COMMONWEALTH OF MASSACHUSETTS
Energy Facilities Siting Board

In the Matter of the Petition of Colonial Gas Company d/b/a KeySpan Energy Delivery New England to Construct an Underground Natural Gas Pipeline in the Towns of Bourne, Sandwich, and Falmouth, Massachusetts	EFSB 02-1

FINAL DECISION

Selma Urman
Presiding Officer
May 9, 2003

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FIGURE 1: Map of Preferred and Alternative Routes

LIST OF ABBREVIATIONS

AFNG	Air Force National Guard
Algonquin	Algonquin Gas Transmission Company
Btu	British thermal units
BBtu	billion British thermal units
1997 BECo Decision	Boston Edison Company- Hopkinton and Milford, 6 DOMSB 208 (1997)
Bourne	Town of Bourne
Bourne Line	Pipeline extending from Bourne Take Station to Falmouth and Hyannis
1998 Cabot Power Decision	Cabot Power Corporation, 7 DOMSB 233 (1998)
CELCo Decision	Cambridge Electric Light Company, 12 DOMSB 305 (2001)
Colonial	Colonial Gas Company
Company	KeySpan Energy Delivery New England
CWMA	Crane Wildlife Management Area
d/b/a	doing business as
dBA	decibels, A-weighted
Department	Massachusetts Department of Telecommunications and Energy
Distrigas	Distrigas of Massachusetts Corporation
DSM	demand-side management
D.T.E. 01-105	KeySpan Energy Delivery New England, D.T.E. 01-105 (2003)
ENF	Environmental Notification Form
2001 Forecast and Supply Plan	KeySpan Energy Delivery New England, D.T.E. 01-105 (2003)
G.L.	Massachusetts General Laws
KeySpan	KeySpan Energy Delivery New England
LNG	liquified natural gas
MAOP	maximum allowable operating pressure

MECo/NEPCo Decision	Massachusetts Electric Company and New England Power Company, 18 DOMSC 383 (1989)
MHC	Massachusetts Historical Commission
MHD	Massachusetts Highway Department
MMBtu	million British thermal units
MMBtu/day	million British thermal units per day
MMBtu/hr	million British thermal units per hour
MMR	Massachusetts Military Reservation
MMWEC Decision	Massachusetts Municipal Wholesale Electric Company, 12 DOMSB 18 (2001)
1998 NEPCo Decision	New England Power Company, 7 DOMSB 333 (1998)
NHESP	Massachusetts Natural Heritage and Endangered Species Program
NSTAR	NSTAR Electric Company
NSTAR Decision	NSTAR Gas Company, 13 DOMSB 143 (2001)
ORW	outstanding resource water
psi	pounds per square inch
psig	pounds per square inch, gauge
ROW	right of way
Sagamore Line	Pipeline extending from Sagamore Take Station to lower Cape
Siting Board	Massachusetts Energy Facilities Siting Board

The Energy Facilities Siting Board hereby APPROVES, subject to one condition, the petition of Colonial Gas Company, d/b/a KeySpan Energy Delivery New England, to construct approximately six miles of 12-inch diameter natural gas pipeline along a route between a point near the intersection of Route 28 and Barlow's Landing Road in Bourne and an existing regulator station at the junction of Currier Road and Route 151 in Falmouth.[1]

I. INTRODUCTION

A. Summary of the Proposed Project

Colonial Gas Company ("Colonial"), d/b/a KeySpan Energy Delivery New England[2] ("KeySpan," or the "Company"), distributes and sells natural gas to local customers in twelve towns on Cape Cod plus portions of Wareham, Carver, and Plymouth (Exh. KEY-1, at 1-5, 2-3).[3] In order to distribute gas to customers on Cape Cod, the Company owns and operates a system of pipelines and also receives liquified natural gas ("LNG") at its plant in South Yarmouth (id. at 2-3). The backbone of the Company's Cape Cod system consists of: (1) a pipeline extending from the Bourne Take Station near the Bourne Bridge southward toward Falmouth and then eastward toward Hyannis (the "Bourne Line"); and (2) a pipeline extending from the Sagamore Take Station near the Sagamore Bridge eastward to the lower Cape (the "Sagamore Line") (id.). The Company proposes to upgrade approximately 30,000 linear feet of 12-inch diameter pipeline in Bourne, Sandwich, and Falmouth ("proposed project" or "proposed pipeline") in order to accommodate increased demand for natural

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[1] While the Siting Board's decision constitutes approval of the entire project, including approximately 9000 feet of natural gas pipeline previously constructed, it does not resolve the question of whether Colonial Gas Company constructed approximately 6000 feet of pipeline in violation G.L. c. 164, § 69J, and, if so, what penalties the Siting Board may assess. That matter is the subject of an ongoing investigation, Colonial Gas Company d/b/a KeySpan Energy Delivery New England, EFSB 02-3.

[2] KeySpan New England LLC is a Massachusetts limited liability company that wholly owns Colonial Gas Company, Boston Gas Company, and Essex Gas Company (Exh. KEY-1, at 1-8).

[3] Colonial also delivers gas to customers in the Lowell area (Exh. KEY-1, at 2-2).

gas in the area served by the Bourne Line (id. at 1-1). The Company anticipates converting the existing 8-inch pipeline for use as part of the 60 pounds per square inch ("psi") system, delivering gas from a regulator on the Bourne Line in the Town of Bourne ("Bourne") to existing distribution lines within the Massachusetts Military Reservation ("MMR") (id. at 1-1, 2-6). The new pipeline would generally follow the route of the existing Bourne Line, but would depart from it in three locations (id. at Fig. 4-16). Construction would not occur along two sections of the proposed route where Colonial already has replaced 8-inch pipeline with 12-inch pipeline (Exh. PO-G-12). The proposed pipeline would be tested for certification to operate at a pressure of 270 per square inch gauge ("psig"), but would be operated at a maximum of 200 psig, consistent with the certification of contiguous lengths of pipeline on the Bourne Line (Exh. KEY-1, at 2-6; Exh. PO-G-10).

KeySpan's preferred route for the pipeline begins on the existing Bourne Line near the intersection of Route 28 and Barlow's Landing Road in Bourne (Exh. KEY-1, at Fig.1-2 and p. 4-18). From this intersection, the preferred route follows the west edge of Route 28 south to Otis Circle (id.). Crossing Otis Circle, the preferred route follows Connery Avenue southeast into the MMR and also into Sandwich (id. at Figs. 1-1, 1-2 and p. 4-20). The preferred route skirts the cantonment area of MMR, southward on West Truck Road and eastward on South Inner Road, southward on Guenther Road, eastward on South Truck Road, and southeast on Simpkins Road, where it leaves the MMR (id. at 4-18; Exh. PO-RS-1). The route then follows the west side of Sandwich Road to the south (crossing into Falmouth), and the north side of Route 151 eastward to the Route 151 regulator station at the junction of Route 151 and Currier Road (Exh. KEY-1, at 4-18).

The Company also provided notice of an alternative route which starts along Route 28, continues generally along Route 28A to its intersection with Route 151, and then follows Route 151 east to the Route 151 Regulator Station (id. at 1-3, 1-4). The alternative route is entirely within the towns of Bourne and Falmouth (id. at 1-4). The preferred and alternative routes are shown in Figure 1.

B. Procedural History

On September 9, 2002, KeySpan filed with the Energy Facilities Siting Board ("Siting Board") its petition to construct the proposed project. The Siting Board docketed the petition as EFSB 02-1.

In accordance with the direction of the Presiding Officer, KeySpan provided Notice of Public Comment Hearing and Adjudication. On October 29, 2002, the Siting Board conducted a public comment hearing in Bourne, Massachusetts regarding the proposed project. The Air Force National Guard ("AFNG") filed a timely petition to intervene in this proceeding. The Presiding Officer granted the AFNG's petition to intervene.

The Siting Board conducted one day of evidentiary hearings in this proceeding on February 11, 2003. KeySpan presented the testimony of the following witnesses: Theodore E. Poe, Jr., Manager of Energy Planning at KeySpan, regarding need and project alternatives; David C. Kearney, Manager of Operations Engineering, regarding project overview, need, project alternatives and route selection; Theodore A. Barten, P.E., Managing Principal of Epsilon Associates, Inc., regarding project overview, project alternatives, route selection, environmental impacts and consistency with the policies of the Commonwealth; and John Vieira, Senior Scientist at Epsilon, regarding route selection and environmental impacts. In addition, Stanley Allgore, Construction Manager for KeySpan, testified at the hearing with respect to certain construction permitting issues. The AFNG did not present a direct case.

The Presiding Officer entered 133 exhibits, consisting primarily of information request responses and record request responses, into the evidentiary record. On February 28, 2003, KeySpan submitted a brief.

C. Jurisdiction and Scope of Review

KeySpan filed its petition to construct a natural gas pipeline in accordance with G.L. c. 164, § 69H, which requires the Siting Board to implement the energy policies in its statute to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost, and pursuant to G.L. c. 164, § 69J, which requires a project applicant to obtain Siting Board approval for the construction of proposed energy facilities before a construction permit may be issued by another state agency.

As a new pipeline over one mile in length intended for the transmission of natural gas, KeySpan's proposed project falls within the definition of "facility" set forth in G.L. c. 164,

§ 69G, which provides that a "facility" includes:

> a new pipeline for the transmission of gas having a normal operating pressure in excess of 100 pounds per square inch gauge which is greater than one mile in length except restructuring, rebuilding, or relaying of existing transmission lines of the same capacity.

G.L. c. 164, § 69G.

Before approving a petition to construct facilities, the Siting Board requires an applicant to justify its proposal in three phases. G.L. c. 164, § 69J. First, the Siting Board requires the applicant to show that additional energy resources are needed (see Section II.A, below). Next, the Siting Board requires the applicant to establish that, on balance, its proposed project is superior to alternative approaches in terms of cost, environmental impact, reliability, and ability to address the identified need (see Section II.B, below). Finally, the Siting Board requires the applicant to show that it has considered a reasonable range of practical facility siting alternatives and that the proposed site for the facility is superior to a noticed alternative site in terms of cost, environmental impact, and reliability of supply (see Section III., below).

II. ANALYSIS OF THE PROPOSED PROJECT

A. Need Analysis

1. Standard of Review

In accordance with G.L. c. 164, § 69H, the Siting Board is charged with the responsibility for implementing energy policies in its statute 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. In carrying out this statutory mandate with respect to proposals to construct natural gas pipelines, the Siting Board evaluates whether there is a need for additional natural gas facilities in the Commonwealth to meet reliability, economic efficiency, or environmental objectives. See NSTAR Gas Company, 13 DOMSB 143, at 153 (2001) ("NSTAR Decision"); Massachusetts Municipal Wholesale Electric Company, 12 DOMSB 18, at 43 (2001) ("MMWEC Decision"); Massachusetts Electric Company and New England Power Company, 18 DOMSC 383, at 393 (1989) ("MECo/NEPCo Decision").

In evaluating the need for new energy facilities to meet reliability objectives, the Siting Board

may evaluate the ability of its existing system to accommodate changes in aggregate demand or supply,[4] to serve major new loads, or to maintain reliable service in certain contingencies. The Siting Board previously has approved proposals to construct gas pipelines to accommodate load growth within a utility's service territory (see Boston Gas Company, 17 DOMSC 155 (1988)) and to transport natural gas to generating facilities. See NSTAR Decision at 149; MMWEC Decision, 12 DOMSB 18; Berkshire Gas Company, 20 DOMSC 109 (Phase II) (1990). In such cases, the proponent must demonstrate that additional energy resources are necessary to meet reliability objectives by establishing that its existing system is inadequate to serve the anticipated load with acceptable reliability.

2. Description of the Existing System

KeySpan stated that it receives natural gas for its Cape Cod service territory from the Algonquin Gas Transmission Company ("Algonquin") at the Sagamore Take Station, Bourne Take Station, and Rochester Take Station (Exh. KEY-1, at 2-3). Customers located east of the Cape Cod Canal are supplied with gas from the Sagamore and Bourne Take Stations (id.).

The backbone of the Company's Cape Cod distribution system consists of (1) the Bourne Line, extending from the Bourne Take Station southward toward Falmouth and then eastward toward Hyannis, which typically operates at 200 psig, and (2) the Sagamore Line, extending from the Sagamore Take Station eastward toward the lower Cape, which typically operates at 270 psig (id.).[5] The Bourne Line and the Sagamore Line are linked at a regulator station on Oak Street in Barnstable ("Oak Street Regulator"), which backfeeds the Bourne Line from the higher pressure Sagamore Line

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[4] With respect to changes in demand or supply, the Siting Board has found that new capacity is needed where projected future capacity available to the system is found to be inadequate to satisfy projected load. ANP Blackstone Energy Company, 8 DOMSC 1, at 27 (1999); Cabot Power Corporation, 7 DOMSB 233, at 249 (1998) ("1998 Cabot Power Decision"); New England Electric System, 2 DOMSC 1, at 9 (1977).

[5] Intermediate pressure distribution lines fed by the Bourne Line and by the Sagamore Line are linked to some extent, so there is not a clear-cut boundary between areas served by the two lines (Exh. PO-N-8). The Company typically runs the Bourne and Sagamore Lines at lower pressures in the summer, when demand is lower (Tr. at 9).

(id.). The Company noted that as demand increases on the lower Cape, which is supplied by the Sagamore Line, its ability to backfeed the Bourne Line through the Oak Street Regulator is reduced (Tr. at 25-26). Similarly, the Company indicated that the limited ability of the Bourne Line to move gas from the Bourne Take Station creates a need for supplementary delivery through the Oak Street Regulator, which in turn reduces the ability of the Sagamore Line to deliver sufficient gas to the lower Cape (id. at 26). The Company stated that the Bourne Line is currently able to deliver approximately 2400 million Btus per hour ("MMBtu/hr") into the local distribution system from the Bourne Take Station and through the Oak Street Regulator (Exh. PO-N-9).

In addition to its pipeline resources, KeySpan is able to vaporize LNG delivered by truck to its South Yarmouth LNG facility (Exh. KEY-1, at 2-5). The South Yarmouth LNG facility has a storage capacity of 174.3 million cubic feet and a sendout capacity of 32 million cubic feet per day, with a heat content of approximately 28,800 million Btus per day ("MMBtu/day") (id. at 2-5, n.1; Exh. PO-N-13). The Company stated that in recent years it has become increasingly dependent on the South Yarmouth LNG facility to maintain adequate volumes and pressure in its system, and expressed concern about "over-utilization" of the facility (Exh. KEY-1, at 2-6, 3-7). The Company noted that its use of the South Yarmouth LNG facility to increase pressure on the lower Cape reduces its ability to bring additional pipeline supply into the system through the Bourne and Sagamore Take Stations (id. at 3-7).

3. Need for Additional Resources

a. Sendout Projections

To document the future requirements of its Cape Cod customers, KeySpan provided a copy of its most recent approved forecast, developed in 2001 and entitled "Long-Range Resource and Requirements Plan (2001-02 to 2005-06)" ("2001 Forecast and Supply Plan") (Exh. PO-N-15, Bulk Att.). See KeySpan Energy Delivery New England, D.T.E. 01-105 (2003) ("D.T.E. 01-105"). KeySpan also provided projected annual growth rates for the period 2002-03 to 2005-06 for each of four upper Cape towns served primarily by the Bourne Line (Exh. RR-EFSB-3).

Based on its 2001 Forecast and Supply Plan, KeySpan indicated that base case design year sendout requirements for the Cape Cod service territory are projected to increase from 10.9 trillion Btu

in split year 2001-02 to 12.2 trillion Btu in 2005-06. D.T.E. 01-105, Exh. D.T.E. 1-62. This forecasted growth represents an average sendout growth of 3% per year, which compares to the average annual Cape Cod growth rate of 4.6% reported by the Company for the period of 1994 to 2001 (Exh. PO-N-1; Tr. at 44). As of November 30, 2001, KeySpan had a total entitlement on the Algonquin pipeline system for delivery to all KeySpan city gates of 348,412 MMBtu/day. D.T.E. 01-105, Petition at 9, 95-97. The Company indicated that it has entered into contracts with Algonquin for an additional 15,000 MMBtu/day of deliverability to the Cape Cod system when Algonquin's HubLine project comes on line in the spring or summer 2003, increasing to an additional 25,000 MMBtu/day on November 1, 2003 (Exhs. KEY-1, at 2-2; PO-G-9).[6]

With respect to sendout in the upper Cape area, the Company indicated that it first determined town-by-town growth factors from a Massachusetts market analysis database that includes five-year projections of construction growth by town (Exh. RR-EFSB-3; Tr. at 47). The Company then applied the town growth factors to its forecasted sendout for the Cape Cod service territory, in order to derive projected sendout by town (Exh. RR-EFSB-3; Tr. at 47). The resulting average annual growth rates for sendout between 2002-03 and 2005-06 in four upper Cape towns – Bourne, Falmouth, Mashpee, and Sandwich – range from 3.7 to 5.3% (Exh. RR-EFSB-3). The Company stated that this projected growth compares to an average annual growth rate from 1994 to 2001 of 5.2% for the overall four-town area (Exh. PO-N-1; Tr. at 45).

b. Delivery Volumes and Pressures

KeySpan asserted that in light of increasing gas requirements, reinforcement of the existing Bourne Line delivery system is necessary to maintain adequate delivery pressure throughout Cape Cod (Exh. KEY-1, at 2-6). KeySpan further asserted that its existing facilities will be insufficient to provide continuous natural gas service to existing and new customers on Cape Cod with an adequate margin of

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6 The Company stated in KeySpan Energy Delivery New England, D.T.E. 01-105 (2003) that there is a need for incremental supplies to serve the Cape Cod area; the specific contracts were reviewed and approved by the Department of Telecommunications and Energy ("Department") in KeySpan/Hubline, D.T.E. 02-18 (2002).

reliability, beginning in the 2003-04 heating season (id. at 2-6, 2-8; Exh. PO-N-11).

The Company explained that the peak hour requirements to be served via the Bourne Line, including supply from both the Bourne Take Station and the Oak Street Regulator, would increase from 2073 MMBtu/hr in 2001-02 to 2219 MMBtu/hr in the 2003-04 heating season (Exhs. KEY-1, at 2-7; PO-N-8). The Company indicated that in its system planning, it assumed the portion of this requirement supplied via the Bourne Take Station would increase from 1297 MMBtu/hr in 2001-02 to 1558 MMBtu/hr in 2003-04, an increase of 9.6% per year, while the portion to be provided via the Oak Street Regulator would decrease from 776 MMBtu/hr in 2001-02 to 661 MMBtu/hr in 2003-04 (Exhs. KEY-1, at 2-7; PO-N-8).[7]

The Company stated that, as the system is presently configured, the maximum volume that can be provided by the Bourne Line via the Bourne Take Station is approximately equivalent to the peak hour requirement to be supplied through those facilities in the 2002-03 heating season – a level of 1401 MMBtu/hr (Tr. at 20-21). The Company indicated that, beginning in the 2003-04 heating season, when the peak hour requirement to be supplied through the Bourne Take Station is projected to be 1558 MMBtu/hr, it may no longer be able to maintain the pressure at the intermediate system in Falmouth (Route 151 Regulator) necessary to ensure reliable supply to Woods Hole (Exh. KEY-1, at 2-8 to 2-9).

KeySpan stated that it attempts to maintain a minimum pressure of 10 psig in its intermediate pressure system on Cape Cod in order to maintain an adequate margin of reliability (Exh. PO-N-9; Tr. at 39). For planning purposes, the Company uses a pressure of 15 psig as a trigger to begin evaluation of a potential developing need for system improvements; the Company generally selects pressure regulator settings to maintain 15 psig, where feasible (Exh. PO-N-10; Tr. at 39). The Company stated

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[7] The Company indicated that the flow breakdown reflects its assumptions as to future year operational settings at the Oak Street Regulator, as well as year-to-year sendout and resource supply assumptions for the Cape Cod system (Tr. at 28-29). The Company stated that the regulator setting can be used on a seasonal or contingency basis to restrict flow to the Bourne Line, allowing more gas to flow east on the Sagamore Line (id.). However, the Company did not explain the relationship of its assumed yearly flow rates to any specific constraints or changes on either the Bourne Line or the Sagamore Line for the years modeled.

that problems of inadequate pressure on Cape Cod currently are most acute in the Woods Hole area of Falmouth (Exh. PO-N-1). The Falmouth area is served by a 60 psig distribution system which is fed by the Bourne Line (Exh. KEY-1, at 2-8). Gas from the Bourne Line is regulated down to 76 psig at the Route 151 regulator station, and is further regulated to 60 psig at the Sandwich Road regulator station, approximately 5.5 miles downstream (id.).[8] KeySpan indicated that, in recent years, the inlet pressure for the Sandwich Regulator fell below 60 psig as a result of heavy gas usage in southern Falmouth during peak days (id.). Delivery pressures at Woods Hole fell as low as 1.57 psig in January 2000 (Exh. PO-N-6). Replacement of pipe along Sandwich Road south of the Route 151 Regulator in Falmouth has since alleviated the most serious pressure concerns at Woods Hole (Tr. at 40). However, based on its analysis of future supply reliability, the Company believes that further system enhancement is needed.

To predict the change in reliability of supply over several future years, the Company modeled peak day delivery volumes and pressures in the upper Cape area from 2001-02 to 2005-06 (Exh. PO-N-16).[9] The Company indicated that the peak hour requirements to be served via the Bourne Line, including supply from both the Bourne Take Station and the Oak Street Regulator, will reach 2144 MMBtu/hr in 2005-06 (Exhs. KEY-1, at 2-7; PO-N-8).

The Company analyzed its delivery capability using software identified as the Stoner model, which applies the fundamental flow equation to predict gas flow in a pipeline system (Exh. PO-N-16). The Company stated that the Stoner model, as calibrated by the Company, relative to conditions measured on days of maximum sendout in January 2003, was accurate to within 3.7% for hourly flows and 4.2% for daily flows (id.).

The Company's modeling for 2001-02 design conditions shows an inlet pressure at the Route

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8 An inlet pressure of at least 86 psig at the Route 151 regulator station is required in order to maintain the desired outlet pressure of 76 psig (Exh. KEY-1, at 2-8). An inlet pressure of at least 70 psig at the Sandwich regulator station is required in order to maintain the desired outlet pressure of 60 psig (id. at 2-8, n.3).

9 As specified in its 2001 Forecast and Supply Plan, D.T.E. 01-105, at 83, KeySpan selected as its design day a day of 78 effective degree days at Logan Airport in Boston (Tr. at 57).

151 Regulator of 85 psig, and pressures of 21 psig at the end of the distribution system in Woods Hole and 25 psig at a location in Chatham served by the Sagamore Line, assuming a peak hour flow of 1250 MMBtu/hr at the Bourne Take Station, delivery from Algonquin at 270 psig, and design-day LNG reserves (Exh. PO-N-4). In the 2005-06 heating season, however, the Company's modeling indicates that peak hour flow through the Bourne Take Station would be 1446 MMBtu/hr, which is 698 MMBtu/hr less than the projected total requirement for the area served by the Bourne Line; and that with the other supply assumptions unchanged, the pressure at the inlet to the Route 151 Regulator would be only 8 psig – a level that is well below the Company's minimum (Exhs. PO-N-14; PO-N-16; RR-EFSB-4).[10] The Company further indicated that, under these same assumptions, the 2005-06 modeled minimum pressure would decline to zero at the end of the distribution system in Woods Hole, and to 15 psig at the location in Chatham supplied from the Sagamore Line (Exhs. KEY-1, at 2-7; PO-N-4; PO-N-8;
RR-EFSB-4).

c. Demand Side Management

KeySpan considered whether the implementation of accelerated demand-side management ("DSM") programs could offset the need for upgrades to its distribution system. The Company asserted that, to address the identified pressure issues, it would need to implement enough DSM measures to counter anticipated growth in normalized sendout on Cape Cod (Exh. KEY-1, at 3-12). The Company concluded that DSM measures alone would not address the identified need (id.).

The Company indicated that additional reductions from DSM of 300 billion Btus ("BBtu") in annual sendout and 4 BBtu in peak day sendout would be required each year, on average, to offset growth for the overall Cape Cod service territory over the five-year forecast period (Exh. KEY-1, at 3-12). The Company stated that for the upper Cape area – the area served by the Bourne Line – the

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[10] The Company indicated that the pressure and flow results returned by the computer model may not reflect conditions that would actually occur, but may reflect an inability of the model to solve for all variables simultaneously, when demand at any point is greater than the capacity of the pipeline system (Tr. at 31).

required additional reductions in annual and peak day sendout over the forecast period would be approximately one-third those for the Cape Cod service territory as a whole (Tr. at 91-93). However, the Company noted that DSM efforts targeted at just countering the amount of growth in the upper Cape area would not be sufficient to meet the identified need (id.). Specifically, the Company confirmed that because the Bourne Line is supplied from the Sagamore Line via the Oak Street Regulator as well as from the Bourne Take Station, growth throughout the Cape Cod service territory is a factor in diminishing over time the Company's ability to meet requirements in the upper Cape area (id.).

Comparing these required DSM reductions to past implementation of DSM, the Company stated that in all years up to 1998 it had been able to implement a cumulative total of 156 BBtu in reductions of annual sendout through demand-side response, and 1.4 BBtu in reductions of peak day sendout (Tr. at 90). The Company also estimated that implementing the level of DSM reductions required to offset projected growth in sendout would cost $52,000,000 for the first five years (id.).[11]

d. Analysis

In order to meet its statutory mandate, the Siting Board first evaluates whether there is a need for additional energy resources to meet reliability, economic efficiency, or environmental objectives. The Siting Board must find that additional energy resources are needed as a prerequisite to approving a proposed energy facility. NSTAR Decision, 13 DOMSB at 158; MMWEC Decision, 12 DOMSB at 56; MECo/NEPCo Decision, 18 DOMSC at 396-403.

Here, KeySpan has proposed to increase its distribution system capacity by replacing existing natural gas pipeline with pipeline of a larger diameter and varying the route of the existing pipeline in three areas. The Company has projected an increasing demand for gas on Cape Cod in its Cape Cod Division, and for individual towns in that division. The Company has entered into contracts to acquire

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[11] The Company developed this estimate based on the costs of its existing DSM program (Exh. KEY-1, at 3-12). The Company argued that its cost estimate is conservative (i.e., low) because its calculations are based on proportional program costs rather than an increasing cost of implementing successively less efficient DSM measures (id.).

additional supplies of natural gas to be delivered to the Bourne and Sagamore Take Stations to meet this demand; however, in order to provide reliable gas service, it also must be able to transport these new supplies from its take stations to its customers at adequate pressures.

KeySpan's analysis indicates that its existing delivery system likely will be insufficient to serve peak load beginning in the 2003-04 heating season. Given the present system configuration, the maximum volume that can be delivered by the Bourne Line via the Bourne Take Station is approximately equivalent to the Company's projected peak hour use of these facilities in 2002-03, leaving little room for increased use of these facilities in response to load growth.[12] In addition, the Company's modeling shows design-day inlet pressures at the Route 151 regulator station dropping from 85 psig in 2001-02, to 8 psig in 2005-06. Design-day delivery pressures at this location therefore are likely to be well below the Company's preferred inlet pressure of 86 psig beginning in the 2003-04 heating season. Similarly, the Company's modeling projects that design-day pressures at Woods Hole will drop from 21 psig in 2001-02, to zero pressure for the 2005-06 heating season.[13] Thus, the Company has established that its existing delivery system will be insufficient to maintain adequate pressure for existing and future customers in the Falmouth area, beginning in the 2003-04 heating

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[12] Because the Company can set the Oak Street Regulator to various pressures, the division of flow between the Sagamore and Bourne Take Stations is somewhat discretionary, and the Company's expectation of the flow that needs to be carried by each line is somewhat flexible. However, any increase in gas provided to the Falmouth area through the Oak Street Regulator would reduce the supplies of gas available to serve growing load on the lower Cape. In light of the developing pressure problems in the Chatham area, the Company's assumption that declining volumes would be available via the Oak Street regulator over time appears reasonable.

[13] The Siting Board notes that the 2005-06 modeling run projects only an 8 psig pressure drop between the Route 115 regulator station and Woods Hole, despite the existence of an intermediate regulator station at Sandwich Road. The specific modeled values may reflect an inability of the model to solve for all variables simultaneously in a situation where demand exceeds capacity at some point on the pipeline system. However, given the already marginal pressures both at the Route 151 regulator station and at Woods Hole, any possible inconsistencies do not cast doubt on the need for additional resources to provide reliable service to the Woods Hole area.

season. In addition, the Company's modeling suggests that in the longer term, low pressures may develop in the Chatham area, where delivery pressures are expected to decline from 25 psig in 2001-02 to 15 psig by the 2005-06 heating season in the absence of delivery system reinforcements.

To evaluate the potential to meet the identified need through accelerated implementation of DSM, the Company assumed that sufficient DSM to offset Cape Cod's projected year-to-year growth in annual and peak day sendout of 300 BBtu and 4 BBtu, respectively, would be required. The Company appropriately determined that, given the current operational necessity of backfeeding gas to the Bourne Line from the Sagamore Line in the mid-Cape area during peak load periods, it would not be able to meet the identified need simply by offsetting sendout growth in the upper Cape area. In addition, the Company's analysis of the level of DSM required to offset projected sendout growth on Cape Cod, in comparison to the level of DSM currently being attained there, and of the estimated cost of the added DSM, supports the Company's conclusion that it is unlikely accelerated DSM could reasonably be implemented to meet the identified need. Therefore, the Siting Board finds that accelerated DSM would not eliminate the need for additional energy resources.

Based on the modeled delivery pressures at Falmouth and Woods Hole, the Company has established that its existing system is inadequate to serve its anticipated load with sufficient reliability, specifically in the Falmouth area. Consequently, the Siting Board finds that there is a need for additional energy resources to maintain reliable gas service to customers on Cape Cod, especially in the Falmouth area.

4. Consistency with Long-Range Forecast

G.L. c. 164, § 69J requires that a facility proposed by a gas company required to file a long-range forecast pursuant to G.L. c. 164, § 69I be consistent with that company's most recently approved long-range forecast. G.L. c. 164, § 69J. KeySpan is a gas company required to file a long-range forecast pursuant to G.L. c. 164, § 69I. See G.L. c. 164, §§ 75B, 75H. Consequently, to satisfy the statutory requirement, the Siting Board reviews the consistency of the proposed gas pipeline with KeySpan's most recently approved long-range forecast.

The Company stated that its most recent forecast – the 2001 Forecast and Supply Plan – was

approved by the Department in January 2003 (Exh. PO-N-15, Att.). See D.T.E. 01-05. The Company stated that it continues to use the methods detailed in the 2001 Forecast and Supply Plan to prepare updated forecasts (Exh. PO-N-18). The Company added that no updates were made to assumptions of the model between the preparation of the 2001 Forecast and Supply Plan and the subject petition (Tr. at 15).

Tables provided in the Petition as Attachments F, G, and H contain the same data as three pages of tables in the 2001 Forecast and Supply Plan showing base case comparison of resources and requirements (Exhs. KEY-1, at 2-19 to 2-21; PO-N-15, Bulk Att., at Tables G-22D(rev.) and G-23D(rev.)). These tables project design-year and design-day resources and requirements for KeySpan from 2001-02 to 2005-06 (id.).

As discussed in Section II.A.3.a, above, the Company developed its projections of future gas delivery requirements for the upper Cape area by applying town-by-town growth factors to its forecasted sendout for the Cape Cod service territory, in order to derive projected sendout by town. These projections drive the findings of need for additional energy resources to serve the Falmouth area. Thus, the Company has established that the load assumptions in its system analysis for the proposed project are consistent with its current town-level forecasts for the Cape Cod district, and are derived from the information presented in its most recently approved long-range forecast. Accordingly, the Siting Board finds that the proposed project is consistent with the Company's most recently approved long-range forecast.

B. Comparison of Proposed Project and Alternative Approaches

1. Standard of Review

G.L. c. 164, § 69H requires the Siting Board to evaluate proposed projects in terms of their consistency with providing a reliable energy supply to the Commonwealth with a minimum impact on the environment at the lowest possible cost. General Laws, c. 164, § 69J requires a project proponent to present "alternatives to planned action" which may include: (a) other methods of generating, manufacturing, or storing electricity or natural gas; (b) other sources of electrical power or natural gas;

and (c) no additional electric power or natural gas.[14]

In implementing its statutory mandate, the Siting Board requires an applicant to show that, on balance, its proposed project is superior to alternative approaches in terms of cost, environmental impact, and ability to meet the identified need. Cambridge Electric Light Company, 12 DOMSB 305, at 321 ("CELCo Decision"); Boston Edison Company - Hopkinton and Milford, 6 DOMSB 208, at 252 (1997) ("1997 BECo Decision"); Boston Edison Company, 13 DOMSC 63, at 67-68, 73-74 (1985). In addition, the Siting Board requires a petitioner to consider reliability of supply as part of its showing that the proposed project is superior to alternative project approaches. CELCo Decision, 12 DOMSB at 321; 1997 BECo Decision, 6 DOMSB at 253-257; MECo/NEPCo Decision, 18 DOMSC at 404-405.

2. Potential Project Approaches

The Company presented six project approaches[15] for analysis: (1) installation of a 12-inch pipeline to replace existing sections of the Bourne Line ("proposed project"); (2) installation of a new 12-inch pipeline connecting the existing Sagamore Line and the Bourne Line on a route through the Farmersville section of Sandwich and the Newtown and Santuit sections of Barnstable ("Newtown-Santuit Connector"); (3) expansion of unloading, vaporization, and piping capacity at the existing South Yarmouth LNG facility ("South Yarmouth LNG Expansion"); (4) construction of a new LNG storage and injection facility ("New LNG Facility"); (5) construction of a new propane/air storage and injection

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[14] G.L. c. 164, § 69J, also requires an applicant to provide a description of "other site locations." G.L. c. 164, § 69J. The Siting Board reviews the Company's preferred route, as well as other possible routes, in Section III.B, below.

[15] G.L. c. 164, § 69J requires the Company to consider the alternative of "no additional electric power." The Company considered a no-build alternative, but concluded that it would not be an effective long-term solution to supply and pressure issues associated with increasing growth (Exh. KEY-1, at 3-12 to 3-13). The Siting Board notes that the no-build alternative would not meet the needs identified in Section II.A, above, and therefore eliminates it from further consideration. KeySpan also analyzed additional conservation and load management options and determined that these options would not meet the identified need. These options are discussed in Section II.A.3(d), above.

facility ("New Propane/Air Facility"); and (6) addition of compression along the Bourne and/or Sagamore Lines ("Compression Stations") (Exh. KEY-1, at 3-1 to 3-12).[16]

a. The Proposed Project

The Company proposes to install 12-inch diameter pipeline with a design pressure of 270 psig to replace existing 8-inch sections of the Bourne Line (Exhs. KEY-1, at 3-2; PO-G-3; PO-G-10). The Company would construct pipeline in Bourne and Falmouth and, depending on the route selected, also in Sandwich (Exh. KEY-1, at 1-4). The Company provided a map indicating that the majority of the proposed route avoids residential areas (id. at 4-17).

b. Newtown-Santuit Connector

The Newtown-Santuit Connector approach would consist of constructing an additional connection between the Sagamore Line and the Bourne Line approximately 3 miles west of the existing connection at the Oak Street Regulator (id. at 3-3). The new connector would begin at the Sagamore Line along Route 6 in Sandwich, approximately 9 miles east of the Sagamore Take Station, and end at Route 28 in the Santuit section of Barnstable, connecting there to the Bourne Line (id. at 3-3, 3-4, 3-6; Exh. PO-G-6, Att.).

c. South Yarmouth LNG Expansion Approach

The South Yarmouth LNG Expansion approach would involve enlarging the truck unloading facilities at the existing South Yarmouth LNG facility, adding a fifth vaporizer, enlarging plant discharge

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[16] The Company briefly discussed other approaches that it considered and rejected during project development. For instance, the Company considered constructing an LNG facility at Chatham, which had previously been studied by Colonial (Exh. PO-G-16, Att.). However, KeySpan stated that an LNG facility in Chatham had been proposed to address pressure needs on the lower Cape and would not meet supply needs identified in the Falmouth area; consequently, this approach was not considered further (Exh. EFSB-PA-4). In addition, the Company provided information on reactivating the Cataumet propane/air facility, but stated that reactivating the Cataumet facility would cost more than building new infrastructure (Exh. PO-PA-18).

piping, and increasing the frequency of LNG trailer deliveries (Exh. KEY-1, at 3-8). The Company indicated that this approach would not alleviate pressure problems in the Falmouth/Woods Hole area (id. at 3-9). In addition, the Company stated that it has concerns about delivering gas in the event of winter storms that may disrupt truck traffic (id.).

d. New LNG Facility Approach

The New LNG Facility Expansion approach would involve construction of a new satellite LNG facility in the Falmouth area (Exh. KEY-1, at 3-9). As conceived by the Company, the new LNG facility would consist of four 55,000 gallon LNG tanks, a vaporization system, truck unloading facilities, and associated structures and equipment (id.). The Company did not identify potential sites for such a facility, but stated that at least 10 acres would be needed (id.).

e. New Propane/Air Facility Approach

The New Propane/Air Facility approach would be generally similar to the New LNG Facility approach (Exh. KEY-1, at 3-10). Propane would be trucked in instead of LNG, and the propane would be mixed with air to provide a fuel with burning characteristics generally similar to natural gas (id.; Tr. at 65). The Company did not identify potential sites for such a facility, but stated that at least 10 acres would be needed (Exh. KEY-1, at 3-10).

The Company suggested that reliability of this approach would be inferior to the proposed project because deliverability to customers would be dependent on truck deliveries during winter months (id. at 3-14; Tr. at 64). The Company stated that the preferred pipeline pressure for blending propane/air into natural gas is low pressure up to 60 psig; the Company asserted that because of the pressure profile on the Cape, actual blending would be very limited under this alternative (Exh. KEY-1, at 3-10). High pressure compressors would be required if the Company chose to feed the propane/air mixture directly into the relatively high pressure Bourne Line, which would add further to operating costs (id. at 3-10; Exh. PO-PA-13).

f. Compression Stations Approach

The Compression Stations approach, as envisioned by the Company, would consist of installation of three compression stations along the Bourne Line by 2005-06, with back-up compressors at each location (Exh. KEY-1, at 3-10).

g. Analysis

The Company has presented six approaches to addressing gas supply and pressure issues in the Falmouth area, and throughout its Cape Cod distribution system. Of these approaches, one, the South Yarmouth LNG Expansion approach, would not directly support pressure and delivery requirements in the Falmouth area. This approach also would involve the environmental and traffic impacts associated with a large number of truck trips, and would be subject to weather interruption. The Siting Board therefore will not pursue this approach further.

In addition, the New Propane/Air Facility approach is generally similar to the New LNG Facility approach, but would require compression. Compression adds costs to this approach and may have noise impacts. As with the New LNG Facility, this approach raises reliability issues associated with reliance on trucking in winter. Based on these disadvantages, the Siting Board will not analyze this approach further. Consequently, the Siting Board will confine its further review to the proposed project, the Newtown-Santuit Connector approach, the New LNG Facility approach, and the Compressor Station approach.

3. Reliability Comparison

a. The Proposed Project

The Company stated that the proposed project would allow delivery of sufficient gas to its customers through 2005-06, beyond which it did not project the amount of demand growth (Tr. at 74). The Company stated that the proposed pipeline could supply 1821 MMBtu of gas [per hour] through the Bourne Take Station, which would be sufficient for Cape Cod through 2005-06, if Algonquin delivers gas at 270 psig and if 1400 MMBtu/hr were available from the South Yarmouth LNG facility (Exhs. PO-PA-8; RR-EFSB-1; Tr. at 84). The Company noted that the proposed project would not add to the mechanical complexity or operational control complexity of the KeySpan distribution system

(Exh. KEY-1, at 4-3). The Company also indicated that, by improving the ability of the Bourne Line to deliver gas, the proposed project would enhance the ability of the Sagamore Line to serve the lower Cape, since less gas would be backfed into the Bourne Line at the Oak Street Regulator in Barnstable (Tr. at 26, 66). The Company asserted that the proposed project would be the most reliable approach among the alternatives considered (Exh. KEY-1, at 3-14).

b. New LNG Facility

The Company indicated that construction of a new LNG Facility on the Bourne Line could address the need for greater distribution system pressures in the Falmouth area at least through 2005-06 (id. at 3-9; Tr. at 84). The Company noted that this approach also would enhance the ability of the Sagamore Line to serve the lower Cape, since less gas would be backfed into the Bourne Line at the Oak Street Regulator in Barnstable (Tr. at 66). However, the Company noted that it has concerns about the deliverability of gas by truck during winter storms, which could reduce the reliability with which this alternative would be available to meet peak demand, and argued that this approach therefore would be less reliable than the proposed project (Exh. KEY-1, at 3-9, 3-14).

c. Compression Stations Approach

The Company stated that three compression stations could deliver sufficient volumes and pressures of gas to serve the Falmouth area adequately through 2005-06 (Tr. at 84). The Company also indicated that this approach would enhance the ability of the Sagamore Line to serve the lower Cape, since less gas would be backfed into the Bourne Line at the Oak Street Regulator in Barnstable (Tr. at 66). Since compressors need regular maintenance in order to provide continuous service, each compressor station would include a redundant (i.e., back-up) compressor and appropriate controls (Exh. KEY-1, at 3-12).

d. Newtown-Santuit Connector

The Company stated that its modeling shows that this approach would provide adequate supplies and pressures in Falmouth only through the 2003-04 winter heating season (Exhs. KEY-1, at

3-4; PO-PA-10). Maintaining adequate supplies and pressure in Falmouth in later years would require the installation of approximately four miles of 12-inch diameter main along the Sagamore Line (Exh. KEY-1, at 3-4).

e. Analysis

The proposed project, the New LNG Facility approach, and the Compression Stations approach would provide additional energy resources to meet the needs of KeySpan customers on the upper Cape at least through 2005-06. All three approaches would reduce the extent to which the Sagamore Line, which is needed for other customers, is used as a supplementary source of gas along the Bourne Line. The proposed project results in the simplest operating system and is likely to be least vulnerable to disruption. However, redundant equipment, built as part of each compression station, would enhance the reliability of the Compression Stations approach. The record shows that, with respect to reliability, the proposed alternative would likely be superior to the new LNG facility, which involves supplementary delivery of fuel by truck. Accordingly, the Siting Board finds that the proposed project would be comparable to the Compression Stations, and superior to the New LNG Facility, with respect to reliability.

The Newtown-Santuit Connector, while providing pressure relief to the Falmouth area through 2003-04, would not, without further reinforcement of the Sagamore Line, provide adequate design-day pressures in the 2004-05 and 2005-06 heating seasons. The Siting Board therefore finds that the proposed project would be superior to the Newtown-Santuit Connector with respect to reliability.

4. Environmental Impacts

a. The Proposed Project

KeySpan asserted that there would be no long-term environmental impacts from the proposed project (Exh. KEY-1, at 3-3). The Company indicated that there would be short-term impacts along existing roads, including traffic impacts that it characterized as minimal along the preferred route and construction noise for two or three days at residences such as those along Sandwich Road in Falmouth (id.; Exh. PO-E-30). The Company stated that construction of the proposed project would require no

significant tree clearing (Exh. KEY-1, at 3-3)

b. New LNG Facility

The Company argued that this approach is inferior to the proposed project on environmental grounds because 10 to 12 acres of land would be occupied and because significant truck traffic would be required to refill the LNG facility on an ongoing basis (Exh. KEY-1, at 3-9, 3-14). The Company suggested that it would be challenging to find a suitable site (id.). The Company stated that, in addition to the land use impacts, trucking fuel in from an LNG off-loading facility such as Distrigas in Everett would result in traffic, noise, and air pollution impacts (Exh. PO-PA-14).

c. Compression Stations

KeySpan argued that the Compression Stations approach is inferior to the proposed project on environmental grounds because the compressors would consume gas and would emit noise and nitrogen oxides when operating (Exh. KEY-1, at 3-12, 3-14). The Company noted that three 1,000 horse-power engines operating at full load for 1,300 hours per year would emit approximately 1,800 pounds of nitrogen oxides and 2,600 pounds of carbon monoxide annually (id. at 3-12). The Company stated that using mufflers and acoustic enclosures would mitigate the noise of compressor engines (id.).

d. Newtown-Santuit Connector

As presented by the Company, the Newtown-Santuit Connector would consist of approximately 28,000 feet of new 12-inch pipeline beginning at the Sagamore Line along Route 6 in Sandwich, approximately 9 miles east of the Sagamore Take Station, and ending at Route 28 in the Santuit section of Barnstable, connecting there to the Bourne Line (id. at 3-3, 3-4, 3-6; Exh. PO-G-6, Att.). The pipeline route is along Great Hill Road and Newtown Road in Sandwich and along Santuit Newtown Road in Barnstable (Exh. KEY-1, at 3-3, 3-4). The Company indicated that the route for the Newtown-Santuit Connector would run largely through residential neighborhoods (id. at 3-4, 3-6).

e. Analysis

The record shows that the proposed project, which involves the installation of approximately 32,600 feet of new 12-inch pipeline either along an existing pipeline right-of-way ("ROW"), or within streets, would have limited temporary environmental impacts associated with the installation of the pipeline. Construction of the Newtown-Santuit Connector would have similar types of impacts but would affect an area with more residences than the proposed project. Construction of a new LNG facility would require the development of at least 10 acres of land; operation of the facility would result in minor traffic, noise, and air pollution impacts associated with trucking fuels to the Cape. Finally, the record shows that the operation of three compressors would generate some noise and air pollution, unlike the proposed project. Consequently, the Siting Board finds that the proposed project would be superior to the Newtown-Santuit Connector, the New LNG Facility and the Compression Stations, with respect to environmental impacts.

5. Cost

a. Description

KeySpan estimated that the capital cost of the proposed project following the preferred route would be $3,200,000 (KEY-1, at 3-14). However, depending on the route selected, the length of construction could be from 32,600 to 42,900 feet; therefore, the estimated project cost would be approximately $3,200,000 to $5,000,000 plus easement costs (id. at 3-2, 4-21 to 4-23, 4-33). There would be essentially no additional costs to operate and maintain the proposed project (id. at 3-14).

The Company estimated the capital costs of the New LNG Facility at approximately $9,300,000, including construction and equipment costs but exclusive of site acquisition costs (id. at 3-9).[17] The Company estimated that the capital cost of the compressors comprising the Compression Stations approach would be $12,000,000 (id. at 3-11). The Company estimated the capital cost of the Newtown-Santuit Connector at approximately $3,700,000 (id. at 3-4).

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[17] The comparison presented by the Company excludes fuel price differences between pipeline gas and LNG; however, the Company indicated that fuel price differences would be small relative to the difference in capital costs (Exh. KEY-1, at 3-14; Tr. at 70).

The Company indicated that operating costs would be lowest for the proposed project and highest for the New LNG Facility (id.). A cost breakout is provided below in Table 1.

Table 1. Cost Comparison Among Three Project Approaches

Approach	Capital Cost	Annual Operations & Maintenance [1]
Proposed Project [2]	$3,200,000 - $5,000,000	$0
New LNG Facility [3]	$9,300,000	$100,000
Compression Stations	$12,000,000	$18,000
Newtown-Santuit Connector	$3,700,000	NA

1. Does not include differential fuel costs.
2. Range for proposed project along preferred route and noticed alternative.
3. Cost excludes cost of land.

NA. Not available

Source: Exh. KEY-1, at 3-14.

b. Analysis

The Company's cost estimates indicate that the proposed project would cost $4,000,000 to $9,000,000 less than the other project approaches (the New LNG Facility and the Compression Stations) that meet need through 2005-06. The Newtown-Santuit Connector, standing alone, is comparable in cost to the proposed project. Consequently, the Siting Board finds that the proposed project would be comparable to the Newtown-Santuit Connector approach and superior to the New LNG Facility approach and the Compression Stations approach with respect to cost.

6. Project Capacity

Because the proposed project may provide adequate pressures to the Falmouth area only through 2005-06, the Siting Board also considered an alternative approach involving the construction of the proposed project with a larger diameter pipe. KeySpan indicated that the project, with a 12-inch diameter as proposed, would provide a pressure of 114 psig at the upstream side of the Route 151

regulator (Exh. RR-EFSB-5(1)). With use of 16-inch pipe, the project would provide a pressure of 125 psig (Exh. RR-EFSB-5(2)). According to the Company, this pressure difference would be sufficient to maintain adequate pressures in the Falmouth area for only one additional year (Tr. at 75-77). However, the Company did not provide projections of sendout or system pressure beyond 2005-06 in support of its contention.

The Company acknowledged that measures other than the proposed project could be required to enhance gas flow in the foreseeable future (Tr. at 78). The Company indicated that its longer term options for maintaining adequate service in the Falmouth area include raising the operating pressure of the Bourne Line, using the 60 psig distribution system as a supplement to the Bourne Line for moving gas into the Falmouth area, and replacing Bourne Line sections north of Barlow's Landing Road with larger diameter pipe (id. at 75-77). The Company indicated that, with these enhancements, it expected that the system would be adequate to provide customers with gas, and a diameter larger than 12 inches would not be necessary within the next 15 years (id. at 81-82).

The Company noted that, to facilitate the uprating of the Bourne Line, it plans to certify at 270 psig the pipe to be installed as part of the proposed project (Exh. PO-G-10). The Company stated that in order to obtain a Maximum Allowable Operating Pressure ("MAOP") of 270 psig for the Bourne Line, it also would need to review existing pipeline components and pipeline operating and maintenance history, replace components as needed, analyze system operation at 270 psig, prepare a written uprating procedure, hold operations department meetings, and implement the uprating procedure (Exh. PO-PA-2).

Given the minimal benefit apparently provided by installing the proposed project with a larger diameter pipe, the Siting Board concludes that the Company's decision to use 12-inch diameter pipe is reasonable.

7. Conclusions

In the sections above, the Siting Board considered the six project approaches presented by the Company. The Siting Board dismissed the South Yarmouth LNG Expansion approach because it would not directly address pressure concerns in the Falmouth area. The Siting Board dismissed the

New Propane/Air Facility approach, because it is generally similar to the New LNG Facility approach but had additional disadvantages. The Siting Board focused on the remaining four approaches – the proposed project, the New LNG Facility approach, the Compression Stations approach, and the Newtown-Santuit Connector approach. The Siting Board found that: (1) the proposed project would be comparable to the Compression Stations, and superior to the New LNG Facility and the Newtown-Santuit Connector, with respect to reliability; (2) the proposed project would be superior to the Newtown-Santuit Connector, the New LNG Facility, and the Compression Stations with respect to environmental impacts; and (3) the proposed project would be comparable to the Newtown-Santuit Connector, and superior to the New LNG Facility and the Compression Stations with respect to cost. The proposed project is superior to each alternative with respect to one or more criteria, and distinctly inferior to none with respect to any criteria. Accordingly, the Siting Board finds that the proposed project would be superior to the New LNG Facility approach, the Compression Stations approach, and the Newtown-Santuit Connector approach with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

III. ANALYSIS OF THE PREFERRED AND ALTERNATIVE ROUTES

A. Site Selection

1. Standard of Review

G.L. c. 164, § 69J provides that a petition to construct a proposed facility must include "a description of alternatives to [the applicant's] planned action" including "other site locations." G.L. c. 164, § 69J. In past reviews of alternative site locations identified by an applicant, the Siting Board has required the applicant to demonstrate that it examined a reasonable range of practical siting alternatives. See CELCo Decision, 12 DOMSB at 323; MMWEC Decision, 12 DOMSB at 119; 1998 NEPCo Decision, 7 DOMSB 333, at 374. In order to determine whether an applicant has considered a reasonable range of practical alternatives, the Siting Board has required the applicant to meet a two-pronged test. First, the applicant must establish that it developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner which ensures that it has not overlooked or eliminated any routes which, on balance, are clearly superior to the proposed route.

CELCo Decision, 12 DOMSB at 323; MMWEC Decision, 12 DOMSB at 119; 1998 NEPCo Decision, 7 DOMSB 333, at 374. Second, the applicant must establish that it identified at least two noticed sites or routes with some measure of geographic diversity. CELCo Decision, 12 DOMSB at 323; MMWEC Decision, 12 DOMSB at 119; 1998 NEPCo Decision, 7 DOMSB 333, at 374.

2. Site Selection Process

a. Identification and Screening of Routes

The Company indicated that its site selection process included the development of route selection guidelines, identification of a study area, characterization of the study area, initial route selection, development of route evaluation criteria and scoring methods, and a scoring of the alternative routes based on the route evaluation criteria (Exh. KEY-1, at 4-8 to 4-31).

The Company developed the following route selection guidelines:

- Use direct routes, as opposed to more circuitous routes;
- Use existing ROWs and easements where possible;
- Avoid crossing cemeteries, war memorials, and similar public or quasi-public lands;
- Avoid crossing public lands that have been acquired for purposes of wildlife conservation, public recreation or other uses subject to Article 97 of the Massachusetts Constitution;
- Avoid significant residential areas or densely developed mixed use areas;
- Avoid routes that would require significant disruption of rare/endangered species habitat;
- Avoid mapped wetlands and significant water resources (id. at 4-8 to 4-9).

KeySpan then looked at the principal land uses between the starting and ending points of the pipeline (i.e., Barlow's Landing Road at Route 28 to the north and the Route 151 regulator station to the south). The Company noted that the predominant intervening land use is the 22,000-acre MMR (Exh. KEY-1, at 4-9). It identified other major land uses as: (1) the 1,824-acre Massachusetts Division of Fisheries & Wildlife's Frances A. Crane Wildlife Management Area ("CWMA"); (2) a

national veterans cemetery; (3) Routes 28, 28A, and 151; (4) a residential area between Sandwich and Currier Roads; and (5) several large ponds to the south and southeast of the MMR and CWMA (id. at 4-10; Figs. 1-2 and 4-5).

The Company stated that it determined its study area based on the route endpoints, the general nature of the intervening land uses, and an effort to provide a measure of geographic diversity (Exh. KEY-1, at 4-9). The Company delineated a study area shaped roughly like a truncated parallelogram with corners encompassing the pipeline's starting point on Barlow's Landing Road, the intersection of Routes 28A and 151 to the southwest, and the pipeline's endpoint at the Route 151 regulator station; the northeast boundary of the study area extends across the MMR (id. at Fig. 4-6). The Company stated that, at its widest, the study area is approximately five miles across from west to east (id. at 4-10).

The Company next identified four potential routes from the Barlow's Landing Road starting point to the Route 151 regulator station:

- *Optimized Existing route:* From the starting point, this route would follow the existing KeySpan ROW south along Route 28 and across Otis Circle into the MMR. Within the MMR, the route would proceed southeast along Connery Avenue, West Truck Road, South Inner Road, Guenther Road and South Truck Road (Exh. PO-RS-1), exiting the MMR on Simpkins Road. It would then continue south onto Sandwich Road to the regulator station on Route 151.
- *Route 28A/Route 151 route:* From the starting point, this route would follow the existing KeySpan ROW along Route 28 to Otis Circle, where it would continue south along Route 28A to its intersection with Route 151, then east to the regulator station.
- *The Transmission Line/Distribution Line route:* From the starting point, this route would cross beneath Route 28 and follow an NSTAR Electric Company ("NSTAR") 115 kilovolt transmission line ROW in a generally southerly direction along or near Route 28, which it crosses twice more. Just south of the Bourne/Sandwich town line, the route would follow the transmission line ROW to the southeast, cross Route 151, and continue eastward along an NSTAR ROW that parallels Route 151 the rest of the way to the regulator station.

- *The Distribution Line route:* From the starting point, this route would cross beneath Route 28 and join an electric distribution line ROW owned by MMR that runs in a southeasterly direction to Connery Road. At Connery Road, the route would continue to the southeast in a distribution line ROW owned by NSTAR. This ROW continues south through the MMR, through the CWMA, and across Route 151. The route would continue in the NSTAR ROW along Route 151 to the regulator station (Exh. KEY-1, at 4-18 to 4-23).

The Company stated that it undertook a comparison of these four routes based on their environmental, cost and reliability attributes (Exh. KEY-1, at 4-23). To compare the routes' environmental attributes, the Company developed a series of evaluation criteria for ten environmental factors, grouped into the three categories of water resources, land resources, and community resources (id. at 4-23), as follows (id. at 4-24 to 4-29):

- **Water Resources**
  - Wetlands and vernal pools
  - Surface water resources
  - Groundwater resources/existing contamination
- **Land Resources**
  - Significant habitat
  - Tree clearing
  - Protected lands
- **Community Resources**
  - Residential lands
  - Sensitive land uses
  - Traffic
  - Easements

The Company explained that to evaluate the routes, it used a three-level ranking scale with a score of "1" representing the lowest potential impact and "3" representing the greatest impact (Exh. KEY-1, at 4-23). The Company described generically the types of impacts that would warrant each score for each factor (id. at 4-24 to 4-29). The following table presents the Company's scoring of the

four routes based on its environmental criteria:

Potential Routes -- Environmental Evaluation

Factor	Optimized Existing	Route 28A/ Route 151	Transmission /Distribution	Distribution
Wetlands & Vernal Pools	2	2	3	3
Surface Water & ORW[1]	1	1	2	1
Groundwater Resources	2	3	1	2
Rare Species/Significant Habitat	1	1	3	3
Protected & Managed Lands	1	1	3	3
Tree Clearing	1	1	2	3
Residential Lands	2	3	2	1
Sensitive Land Use	1	2	1	1
Traffic	2	3	1	1
Historic & Cultural Resources	1	1	2	2
Easements	2	1	3	3
Total	**16**	**19**	**23**	**23**

[1] Outstanding Resource Water

Source: Exhs. KEY-1, at 4-31; PO-E-5

Based on this analysis, the Company concluded that the "Optimized Existing" route had the best environmental score overall (id. at 4-31).

For purposes of route selection, the Company stated that there would be no major differences in reliability[18] among the four options under consideration (Exh. KEY-1, at 4-30). The Company explained that, regardless of route, the pipeline would be constructed of the same material, would be

[18] The Company's assessment of relative reliability of the alternative routes focused on "physical reliability once the line was constructed" (Exh. PO-RS-2); the Company did not consider potential differences in the time required for permitting, securing easements, or construction as reliability issues (id.).

buried to the same depth, and would operate at the same pressure (id.). The Company also stated that the route alternatives were comparable in length (6.6 to 8.1 miles) and that all would be accessible for periodic inspection (id.). The Company noted that the routes using existing transmission line and distribution line ROWs might be less subject to risk of disruption due to utility installation or repair than routes along streets or highways, but that this would be offset by their somewhat lower accessibility (id. at 4-31). The Company also stated that the routes that are primarily across the MMR would benefit from the base's security measures and "a more controlled environment" with respect to construction and repair work
(id.). Nonetheless, the Company concluded that the four alternative routes present no quantifiable differences in reliability (id.).

The Company derived cost estimates for the four routes based primarily on unit costs per foot of installation for each type of roadway or easement location (Exh. KEY-1, at 4-30). The highest unit-cost segments were those along Route 28A or in NSTAR transmission easements (id.). The Company stated that the principal factors accounting for higher unit costs along Route 28A, as compared to other roadways, were the need for traffic management and the presence of existing utilities (Exh. PO-E-41). The Company adjusted the construction cost estimates to account for its internal project costs, such as engineering, environmental, legal, community relations, procurement, construction oversight, accounting and insurance expenses (Exh. KEY-1, at 4-30). Not included in the Company's estimates were any payments to NSTAR for the use of its easements, or costs associated with obtaining other easements (id.). The Company estimated the total project costs for the four routes as follows (id. at 4-32):

- Existing Optimized $3,200,000
- Route 28A/Route 151 $5,000,000
- Transmission/Distribution $5,000,000, plus easement-related costs
- Distribution $4,300,000, plus easement-related costs

The Company noted that the Existing Optimized route had both the best environmental score and the lowest cost (Exh. KEY-1, at 4-32 to 4-33), and therefore chose it as its preferred route.

To select a route to serve as the noticed alternative, the Company first noted that the Route 28A/Route 151 route had the second best environmental score (Exh. KEY-1, at 4-38). KeySpan then

introduced another factor: the certainty of securing all necessary easements and approvals (id.).[19] It determined that the Route 28A/Route 151 alternative has a high degree of certainty with respect to obtaining easements because it is located entirely within existing roadway layouts (id.). The Company stated that the Distribution Line alternative would require a road opening permit from MHD to cross Route 28; permission from NSTAR, the Commonwealth of Massachusetts, and the AFNG to use parts of existing NSTAR easements across MMR; and, to cross the CWMA, permission from NSTAR and perhaps both a new easement from Commonwealth of Massachusetts and approval under Article 97 of the Massachusetts Constitution to use lands acquired for conservation and recreation purposes (id. at 103-105). To use the Transmission Line/Distribution Line route, the Company stated that in addition to permission from NSTAR for use of its easements, it would need a permit from MHD to cross Route 28 in three locations; permission from the Veterans Administration to cross a portion of the national veterans cemetery; and approval from the Town of Falmouth to run along Route 151. Further, KeySpan noted that this route may require approvals from the Commonwealth to use NSTAR's easement through MMR and the CWMA, as well as approval under Article 97 to cross the CWMA, and easements from private landowners (id. at 105-107).

The Company stated that while there are "no obvious reasons" that necessary easements could not be secured for any of these routes, some degree of uncertainty is associated with that process (Exh. KEY-1, at 4-38). In addition, the Company stated that it would be likely to incur additional costs to obtain the easements (id.).[20] The Company therefore selected the Route 28A/Route 151 route for its

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[19] The Company noted that the following authorizations would be required for the preferred route: (1) a road opening permit from the Massachusetts Highway Department ("MHD") for the sections of pipeline along Route 28 and crossing Otis Circle; (2) easements from the Commonwealth of Massachusetts and consent from the AFNG and Army National Guard for work along roads in the MMR; and (3) a street opening permit from the Town of Falmouth for sections of Sandwich Road and Route 151 (Exh. PO-RS-13; Tr. at 100-102). The Company stated that it did not foresee difficulty in obtaining any of these permits or easements, and noted that the processes for obtaining them were already underway (id.).

[20] KeySpan stated that it did not discuss with NSTAR the cost of obtaining easements, and that the Company did not have any recent experience from which to make estimates of such costs

(continued...)

noticed alternative (id.).

b. Analysis

KeySpan has developed a set of route selection guidelines and a set of environmental criteria that address environmental impacts, land use concerns, and community issues – types of criteria that the Siting Board has found to be appropriate for the siting of energy facilities. See NSTAR Decision, 13 DOMSB at 177; MMWEC Decision, 12 DOMSB at 125; 9 DOMSB at 43-44; New England Power Company, 4 DOMSB 109, at 167 (1995).

To develop route options for further evaluation, the Company identified an area that would encompass the starting and ending points for the pipeline and a variety of land ownerships and uses. The Company then created four possible routes, each of which made use of existing roadways and/or utility easements (not necessarily the Company's own) within the study area. KeySpan next rated each of the four routes based on its environmental criteria, giving equal weight to each criterion. The Company presented both the total environmental score and the estimated cost for each route. Noting that the "Optimized Existing" route had both the best environmental score and the lowest cost, KeySpan selected it as its preferred route. The Siting Board observes that the Company did not explain how it would have balanced any conflicts between cost and environmental factors; however, the particular circumstances of this case did not necessitate such balancing. Overall, the Siting Board finds that the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner the ensures that it has not overlooked or eliminated any routes that are, on balance, clearly superior to the proposed route.

With respect to selection of a noticed alternative route, the Company's analysis showed that the Route 28A/Route 151 route received the best environmental score of the remaining three options. The Company also considered an additional criterion: the uncertainty associated with obtaining new easements. The Company judged the Route 28A/151 route superior on this criterion. With regard to

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[20] (...continued)
(Exh. PO-RS-5).

cost, the Company estimated the Route 28A/151 route to be no more expensive than the Transmission/Distribution route, though initially more expensive than the Distribution route (depending on the ultimate cost, if any, for the latter's easements). Because the Company did not quantify the potential costs related to obtaining easements for either the Distribution or Transmission/Distribution routes, the Company did not attempt to balance cost with the other factors in its choice of a noticed alternative.[21] Nonetheless, based on superior rankings for environmental and easement factors, and an indeterminate ranking on cost, the Siting Board finds that the Company made a reasonable selection for the noticed alternative route.

3. Geographic Diversity

KeySpan considered four routes between the starting point at Barlow's Landing Road and the endpoint at the regulator station on Route 151. Broadly speaking, the four routes consist of two that pass through the MMR (the Optimized Existing and Distribution Line routes), and two that skirt the southwest corner of the study area, then extend east along Route 151 for at least 2.75 miles (the Transmission/Distribution Line and Route 28A/Route 151 routes). However, the routes use a variety of paths, including existing gas line, electric line, highway and/or roadway easements or ROWs, and are adjacent to a variety of land uses. Except for an overlap of approximately 2.75 miles between the Transmission/Distribution Line and Route 28A/Route 151 routes, the routes are quite distinct, and offer different sets of constraints and advantages with respect to many environmental factors, as well as the difficulty and cost of ROW acquisition.[22] From the four identified options, the Company has selected two practical routes. These two routes overlap for only about 2/3 mile along Route 28 as they leave the starting point, and about 2/3 mile along Route 151 as they approach the endpoint. Consequently, the Siting Board finds that the Company has identified a range of practical pipeline routes with some

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[21] The Company's route selection process also did not provide for an explicit balancing of the uncertainty associated with obtaining new easements in its selection of the preferred route. However, the Company provided adequate evidence that this factor would not have affected its selection of the Optimized Existing route as the preferred route.

[22] As noted above, the Company determined that all routes were equivalent in terms of reliability.

measure of geographic diversity.

4. Conclusions on Site Selection

The Siting Board has found that the Company has developed and applied a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that it has not overlooked or eliminated any routes that are clearly superior to the proposed route. In addition, the Siting Board has identified a range of practical pipeline routes with some measure of geographic diversity. Consequently, the Siting Board finds that KeySpan examined a reasonable range of practical siting alternatives.

B. Description of the Preferred and Alternative Routes

1. Preferred Route

The Company stated that the preferred route is 40,200 feet in length, of which 32,600 feet would be constructed for this project (Exh. PO-G-5).[23] The preferred route runs through Bourne, Sandwich, and Falmouth (Exh. KEY-1, at Fig. 4-12). The route begins in the existing KeySpan ROW near the intersection of Barlow's Landing Road and Route 28 (id. at 4-18). The route proceeds south along the west side of Route 28, then crosses beneath Route 28 and the Otis Circle to Connery Avenue, where the pipeline would enter MMR property (id. at 4-20). The preferred route continues southeast along Connery Avenue, south on West Truck Road, east on South Inner Road, south on Guenther Road, and east on South Truck Road (Exh. PO-RS-1). The preferred route next follows Simpkins Road to the exit of the MMR, then continues south on Sandwich Road and east on Route 151 to the regulator station (Exh. KEY-1, at 4-20). KeySpan stated that if this route were selected, the pipeline could be constructed in increments over three years (id. at 4-30; Exh. PO-C-3).[24]

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[23] KeySpan explained that the total length of the preferred route from starting point to ending point is 40,200 feet, but that it already has installed pipeline along two portions of this length, leaving 32,600 feet to complete the project along this route (Exh. PO-G-5).

[24] The Company explained that construction in phases would be possible because the preferred

(continued...)

2. Noticed Alternative Route

The Company selected the "Route 28A/Route 151" route as its noticed alternative. From the Barlow's Landing Road starting point, this route follows Route 28 south past Otis Circle and then along Route 28A all the way to the intersection with Route 151 (Exh. KEY-1, at 4-20). The route then turns east to run along the south side of Route 151 about 18,700 feet until reaching Fordham Road, at which point it crosses beneath Route 151 to continue the final 1,900 feet to the regulator station on the north side of Route 151 (id. at 4-21). The Company stated that the total length of this route would be 42,900 feet (id.). KeySpan stated that, if this route were selected, the pipeline would have to be completed within one construction season (id. at 4-30).

C. Environmental Impacts, Cost, and Reliability of the Preferred and Alternative Routes

1. Standard of Review

In implementing its statutory mandate to ensure a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost, the Siting Board requires a petitioner to show that its proposed facility is sited at a location that minimizes costs and environmental impacts while ensuring a reliable energy supply. To determine whether such a showing is made, the Siting Board requires a petitioner to demonstrate that the proposed site for the facility is superior to the noticed alternatives on the basis of balancing cost, environmental impact, and reliability of supply. NSTAR Decision, 13 DOMSB at 181; MMWEC Decision, 12 DOMSB at 127; 1997 BECo Decision, 6 DOMSB at 287.

An assessment of all impacts of a proposed facility is necessary to determine whether an appropriate balance is achieved both among conflicting environmental concerns as well as among environmental impacts, cost, and reliability. A facility which achieves that appropriate balance thereby meets the Siting Board's statutory requirement to minimize environmental impacts at the lowest possible cost. NSTAR Decision, 13 DOMSB at 181; MMWEC Decision, 12 DOMSB at 128; 1997 BECo

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[24] (...continued)
route is adjacent to the existing line in places, allowing the new pipeline to be tied back into the existing pipeline at various points (Tr. at 52).

Decision, 6 DOMSB at 287.

The Siting Board recognizes that an evaluation of the environmental, cost, and reliability trade-offs associated with a particular proposal must be clearly described and consistently applied from one case to the next. Therefore, in order to determine if a petitioner has achieved the proper balance among environmental impacts and among environmental impacts, cost, and reliability, the Siting Board must first determine if the petitioner has provided sufficient information regarding environmental impacts and potential mitigation measures. The Siting Board then can determine whether environmental impacts would be minimized. Similarly, the Siting Board must find that the petitioner has provided sufficient cost information in order to determine if the appropriate balance among environmental impacts, cost, and reliability would be achieved. NSTAR Decision, 13 DOMSB at 181; MMWEC Decision, 12 DOMSB at 128; Commonwealth Electric Company, 5 DOMSB 273, at 337 (1997).

Accordingly, in the sections below, the Siting Board examines the environmental impacts, reliability, and cost of the proposed facilities along KeySpan's preferred and noticed alternative routes to determine: (1) whether environmental impacts would be minimized; and (2) whether an appropriate balance would be achieved among conflicting environmental impacts as well as among environmental impacts, cost, and reliability. In this examination, the Siting Board compares the preferred and alternative routes to determine which is superior with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

2. Environmental Impacts

In this section, the Siting Board compares the environmental impacts of the proposed facilities along the preferred and alternative routes, the proposed mitigation for such impacts, and any options for additional mitigation. The Siting Board then determines whether the environmental impacts along the preferred route have been minimized. The subsections below consider impacts to adjacent water resources, land resources, land uses, noise, and traffic disruption.

a. Water Resources

i. Surface Waters/Outstanding Resource Waters

KeySpan stated that neither the preferred route nor the noticed alternative would pass within 100 feet of any outstanding resource water or other surface water (Exh. KEY-1, at 5-18, 5-20). The Company noted that the preferred route would pass approximately 300 feet from an unnamed pond east of Otis Circle, and that the noticed alternative would pass approximately 250 feet from an unnamed pond on the south side of Route 151 near the intersection of Routes 151 and 28 (id.). The Company asserted that its use of "stovepipe" construction methods[25] and erosion and sedimentation control practices would prevent impacts to surface waters (id. at 5-43; Tr. at 120).

ii. Wetlands and Vernal Pools

The Company stated that the preferred route would pass within 100 feet of one isolated wetland that is a potential vernal pool (Exh. KEY-1, at 5-9). According to the Company, a number of other wetland areas are located at distances between 100 and 500 feet from the preferred route (id.). These include one certified vernal pool, four potential vernal pools, two wetlands associated with unnamed ponds, and one isolated wetland; in addition, a second certified vernal pool is located within 500 feet of the alignment along Sandwich Road where work already has been completed (id.).

The Company stated that the noticed alternative route, by contrast, would pass within 100 feet of wetland resources in five locations, one of which is the same location that is within 100 feet of the preferred route (Exh. KEY-1, at 5-13). The remaining four wetlands include a small forested wetland, a series of active commercial cranberry bogs, a vegetated wetland bordering an intermittent stream, and a wetland with emergent and scrub/shrub vegetation (id.). In addition, the Company noted several wetland resources that would be between 100 and 500 feet of the alternative route: three certified vernal pools, four potential vernal pools, a cranberry bog complex, a wooded swamp, and a shallow marsh/scrub shrub complex associated with a small pond (id. at 5-18).

The Company stated that neither route crosses any wetland resource areas, and that the

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[25] KeySpan described stovepipe pipeline construction as an approach that limits the length of open trench: only one or two pipe sections are installed at a time, including associated welding, radiography, and coating activities, so that the newly installed section can be backfilled at the end of each day (Exhs. KEY-1, at 5-2; PO-E-43).

implementation of erosion and sedimentation control best management practices would minimize any temporary effects on nearby wetlands (Exh. KEY-1, at 5-43).

iii. Groundwater

KeySpan stated that both the preferred route and the noticed alternative would be located entirely within Cape Cod's U.S. Environmental Protection Agency-designated sole source aquifer (Exh. KEY-1, at 5-20, 5-23). The Company stated that the average depth to groundwater in the area of the preferred route is approximately 60 feet (Exh. PO-E-8). The Company stated that the noticed alternative would pass through the Zone I water supply protection area of the Town of Bourne's Well #2 and provided a map showing that the route also would pass in close proximity to the Zone I areas for Bourne's Well #5 and a transient non-community well (Exh. PO-RS-8 and Fig. PO-RS-8). The Company also provided a map showing that significant portions of both routes are within the Zone II protection areas for multiple public water supply wells (including active, closed, and proposed new wells) (Exh. KEY-1, at Fig. 5.3-9, 5-20 and 5-26). The Company stated that 26,000 feet of the preferred route would be within Zone II areas, while 14,000 feet of the noticed alternative would be within such areas (id. at 5-43).

Massachusetts Department of Environmental Protection regulations state, in part, that "land uses within the Zone I shall be limited to those land uses directly related to the provision of the public water system or to other land uses which the public water system has demonstrated have no significant impact on water quality." 310 CMR 22.21(3)(b). The Company provided a copy of Bourne's wellhead protection regulations, which are part of the Town's zoning bylaws (Exh. PO-E-17, Att.). Among the provisions of the Bourne regulations is a prohibition against "motor vehicle service, washing, or repair" within a water resource district (id.). According to the Company, the Towns of Sandwich and Falmouth do not have additional wellhead protection regulations (Exh. PO-E-17).

The Company asserted that the limited duration of pipeline construction activities and the relatively shallow depth of trenching – no greater than six feet – would preclude impact to groundwater resources (Exh. KEY-1, at 5-43 and 5-44). The Company also stated that it would protect

groundwater resources during construction by implementing a spill prevention and containment plan (Exh. PO-E-13). The Company asserted that the application of best management practices during construction would ensure that new sources of groundwater contamination are not introduced to underlying aquifers, including Zone II or interim wellhead protection areas (Exh. KEY-1, at 5-44). In its comments on the Environmental Notification Form ("ENF") for this project, the Cape Cod Commission recommended (and the Secretary's Certificate on the ENF reiterated) that "all refueling and equipment-maintenance activities be conducted outside wellhead protection areas" (Exh. PO-G-1-S, Att. D at 3, and Att. E at 4). The Cape Cod Commission also recommended that KeySpan "limit equipment maintenance activities in the field to the minimum necessary to keep equipment functioning… [and that] major maintenance should be performed elsewhere, on an impervious surface, with containment and under cover" (Exh. PO-G-1-S, Att. D at 3).

The Company noted that both the preferred and noticed alternative routes cross above multiple groundwater contamination plumes (Exh. KEY-1, Fig. 5.3-11). However, the Company indicated that the depth of known plumes of contamination is in excess of 50 feet (id. at 5-44). KeySpan explained that the MMR has installed extensive groundwater withdrawal and treatment facilities in the project area and that piping for the groundwater remediation system lies four feet below ground surface (id. at 5-23; Exh. PO-E-18). The Company stated that the preferred route would parallel the treatment system piping for approximately 1900 linear feet, and cross the piping in three locations (Exh. KEY-1, at 5-23). KeySpan acknowledged the need to consult with MMR personnel when working in these areas (id. at 5-44).

In addition to contaminated groundwater, the Company indicated that the preferred route would pass adjacent to six identified hazardous waste sites on the MMR, of which four have been designated as Tier 1A sites by the Massachusetts Department of Environmental Protection, in accordance with 310 CMR 40.0500 (id. at 5-23 and Fig. 5.3-10). The Company stated that the noticed alternative route would pass near a Tier 1B hazardous waste site near Route 28A (id. at 5-26 and Fig. 5.3-10).

KeySpan asserted that construction of the pipeline along the preferred route would have no effect on the areas of groundwater contamination nor on the remediation systems (id. at 5-26). In

addition, the Company stated that it would try to avoid working in the immediate vicinity of any area of contamination on the MMR that has not been remediated prior to the start of pipeline construction (id. at 5-23). If avoidance is not possible, the Company stated it would follow established protocols for the safe removal and proper disposal of any contaminated materials encountered during trenching operations (id.). With respect to the noticed alternative, KeySpan stated that pipeline construction would not affect underlying groundwater resources (id. at 5-26).

iv. Analysis of Water Resource Impacts

The record shows that the noticed alternative would pass close to more wetland resources than would the preferred route. Conscientious application of best management practices to minimize erosion and sedimentation should prevent adverse impacts to any of these resources. However, given the difference in the numbers of resource areas proximate to the two routes, the Siting Board finds that the preferred route is superior to the noticed alternative with respect to impacts on wetlands and vernal pools.

The record shows that surface water resources along the two routes are comparable, and the Siting Board agrees with the Company that appropriate construction methods and erosion and sedimentation control practices will minimize impacts to surface waters along either route. Accordingly, the Siting Board finds that the two routes are comparable with respect to impacts on surface waters.

The record shows that both the preferred and noticed alternative routes pass through designated wellhead protection zones. While the preferred route is within the Zone II of drinking water wells for greater distances, the noticed alternative passes closer to some wells – through the Zone I of one well and close to the Zone I of two others. The Company has stated that it would implement a spill prevention and containment plan. While such a plan will be important in minimizing any impacts to groundwater, the Siting Board agrees with the Cape Cod Commission. that certain activities should be avoided entirely in Zone I and II areas. Therefore, the Siting Board directs the Company to refrain from all refueling and equipment-maintenance activities that have the potential for fluid spills when vehicles are in the field in Zone I or II areas.

The record shows that both the preferred route and noticed alternative would be constructed in areas that lie over groundwater contamination plumes. Given that the depth of these plumes is significantly greater than the depth of excavation for the gas pipeline, the construction should not have any impact on groundwater movement. Unlike the contamination plumes, however, piping for the groundwater remediation systems on the MMR is at a depth similar to that of the proposed gas pipeline. Although coordination with MMR personnel should prevent accidental damage to these systems, construction activities have the potential to damage the shallow piping. This risk somewhat offsets the risks posed by construction in or near the Zone I areas associated with drinking water wells along the alternative route. On balance, the Siting Board finds that the two routes are comparable with respect to groundwater resources.

Overall, the Siting Board finds that the preferred route is superior to the alternative route with respect to impacts on water resources. Further, with the sedimentation controls, erosion controls, spill prevention and containment plan, and the condition described above, the Siting Board finds that impacts to water resources will be minimized.

b. Land Resources

i. Significant Habitat and Wildlife

The Company explained that the Massachusetts Natural Heritage and Endangered Species Program ("NHESP") has designated the entire 22,000-acre MMR complex as "priority habitat" for state-protected rare species (Exh. KEY-1, at 5-7 and 5-27). Consequently, the preferred route would use roads that either pass through or are immediately adjacent to designated priority habitat for most of its length (id. at 5-27 and Fig. 5.3-13). In addition to the 25,000 linear feet of priority habitat that the preferred route would cross within the MMR, the Company stated that the preferred route would pass adjacent to approximately 3600 linear feet of priority habitat associated with the CWMA along the west side of Sandwich Road; and adjacent to approximately 3000 linear feet of priority habitat associated with the CWMA along the south (opposite) side of Route 151 (id. at 5-27). In addition, the Company stated that approximately 850 linear feet of the preferred route would pass through an area designated as "estimated habitat" of rare wildlife in an area associated with the unnamed pond located

east of the Otis Circle (id.).[26]

According to NHESP, 20 state-protected rare species are known to occur within 1000 feet of the preferred route (Exh. PO-E-25, Att. B at 1). However, the Company described the preferred habitat of each of these species and determined that the preferred route does not pass through any such habitat (Exhs. PO-G-1, Att. at Appendix 5-1; PO-E-51). KeySpan also stated that in all cases, the pipeline would be located along the edge of existing pavement and asserted that the pipeline would not affect the estimated or priority habitat areas (Exh. KEY-1, at 5-27).

The Company stated that the noticed alternative route would be located just south of approximately 21,500 linear feet of priority habitat along Route 151 from the intersection with Route 28 to the intersection with Sandwich Road (id.). The Company noted that within this length, the route would also cross approximately 1500 linear feet designated both as priority habitat and as estimated habitat associated with an unnamed pond north of the highway (id. at 5-27 to 5-28). KeySpan stated that the noticed alternative also would pass adjacent to the same 3000 linear feet of priority habitat as the final segment of the preferred route. According to NHESP, 20 state-protected rare species are known to occur within 1000 feet of the noticed alternative route (Exh. PO-E-25, Att. B at 2). As with the preferred route, the Company stated that the pipeline would be located along the edge of existing pavement and would not affect the estimated or priority habitat areas (Exh. KEY-1, at 5-28). The Company also stated that the noticed alternative route does not pass through habitat that is suitable for any of the 20 state-protected rare species known to occur within 1000 feet of this route (Exh. PO-E-51, at 2).

The Company stated that all construction activity along either the preferred or noticed alternative route would occur either within existing roadways or within 15 feet of the edge of pavement (Exh. PO-E-22). The Company noted that it may need to remove some small trees or shrubs, or trim branches that would interfere with construction equipment, but that it would not need to remove any trees of six inches or more in diameter at breast height (id.; Exh. KEY-1, at 5-29 and 5-32).

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[26] Although the Company also stated that a portion of the route would skirt areas of estimated and priority habitat associated with Ashumet Pond (Exh. KEY-1, at 5-27), it appears that all of this portion of the route was previously constructed (Exh. PO-E-52).

Regarding wildlife in general, KeySpan stated that since construction would be primarily near the edges of paved roads or beneath the pavement of existing roads, the areas disturbed would not be those that provide any value to wildlife (Exh. PO-E-26). The Company acknowledged that noise from construction could disturb wildlife in areas immediately adjacent to the work areas, but asserted that any effects would be temporary (id.). In the Company's view, there is no significant difference between the two routes with respect to potential impacts on rare species or other wildlife (Exh. PO-E-27; Tr. at 115).

ii. Protected and Managed Lands/Areas of Critical Environmental Concern

KeySpan stated that neither the preferred route nor the noticed alternative passes through or near any area designated as an Area of Critical Environmental Concern (Exh. KEY-1, at 5-32). However, the Company noted that both routes pass near or adjacent to several protected or specially managed areas. Specifically, the preferred route is adjacent to the northern edge of the national veterans cemetery for approximately 9000 linear feet and adjacent to a portion of the MMR under the jurisdiction of its Environmental Management Commission for approximately 4400 linear feet (id. at 5-32 and Fig. 5.3-17; Exh. PO-E-23).[27] In addition, the preferred route is adjacent to two separate portions of the CWMA for approximately 6000 linear feet (Exh. KEY-1, at 5-32 and Fig. 5.3-17).

The Company indicated that the noticed alternative route is adjacent to the CWMA in two locations along Route 151, for a total of 11,650 linear feet (Exh. PO-E-24).

iii. Historical and Cultural Resources

KeySpan stated that there are no known historical resources along the preferred route (Exh. KEY-1, at 5-42). The Company stated that one cultural resource area was identified along this route, but that the Massachusetts Historical Commission ("MHC") determined that this site is not significant (id.). The Company provided documentation from MHC stating that the project is unlikely to affect

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[27] These lengths may each include up to 2,800 feet along Connery Avenue where pipeline was previously installed (Exh. PO-G-5).

significant historical or archaeological resources (Exh. PO-E-31). KeySpan stated that no known historical or cultural resources are located along the noticed alternative route (Exh. KEY-1, at 5-42).

iv. Analysis of Land Resource Impacts

The record shows that both the preferred route and noticed alternative pass through or adjacent to areas designated for habitat protection for significant portions of their length. However, the record shows that construction activities would take place either within or close to the paved areas of existing roadways – areas that are unlikely to provide great value to wildlife. Any adverse effects would be limited to temporary noise and dust. Any impacts on the national veterans cemetery would be similarly limited. Therefore, the Siting Board finds that the two routes are comparable with regard to potential impacts on land resources, and that the land resource impacts of the proposed project along the preferred route would be minimized.

c. Land Use and Noise

The Company stated that the preferred route would pass close to residential land uses in four areas that range in density from low to high (Exh. KEY-1, at 5-35). KeySpan stated that there are no housing units within 50 feet of the preferred route alignment, but it identified one house at the intersection of Fordham Road and Route 151 that would be slightly more than 50 feet from the pipeline construction area (Exh. PO-E-28). The Company stated that approximately 18 homes are located along Sandwich Road from Currier Road to Route 151 (Exh. KEY-1, at 4-20); according to an aerial photograph provided by the Company, approximately nine of these houses are between 75 and 100 feet from the preferred route alignment (Exh. PO-E-28).

For the noticed alternative route, KeySpan identified eight houses along Route 28A that would be approximately 50 feet from the pipeline, and another that would be 75 feet from the pipeline (Exh. PO-E-28). In addition, this route would pass slightly more than 50 feet from the house at the intersection of Fordham Road and Route 151 that is also adjacent to the preferred route (id.; Tr. at 116-117).

The Company noted the presence of several commercial establishments along the Route 28A

portion of the noticed alternative route (Exh. PO-E-28; Tr. at 122). With regard to access to these establishments, KeySpan stated that it would typically block only one entrance at a time at a two-driveway property, and would have steel plates available to maintain access to all properties (Tr. at 123).

The Company stated that the principal sources of noise during construction would be pavement saws, jackhammers, backhoes, and excavators (Exh. PO-E-30). The Company estimated that noise from the excavator, the piece of equipment in most frequent use, would be approximately 76 decibels, A-weighted ("dBA") at 50 feet, and 66 dBA at 150 feet (Exh. PO-E-55). The Company acknowledged that jackhammers and pavement saws likely would be louder, but noted that their use would be sporadic (Tr. at 119). The Company estimated that a given residence would not experience significant construction noise for more than two or three working days (Exh. PO-E-30).

The Company stated that the typical work hours would be on weekdays between 7 a.m. and 5 p.m., and that noise would be limited to portions of each workday (Exh. PO-E-30; Tr. at 117). The Company did not preclude the possibility of working on Saturdays to keep the project on schedule (Tr. at 117). It stated that the most probable reasons for working on a Saturday would be a period of bad weather or the work crew's discovery of unexpected underground utilities (id. at 117-118). The Company indicated that a six-day-per-week work schedule would be more likely if the noticed alternative route were selected, which would require finishing the entire project within one year, than if the pipeline were to be constructed along the preferred route (id. at 118).

KeySpan stated that the preferred route would not pass near any sensitive land uses (Exh. KEY-1, at 5-37). It noted that the noticed alternative would pass two child-care facilities along Route 28A, each between 100 and 200 feet from the west edge of the road (Exh. PO-E-29). The Company stated that these facilities may experience temporary traffic, noise, and dust impacts (Exh. KEY-1, at 5-46).

The record shows that both routes would pass residential areas and that the principal type of disturbance to residents would be noise. In the case of the preferred route, more houses are close enough to the road to be disturbed by construction noise than along the noticed alternative. However, the houses along the noticed alternative tend to be a little closer to the road, and the possibility of

Saturday construction is higher along the alternative. In addition, the record shows that a number of commercial establishments and two child-care facilities are located along the alternative route. On balance, the Siting Board finds that the preferred route would be superior to the noticed alternative with respect to land use and noise, and that the land use and noise impacts of the proposed project along the preferred route would be minimized.

d. Traffic

Both the preferred route and noticed alternative are located almost entirely along existing roadways (Exhs. KEY-1, at 5-45; PO-RS-9) and would be constructed primarily at the edge of the pavement (Exh. KEY-1, at 5-47). The Company has proposed to use a construction method that would place most excavation beyond the pavement, although it notes that equipment may need to be located on the pavement (Tr. at 120). The Company explained that it would cover any street openings with steel plates at the end of the day, and that it would protect and barricade openings in the shoulder to ensure traffic and pedestrian safety (Exh. KEY-1, at 5-2 to 5-3). KeySpan stated that it would limit construction along highways to the off-season (id. at 5-47). The Company estimated that it would take approximately 165 work days to construct the pipeline along the preferred route, and 215 work days to construct the pipeline along the noticed alternative (Exh. PO-E-34).

The Company explained that construction of the first segments of both the preferred and noticed alternative routes, from Barlow's Landing Road to Otis Circle, would take place in unpaved areas on the west side of Route 28 (Exh. PO-E-37). According to KeySpan, this segment experiences both daily and seasonal fluctuations in traffic volume (Exh. KEY-1, at 5-41). The Company stated that it would be necessary to occupy a portion of the western-most lane of Route 28 for limited lengths as the work progresses south, potentially constricting traffic to one lane in the immediate area of construction (Exh. PO-E-37). However, the Company said it could minimize traffic impacts by limiting construction along highways to the off-season (Exh. KEY-1, at 5-47).

Use of the preferred route would entail crossing Otis Circle, a traffic rotary along Route 28 (Exh. PO-E-37). The Company stated that this crossing would be accomplished using either directional drilling or jacking, thus affecting traffic only when construction equipment must access or

leave the immediate work areas (id.). KeySpan stated that it would manage traffic at Otis Circle in consultation with MHD and would use police details to direct traffic during construction (id.). The remainder of the preferred route is located on the MMR, Sandwich Road, and Route 151 (Exh. KEY-1, Fig. 4-13). While the Company provided information showing traffic flows along Route 151 comparable to or higher than counts for Route 28A, the Company explained that over 80% of the preferred route is on the MMR or Sandwich Road, where traffic flows are more moderate and do not exhibit strong seasonal fluctuations (id. at 5-41 and 5-42).

The Company stated that the roads used along the noticed alternative route, namely Routes 28A and 151, experience greater traffic flow than the roads used along the preferred route (Exh. KEY-1, at 5-47). Although the noticed alternative crosses Route 151 twice, the Company stated it would jack the pipeline in those locations, thereby maintaining two-way traffic during construction (Tr. at 116).

The record shows that both the preferred and noticed alternative routes would be constructed almost entirely within existing roadway ROWs, and therefore pose the likelihood of traffic impacts. Although the preferred route must cross Otis Circle, the Company has proposed measures to minimize traffic disruption at this location. Further, the preferred route is shorter than the noticed alternative, and uses roads that are substantially less travelled than the alternative. For these reasons, the Siting Board finds that the preferred route is superior to the noticed alternative with respect to traffic impacts, and that the traffic impacts of the proposed project along the preferred route would be minimized.

e. Overall Environmental Impact

In the sections above, the Siting Board has reviewed the evidence presented regarding the environmental impacts of the proposed project along the preferred and noticed alternative routes. The Siting Board finds that KeySpan has provided sufficient information on the environmental impacts of the proposed project, including information on the potential for mitigation, for the Siting Board to determine whether the environmental impacts would be minimized.

The principal differences between the environmental impacts of the preferred and noticed alternative routes stem from the length of the routes, proximity to noise receptors, and disruption to traffic. The Siting Board has found that the two routes are comparable with respect to impacts on land

resources. The Siting Board has found that the preferred route is superior to the noticed alternative with respect to water resources, land use and noise, and traffic. Accordingly, the Siting Board finds that the preferred route is superior to the alternative route with respect to environmental impacts.

The Siting Board has found that impacts to water resources would be minimized by KeySpan's use of stovepipe construction methods, in addition to implementation of the conditions on vehicle refueling and maintenance, described above. The Siting Board has found that the land resource, land use, noise, and traffic impacts of the project along the preferred route would be minimized. Consequently, the Siting Board finds that the environmental impacts of the proposed project along the preferred route would be minimized.

3. Facility Cost

KeySpan estimated that the cost of constructing the project along the noticed alternative route would be $5,000,000, based on 2002 unit costs (Exhs. KEY-1, at 4-32; PO-C-3). The Company estimated that the cost of constructing the project along the preferred route would be $3,200,000, based on 2002 unit costs (Exh. PO-C-3). However, the Company noted that the project along the preferred route could be constructed in segments over three years, in which case the present value cost of the project would be approximately $2,965,000 (id.). The Company also noted that the cost of the construction that already has taken place along the preferred route (not included in the above estimates) was in excess of $181,200 (Exh. PO-C-2).[28]

Based on the lower cost of constructing the preferred route rather than the alternative route, the Siting Board finds that the preferred route is superior to the noticed alternative with respect to cost.

4. Reliability

As discussed under Route Selection, above, the Company determined that the two routes were

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[28] The Company stated that the cost of constructing 6,000 feet of 12-inch diameter pipeline along Simpkins and Sandwich Roads in 2000 was $181,217.25; the Company did not provide a cost for the 2800-foot segment of 12-inch pipe it installed in Connery Avenue in 1992 (Exh. PO-C-2).

indistinguishable in terms of reliability (Exh. KEY-1, at 4-31). The Company described the project, constructed along either route, as delivering the needed gas with a high degree of reliability (id. at 3-3). Because the choice between the two routes does not affect the reliability of the project, the Siting Board finds that the two routes are comparable with respect to reliability.

5. Conclusions on Facility Routing

The Siting Board has found that the preferred route would be superior to the noticed alternative with respect to environmental impacts and cost, and that the two routes would be comparable with respect to reliability. Accordingly, the Siting Board finds that the preferred route would be superior to the noticed alternative route with respect to providing a reliable energy supply to the Commonwealth with a minimum impact on the environment at the lowest possible cost. The Siting Board also finds that the proposed project along the preferred route would achieve an appropriate balance among conflicting environmental concerns, as well as among environmental impacts, reliability and cost.

IV. DECISION

The Siting Board's enabling statute directs the Siting Board to implement the energy policies contained in G.L. c. 164, §§ 69H to 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. In addition, the statute requires that the Siting Board determine whether plans for the construction of energy facilities are consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth. G.L. c. 164, § 69J.

In Section II.A, above, the Siting Board found that there is a need for additional energy resources to maintain reliable gas service to customers in the Falmouth area and throughout Cape Cod. Further, in Section II.A, above, the Siting Board found that the proposed project is consistent with the Company's most recently approved long-range forecast.

In Section II.B, above, the Siting Board found that the proposed project would be superior to a New LNG Facility, the Compression Stations, and the Newtown-Santuit Connector with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at

the lowest possible cost.

In Section III.A, above, the Siting Board found that the Company has examined a reasonable range of practical siting alternatives.

In Section III.B, above, the Siting Board found that the proposed project would be superior to the alternative route with respect to providing a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. The Siting Board also found that, with the implementation of the condition addressing refueling and equipment maintenance activities, and compliance with all applicable local, state and federal requirements, the environmental impacts of the proposed project along the preferred route would achieve an appropriate balance among conflicting environmental concerns as well as among environmental impacts, reliability and cost.

In Section III, above, the Siting Board reviewed the environmental impacts of the proposed project in light of related regulatory or other programs of the Commonwealth, including programs related to wetlands protection, groundwater protection, rare and endangered species' habitat, protected and managed lands and historic preservation. As evidenced by the above discussions and analyses, the proposed project along the preferred route would be generally consistent with the identified requirements of all such programs. Consequently, the Siting Board finds that the construction of the proposed project is consistent with current health, environmental protection, and resource use and development policies as adopted by the Commonwealth.

Accordingly, the Siting Board APPROVES the proposal of Colonial Gas Company, d/b/a KeySpan Energy Delivery New England to construct an approximately six-mile, 12-inch diameter gas pipeline in the Towns of Bourne, Sandwich and Falmouth using the preferred route, subject to the following condition:

The Siting Board directs the Company to refrain from all refueling and equipment-maintenance activities that have the potential for fluid spills when vehicles are in the field in Zone I or II areas.

Because the issues addressed in this decision are subject to change over time, construction of the proposed pipeline must commence 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 KeySpan 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. KeySpan 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.

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Selma Urman
Presiding Officer

Dated this 9th day of May, 2003

APPROVED by the Energy Facilities Siting Board at its meeting of May 8, 2003, by the members and designees present and voting: Paul B. Vasington (Chairman, DTE/EFSB); Deirdre K. Manning (Commissioner, DTE); David L. O'Connor (Commissioner, Division of Energy Resources); Stephen Pritchard (for Ellen Roy Herzfelder, Secretary of Environmental Affairs); and Joseph Donovan (for Barbara B. Berke, Director of Economic Development).

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Paul B. Vasington, Chairman
Energy Facilities Siting Board

Dated this 8th day of May, 2003.

Appeal as to matters of law from any final decision, order or ruling of the Siting Board may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the order of the Siting Board be modified or set aside in whole or in part.

Such petition for appeal shall be filed with the Siting Board within twenty days after the date of service of the decision, order or ruling of the Siting Board, or within such further time as the Siting Board may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the clerk of said court. (Massachusetts General Laws, Chapter 25, Sec. 5; Chapter 164, Sec. 69P).