively regulates emissions of criteria and non-criteria pollutants that result from modifications to existing sources such as Canal Station. The Company has demonstrated that it expects to comply with all applicable MDEP standards.

As discussed in Section III.C, above, the EPA, the Army Corps, the National Marine Fisheries Service, U.S. Fish and Wildlife Service, MDMF and the MDEP regulate various wastewater discharges, and the impact of the proposed project on surface and groundwater bodies, water quality, and fisheries in the Cape Cod Canal and Massachusetts Bay. The Company has demonstrated that it expects to comply with all applicable regulatory standards.

As discussed in Section III.D, above, the Company has demonstrated that it is working to evaluate design options consistent with MDEP, Sandwich Conservation Commission, EPA and Army Corps environmental protection policies that would result in minimizing the wetlands impacts of (1) the proposed cooling water intake/discharge on the banks of the Cape Cod Canal and (2) a transmission line to a substation that crosses over a forested wetland area.

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be construed as an energy policy of the Commonwealth adopted for the purpose of guiding the decisions of the Siting Board. The proposed project's compliance with 980 CMR, § 12.00 is discussed in Sections I.D and III.B, above. The Commonwealth has not adopted any other energy policies pertaining to the Siting Board's review of generating facilities since G.L. c. 164, § 69J¹/₄ was enacted.

As discussed in Section III.G, above, the Company has demonstrated that it will maintain Canal Station noise at or below existing levels, consistent with MDEP Policy 90-001, which limits noise increases to 10 dBA.

As discussed in Section III.K, above, the Company has demonstrated that it has complied with state programs protecting rare and endangered species and habitats, and historic and archaeological resources.

The proposed project also is subject to federal coastal zone consistency review pursuant to policies implemented by the Commonwealth of Massachusetts Office of Coastal Zone Management (“CZM”) (Exhs. SEC-1, at 2-12-2-15; EFSB S-12-A (Att.)). The Company is required to obtain a certification from CZM that the Company’s activities comply with policies under the Massachusetts Coastal Zone Management Program (Exh. EFSB-G-5-C at 5-8). CZM policies require non-coastal-dependent sites in a coastal zone to submit an alternative inland siting analysis (Exh. EFSB-S-12). However, CZM does not require an inland siting analysis if a developer can demonstrate that: (1) the proposed project would be dependent on the existing facility’s infrastructure that is located in the coastal zone; (2) the effects of ancillary construction on the coastal zone are fully addressed; (3) the effects of the proposed project on the land and water resources and uses of the coastal zone are fully evaluated and mitigated; and (4) the effects of additional generating capacity on residential and commercial growth can be described (Exhs. EFSB-G-5-A; EFSB-S-12, at 2; EFSB-S-12-B (Att.)). The Company provided an analysis of the proposed project’s consistency with CZM requirements (Exh. SEC-1, at 2-12 to 2-15). The Siting Board concludes that the proposed project appears consistent with the policies of the Commonwealth regarding development in coastal zone areas.

Consequently, based on its review above, the Siting Board finds that plans for construction of the proposed project are consistent with current health and environmental protection policies of the Commonwealth and with such energy policies of the Commonwealth as have been adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board.

V. DECISION

The Siting Board's enabling statute directs the Siting Board to implement the energy policies contained in G.L. c. 164, §§ 69H-69Q to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

G.L. c. 164, § 69H. Section 69J¼ requires that, in its consideration of a proposed generating facility, the Siting Board review inter alia the site selection process, the environmental impacts of the proposed project, and the consistency of the plans for construction and operation of the proposed project with the current health and environmental protection policies of the Commonwealth and with such energy policies of the Commonwealth as have been adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board.

In Section II, above, the Siting Board has found that the Company's description of the site selection process it used is accurate, and that the site selection process resulted in the selection of a site that contributes to the minimization of the environmental impacts of the proposed project and the costs of mitigating, controlling, and reducing such impacts.

In Section III, above, the Siting Board has found that with the implementation of listed conditions relative to air quality, water resources, solid waste, visual, noise, safety, traffic and EMF impacts, the Company's plans for the construction of the proposed generating facility would minimize the environmental impacts of the proposed project consistent with the minimization of costs associated with the mitigation, control and reduction of the environmental impacts of the proposed project.

In Section IV, above, the Siting Board has found that the plans for the construction of the proposed project are consistent with current health and environmental protection policies of the Commonwealth and with such energy policies of the Commonwealth as have been adopted by the Commonwealth for the specific purpose of guiding the decisions of the Siting Board.

Accordingly, the Siting Board finds that, upon compliance with the conditions set forth in Sections III.B, III.C, III.E, III.F, III.G, III.H, III.I, and III.J above, and listed below, the construction

and operation of the proposed project will provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

Accordingly, the Siting Board hereby APPROVES, subject to conditions, the petition of Mirant Canal II, L.L.C. for approval to upgrade generating facilities at the existing Canal Station in Sandwich, Massachusetts. This upgrade would increase the electrical generating capacity of Unit 2 at Canal Station from 560 megawatts to 1225 megawatts.

The Company shall comply with the following conditions during construction and operation of the proposed generating facility:

Prior to the commencement of construction:

- A. In order to minimize safety impacts, the Siting Board directs the Company to update the construction section of its ERP in consultation with appropriate Sandwich officials and file it with Sandwich

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- B. In order to minimize traffic related impacts, the Siting Board directs the Company to file with the Siting Board plans for satellite parking for construction workers, including a supporting analysis of LOS and other traffic impacts near the satellite parking area(s), and specific measures (e.g., carpooling) to mitigate any traffic impacts during construction of the project. In developing final plans for satellite parking and other traffic mitigation measures, the Siting Board directs the Company, together with its EPC contractor, to coordinate with appropriate municipal authorities concerning

procurement of satellite parking and to identify and implement appropriate measures to address traffic impacts and ensure pedestrian safety in the vicinity of the satellite parking area(s) and the related bus route(s) to the project site. The plan should allow the Company to maintain communication with local officials and safety departments to address any traffic impacts arising from construction of the proposed facility, and to ensure smooth passage of safety and emergency vehicles at all times. The Siting Board will expeditiously review the Company's filing to determine whether traffic impacts at the satellite parking area(s) would be minimized.

- C. In order to minimize noise impacts, the Siting Board directs the Company to consult with local authorities prior to undertaking pile driving, steam blows, or other noisy construction activity outside the hours of 6:00 a.m. to 4:00 p.m., Monday to Friday, and to provide advance notice of such activities to any neighborhood representatives that request such notice. The Company shall provide the Siting Board with a copy of its protocol for consultation and advance notification regarding construction outside of normal hours prior to commencement of construction.

Prior to Operation:

- D. In order to minimize solid waste impacts, the Siting Board directs the Company to file a copy of its updated recycling plan with the Siting Board, and to report on its recycling rate for construction and demolition debris and its anticipated recycling rate for operational wastes.

During Construction and Operation:

- E. In order to minimize air quality impacts, the Siting Board directs the Company to develop, in consultation with the Siting Board staff, a plan to provide CO₂ mitigation beginning no later than the end of the first year following commencement of commercial

operation of the proposed project. Consistent with the Siting Board's rulings in recent cases, Mirant Canal II shall either: (1) by the end of the first year of operation, make a monetary contribution of \$1,134,498 (plus an adjustment for tree-clearing) to a cost-effective program or programs for CO₂ mitigation to be selected upon consultation with the staff of the Siting Board; or (2) by the end of the first year of operation, make a monetary contribution \$474,050 (plus an adjustment for tree-clearing), if it can establish that it will make no additional use of the CO₂ emissions reductions from existing equipment to provide offsets for CO₂ emissions from other sources; or (3) provide offsets for 1% of the proposed project's maximum net CO₂ emissions (plus an adjustment for tree-clearing) based on voluntary curtailment of operations of other existing equipment at Canal Station, or of equipment at another existing source, subject to conditions that the curtailment of operations be based on enforceable and verifiable limits and that there be no collateral use of the curtailment of operations to satisfy or avoid emissions offset requirements relating to other air pollutants emitted from Canal Station and/or to provide emissions offsets for any air pollutants emitted by other sources. If the Company elects one of the monetary contribution options, it should provide the Siting Board with detailed information regarding the program or programs to which the contribution will be made.

- F. In order to minimize water impacts, the Siting Board directs the Company to consult with the MDEP, the Cape Cod Commission, and the Sandwich Conservation Commission concerning the need for, and design of, well monitoring for any part of the operational lifetime of the facility, in order to assess the impact of groundwater withdrawals on salinization of groundwater and on water levels in nearby wetlands; and to file with the Siting Board a description of any plans that result from this consultation for monitoring salinization and wetland impacts.

- G. In order to minimize visual impacts, the Siting Board directs the Company to provide reasonable off-site mitigation of visual impacts, including shrubs, trees, window awnings, or other mutually-agreeable measures, that would screen views of the new turbine building or compressor building at affected residential properties, roadways and other locations within one-half mile to the east of the proposed facility, or within one-half mile to the southeast or south of the proposed facility east of the Commonwealth Electric substation, as requested by individual property owners or appropriate municipal officials. In implementing this requirement, the Company: (1) shall provide shrub and tree plantings, window awnings, or other reasonable mitigation on private property, only with the permission of the property owners, and along public ways, only with the permission of the appropriate municipal officials; (2) shall provide written notice of this requirement to appropriate officials and to all potentially affected property owners 30 days prior to the commencement of structural work on the new turbine building or compressor building, whichever occurs first; (3) may limit requests for mitigation measures from local property owners and municipal officials to a specified period ending no less than twelve months after initial operation of the plant; (4) shall complete all agreed-upon mitigation measures within one year after completion of construction, or if based on a request filed after commencement of construction, within one year after such request; and (5) shall be responsible for the reasonable maintenance and replacement of plantings, as necessary to ensure that healthy plantings become established.
- H. In order to reduce the visual impacts of the project at the Sandwich Marina and Freezer Road and along the Canal Walk, the Siting Board also directs the Company, in conjunction with appropriate local and regional authorities, to develop and implement a landscaping plan for the eastern boundary of the Canal Station site, and for the northern boundary in the vicinity of the proposed new structures.

- I. In order to minimize safety impacts, the Siting Board directs the Company to consult with the appropriate Sandwich officials in preparing its updated SPCC plan.

- J. In order to minimize EMF impacts, the Siting Board directs the Company to provide the Siting Board with an update on the extent and design of any required transmission upgrades, and the measures incorporated into such transmission upgrade designs to minimize magnetic field impacts, at such time as the Company reaches final agreement with all transmission providers regarding transmission upgrades.

Because the issues addressed in this Decision relative to this facility are subject to change over time, construction of the proposed generating facility must be commenced within three years of the date of the decision.

In addition, the Siting Board notes that the findings in this decision are based upon the record in this case. A project proponent has an absolute obligation to construct and operate its facility in conformance with all aspects of its proposal as presented to the Siting Board. Therefore, the Siting Board requires the Company to notify the Siting Board of any changes other than minor variations to the proposal so that the Siting Board may decide whether to inquire further into a particular issue. The Company is obligated to provide the Siting Board with sufficient information on changes to the proposed project to enable the Siting Board to make these determinations.

William H. Stevens, Jr.
Hearing Officer

Dated this 15th day of June, 2001